



**FAO-BASED RESPONSIBLE FISHERY MANAGEMENT CERTIFICATION
1st SURVEILLANCE REPORT**

For The
Alaska Pollock Commercial Fisheries

Facilitated By the
Alaska Seafood Marketing Institute

February 2013

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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 (*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 **1st Surveillance Report (ref: AK/POL/001.1/2012)** 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 full assessment) 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. Non non conformances were identified during either the full or the 1st surveillance assessment. Consequently, no corrective action plans were issued.

The certification covers the Alaska pollock (*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

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1. Introduction

This Surveillance Report documents the 1st Surveillance Assessment (2012) of the Alaska pollock commercial federal and state fisheries originally certified on December 6th 2011, and presents the recommendation of the Assessment Team and the Certification Committee for continued FAO-Based RFM Certification.

Unit of Certification

The Alaska pollock (or walleye pollock) (*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 1st surveillance assessment against the requirements of the FAO-Based RFM Conformance Criteria Version 1.2 Fundamental clauses.

This 1st 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 1st Surveillance Assessment, in 2012, 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 (*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			
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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
Walleye pollock (<i>Theragra chalcogramma</i>)	Gulf of Alaska and Bering Sea & Aleutian Islands	Pelagic trawl Gears (bottom trawl, jig, longline, pot) from other non-directed pollock fisheries legally landing pollock	National Marine Fisheries Service (NMFS) North Pacific Fishery Management Council (NPFMC) Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)

4. Surveillance Meetings

Date	Organization	Meetings attended
December 5 th - 8 th 2012.	North Pacific Fisheries Management Council, December 2012 Meeting, Anchorage.	<ul style="list-style-type: none"> - Groundfish Specifications <ul style="list-style-type: none"> (a) Review Salmon Excluder EFP application. (b) Adopt final harvest specifications (2013 fishing season) for GOA groundfish. (c) Adopt final harvest specifications (2013 fishing season) for BSAI groundfish. - Salmon PSC <ul style="list-style-type: none"> (a) Update on salmon genetics. Postponed (b) Initial review of BSAI chum salmon bycatch measures. (c) Initial review of GOA Chinook bycatch measures for all trawl fisheries. - Steller Sea Lion Mitigation Identify Alternatives for SSL EIS Analysis.

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. The NPFMC and the BOF actively encourages stakeholder participation, and all 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 (Magnuson Stevens Act, MSA) is the primary domestic legislation governing 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. 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 regulation 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 e-landing (electronic fish tickets) catch recording system and secondly collected by vessel captains in voluntary and required logbooks. Fishery independent data are collected in regular surveys of both the GOA and BSAI regions and by the extensive observer coverage in both regions. A summer acoustic trawl is carried out annually, alternating between the GOA and EBS fisheries. 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. Survey data for the Gulf of Alaska fishery was more limited than usual in*

- 2011 due to a combination of weather, personnel and maintenance factors. 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 complex and multi-faceted in order 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 categorised as tier 1a while the GOA pollock stock is categorised 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 categorised (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 $(0.05 \times B_{MSY})$, and (c) indicating a stock where biomass is below $(0.05 \times B_{MSY})$. 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 Alaska 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 OY in the GOA is currently 116,000 to 800,000 mt, and in the BSAI is 1,400,000 to 2,000,000 mt. 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, and the more conservatively catch limits are set. At present the GOA pollock fishery is 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 (F_{msy}). 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 managing 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 NPFMC 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 (also known as habitat protection, 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)). Based on this evidence, the assessment team concludes that the NPFMC harvest control system represents a complex and multi-faceted suite of management measures sufficient to address issues related to sustainability, legislative mandates, and quality of information.*
- 9. Fishery managers aim to consider concepts such as productivity and MSY in terms of the groundfish fishery as a unit rather than for individual stocks or stock complexes; however due to the difficulty of estimating the parameters that govern interactions between species, estimates of MSY for the groundfish fisheries have sometimes been computed by summing MSY estimates for the individual stocks and stock complexes. The Optimum Yield (OY) of the groundfish fisheries in the GOA and BSAI management regions is based on historical MSY values for the groundfish complex as a whole. Additionally, stock-specific MSY values or proxies are used in the annual calculation of OFL, ABC, and TAC for each species, including walleye pollock. The quota-setting system described under clause 7 ensures that sustainable, precautionary levels of fishing are maintained whatever the level of scientific understanding of the stock.*
- 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 a vessel monitoring systems (VMS) on board vessels and USCG boardings and inspection activities. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce fisheries laws and regulations. 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 on pollock and associated species and their habitats. Findings and conclusions are published in SAFE document, annual Ecosystem Considerations documents, and other research reports. The SAFE documents for BSAI and GOA pollock summarize ecosystem considerations for the stocks. They include sections for 1) Ecosystem effects on the stock; and 2) Effects of the pollock fishery on the ecosystem. SAFE reports also describe results of first-order trophic interactions for pollock from the ECOPATH model, an ecosystem modelling software package. 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 minimise 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 (*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 Willim 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 MSA provides the primary layer of governance for the federal Alaska pollock fisheries. The main agencies involved in pollock management within Alaska's EEZ (NMFS, NPFMC), and all of their activities and decisions, are subject to the MSA. The MSA, as amended last on January 12th 2007, sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all Fishery Management Plan (FMP) must be consistent.

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

The FMPs, more specifically, 1) the GOA Groundfish FMP, and 2) the BSAI Groundfish FMP govern the management of the pollock federal fisheries. In federal waters (3-200 nm), Alaska pollock fisheries are managed by the NPFMC and the NMFS Alaska Region. 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, NMFS Alaska Regional Office conducts biological studies, stock survey and 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 USCG is responsible for enforcing these FMPs at sea, in conjunction with NMFS 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 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). The current amount is 2.5% of the GOA 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. Typically, ADFG surveys of pollock in PWS are used to set the GHL, which then becomes a fraction of the federal ABC for the GOA. While the State of Alaska mostly adopts complimentary regulations, even imposing an annual State Emergency Order that adopts federal Regulations in most instances, state regulations are used to manage 0-3 nm & inside waters and are not subject to MSA.

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. 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)

The United States and Russian Federation maintain the bilateral Intergovernmental Consultative Committee (ICC) fisheries forum pursuant to the U.S.-Soviet Comprehensive Fisheries Agreement, signed on May 31, 1988. The ICC is responsible for furthering the objectives of the Comprehensive Fisheries Agreement. The objectives of the Agreement include maintaining a mutually beneficial and equitable fisheries relationship through cooperative scientific research and exchanges; reciprocal allocation of surplus fish within the respective 200-mile Exclusive Economic Zones (EEZs), consistent with national laws; cooperation and the establishment of joint fishing ventures; general consultations on fisheries matters of mutual concern; and cooperation to address illegal fishing on the high seas of the North Pacific and the Bering Sea. These meetings have also resulted in US vessels doing acoustical surveys with Russian Federation scientists in the Federation's zone of the Bering Sea.

XXIII Session of the Russia-USA Intergovernmental Consultative Committee (ICC)

At the 23rd session of the Russia-USA Intergovernmental Consultative Committee (ICC), held in St. Petersburg (Russia) on 5th to 7th September 2012, the delegations exchanged data of Pollock stock surveys in the Bering Sea, for stock management in this area. The parties also presented survey information on stocks status of commercial crabs, salmon and marine mammals.

It was confirmed at the session that the ICC members intend to complete long term work on preparation of new Comprehensive Agreement on fishing and conservation of living resources in the northern Bering Sea, an Agreement of cooperation in the enforcement of legislation regulating the fishery, an Agreement to prevent illegal fishing, an Arctic Fisheries Agreement, and have agreed that drafts of these agreements will be prepared in the interim period.

The Russian and US delegations noted the positive trend of the expansion of cooperation in fisheries research between TINRO-Centre (Russian Pacific Fishery Scientific Research Institute) and the Alaska Fisheries Science Centre, and shared the view of a significant potential for the cooperation development. Both parties will continue to work on the Joint research program for Pollock in the northern Bering Sea. According to the participants, the outcome of the XXIII session of the USA-Russia Intergovernmental Consultative Committee (ICC) on fisheries demonstrated the growing importance of active cooperation and communication within its framework for the development of mutually beneficial relations between Russia and the USA in the field of fisheries. The next, XXIV session of the ICC will be held in the USA around the 13th September 2013 in Washington, DC.

<http://pollock.ru/en/news-events/news/russia-and-the-us-discussed-the-bering-sea-pollock-stock-status.html>

The Donut Hole Convention Agreement

The Donut Hole convention agreement established responsibility for the conservation, management, and optimum utilization of pollock resources in the high seas area of the Bering Sea.

Member states (China, Japan, Korea, Poland, Russia, and the United States) have maintained a moratorium on commercial pollock fishing in the Convention Area since 1993 in an effort to allow the stock to rebuild.

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

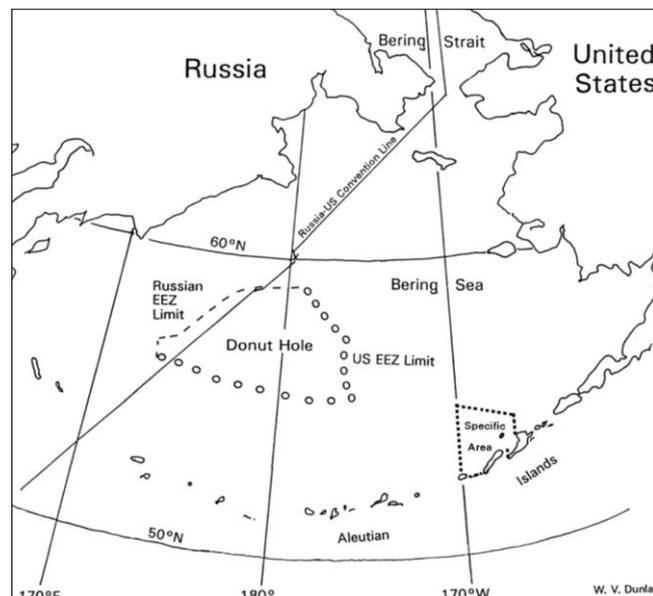


Figure 1. The Donut Hole area in the Bering Sea

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 semidemersal (i.e., semi-bottom dwelling) distributed from near the surface to depths of 500 m. In the BSAI region, three areas are identified for pollock management purposes. These include the eastern Bering Sea shelf, the Aleutian Islands Region and the Central Bering Sea - Bogoslof Island area. In late winter/early spring pollock form huge spawning aggregations, including those found in Shelikof Strait and the eastern Bering Sea northwest of Unimak Island. Smaller aggregations in the Gulf of Alaska include those at the Shumagin Islands, the entrance to Prince William Sound, and near Middleton Island. In summer, large aggregations have been found on the east side of Kodiak Island, nearshore along the southern Alaska Peninsula, and other areas. Pollock migrate seasonally between spawning and feeding areas. They feed on copepods, euphausiids, and fish, and are preyed on by other fish, marine mammals, and seabirds. 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. For the latest year of public data available, 2010, the Alaska EEZ contained 95% of the pollock stock. This

can be seen in Figure 2 as reported in the document “Results of the Acoustic-Trawl Survey of Walleye Pollock (*Theragra chalcogramma*) on the U.S. and Russian Bering Sea Shelf in June - August 2010 (DY1006)” (<http://www.afsc.noaa.gov/Publications/ProcRpt/PR2012-01.pdf>).

