FAO-BASED RESPONSIBLE FISHERY MANAGEMENT CERTIFICATION SURVEILLANCE REPORT (NO.3)

For The

Alaska Pacific Halibut Commercial Fishery

Facilitated By the

Alaska Seafood Marketing Institute (ASMI)

Assessors: **Vito Ciccia Romito, Lead Assessor**
Ivan Mateo, Assessor
Geraldine Criquet, Assessor
Bruce Turris, Assessor

Report Code: **AK/Hal/001.3/2014**
(Report published in June 2014)

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

Contents

I. Summary and Recommendations

The Alaska Seafood Marketing Institute (ASMI) requested an assessment of the Alaska Pacific halibut (*Hippoglossus stenolepis*) 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 April 2011. The first surveillance report was carried out in and terminated in mid-2012.

This report is the **3rd Surveillance Report (ref: AK/HAL/001.3/2014)** for the Alaska Pacific Halibut commercial fisheries following Certification award against the FAO-Based RFM Program, on the 25th April 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 2nd Surveillance) 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 (following identified non-conformance) in the previous assessment are reassessed and a new conclusion on consistency of these items with the Conformance Criteria is given accordingly. Non-conformances were identified neither during the full nor the 1st or 2nd surveillance assessment. Consequently, no formal corrective action plans were issued. However, a number of issues relating to the estimation of bycatch in the halibut fleet were identified for review as item for surveillance during the surveillance activities.

The certification covers the Pacific halibut (*Hippoglossus stenolepis*) commercial fisheries employing benthic longline gear within the IPHC's Regulatory Areas 2C, 3A, 3B, 4B and 4CDE, within Alaska jurisdiction (200 nautical miles EEZ), under international [International Pacific Halibut Commission (IPHC)], federal [National Marine Fisheries Services (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG)] management.

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

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

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

II. Assessment Team Details

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

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

Dr. Ivan Mateo, Assessor
SAI Global/ Global Trust Certification Ltd.
Saunderstown, Rhode Island
United States of America
T: +1 401 486 8592

Bruce Turris, Assessor
Independent Fishery Management Consultant
Pacific Fisheries Management Inc.
British Columbia
Canada
T: 1-604-524-0005
F: 1-604-524-0150

III. Acronyms

ABC	Allowable Biological Catch
ACL	Annual Catch Limits
ADFG	Alaska Department of Fish and Game
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
ANILCA	Alaska National Interest Lands Conservation Act
ASMI	Alaska Seafood Marketing Institute
AWT	Alaska Wildlife Troopers
BOEM	Bureau of Ocean Energy Management, Regulation and Enforcement
BOF	Board of Fisheries
BSAI	Bering Sea and Aleutian Islands
CCRF	Code of Conduct for Responsible Fisheries
CDQ	Community Development Quota
CP	Catcher Processor (vessel)
CPUE	Catch per Unit Effort
CV	Catcher Vessel
DEC	Department of Environmental Conservation
DNR	Department of Natural Resources
EBio	Exploitable (stock) biomass
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
IFQ	Individual Fishing Quota
IPHC	International Pacific Halibut Commission
LLP	License Limitation Program
MSA	Magnuson-Stevens 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
OPMP	Office of Project Management and Permitting
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)
SBio	Spawning (stock) biomass
SSC	Scientific and Statistical Committee
TAC	Total Allowable Catch
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service

1. Introduction

This Surveillance Report documents the 3rd Surveillance Assessment (2014) of the Alaska Pacific halibut commercial fisheries originally certified on April 28th 2011, and presents the recommendation of the Assessment Team for continued FAO-Based RFM Certification.

Unit of Certification

The Pacific halibut (*Hippoglossus stenolepis*) commercial fisheries employing benthic longline gear within the IPHC's Regulatory Areas 2C, 3A, 3B, 4B and 4CDE, within Alaska jurisdiction (200 nautical miles EEZ), under international [International Pacific Halibut Commission (IPHC)], federal [National Marine Fisheries Services (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG)] management, underwent their 3rd surveillance assessment against the requirements of the FAO-Based RFM Conformance Criteria Version 1.2 Fundamental clauses.