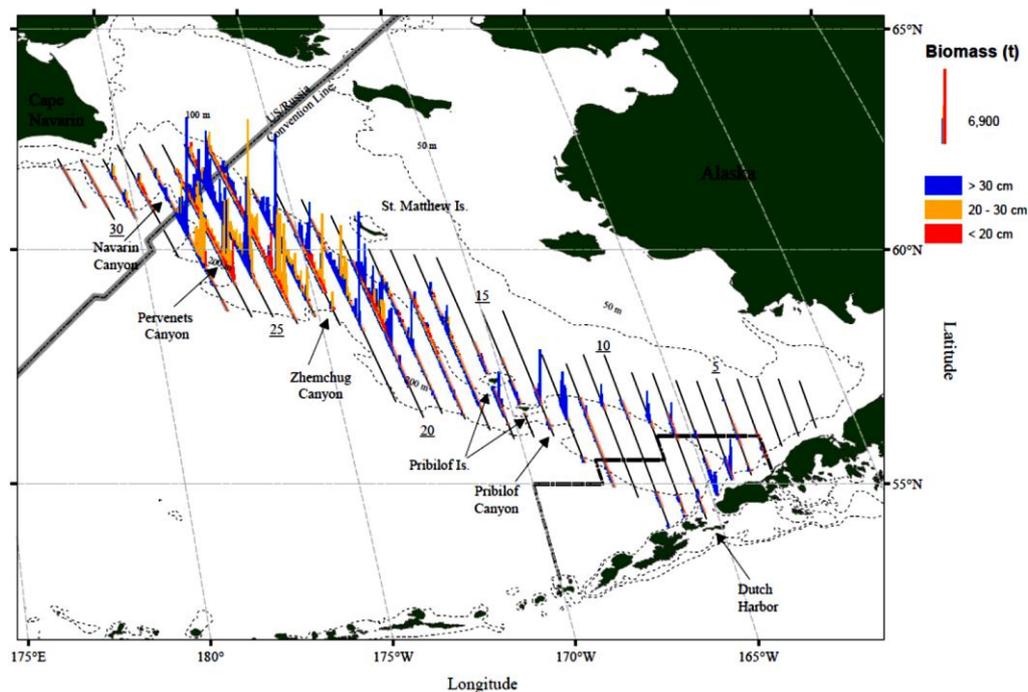


Figure 2. Estimated juvenile and adult (< 20 cm, red; 20-30 cm, yellow; >30 cm, blue) walleye pollock biomass by 0.5 nmi interval for the summer 2010 acoustic-trawl survey (16 m from the surface to 3 m off bottom). Transect numbers are underlined, and the Steller sea lion Conservation Area (SCA) is outlined (dashed line).

Table 1. Estimated numbers and biomass of walleye pollock observed between near surface and 0.5 m off bottom from Bering Sea acoustic-trawl surveys in the United States and 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			

These surveys are largely carried out by the U.S. (apart in 2002 by Russia). Stock assessments used for U.S. management (setting the upper limit of the TAC) have considered this migration and possible removals using sensitivity analyses. Results of these 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 minor 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://www.fakr.noaa.gov/npfmc/>

<http://www.fakr.noaa.gov/>

<http://www.uscg.mil/hq/cg5/cg531/LMR.asp>

<http://www.afsc.noaa.gov/REFM/docs/2011/EBSpollock.pdf>

<http://www.afsc.noaa.gov/REFM/docs/2011/GOApollock.pdf>

<http://www.fakr.noaa.gov/npfmc/fishery-management-plans/goa-groundfish.html>

<http://www.fakr.noaa.gov/npfmc/fishery-management-plans/bsai-groundfish.html>

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

<http://www.dps.alaska.gov/awt/Marine.aspx>

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 planning and managing coastal developments in a transparent, organized and sustainable way. The NPFMC and the BOF actively encourages stakeholder participation, and all 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 and are accounted for (<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 all their deliberations are conducted in open, public sessions. Effectively, these meetings provide forums for avoidance and resolution of potential fisheries conflicts. In addition, stakeholders may review and submit written comments to the NMFS on proposed rules published in the Federal Register.

Monitoring the coastal zone

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

Conclusion

The assessment team agrees that the collectivity of 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 coastal 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=habitatresearch.main>

<http://dec.alaska.gov/water/MoreAboutWater.htm>

<http://www.fakr.noaa.gov/ram/>

<http://dnr.alaska.gov/commis/opmp/anilca/anilca.htm>

<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 (Magnuson Stevens Act, MSA) is the primary domestic legislation governing 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. 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 regulation 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.

<http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOApdf>

<http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIpdf>

Changes of notice to the GOA and BSAI FMPs: restructuring of the observer program.

In order to achieve the management objectives, in the October 2010 NPFMC Public Review Draft "Restructuring the Program for Observer Procurement and Deployment in the North Pacific", the Council approved the restructuring the Observer Program. The NMFS announced to the NPFMC on June 7th 2012 the approval of amendment 86 to the FMP for Groundfish of the BSAI Management

Area and Amendment 76 to the FMP for Groundfish of the GOA (RIN 0648-BB42). These amendments restructure the funding and deployment system for observers in the North Pacific groundfish fisheries and include vessels less than 60 feet in length and halibut vessels in the North Pacific Groundfish Observer Program, in compliance with the MSA.

This program will improve the GOA estimates of bycatch as vessels in this Region tend to be smaller in length than in the BSAI and have subsequently, in the past, been subjected to an overall lower observer coverage. NOAA Fisheries is providing the \$3.8 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. The restructured observer program has been deployed starting January 2013, as planned and formally communicated in 2012.

<http://www.fakr.noaa.gov/newsreleases/2012/observers041212.htm>

<http://www.fakr.noaa.gov/notice/77fr29961.pdf>

<http://www.st.nmfs.noaa.gov/observer-home/regions/northpacific/north-pacific-alaska>

<http://www.afsc.noaa.gov/FMA/default.htm>

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.

[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://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>

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 e-landing (electronic fish tickets) catch recording system and secondly collected by vessel captains in voluntary and required logbooks. Fishery independent data are collected in regular surveys of both the GOA and BSAI regions and by the extensive observer coverage in both regions. A summer acoustic trawl is carried out annually, alternating between the GOA and EBS fisheries. 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. Survey data for the Gulf of Alaska fishery was more limited than usual in 2011 due to a combination of weather, personnel and maintenance factors. 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).

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
Shelikof straight egg production biomass estimate	Biomass estimate	1981, 1985-1992
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 estimates, size and age composition	Annual
Landings data	Total landings, size and age composition	Annual

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 gears 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

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 and ADFG fish tickets and more recently the electronic eLandings system.

The catches used in the Alaskan pollock stock assessment include catches from the federal BSAI and GOA federal fisheries as well as the state-managed PWS pollock fishery, which are reported on the eLandings reporting system. The eLandings 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 shorebased 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. The observer program in Alaska has

been restructured to cover smaller vessel previously uncovered, starting January 2013. The new program will likely accrue more specific data for bycatch species and levels in the GOA. The observer coverage in the BSAI area is virtually 100%, while that of the GOA is of about 30%.

The GOA pollock fishery is conducted entirely by catcher vessels under 125 feet in length. Vessels over 60 feet are required to carry observers and only 30% of their fishing effort is observed. Vessels under 60 feet in length, starting January 2013, as part of the restructured North Pacific Groundfish observer programme are required also to carry partial observer coverage (e.g. trip selection). Small do not sort their catch onboard for safety reasons. Instead, the catches are either pumped directly to other carriers or placed directly into the catcher vessel hold. The catches are then examined when landed at shoreside plants where there is 100% observer coverage.

Catch data

Table 4. Walleye pollock catch (t) in the Gulf of Alaska. The TAC for 2011 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 (1650 t).

<i>Year</i>	<i>Foreign</i>	<i>Joint Venture</i>	<i>Domestic</i>	<i>Total</i>	<i>TAC</i>
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			88,620

Average (1977-2010) 102,519 117,775

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). 1991-2010 --NMFS Alaska Regional Office.

The catches for 2011 were of 81,307 t in the GOA, in line with TAC specifications.

Table 5. Catch from the Eastern Bering Sea by area, the Aleutian Islands, the Donut Hole, and the Bogoslof Island area, 1979-2011 (2011 values preliminary). The southeast area refers to the EBS region east of 170°W; the Northwest is west of 170°W.

Year	Eastern Bering Sea			Aleutians	Donut Hole	Bogoslof I.
	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		
2009	356,258	451,688	807,947			

2010	253,935	555,013	808,948
2011	445,239	726,483	1,171,722
Average	757,848	422,166	1,180,014
	64%	36%	

1979-1989 data are from Pacfin.

1990-2011 data are from NMFS Alaska Regional Office, and includes discards.

2011 EBS catch is preliminary

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 the 2011 survey were not available at the time of the 2011 SAFE assessment; however 1,554 individuals were aged in the 2009 survey.

Shelikof straight acoustic survey

The Shelikof straight acoustic survey has been conducted annually in almost every year since 1981 (excluding 1982 and 1999), although it was not conducted in 2011 due to scheduled repairs to the research vessel. 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. Historically the biomass in the Shelikof straight area was estimated using the egg production method, and where they are considered reliable these estimates are included in the stock assessment model.

Winter acoustic pollock survey

The winter acoustic trawl survey is conducted in the GOA biennially, being conducted in alternate years in the EBS region. In 2011 the survey was conducted in the GOA, although equipment failure, crew injuries and staffing issues prevented the completion of the survey process. For this reason the results of the 2011 survey were not considered for inclusion in the 2011 SAFE assessment model.

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 is used in the assessment.

Table 6. Summary of historical biomass estimates (t) of walleye pollock in the GOA from NMFS echo integration trawl surveys in Shelikof Strait, NMFS bottom trawl surveys (west of 140 W. long.), egg production surveys in Shelikof Strait, and ADFG crab/groundfish trawl survey From the 2011 GOA

pollock SAFE.

<i>Shelikof Strait acoustic survey</i>						
<i>Year</i>	<i>R/V Miller Freeman</i>		<i>R/V Oscar Dyson</i>	<i>NMFS bottom trawl west of 140° W lon.</i>	<i>Shelikof Strait egg production</i>	<i>ADF&G crab/groundfish survey</i>
	<i>Biosonics</i>	<i>EK500</i>				
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		649,401				
1996		777,172		666,521		122,477
1997		583,017				93,728
1998		504,774				81,215
1999				607,409		53,587
2000		391,327				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		338,038		358,017		79,089
2006		293,609				69,044
2007		180,881		282,356		76,674
2008			188,942			83,476
2009			265,971	669,505		145,438
2010			429,730			124,110
2011				667,131		100,839

Cooperative research acoustic surveys

Though not included in the 2011 SAFE assessment model, a series of surveys were conducted 2007 – 2011 by the AFSC in cooperation with a commercial fishing vessel in the Western Gulf of Alaska, with the initial aim of evaluating the feasibility of conducting acoustic-trawl surveys of pollock using local fishing vessels. A number of additional objectives were then completed, and the results published in July 2012. These results are likely to inform future developments in the data collection and stock assessment process.

Eastern Bering Sea

Eastern Bering Sea Continental shelf bottom trawl survey

Conducted annually by the AFSC since 1971, and with consistent gears since 1982, the 2011 shelf trawl survey conducted 381 trawls over an area of a little under 500,000 km². The survey collected 36,277 length measurements, 1,760 age estimates and 2,016 stomach contents analyses from pollock individuals, in addition to CPUE and total biomass estimates.

The 2011 biomass estimate was 3.11 million t, a drop of 17% from the 2010 value (3.75 million t) and 35% below the mean value for this survey (4.77 million t).

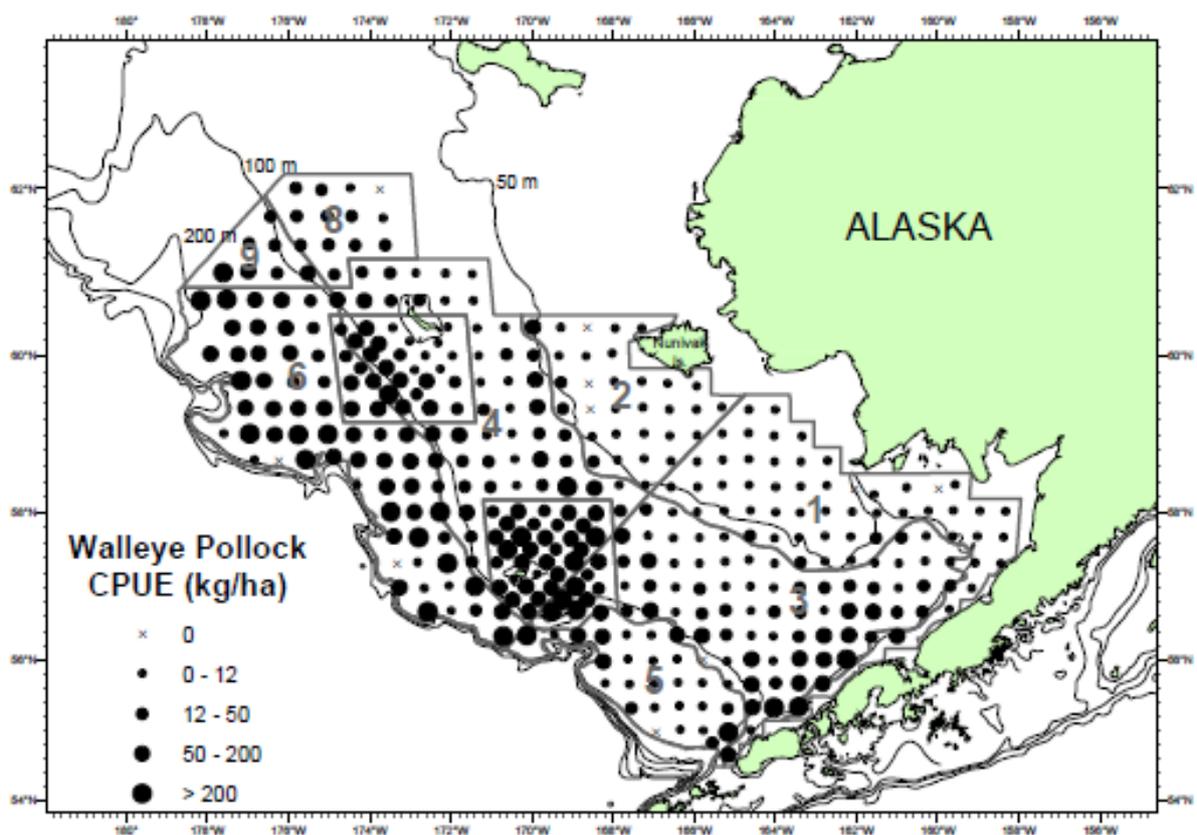
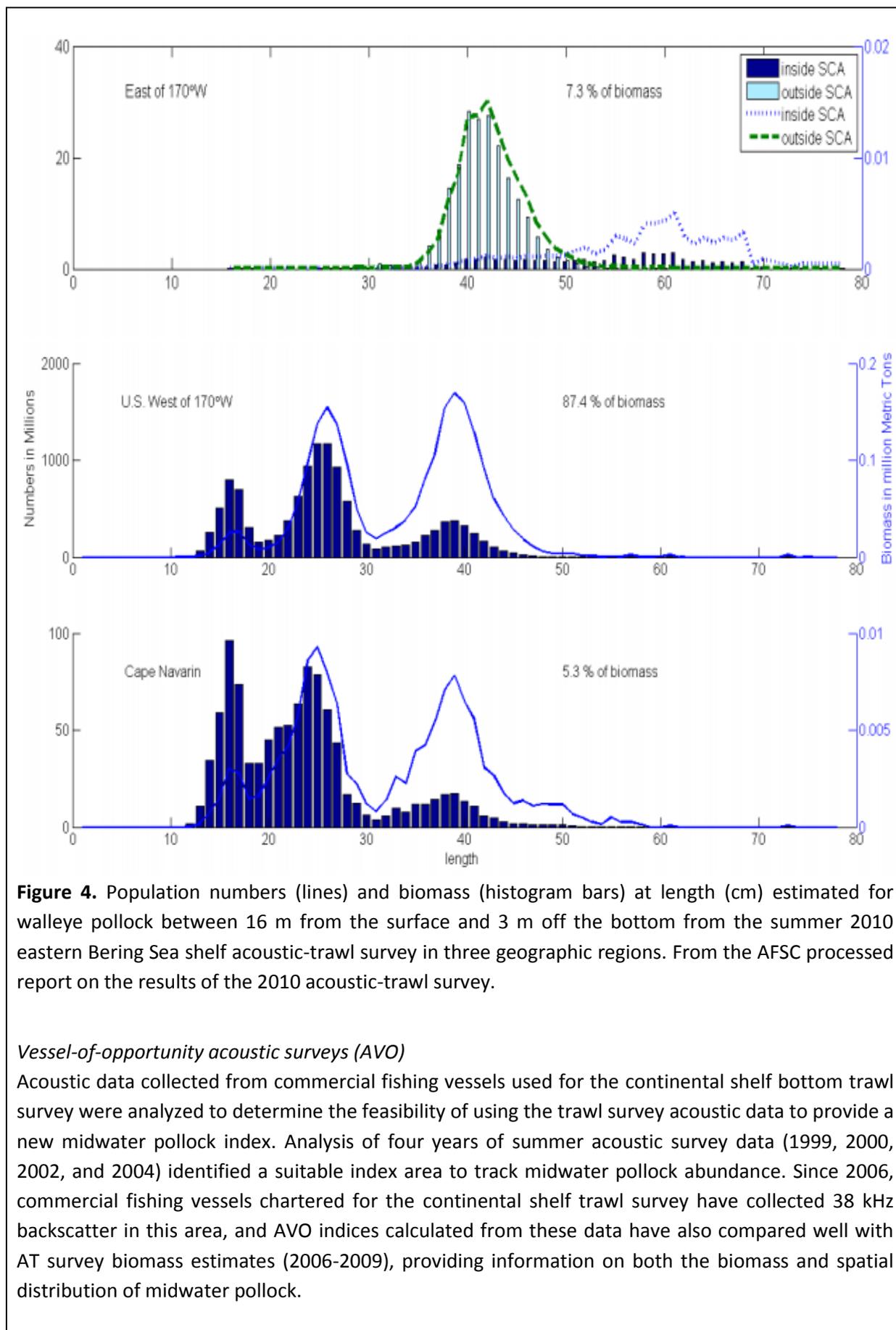


Figure 3. Catch rates (kg/ha) of walleye pollock during the 2011 shelf bottom trawl survey. From the Cruise Synopsis for the Eastern Bering Sea Continental Shelf Bottom Trawl Survey of Groundfish and Invertebrate Resources.

Summer acoustic pollock survey

The summer acoustic trawl survey is normally conducted in the EBS biennially, being conducted in alternate years in the GOA region. From 2006-2010 the survey was conducted annually due to additional funding for BSIERP research. The most recent survey was conducted in 2012. The summer acoustic survey also collects age composition data.



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.

Bering-Aleutian Salmon International Survey (BASIS)

Since 2006, BASIS survey scientists have collected acoustic backscatter both in and outside of standard survey areas. 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.

Bogoslof Island

There was no new Bogoslof pollock echo integration-trawl (EIT) survey in 2011 nor in 2010. The most recent Bogoslof pollock EIT survey (in 2009) biomass estimate was 110,000 t. The Bogoslof fishery primarily targeted winter spawning aggregations but in 1992, this area was closed to directed pollock fishing, and still is to date. Updated estimates of pollock bycatch levels from other fisheries were small in recent years. The increase in pollock bycatch in the last two years (9.29 t in 2008 to 120.56 t in 2010) can be attributed to the nonpelagic trawl arrowtooth flounder target fishery.

Aleutian Islands

A total of 932 t and 1,100 t of pollock (survey catch) were harvested during 2006 and 2007 respectively, and biological data collected during the studies were treated in the stock assessment as fishery data. In 2008 additional surveys of Aleutian Islands region pollock in the same area were conducted on board the R/V Oscar Dyson and in cooperation with the F/V Muir Milach; the work was funded through a North Pacific Research Board grant and less than 10 t of groundfish were taken for the study. In 2009 the directed pollock fishery in the Aleutian Islands region took 403 t and 1,326 t were taken as bycatch in other fisheries, predominantly the Pacific cod and rockfish fisheries. In 2010 and 2011 financial problems with the Adak processing plant greatly hindered the directed fishery and as of October 8, 2011 0 t had been taken in the directed fishery while 1,141 t were taken as bycatch in other fisheries. Since 2005 the TAC has been constrained to 19,000 t or the ABC, whichever is lower, by statute.

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 GHF has been determined to be 2.5% of the GOA ABC.

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 NPFMC, the AFSC, and community stakeholder organizations have identified ongoing collection of community-level socio-economic information that is specifically related to commercial fisheries as a priority. To address this need, the AFSC's Economic and Social Sciences Research (ESSR) Program has been preparing the implementation of the Alaska Community Survey, an annual voluntary data collection program initially focused on Alaska communities for feasibility reasons, in order to improve the socio-economic data available for consideration in North Pacific fisheries management.

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. In addition to this, an "Economic SAFE" is produced yearly to assist the decision making processes at the federal and state level. The draft 2012 economic status report of the Stock Assessment and Fishery Evaluation (SAFE) Report for the North Pacific groundfish fisheries was recently prepared for the September 2012 Groundfish Plan Team meeting. The report presents information on various economic characteristics of the commercial groundfish fisheries in the BSAI and GOA regions, including harvest and processing activity; prohibited species catch; ex-vessel and first wholesale value; and fishing effort. The economic status reports are presented at the December meeting of the NPFMC.

Evidence

http://www.afsc.noaa.gov/refm/stocks/2011_assessments.htm
<http://www.afsc.noaa.gov/REFM/docs/2011/EBSpollock.pdf>
<http://www.afsc.noaa.gov/REFM/docs/2011/Alpollock.pdf>
<http://www.afsc.noaa.gov/REFM/docs/2011/BOGpollock.pdf>
<http://www.afsc.noaa.gov/REFM/docs/2011/GOApollock.pdf>
<http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-238.pdf>
<http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-227.pdf>
<http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-224.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 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 1961 to 2011 is used to assess Gulf of Alaska pollock, and includes individuals from age 2 to age 10. The same fundamental model structure and assumptions have been used since the 1999 assessment, although some minor changes have been implemented to deal with novel situations. Population dynamics are modeled using standard formulations for mortality and fishery catch. The 2011 SAFE assessment saw no significant changes in assessment methodology compared to 2010, although the lack of a 2011 winter acoustic survey increased the level of uncertainty.