This 3rd Surveillance Report documents the assessment result for the continued certification of commercially exploited Pacific halibut 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 accredited 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.

The assessment is based on 6 major components of responsible management derived from the FAO Code of Conduct for Responsible Fisheries (1995) and Guidelines for the Eco-labelling 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 4. Assessors included both externally contracted fishery experts and Global Trust internal staff (Appendix 1).

1.1. Recommendation of the Assessment Team

Following this 3rd Surveillance Assessment, in 2014, 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 fisheries, the Pacific halibut (*Hippoglossus stenolepis*) commercial fisheries employing benthic longline gear within the IPHC's Regulatory Areas 2C, 3A, 3B, 4B and 4CDE, within Alaska jurisdiction (200 nautical miles EEZ), under international [International Pacific Halibut Commission (IPHC)], federal [National Marine Fisheries Services (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG)] management.

2. Fishery Applicant Details

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

3. Unit of Certification

Unit of Certification			
U.S. ALASKA PACIFIC HALIBUT COMMERCIAL FISHERIES			
Fish Species (Common & Scientific Name)	***Geographical Location of Fishery***	***Gear Type***	***Principal Management Authority***
Pacific halibut (Hippoglossus stenolepis)	*Gulf of Alaska* *and* *Bering Sea & Aleutian Islands*	*Benthic longline*	*International Pacific Halibut Commission (IPHC)* *National Marine Fisheries Service (NMFS)* *North Pacific Fishery Management Council (NPFMC)* *Alaska Department of Fish and Game (ADFG)*

4. Surveillance Meetings

Date, time	Organization	Representatives	Item discussed
3rd March 2014, 9:30 AM	International Pacific Halibut Commission (IPHC), Seattle, U.S.	Bruce Leaman (Executive Director), Gregg Williams (Research Program Manager Steve Martell (Quantitative Scientist), Ian Stewart (Quantitative Scientist) Vito Romito (GTC), Ivan Mateo (GTC)	• Updates in law, regulations or commercial fisheries operations affecting the management of Pacific halibut in the BSAI or GOA. Specifically, updates on Control of Charter Harvest in Area 2C Halibut Retention in Sablefish Pots in Area 4A • Proposal of Abundance-Based Management of all Halibut Removals? • Updates on the IPHC's annual setline survey expansion • Considerable differences between the 2013 and the 2012 setline survey? • Fishery dependent data collection: Major changes in log book reporting from 2012 2013 and repercussions on WPUE estimates. Weights-at-age for most of the historical period (how is this issue currently handled on the model) Evaluation of surface ageing bias or precision for the period prior to the 1990s sex-specific weights-at-age for the time-series The weight of U32 halibut discarded must be estimated by indirect methods (how did this change since inclusion of observer program data from 2013)? • Estimates of the coast-wide personal use harvest in 2013 • Bycatch data collection: Since the implementation of the restructured observer program was there additional data and better estimates on discards of halibut and bycatch/discards of non-halibut species in the halibut directed fishery? How do you incorporate uncertainty arising from bycatch estimates? Inclusion of bycatch-related uncertainty in regulatory area catch levels? Updates on developing simulation studies examining uncertainty in the estimated downstream impacts of bycatch? • Bycatch and discards avoidance mechanisms/improved