Summary of changes in assessment inputs as reported in the December 2011 GOA pollock SAFE

Fishery: 2010 total catch and catch at age.

NMFS bottom trawl survey: 2011 biomass and length composition.

ADFG crab/groundfish trawl survey: 2011 biomass and length composition.

Results

The model projection of spawning biomass in 2012 was 227,723 t, which is 33.6% of unfished spawning biomass (based on average post-1977 recruitment) and below B40% (271,000 t). The 2012 ABC recommendation for pollock in the Gulf of Alaska west of 140° W was 108,440 t, an increase of 22% from the 2011 ABC. See the table below for a full summary of the SAFE assessment conclusions.

Quantity/Status	Last year		This year	
	2011	2012	2012	2013
<i>M</i> (natural mortality)	0.3	0.3	0.3	0.3
Specified/recommended Tier	3b	3b	3b	3b
Projected biomass (ages 3+)	893,700	988,580	863,840	926,890
Female spawning biomass (t)				
Projected	198,767	227,345	227,723	232,632
<i>B</i> _{100%}	690,000		678,000	
<i>B</i> _{40%}	276,000		271,000	
<i>B</i> _{35%}	242,000		237,000	
<i>F</i> _{OFL}	0.16	0.18	0.19	0.19
<i>maxF</i> _{ABC}	0.14	0.16	0.17	0.17
Specified/recommended <i>F</i> _{ABC}	0.12	0.14	0.14	0.15
Specified/recommended OFL (t)	118,030	151,030	143,720	155,400
Specified/recommended Max. Permissible ABC (t)	102,940	127,990	125,560	135,790
Specified/recommended ABC (t)	88,620	114,054	108,440	117,330
Is the stock being subjected to overfishing?	No		No	
Is the stock currently overfished?	No		No	
Is the stock approaching a condition of being overfished?	No		No	

<http://www.afsc.noaa.gov/REFM/docs/2011/GOApollock.pdf>

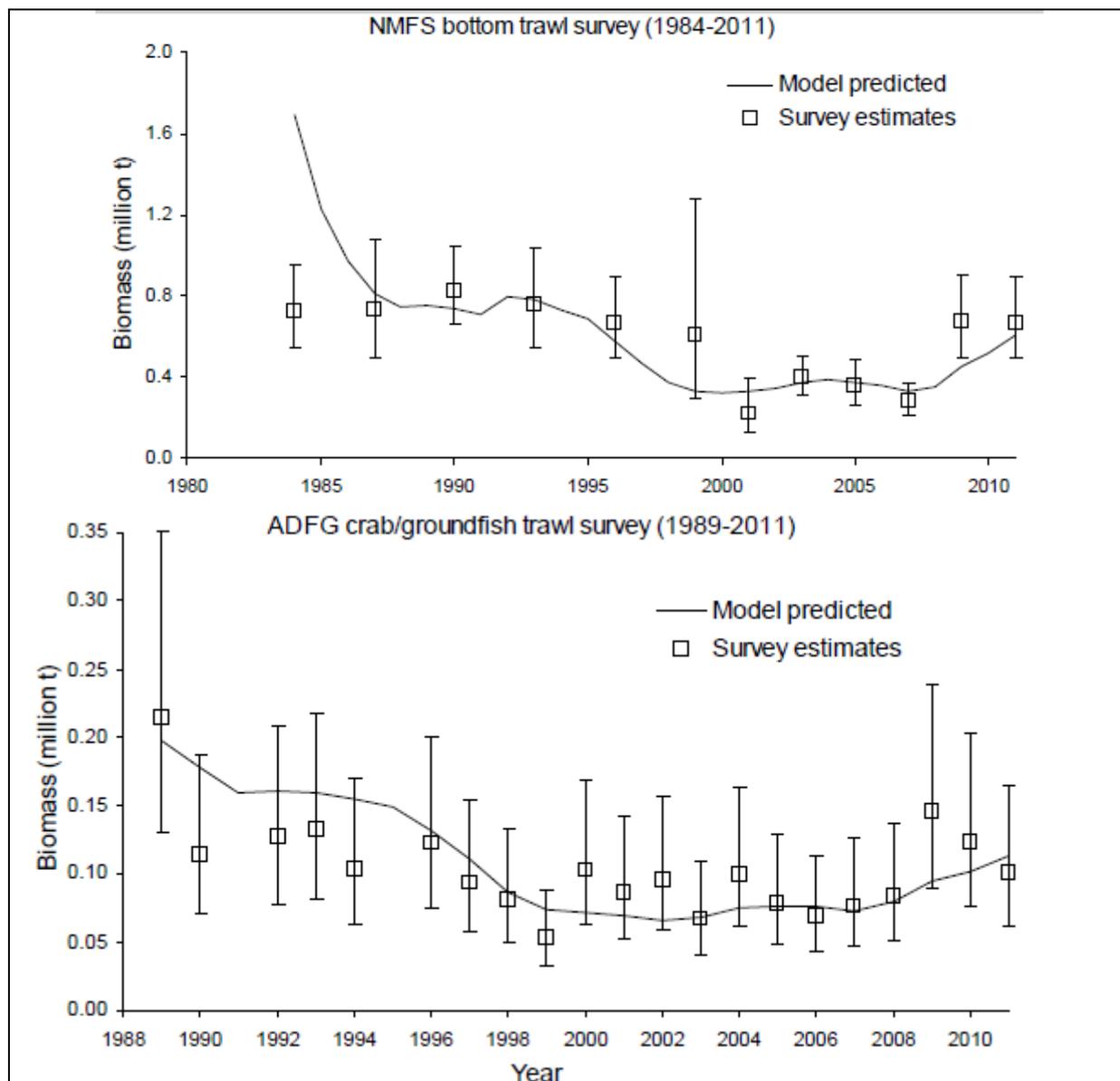


Figure 5. Biomass as predicted by the GOA stock assessment model and observed survey biomass for the NMFS bottom trawl survey (top), and ADFG crab/groundfish survey (bottom). Error bars indicate plus and minus two standard deviations. From the 2011 GOA SAFE report - <http://www.afsc.noaa.gov/REFM/docs/2011/GOApollock.pdf>

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, and produced recommendations of 10,774 t for the ABC and 14,366 t for the OFL in 2012.

Eastern Bering Sea

The EBS stock is assessed using a statistical age-structured assessment model applied over the period 1964-2011, an approach which has been used since 1996. The 2011 assessment saw no major changes in methodology, although an economic vector to weight relative costs and value by age

classes was developed as part of the model FMSY calculations for sensitivity.

Summary of major changes as reported in the Dec 2011 EBS pollock SAFE

The primary changes include:

- The 2011 NMFS summer bottom-trawl survey (BTS) abundance at age estimates were computed and included for this assessment.
- The 2010 age composition estimates were updated using AT age data (last year the age-length key used was derived from the 2010 BTS age data).
- Observer data for age and average weight-at-age from the 2010 fishery was finalized and formally included.
- Total catch as reported by NMFS Alaska Regional office was updated and included through 2011.
- The acoustic index from the bottom trawl survey vessels presented in 2010 was updated from 2006-2011. This index is derived from opportunistic acoustic recordings from the fishing vessels (so called acoustic vessels of opportunity or AVO index) chartered to conduct the bottom trawl survey and has been shown to be consistent with the AT survey data.

Results

The model projection of spawning biomass in 2012 was 2,379,000 t, which is above the B_{msy} value of 2,034,000 t. For a tier 1a stock this leads to a maximum 2012 ABC of 2,198,000 t and a maximum OFL of 2,474,000 t. However, the 2011 SAFE assessment recommended a 2012 ABC of 1,088,000 t to take into account additional uncertainties identified during the assessment process, particularly an apparent shift in pollock spatial distribution and potential recruitment variability. See the table below for a full summary of the 2011 SAFE assessment conclusions.

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2011	2012	2012	2013
<i>M</i> (natural mortality rate, ages 3+)	0.3	0.3	0.3	0.3
Tier	1a	1a	1a	1a
Projected total (age 3+) biomass (t)	9,620,000 t	11,318,000 t	8,341,000 t	8,690,000 t
Female spawning biomass (t)				
Projected	2,444,500 t	3,019,500 t	2,379,000 t	2,534,000 t
B_0	5,140,000 t	5,140,000 t	5,329,000 t	5,329,000 t
B_{MSY}	1,948,000 t	1,948,000 t	2,034,000 t	2,034,000 t
F_{OFL}	0.640	0.640	0.6	0.6
$maxF_{ABC}$	0.564	0.564	0.533	0.533
F_{ABC}	0.332	0.332	0.296	0.296
OFL (t)	2,447,000 t	3,170,000 t	2,474,000 t	2,842,000 t
maxABC (t)	2,154,000 t	2,255,000 t	2,198,000 t	2,526,000 t
ABC (t)	1,267,000 t	1,595,000 t	1,088,000 t	1,142,000 t
Status	As determined last year for:		As determined this year for:	
	2009	2010	2010	2011
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/2011/EBSpollock.pdf>

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. The 2011 assessment included no additional data over the 2010 assessment except the 2011 landings estimates; there were also some minor changes in the range of data included in the model. Two additional changes to the model were to reduce the natural mortality rate from 0.2 to 0.19, and a new approach to filling in missing weight-at-age data.

Results

The maximum permissible AI ABC for 2012 and 2013 (assuming the five year average catch in 2012) under Tier 3b are 32,454 t and 35,153 t, respectively. The OFL for 2012 and 2013 under Tier 3b are 39,607 t and 42,887 t respectively. However, since 2005 the TAC has been constrained to 19,000 t or the ABC, whichever is lower, by statute, and so the 2012 TAC remained at 19,000 t. See the table below for a full summary of the 2011 SAFE assessment conclusions.

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2011	2012	2012	2013*
<i>M</i> (natural mortality rate)	0.20		0.19	
Tier	3b		3b	
Projected total (age 2+) biomass (t)	298,034	366,107	250,905	285,228
Female spawning biomass (t)				
Projected	80,867	89,780	70,894	73,033
<i>B</i> _{100%}	270,774		234,074	
<i>B</i> _{40%}	108,310		93,630	
<i>B</i> _{35%}	94,771		81,926	
<i>F</i> _{OFL}	0.32	0.31	0.33	0.35
<i>maxF</i> _{ABC}	0.26	0.26	0.27	0.29
<i>F</i> _{ABC}	0.26	0.26	0.27	0.29
OFL (t)	44,497	43,295	39,607	42,887
maxABC (t)	36,668	35,617	32,454	35,153
ABC (t)	36,668	35,617	32,454	35,153
Status	As determined last year for:		As determined this year for:	
	2009	2010	2010	2011
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

* After 2012 catch of the five year average catch of 1,540 t. If the 2012 catch is max TAC of 19,000 t the 2013 projected total age 2+ biomass would be 269,894 t, the female spawning biomass would be **67,153** t, the maximum permissible ABC would be 29,324 t and the 2013 OFL would be 35,895 t. In which case the 2013 *F*_{OFL} would be 0.32 and the max *F*_{ABC} would be 0.26.