			selectivity, regulatory measures and technical, operational methods in use by the fleet. Updates for 2013? • Endangered species interactions in 2013 (e.g. short tailed albatross) • Future research: Methods for sampling the sex-ratio of the commercial catch Implicit and explicit spatial models for incorporation of migration and recruitment distribution among regulatory areas, Investigation of the factors contributing to recruitment strength and observed size- at-age Projection methods for weight-at-age to determine if alternatives to recent trend might provide better estimates of likely future values and the uncertainty associated with these values. Significant uncertainty associated with estimation of model parameters, treatment of the data sources (e.g., short and long time-series, redundancy vs. orthogonality), structuring of selectivity (length vs. age-based), natural mortality (fixed vs. estimated) and other differences among the three models included in the ensemble. • Updates on the Management Strategy Evaluation • Identified concerns relative to sport removals
4th March 2014	ASMI (Seattle), U.S.	Randy Rice Vito Romito (GTC), Ivan Mateo (GTC)	• Client meeting.
6th March 2014, 1:00 PM	US Coast Guard, Juneau, Alaska, U.S.	Lt Tony Kenne Vito Romito (GTC), Ivan Mateo (GTC)	• Enforcement legislation, rules or proposals. Significant changes and updates over calendar year 2013. • Enforcement of management measures that support reduction of bycatch and discards, reduction of impacts on habitat, 2013 updates. • Number of boardings, number of violations detected, types of violations for the species in question. General level of compliance overall. Updates for 2013. • Gear loss concerns? Updates for 2013 mostly related to longline gear. • Relationships and interaction with AWT, updates for 2013.

			Significant prosecution from NMFS OLE in 2013. • Dixon Entrance: foreign fleet fishing activities? Russian federation line, foreign vessel encroachment? • Donut Hole: any fishing activity detected in 2013?
7th March 2014, 1:00 PM	Alaska Troopers, Juneau, Alaska, U.S.	Lt Jon Streifel Vito Romito (GTC), Ivan Mateo (GTC)	• Enforcement legislation, rules or proposals: Significant changes and updates over 2013 affecting Halibut stocks. New regulations for the SEAK area? • Enforcement of management measures that support reduction o bycatch and discards, 2013 updates. • Enforcement of AK halibut sport sector, updates for 2013. • Number of boardings, number of violations detected, types of violations for Halibut in the 2013 calendar year. • Gear marking regulations, checking and concern relating the loss of gear • General level of overall compliance in the halibut fisheries. Updates for 2013. • Relationships with USCG for halibut enforcement. Updates for 2013. • Dixon Entrance: foreign fleet fishing activities •
11th March 2014, 2:30 PM	AWT Kodiak, Alaska, U.S.	Lt Ellis Willard Vito Romito (GTC), Ivan Mateo (GTC)	• Enforcement legislation, rules or proposals: Significant changes in regulations or difficulties in regulation enforceability over 2013 concerning the species in questions? • Enforcement of management measures that support reduction of bycatch, discards, ghost fishing of Halibut , 2013 updates. • Central GOA trawl sweeps modifications:. Is the rule formalized and implemented for 2014? • Restructured observer program. Has the increased observer coverage in smaller groundfish • vessels and halibut vessels impacted your enforcement activities, positively or negatively, in any way? • Enforcement of AK halibut fishery, 2014 updates. Have you seen significant violations in

			• terms of halibut discarding in the sport or commercial fleet? • Number of boardings and number of violations detected, types of violations for halibut fisheries. General rate of compliance and type of violations in the various fisheries for 2013. • Interaction with USCG and NMFS OLE, updates for 2013

5. Assessment Outcome Summary

1. *The IPHC is a bilateral, international treaty based organization, composed of representatives from the USA and Canakkkda. Its mandate is research (on stock assessment and halibut biology research) and management (allocation between regulatory areas in US and Canada, developing various harvest regulations and setting annual harvest levels) of the stocks of Pacific halibut (Hippoglossus stenolepis) within the convention waters of both nations. The Northern Pacific Halibut Act of 1982 (Halibut Act) at 16 U.S.C 773-773k provides the Secretary of State of the US, with the concurrence of the Secretary of Commerce, the authority and general responsibility to carry out the requirements of the Convention and the Halibut Act. Following IPHC apportionments, the halibut fisheries in the American EEZ off Alaska are managed by the North Pacific Fishery Management Council (NPFMC), the National Marine Fisheries Service (NMFS), and the Alaska Department for Fish and Game (ADFG). The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Pacific halibut fisheries laws and regulations in federal waters. The Alaska Wildlife Troopers (AWT) take part in enforcement activities in state waters.*

2. *The NMFS and NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. The state of Alaska is a cooperating agency in the NEPA process for federal actions, giving it a seat at the table for federal actions. The assessment team considers that the collectivity of: the NEPA process, existing agencies and processes (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. The IPHC annual meeting, regular meetings of the NPFMC and the Board of Fisheries (BOF) public meetings provide forums for resolution of potential fisheries conflicts.*

3. *The objectives of the initial US and Canada Agreement for the management, conservation and sustainable utilization of Pacific halibut in the North Pacific, signed in 1923 pointed to the first basic regulations for closure of the fishery in determinate periods, halibut bycatch in other fisheries and the need for reporting such removals, enabling prosecutions for violation of the provisions and investigation into the life history of the Pacific halibut. Amendment 15 and 20 to the Fishery Management Plan (FMP) for the Groundfish Fishery of the BSAI and GOA established an individual fishing quota (IFQ) limited access system in commercial fixed gear fisheries for Pacific halibut and sablefish in and off Alaska and implemented a Western Alaska Community Development Quota (CDQ) program for halibut and sablefish fixed gear fisheries. These amendments effectively provide a framework for the management of halibut resources in the BSAI and GOA. These actions were intended by the NMFS to promote the conservation and management of halibut and sablefish resources, and to further the objectives of the Northern Pacific Halibut Act of 1982 (Halibut Act) and the Magnuson Fishery Conservation and Management Act (Magnuson Stevens Act or MSA) that provided authority for regulating these fisheries.*

4. *The IPHC collects yearly data from a variety of sources to characterize the fishery, status and population trends in all regulatory areas, and assist in fitting a population assessment model. The key datasets collected include IFQ e-landings catch, sport catch, bycatch, personal use and wastage data. Every year, the IPHC places a sampler aboard the NMFS EBS groundfish/crab trawl survey. The sampler collects biological data on the halibut catches, taking lengths of almost all halibut caught and selecting a subsample for ageing. The biennial GOA survey was conducted in 2013. The biennal EBS survey was conducted in 2013, and the IPHC participated in the survey for the first time since 2000. The swept-area estimates of abundance derived from the three NMFS trawl surveys (BS, GOA, AI) are a valuable independent indicator of long-term trends in halibut biomass. Eleven commercial longline vessels, seven Canadian and four U.S., were chartered by the IPHC for survey operations in 2013. On the 1,289 stations planned for the 2013 survey, 1,279 survey stations were effective for stock assessment analysis. Seabird occurrence data have also been collected during IPHC stock assessment surveys since 2002. Bycatch data collected during the IPHC surveys are used as proxy to estimate total bycatch in the halibut fishery. However, from January 2013, there are new partial coverage observer requirements for halibut vessels fishing hook and line gear. Halibut vessels are registered with the NMFS and can be selected on a vessel or trip basis.*

5. *For 2013, there was a full review of the data, specific model equations and general approach used to assess the stock in recent years. Allowing for time-varying availability in the assessment model removed the retrospective bias in recent status estimates and is consistent with observed geographic and demographic trends. The results of the 2013 stock assessment indicate that the Pacific halibut stock has been declining continuously over much of the last decade. The change to the assessment model resulted in a much more pronounced decline in the estimated stock trend in recent years, a large reduction in the scale of current population estimates, and also a decrease in the estimated average level of productivity. Spawning biomass is estimated to have decreased from 198 to 197 million lb from 2012 to 2013, and exploitable biomass to have decreased from 176 to 170 million lb, over the same period. The 2013 stock assessment results indicate that the Pacific halibut stock has been declining continuously over much of the last decade, primarily as a result of recruitment strengths that are much smaller than those observed through the 1980s and 1990s, as well as decreasing size-at-age. In the last few years, female spawning biomass is estimated to have stabilized near 200 million pounds. The 2014 estimate of exploitable biomass consistent with the IPHC's current harvest policy is 170.29 million pounds. The long time-series model provided several alternative reference points for comparison: the stock is currently estimated to be at 38% of the long-term average equilibrium spawning biomass, and 34% of the current stock size projected in the absence of fishing. It is also estimated to be considerably larger (187%) than the spawning biomass estimate from the late 1970s. As in 2013, forecast projections were conducted for a range of alternative management actions; and probabilities of various risk metrics are reported in a decision-making table framework. The application of the current harvest policy results in the Blue Line of the decision table with a coastwide TCEY of 27.515 million pounds.*