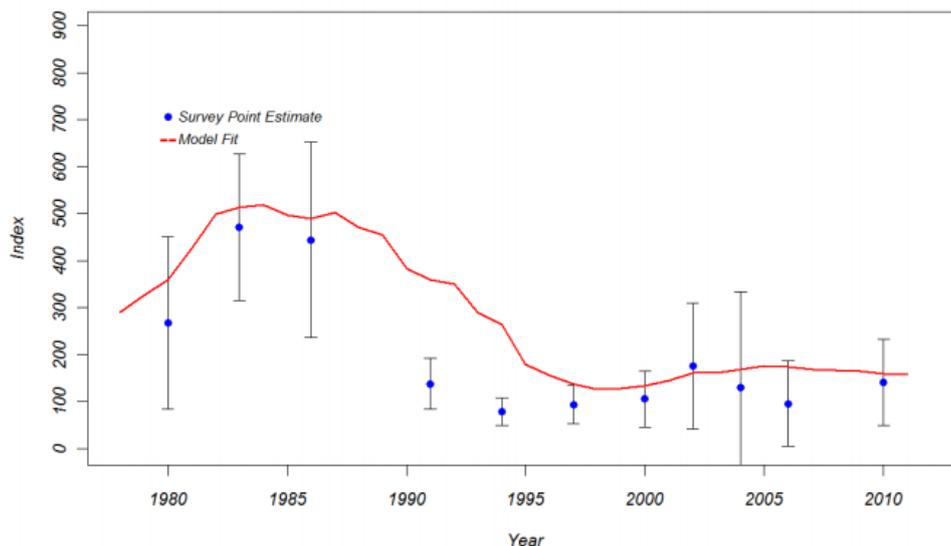


Figure 6. Aleutian Islands index as predicted by the stock assessment model (red line) and as estimated by NMFS summer bottom trawl survey (blue dots). From the 2011 AI SAFE report - <http://www.afsc.noaa.gov/REFM/docs/2011/AIpollock.pdf>

Bogoslof Island

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 the highest in recent years being the 140 t caught in 2011. Previous stock assessments have developed a full age-structured model; however the 2011 SAFE assessment produced ABC and OFL recommendations on a strictly survey-based management approach. Multiple methodologies were considered, with the final recommendation being the use of a straightforward Tier 5 calculation, i.e.:

$$ABC = B_{2009} \times M \times 0.75 = 110,000 \times 0.2 \times 0.75 = 16,500 \text{ t.}$$

Results

The 2011 SAFE report recommendations for the Bogoslof Island pollock fishery are summarised in the table below.

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2011	2012	2012	2013
M (natural mortality rate)	0.2	0.2	0.2	0.2
Tier	5	5	5	5
Biomass (t)	110,000	110,000	110,000	110,000
F _{OFL}	0.2	0.2	0.200	0.200
maxF _{ABC}	0.15	0.15	0.150	0.150
F _{ABC}	0.00141	0.00141	0.150	0.150
OFL (t)	22,000	22,000	22,000	22,000
maxABC (t)	16,500	16,500	16,500	16,500
ABC (t)	156	156	16,500	16,500
Status	As determined last year for:		As determined this year for:	
	2009	2010	2010	2011
Overfishing	No	n/a	No	n/a

Bogoslof Island pollock stock assessment summary table, from the 2011 BI SAFE report - <http://www.afsc.noaa.gov/REFM/docs/2011/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 by ADF&G conducted bottom trawl and hydroacoustic surveys. Although the stock is assessed independently, pollock catches in the PWS fishery are included in GOA stock assessment models, and the state-set PWS GHLL is subtracted from the ABC of the broader GOA stock.

Evidence

http://www.afsc.noaa.gov/refm/stocks/2011_assessments.htm

<http://www.afsc.noaa.gov/REFM/docs/2011/EBSpollock.pdf>

<http://www.afsc.noaa.gov/REFM/docs/2011/Alpollock.pdf>

<http://www.afsc.noaa.gov/REFM/docs/2011/BOGpollock.pdf>

<http://www.afsc.noaa.gov/REFM/docs/2011/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 target. Remedial actions shall be available and taken where reference point or other suitable proxies are approached or exceeded.

*FAO CCRF 7.5.2/7.5.3
Eco 29.2/29.2bis/30-30.2*

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 categorised as tier 1a while the GOA pollock stock is categorised 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 categorised (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 $(0.05 \times B_{MSY})$, and (c) indicating a stock where biomass is below $(0.05 \times B_{MSY})$. 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 BI pollock

The 2012 EBS pollock spawning biomass was projected by the 2011 SAFE to be 2,379,000 t (at the

time of spawning, assuming the stock is fished at recommended ABC level). This is above the B_{MSY} value of 2,034,000 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: <i>Reliable point estimates of B and B_{MSY} and reliable pdf of F_{MSY}.</i>
	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: $B/B_{MSY} \leq \alpha$ $F_{OFL} = 0$ $F_{ABC} = 0$

Harvest control rules for Tier 1 stocks, where $\alpha = 0.05$ by default. From the 2011 BSAI SAFE report introduction.

The 2012 AI pollock spawning biomass was projected by the 2011 SAFE to be 70,894 t, which is below the $B_{40\%}$ (the B_{MSY} proxy in tier 3 stocks) of 93,630 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: <i>Reliable point estimates of B, $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.</i>
	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: $B/B_{40\%} \leq \alpha$ $F_{OFL} = 0$ $F_{ABC} = 0$

Harvest control rules for Tier 3 stocks, where $\alpha = 0.05$ by default. From the 2011 BSAI SAFE report introduction.

The 2012 Bogoslof Island spawning biomass was projected by the 2011 SAFE to be 110,000 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: <i>Reliable point estimates of B and natural mortality rate M.</i>
	$F_{OFL} = M$ $F_{ABC} \leq 0.75 \times M$

Harvest control rule for Tier 5 stocks. From the 2011 BSAI SAFE report introduction.

GOA pollock stock

The 2012 GOA pollock spawning biomass was projected by the 2011 SAFE to be 227,723t, which is below the $B_{40\%}$ of 271,000t. This places the stock into tier 3b – see the AI pollock section above for the tier 3 harvest control rules.

Overfishing and overfished determinations.

Neither of the EBS, AI, BI or GOA pollock management units is 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 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.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/213134838.pdf>

<http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/119185000.pdf>

<http://www.seafa.org/?p=1580>

<http://www.alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAI.pdf>

<http://www.alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA.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 Alaska 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 OY in the GOA is currently 116,000 to 800,000 mt, and in the BSAI is 1,400,000 to 2,000,000 mt. 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, and the more conservatively catch limits are set. At present the GOA pollock fishery is 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 groundfish FMPs define OY as the amount of fish prescribed as being most beneficial to land on the basis of the MSY from the fishery, as reduced by any relevant economic, social, or ecological factor. In the case of overfished fisheries, the OY provides for rebuilding to a level consistent with producing the MSY. In practice, the groundfish OY for each management region is set in relation to historical estimates of MSY and landings when groundfish stocks were less robust. Trawl assessment surveys indicate 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. For this reason, the upper limit of the OY is a cap which assures a precautionary approach.

The GOA groundfish complex OY is 116,000 to 800,000 mt, and was established in 1987 by FMP amendment. The minimum value is approximately equal to the lowest annual catch between 1965-1985, and the maximum is derived from MSY information for the period 1983-1987. The BSAI groundfish complex OY is 1,400,000 to 2,000,000 mt and was established in 1981. These values were

derived from historical MSY estimates for the stock reduced by 15%, with the reduction implemented for a range of reasons including ecological.

The sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within the OY range; however, in practice, only the upper limit has been used to restrict quotas. The OY range ensures that total fishery removals across each groundfish fishery are limited by the MSY of the groundfish complexes.

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

In tiers 1-5 the MFMT is applied to the best estimate of stock size (which, depending on tier, may or may not be age structured) for the coming year to produce the OFL, which is expressed in units of catch biomass. In the case of Tier 6, the MFMT is already expressed in units of catch biomass, meaning that the MFMT and the OFL are identical. Specification of ABC is similar to specification of OFL, in that both involve harvest control rules with six tiers relating to various levels of information availability. However, somewhat more flexibility is allowed in specifying ABC, in that the control rule prescribes only an upper bound. The ACL is equal to the ABC for each target stock and stock complex in the groundfish management plan. The TAC for each stock is set equal to or lower than the ABC, based on biological and socioeconomic information. The sum of all TACs in each management region must not exceed the upper boundary of the OY, as described above. TACs can be further divided by season or geographical area; see section 8 for specifics in the case of pollock. The attainment of a TAC for a species results in the closure of the targeted fishery for that species.

The Alaska pollock 2012 total allowable catches have been conservative in all the stock regions (see ABC vs OFL for EBS, AIBI 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. The EBS ABC for 2012 has in fact been set at 1.088.000 t, despite a *MaxABC* of almost 2.2 million tonnes.

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. The targeted fishery is usually closed before the TAC is reached, allowing for other fisheries to continue catching the species as bycatch without exceeding the TAC. Closure of a directed fishery limits retention of that species caught as bycatch to a maximum retainable amount (MRA). The MRA is expressed as a percentage of an alternate target fishery. The MRA is reduced to zero if the total TAC for the bycatch species is caught

before the end of the year. Prohibiting retention removes any incentive to increase incidental catch as a portion of other fisheries. If the ABC is taken and the trajectory of catch indicates the OFL may be approached, additional closures are imposed. Initially, specific fisheries identified by gear and area to incur the greatest incidental catch are closed. Closures then expand to other fisheries if the rate of take is not sufficiently slowed. This process is the NPFMC's management approach to deal with risk assessment and uncertainty.

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 pollock in the Gulf of Alaska are considered one stock, pollock in Prince William Sound are not assessed by NMFS trawl surveys; though in two recent years they have assisted 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://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA.pdf>

<http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAI.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 managing 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 NPFMC 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 (also known as habitat protection, 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. After more than \$100 million in research directed at SSL and fishery interactions, no linkage could be found between pollock fishing and declines in SSL, or reasons for lack of recovery in some areas. 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 km² (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).

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 standard 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 NPFMC is currently developing a separate program for managing the bycatch of chum salmon in the Bering Sea Pollock fishery. 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, hard caps and RHS regulations. The NPFMC will continue to review and take action on new chum salmon bycatch measures in 2012 and 2013.

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 would cause NMFS to close the directed pollock fishery in the Central or Western regulatory areas of the GOA, if the applicable limit is reached. 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>).

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 behaviour 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. The NPFMC approved John Gauvin's application to test the excluder on Dec. 5, 2012, at the recommendation of both the Scientific and Statistical Commission, and the Advisory Panel. The council's motion allows researchers to solicit two vessels to conduct the research that will be exempted from the regular pollock fishery and hard cap for prohibited species catch. That is necessary so that the research can fully determine how many salmon are excluded from the tow, how many are caught, and how pollock fare. Testing will likely begin in March 2013. The vessels ranging in size from less than 60 feet to 125 feet will be chosen by NOAA after applying, and will be used for two field seasons (<http://www.alaskajournal.com/Alaska-Journal-of-Commerce/January-Issue-4-2013/Spring-test-set-for-Gulf-salmon-excluders/>).

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.

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 updated 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, eLandings. 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 may be required to carry one or more observers for at least a portion of their fishing time. Observer requirements are based on vessel length.

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. In the past, observation has been carried out exclusively by physical on-board presence, but recent discussions may lead to the implementation of more electronic monitoring systems. This is particularly so in the GOA where smaller harvesting vessels participate. The NMFS is bringing a new strategic EM plan to the Council in June 2013. Other updates and changes to the observer program are also under consideration. Starting January 2013, the 60 feet and smaller vessels in the GOA is covered under partial observer requirements as part of the new restructured North Pacific Groundfish Observer Program.

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 the 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.

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 totalling 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 directed 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 7 shows the year round closures in Alaskan waters.

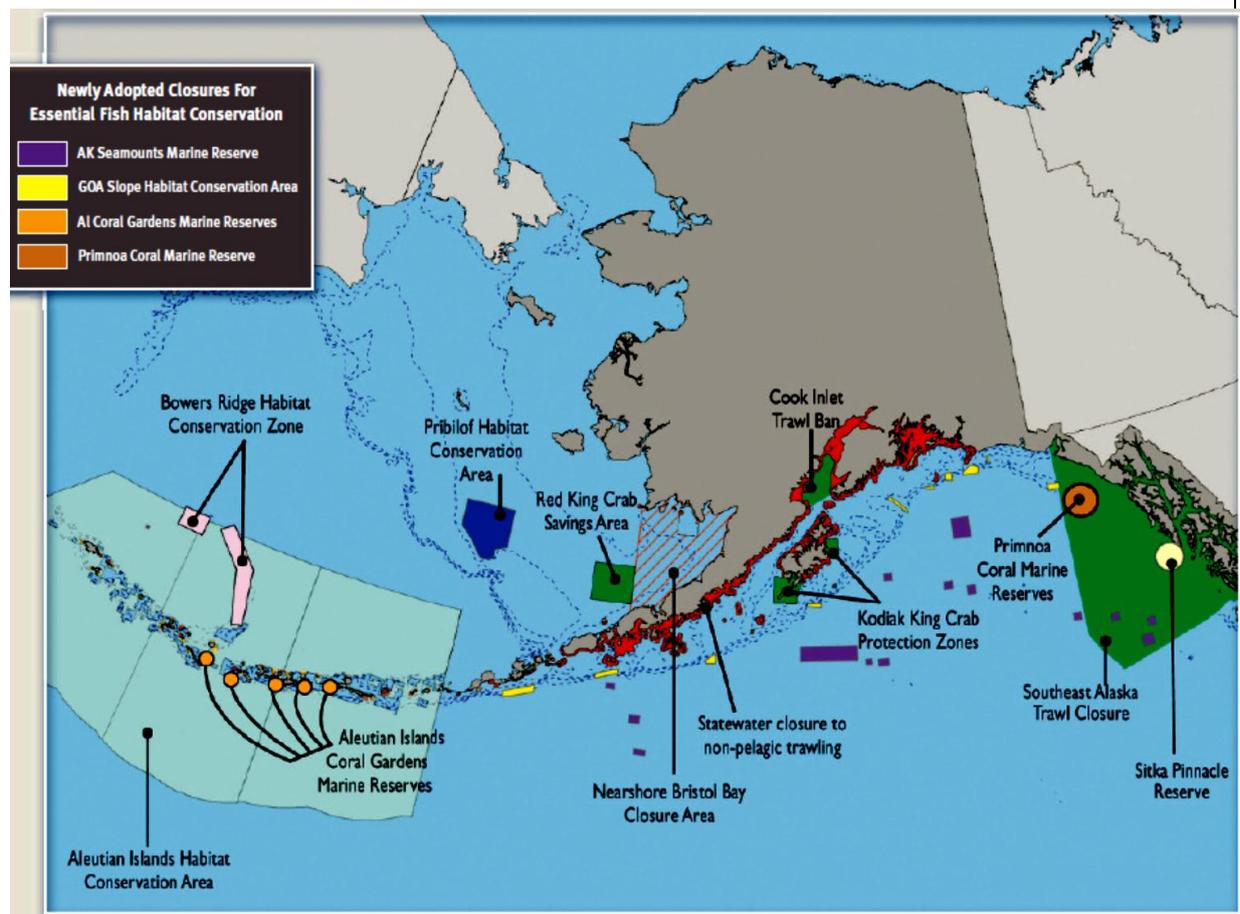


Figure 7. Year round area closures in Alaskan waters.

<https://alaskaseafood.org/sustainability/pdf/Marine%20Protected%20Areas%20Brochure.pdf>

Prohibited species

The following species are prohibited in both the GOA and BSAI groundfish fisheries and must be immediately returned to the sea if caught:

- Pacific halibut
- Pacific herring
- Pacific salmon
- Steelhead trout
- King crab
- Tanner crab (both *C. bairdi* and *C. opilio*)

Gear restrictions

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

Evidence

http://www.afsc.noaa.gov/REFM/stocks/plan_team/EBSPollock.pdf

http://www.afsc.noaa.gov/REFM/stocks/plan_team/GOApollock.pdf

http://www.adfg.alaska.gov/static/license/fishing/pdfs/reporting_requirements.pdf

<http://www.afsc.noaa.gov/REFM/Docs/2011/BSAIntro.pdf>

<http://www.afsc.noaa.gov/REFM/Docs/2011/GOAIntro.pdf>

<http://www.afsc.noaa.gov/FMA/default.htm>

<http://alaskafisheries.noaa.gov/regs/summary.htm#356>

<http://www.alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAI.pdf>

<http://www.alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA.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

Fishery managers aim to consider concepts such as productivity and MSY in terms of the groundfish fishery as a unit rather than for individual stocks or stock complexes; however due to the difficulty of estimating the parameters that govern interactions between species, estimates of MSY for the groundfish fisheries have sometimes been computed by summing MSY estimates for the individual stocks and stock complexes. The Optimum Yield (OY) of the groundfish fisheries in the GOA and BSAI management regions is based on historical MSY values for the groundfish complex as a whole. Additionally, stock-specific MSY values or proxies are used in the annual calculation of OFL, ABC, and TAC for each species.

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 seabirds 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 draft 2012 stock assessments place the 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/stocks/plan_team/EBSPollock.pdf

http://www.afsc.noaa.gov/REFM/stocks/plan_team/GOApollock.pdf

<http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA.pdf>

<http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAI.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#ixzz1Xt1ESQgh>.

The University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training in several other sectors, including –

* better process control; * HACCP (Hazard Analysis / Critical Control Point); * sanitation control procedures; * marine refrigeration technology; * net mending; * icing & handling; * direct marketing; * financial management for fishermen; * maximizing fuel efficiency

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 State of Alaska Department of Labor & Workforce Development (ADLWD) encompasses 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/International Standards of Training, Certification, & Watchkeeping (STCW)-compliant maritime 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.npfvoa.org/>

<http://www.cfec.state.ak.us/>

E. Implementation, Monitoring and Control

11. An effective legal and administrative framework shall be established and compliance ensured through effective mechanisms for monitoring, surveillance, control and enforcement for all fishing activities within the jurisdiction.

FAO CCRF 7.1.7/7.7.3/7.6.2/8.1.1/8.1.4/8.2.1

FAO Eco 29.5

Evidence adequacy rating:

High

Medium

Low

Scoring Determination

The Alaska pollock fishery fleet uses enforcement measures including a vessel monitoring systems (VMS) on board vessels and USCG boardings and inspection activities. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce fisheries laws and regulations. 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 October 2011, the NPFMC approved a motion to initiate a discussion paper to review the use of, and requirements for, VMS in the North Pacific fisheries and other regions of the U.S. 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. The discussion paper linked below was agenda item B-1 at the December 2012 NPFMC meeting.

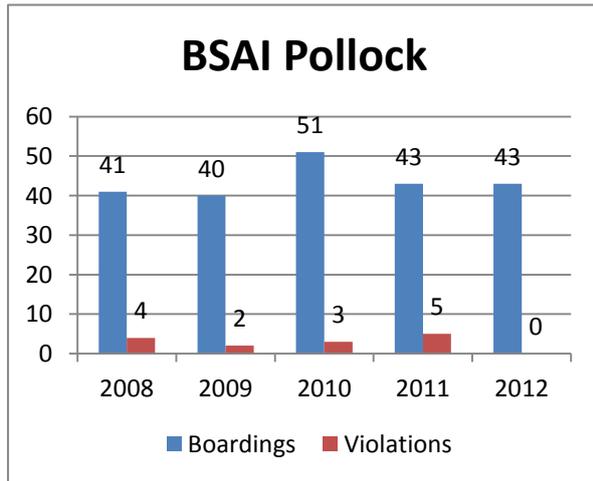
http://www.fakr.noaa.gov/npfmc/PDFdocuments/conservation_issues/VMSdiscusPaper1112.pdf

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 inland 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

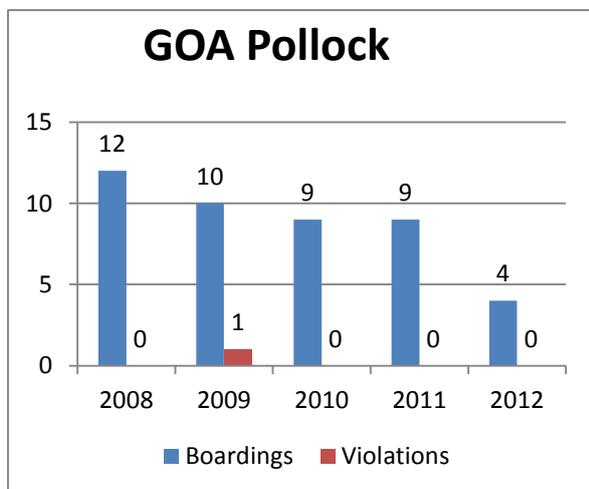
- 44 boardings
- 2.8 violations
- 6.42% of vessels had fisheries violations

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.

Alaska Division: NMFS OLE 2012 Enforcement Priorities, 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.

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, and Steller sea lion.
- Any violation involving injury or potential injury to people, such as a vessel-whale collision.

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. For example, 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 mislabelling of product in domestic or international commerce.
- IUU listed vessels.

MEDIUM PRIORITY

- Misdemeanor and civil violations. For example, 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/2012/ole_priorities_2012.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 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 utilises 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. There are presently around 400 badge holders in the department.

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.

Evidence

NMFS OLE, Alaska region: www.nmfs.noaa.gov/ole/ak_alaska.html

USCG, Alaska region: www.uscg.mil/d17/

http://www.uscg.mil/posturestatement/docs/USCG_2012_Posture_Statement.pdf

http://www.nmfs.noaa.gov/ole/docs/2012/ole_priorities_2012.pdf

<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 (Table 1).
- (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 Penalty Matrix

Harm to the Resource or Regulatory Program, Offense Level	Level of Intent			
	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
Alaska Statutes Title 16 (laws). Alaska Administrative Code Title 5 (regulations)

Evidence

<http://www.nmfs.noaa.gov/ole/investigations.html>

<http://www.noaanews.noaa.gov/stories2011/pdfs/Penalty%20Policy%20--%20FINAL.pdf>

<http://codes.lp.findlaw.com/akstatutes/16/16.43./08>

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 on pollock and associated species and their habitats. Findings and conclusions are published in SAFE document, annual Ecosystem Considerations documents, and other research reports. The SAFE documents for BSAI and GOA pollock summarize ecosystem considerations for the stocks. They include sections for 1) Ecosystem effects on the stock; and 2) Effects of the pollock fishery on the ecosystem. SAFE reports also describe results of first-order trophic interactions for pollock from the ECOPATH model, an ecosystem modelling software package. 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 minimise 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), among many others, have provided and are providing 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 document, 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 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/2011/ecosystem.pdf>).