6. *IPHC's harvest policy is to harvest 20% of the coastwide exploitable biomass when the spawning biomass is estimated to be above 30% (B30 threshold level) of a level defined as the unfished level. The harvest rate is linearly decreased towards a rate of zero as the spawning biomass approaches 20% (B20 limit level) of this estimated unfished level. The unfished female spawning biomass (Bunfished) is computed by multiplying spawning biomass per recruit (SBR, from an unproductive regime) and average coastwide age-six recruitment (from an unproductive regime). Since 1985, the IPHC has followed a constant harvest rate (CHR) policy to determine annual available yield, termed the Constant Exploitation Yield (CEY). A biological target level for total removals from each regulatory area is calculated yearly by applying a fixed harvest rate to the estimate of exploitable biomass in each IPHC regulatory area. IPHC's harvest policy is to harvest 20% of the coastwide exploitable biomass when the spawning biomass is estimated to be above 30% (threshold level) of a level defined as the unfished level. The harvest rate is linearly decreased towards a rate of zero as the spawning biomass approaches 20% (limit level) of this estimated unfished level. That is, fishing ceases completely if the stock is below 20% of the unfished biomass. This combination of harvest rate and precautionary levels of biomass protection have, in simulation model studies, provided a large fraction of maximum available yield minimizing risk to the spawning biomass, while allowing for the quickest stock recovery to at least, threshold levels. The minimum observed spawning biomasses for the three IPHC core areas all occurred in the mid-1970s, approximately 9 million pounds in 2B, 13 million pounds in 2C and 42 million pounds in 3A. By definition, these become the observed spawning biomass limits. The current harvest policy for Pacific halibut utilizes a ramp from target harvest rates to no fishing between 30% relative spawning biomass and 20% relative spawning biomass.*

7. *Although this is common for many fisheries stock assessment, the degree of pre-model processing and redundancy in the halibut data set likely result in a substantial underestimation of this source of uncertainty. Nonetheless, it is included in the decision-making framework described below. Additional sources of uncertainty include choices made in structuring the assessment model, steps taken during data processing, and many other sources that are not included in the results. During the 2012 assessment process, there was substantial discussion regarding estimates of total removals used in the halibut stock assessment. The IPHC has expressed concern over continued declining catch rates in several areas and has taken aggressive action to reduce harvests and recommended to the governments of Canada and the United States catch limits for 2014 totalling 27.515 million pounds, a 11.3% decrease from the 2013 catch limit of 31,028,000 pounds. For 2014, the IPHC adopted a 19.7% effective coastwide harvest rate, down from the 2013 effective coastwide harvest rate of 24.4%. In addition, the staff has noted a continuing problem of reductions in previous estimates of biomass as additional data are obtained, which has the effect of increasing the realized historical harvest rates on the stock. For the 2013 assessment, significant improvements to methods used to forecast future stock size and to calculate the uncertainty associated with these predictions were made. For the 2013 stock assessment, an ensemble of three alternative models was developed to produce the stock biomass estimates and harvest decision table results. This resulted in estimates of stock size and management reference points that are substantially more robust to current or future technical changes to the underlying models. The 2013 stock assessment indicates that the Pacific halibut stock has been declining continuously over the last decade, with recruitment strengths that are much smaller than those observed through the 1980s and 1990s, and more typical of those seen during the last century. Decreasing size at age has also been a contributing factor. In recent years, the estimated female spawning biomass appears to have stabilized near 200 million pounds.* An element clearly illustrating the precautionary nature of the IPHC management

actions is the Slow Up Full Down (SUFullD) harvest policy currently in place. *This harvest policy, allowing full decrease in catch limits when the stock is projected to decline, but only a third increase in catches (from the previous year) when the stock is projected to increase is clearly a long term management measure aimed at increasing halibut harvestable and spawning biomass.*