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.

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 8). The 2011 SAFE concludes that that recruitment remains bottom-up controlled even under the current estimates of high predation mortality, and may lead to strong year classes. 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.

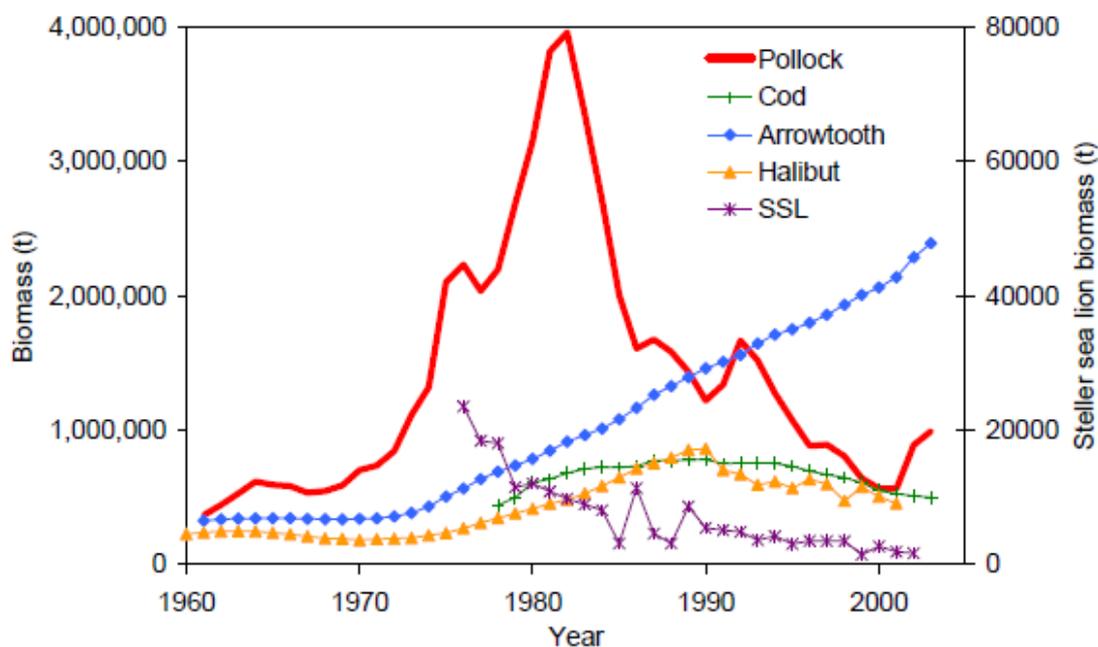


Figure 8. Historical trends in GOA walleye pollock, Pacific cod, Pacific halibut, arrowtooth flounder, and Steller Sea Lions, from stock assessment data. From the 2011 GOA pollock SAFE report.

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 trawl 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 effecting 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

Pacific salmon are taken as bycatch in the GOA pollock fishery, in which they are considered prohibited. The species with the highest bycatch in recent years is Chinook salmon, primarily in the central and western regulatory areas. Between 2003 and 2010, the pollock fishery accounted for an average of three-quarters of intercepted Chinook salmon, while other, primarily nonpelagic, trawl fisheries for flatfish, rockfish, and Pacific cod accounted for the remainder.

In 2011, the 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.

GOA Bycatch data

Table 7. Incidental catch (t) of FMP-managed species in the GOA directed walleye pollock fishery, 2006-2010. Incidental catch includes both retained and discarded bycatch estimates. From the 2011 GOA pollock SAFE report.

<i>Managed species/species group</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
Pollock	69774.9	50646.3	47383.1	39334.5	73033.1
Arrowtooth flounder	2749.1	1630.1	1569.6	761.0	2071.8
Pacific cod	709.8	275.1	579.2	557.0	1497.9
Flathead sole	594.5	327.7	423.5	215.7	360.2
Other species, sleeper shark	153.5	58.9	47.6	31.1	155.7
Other species, squid	1517.8	410.0	91.8	320.9	129.0
Other species, salmon shark	31.4	141.6	6.4	6.9	103.7
Pacific ocean perch	71.2	29.8	49.9	36.1	96.6
Shallow water flatfish	438.8	157.0	230.0	17.0	78.5
Rex sole	153.7	43.0	58.1	35.5	60.7
Big skate	23.0	38.1	21.7	33.8	47.1
Rougeye rockfish	25.4	30.2	42.9	12.9	30.5
Other species, spiny dogfish	50.0	47.6	59.6	17.9	19.8
Longnose skate	12.7	26.7	23.6	35.1	9.8
Shortraker rockfish	71.2	55.9	70.3	26.2	9.4
Other species, sculpin	7.6	24.9	8.5	8.1	8.4
Other skates	5.0	9.1	5.9	2.6	7.0
Pelagic shelf rockfish	9.0	6.4	4.1	1.5	5.8
Other species, other sharks	40.9	13.9	4.3	10.4	3.7
Deep water flatfish	11.7	5.5	5.8	2.4	3.1
Northern rockfish	14.5	12.0	7.9	11.7	2.2
Sablefish	5.6	3.2	1.3	0.1	1.3
Other species, octopus	3.4	1.5	0.0	0.1	0.8
Other rockfish	2.5	2.0	4.5	0.2	0.4
Atka mackerel	15.2	200.2	0.1	0.0	0.4
Thornyhead rockfish	0.2	0.3	0.2	0.1	0.1
<i>Percent non-pollock</i>	<i>8.8%</i>	<i>6.6%</i>	<i>6.5%</i>	<i>5.2%</i>	<i>6.1%</i>

Table 8. Incidental catch (t) of non-FMP-managed species in the GOA directed walleye pollock fishery, 2006-2010. Incidental catch includes both retained and discarded bycatch estimates. From the 2011 GOA pollock SAFE report.

<i>Non target species/species group</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
Eulachon	392.25	220.98	760.17	217.62	227.44
Jellyfish	69.02	24.06	191.51	11.30	121.72
Miscellaneous fish	38.44	24.18	35.36	42.90	42.25
Grenadiers	18.70	0.00	26.81	0.00	9.23
Other osmerids	167.94	49.42	401.86	149.79	6.78
Sea stars	1.98	4.73	6.58	0.00	4.74
Giant Grenadier	54.38	4.71	217.09	26.35	1.93
Pandalid shrimp	3.13	1.89	0.83	0.17	1.12
Sea anemone unidentified	0.21	0.68	0.26	0.00	0.47
Eelpouts	0.00	0.00	0.00	0.13	0.09
Hermit crab unidentified	0.00	0.00	0.01	0.00	0.09
Stichaeidae	0.07	0.29	0.00	0.00	0.07
Bivalves	0.00	0.09	0.05	0.00	0.05
Miscellaneous crabs	0.00	0.93	0.07	0.00	0.01
Capelin	0.10	0.00	0.00	0.01	0.00
Invertebrate unidentified	0.00	0.20	0.00	0.00	0.00
Lanternfishes (myctophidae)	0.01	0.00	0.00	0.00	0.00
Misc inverts (worms etc)	0.00	0.03	0.00	0.00	0.00
Snails	0.00	0.00	0.33	0.01	0.00
Surf smelt	0.00	0.00	0.16	0.00	0.00
Echinoderms	0.00	0.00	0.04	0.00	0.00

Table 9. Bycatch of prohibited species for trawls in the Gulf of Alaska during 2006-2010 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 2011 GOA pollock SAFE report.

<i>Species/species group</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
Herring (t)	8.789	19.529	0.421	7.821	0.858
Halibut (t)	115.576	135.392	120.041	62.481	49.192
Bairdi Tanner Crab (nos.)	84,005	19,458	322	6,565	108
Red King Crab (nos.)	0	0	0	0	0
Chinook Salmon (nos.)	15,943	35,042	10,382	2,617	44,755
Non-chinook salmon (nos.)	1,413	982	847	329	749

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.

In comparisons of the Western Bering Sea (WBS) with the Eastern Bering Sea using mass-balance food-web models based on 1980-85 summer diet data, Aydin et al. (2002) found that the production in these two systems is quite different. On a per-unit-area measure, the western Bering Sea has higher productivity than the EBS. Also, the pathways of this productivity are different with much of the energy flowing through epifaunal species (e.g., sea urchins and brittlestars) in the WBS whereas for the EBS, crab and flatfish species play a similar role. In both regions, the keystone species in 1980-85 were pollock and Pacific cod. This study showed that the food web estimated for the EBS ecosystem appears to be relatively mature due to the large number of interconnections among species. In a more recent study based on 1990-93 diet data, pollock remain in a central role in the ecosystem. The diet of pollock is similar between adults and juveniles with the exception that adults become more piscivorous (with consumption of pollock by adult pollock representing their third largest prey item). In terms of magnitude, pollock cannibalism may account for 2.5 million t to nearly 5 million t of pollock consumed (based on uncertainties in diet percentage and total consumption rate; Jurado-Molina et al. 2005).

Regarding specific small-scale ecosystems of the EBS, Ciannelli et al. (2004) presented an application of an ecosystem model scaled to data available around the Pribilof Islands region. They applied bioenergetics and foraging theory to characterize the spatial extent of this ecosystem. They compared energy balance, from a food web model relevant to the foraging range of northern fur seals and found that a range of 100 nautical mile radius encloses the area of highest energy balance representing about 50% of the observed foraging range for lactating fur seals. This suggests that fur seals depend on areas outside the energetic balance region. This study develops a method for evaluating the shape and extent of a key ecosystem in the EBS (i.e., the Pribilof Islands). Furthermore, the overlap of the pollock fishery and northern fur seal foraging habitat (see Sterling and Ream 2004, Zeppelin and Ream 2006) will require careful monitoring and evaluation.

Ecosystem effects on the EBS pollock stock

Euphausiids, principally *Thysanoessa inermis* and *T. raschii*, are among the most important prey items for pollock in the Bering Sea (Livingston, 1991; Lang et al., 2000; Brodeur et al., 2002; Cianelli et al., 2004; Lang et al., 2005). 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. (accepted). New information on euphausiid abundance is anticipated from the planned 2012 surveys.

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 and have been stable at around 5-6 thousand tons per year with catches exceeding 8 thousand t in 2000, 2009, and 2011. Skate bycatch nearly doubled in 2008 compared to

2007 but declined to just over one thousand t in 2010. The data on non-target species shows a high degree of inter-annual variability which reflects the spatial variability of the fishery and high observation error. This variability may mask any significant trends in bycatch.

The catch of other target species in the pollock fishery represent less than 1% of the total pollock catch. Incidental catch of Pacific cod has increased since 1999 but remains below the 1997 levels. The incidental catch of flatfish was variable over time and has increased, particularly for yellowfin sole in 2010. Proportionately, the incidental catch has decreased since the overall levels of pollock catch have increased. In fact, the bycatch of pollock in *other* target fisheries is more than double the bycatch of target species in the pollock fishery.

The catch of prohibited species was also variable but showed noticeable trends, particularly increased "other salmon" (mainly comprising chum salmon) in 2011. Also, the level of crab bycatch drops considerably after 1998 when all BSAI pollock fishing was restricted to using only pelagic trawls but *C. bairdi* crab has averaged just under 10 thousand animals since 2008. Chinook salmon bycatch in the pollock fishery have averaged 17.7 thousand fish since 2008. Much of the salmon bycatch variability is likely attributed salmon run sizes (and in the case of chum salmon-hatchery releases) and also to environmental conditions. The bycatch rate per hour towed based on a subset of catcher vessels shows a significant degree of inter-annual variability.

Salmon bycatch

Chinook salmon

In 2011 the NMFS implemented a new approach to managing Chinook salmon bycatch in the Bering sea pollock fishery. The new approach combines a limit on the amount of Chinook salmon that may be caught incidentally with incentive plan agreements and performance standard to reduce bycatch. The 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. There are three tools that the pollock fleets uses to limit the amount of Chinook salmon that they bycatch in their directed 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 on 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

The NPFMC is currently considering new measures to manage non-Chinook (chum) salmon bycatch in the Bering Sea pollock fishery. The proposed action is to amend the Bering Sea Aleutian Islands groundfish fishery management plan (FMP) and federal regulations to establish new measures to reduce chum salmon bycatch in the Bering Sea pollock fishery to the extent practicable while achieving optimum yield. The proposed action is focused on the Bering Sea pollock fishery because

this fishery catches the majority of the chum salmon taken incidentally as bycatch in the Bering Sea and Aleutian Islands (BSAI) groundfish fisheries. Since 2005 the pollock fishery contribution to the total non-Chinook bycatch has ranged from 88% in 2010 to 99.3% in 2005. 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>)

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. 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. Similar closures instigated to protect Steller Sea lions from the effects of Atka mackerel and Pacific cod fishing in the Western Aleutians were the subject of legal action, but were upheld by a District Court judge in March 2012.

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 increases, some decreases, and others stable. Seabird population trends could affect young-of-the-year mortality.

Changes in habitat quality

The 2010 and 2006 Aleutian Islands summer bottom temperatures indicated that water temperatures were slightly cooler at shallower depths than 2004, but was otherwise an average year. 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. Prior to 1998, levels of bycatch in the pollock fishery of prohibited species, forage, HAPC biota, marine mammals and birds, and other sensitive non-target species was very low compared to other fisheries in the region. The AI pollock fishery opening in 2005 was limited to only four hauls, within these four hauls the bycatch level of POP was very high (~50%). Besides the lack of commercially harvestable levels of pollock, the high levels of POP bycatch convinced fishers to discontinue the fishery in 2005. The 2006 and 2007 AI pollock fisheries were conducted in conjunction with the AICASS, Pacific ocean perch was the most substantial bycatch species and made up 3% of the catch in 2006 and 11% in 2007. The 2008 directed pollock fishery had an observed bycatch rate of 1% with 97% of this being POP. In 2009 there was no observer coverage of the directed fishery and in 2010 there was less than 1% bycatch in the directed fishery which caught less than 50 tons of pollock. There was no directed pollock fishery in the Aleutians in 2011.

Concentration of AI pollock catches in time and space

Since no exempted fishing permit (EFP) is proposed for 2012 there is expected to only be a very limited fishery in 2012, if any at all. The only shore-based plant capable of processing the Aleutian Islands' pollock catch is currently not configured to do so and no pollock processing is expected there in 2012.

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), and 2011 (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 2012 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.

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. As reported in Loughlin and Miller (1989) pups of Northern fur seals, *Callorhinus ursinus*, were first observed on Bogoslof Island in 1980. By 1988 the population had grown at a rate of 57% per year to over 400 individuals, including 80+ pups, 159 adult females, 22 territorial males, and 188 sub-adult males. They noted that the rookery is in the same location where solitary male fur seals were seen in 1976 and 1979 and is adjacent to a large northern sea lion rookery. On July 22, 2005 NMFS surveys resulted in counts of 1,123 adult males, a substantial increase over this time period. The estimated number of Northern fur seal pups born on Bogoslof Island increased from 5,096 (SE = 33) to 12,631 (SE = 335) (Angliss and Allen, 2007). This suggests that conditions in the ecosystem have changed and appear to favor Northern fur seals. The extent that this is due to environmental conditions is unknown. However, pollock abundance may play only a small role since during peak abundance levels, the Northern fur seal abundance was at very low levels. Also, pollock are most concentrated in this region during winter months when Northern fur seals have migrated to more southern areas.

EBS Bycatch data

Table 10. 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). From the 2011 EBS pollock SAFE report.

	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	2,105	2,554	841	557	393	1,051	17	18	8		120	14,100
2005	7,413	2,352	1,125	63	651	652	677	11	31	45		125	13,145
2006	7,285	2,861	1,361	256	1,088	737	789	9	65	11		152	14,612
2007	5,627	4,228	510	86	2,794	624	315	12	107	3		188	14,494
2008	6,761	4,209	1,964	405	1,364	336	15	2	82	30		39	15,205
2009	7,876	4,652	7,534	269	2,143	114	25	2	44	176		25	22,861
2010	6,927	4,271	2,221	1,017	1,450	230	55	2	23	109	1,228	1,579	19,111
2011	9,479	4,598	8,448	1,089	1,369	631	884	1	28	73	881	2,492	29,973
Average	6,337	2,928	2,449	652	1,145	468	345	12	64	46		520	15,106

Table 11. Bycatch estimates of prohibited species caught in the BSAI directed pollock fishery, 1997-

2011 based on then NMFS Alaska Regional Office reports from observers. Herring and halibut units are in t, all others represent numbers of individuals caught. Preliminary 2011 data are through November 4th, 2011. From the 2011 EBS pollock SAFE report.

	Herring	Red king crab	Other king crab	Bairdi crab	Opilio crab	Chinook salmon	Other Salmon	Halibut
1997	1,089	0	156	6,525	88,588	43,336	61,504	127
1998	821	5,098	1,832	35,594	45,623	49,373	62,276	144
1999	785	0	2	1,078	12,778	10,187	44,585	69
2000	482	0	104	173	1,807	3,966	56,707	80
2001	224	38	5,135	86	2,179	30,107	52,835	164
2002	105	6	81	651	1,667	32,222	76,998	127
2003	909	52	9	733	609	43,021	180,782	96
2004	1,104	27	6	1,189	743	51,700	440,477	93
2005	610	0	1	659	2,300	67,364	704,586	113
2006	436	204	3	1,753	3,282	84,436	310,858	122
2007	345	8	3	1,574	3,412	127,409	100,261	293
2008	128	588	41	9,071	10,133	22,123	15,845	331
2009	40	1,137	20	6,267	7,625	13,010	47,602	460
2010	351	1,038	29	13,552	10,020	10,129	14,194	264
2011	375	581	20	10,266	6,550	25,451	191,441	342

Research priorities

The 2011 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>).

Endangered, Threatened, Protected species

Over the last 12 months, the assessment team has found no 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 goal of the ecosystem considerations appendix is to provide stronger links between ecosystem research and fishery management and to spur new understanding of the connections between ecosystem components by bringing together many diverse research efforts into one document.

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>
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<http://access.afsc.noaa.gov/reem/ecoweb/index.cfm>

<p>14. Where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity.</p> <p style="text-align: right;"><i>FAO CCRF 9.1.2/9.1.3/9.1.4/9.1.5/9.3.1/9.3.5</i></p>
<p>Evidence adequacy rating:</p> <p> <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low </p>
<p>Not Applicable for Alaska pollock fisheries.</p>

8. Performance specific to agreed corrective action plans

There are no non-conformances for this fishery.

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

Not applicable.

10. Future Surveillance Actions

The next surveillance assessment will be carried out starting November 2013.

11. Client signed acceptance of the action plan

Not applicable.

12. Recommendation and Determination

The Assessment Team and the Certification Committee recommend that certification under the FAO Based Responsible Fisheries Management Program is maintained for the Alaska pollock (*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 bios)

Based on the technical expertise required to carry out the above fishery assessment, Global Trust Certification Ltd., is pleased to confirm the Surveillance Assessment Team members for the fishery as follows.

Earl Krygier (Assessor)

Earl E. Krygier gained a BSc in Science, an MSc from the Department of Fisheries and Wildlife, and completed a Ph.D. Doctoral Thesis (on the role of nursery areas for juvenile English sole off Oregon) at the Oregon State University. From 1989 to 2008 he worked for ADFG's Commercial Fisheries Division as Extended Jurisdiction Program Manager with primary responsibility on state policy coordination of state, national and international marine fishery matters (research, conservation and management, and policy development), provided support for ADFG's Commissioner in carrying out his NPFMC's responsibilities and acting as the Commissioner's alternate (1989-1997). Earl represented ADFG at the IPHC for 19 years, and he was state representative at the Donut Hole and the U.S./Russian ICC meetings. He sat as alternate for the Commissioner on the North Pacific Research Board (NPRB); represented ADFG on Alaska's CDQ Allocation Team; advised department staff, the Alaska BoF members, the Alaska Legislature and other state officials on NPFMC activities; and proposed management plans, long-range policies and regulatory implications, or inter-jurisdictional issues arising from Council actions.

He coordinated ADFG's staff activities at the NPFMC and recommended policies and strategies to the director, commissioner and other state officials in regards to extended jurisdictional fisheries. Earl coordinated the State's conservation and management policy for halibut at the NPFMC, the PFMC and the IPHC, that resulted in proper halibut bycatch management; stock utilization; equitable Alaska subsistence, sport and commercial harvests; helping ensure that development of CDQs and IFQ was done in accordance with conservation & management objectives, fairly and equitably for user groups. From 2008 to present times he is the Owner/Manager of KEE Biological Consultants and served as the Marine Conservation Alliance Foundation's (MCAF) Cooperative Research Coordinator, implementing MCAF's marine research activities in Alaska in cooperation with state or federal agencies, academia, the seafood industry and other interested parties.

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 Cerbère-Banyuls (France). Geraldine has joined Global trust Certification in August 2012 as Fisheries Assessment Officer and is involved in FAO RFM and MSC fisheries assessments.

Dave Garforth (Assessor)

Dave Garforth, BSC, HDip. (Applied Science), MSC has been involved in fisheries and aquatic resources for over 20 years. Currently, managing Global Trust FAO based Fishery Certification Program, with experience in the application of ISO/IEC Guide 65 based seafood certification systems and a professional background in numerous fishery assessments. Previous professional background includes; Development Officer in the Irish Sea Fisheries Board, supply chain and trade experience at Pan European Fish Auctions, the control and enforcement of fisheries regulations as a UK Fishery Officer. Dave is also a lead, third party IRCA approved auditor.

Vito Ciccia Romito (Lead Assessor)

Vito Ciccia Romito 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 worked 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, crab and cod fisheries as well Icelandic Cod, Saithe, Haddock and Redfish fisheries. Vito is also a lead, third party IRCA approved auditor.