8. *The IPHC has developed, refined, and utilized a constant harvest rate policy since the 1980's. The policy was initially designed to harvest 20% of the coastwide exploitable biomass when the spawning biomass is estimated to be above 30% of the unfished level. The harvest rate is linearly decreased towards a rate of zero as the spawning biomass approaches 20% of the unfished level. This combination of harvest rate and precautionary levels of biomass protection have, in simulation studies, provided a large fraction of maximum available yield while minimizing risk to the spawning biomass. Following the 2008 Committee of Independent Experts (CIE) review of the assessment and harvest policy, the simulations on which the harvest policy was based were modified to incorporate "assessment error". Under the individual fishing quota share system in place for the Pacific halibut fishery, fishing capacity (vessels and gear) has been reduced, seasons were extended and wastage was reduced. Fishing gear is regulated to longline gear only. In 1983, industry made the operational switch from J-hooks to circle hooks in the commercial fishery. Regulations are in placed to address discards. General spawning areas have been mapped in Alaska. The halibut fishery is closed during peak spawning times, by regulation. The NPFMC has established Marine Protected Areas and additional trawl closures that benefit juvenile fish and adult spawners. Bycatch of seabirds were addressed by specific regulations now including the use of streamer (tory) lines, night setting, lineshooters and lining tubes. Management actions are in place in respect to increasing knowledge on the halibut and non-halibut bycatch dynamics in the directed halibut longline fishery. Moreover, in June 2012, the NPFMC took action to reduce halibut bycatch limits in GOA groundfish fisheries. A fishery management plan amendment, "Amendment 95," came into effect in 2014 and is intended to minimize halibut bycatch in the GOA groundfish fisheries. NOAA Fisheries annually sets limits to minimize halibut bycatch in Federal groundfish fisheries in the Gulf of Alaska, and those limits are divided annually and seasonally among different groundfish sectors. If a sector reaches its halibut bycatch limit before it catches the amount of groundfish available for it to harvest, vessels participating in the sector must stop fishing for groundfish. There are two broad sectors that harvest groundfish in the Gulf of Alaska that will be directly affected by the amendment — vessels using hook-and-line gear and vessels using trawl gear*

9. *The IPHC and NPFMC objectives for fisheries management are based on the long term maintenance of MSY levels. The policy for achieving this is based on setting biological reference points that determine the annual CEY for the Pacific halibut stock. Under the individual fishing quota share system in place for the Pacific halibut fishery, fishing capacity (vessels and gear) has been reduced and is now stable. In 1983, industry made the operational switch from J-hooks to circle hooks in the commercial fishery, lowering the mortality of undersized halibut caught and released during commercial fishing. Discards of Pacific halibut, considered a Prohibited Species Catch (PSC) by the groundfish fisheries in Alaska are regulated, and the NPFMC voted in June 2012 to further reduce the halibut bycatch cap in the GOA groundfish fisheries.*

10. *Any aspirant halibut fisherman must have 150 days of halibut fishing experience before being able to purchase halibut IFQs. Obtaining halibut IFQ share most often will require the purchaser (aspirant halibut fisherman) to enter into loan capital arrangements with banks that will require comprehensive fishing business plans supported by competent, professional fishermen with demonstrable fishing experience. Several training opportunities are available to train crew members in Alaska.*

11. *The Northern Pacific Halibut Act, governs the commercial, sport, charter, and subsistence halibut fisheries in the U.S. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations, especially 50CFR679. The violations in this fishery are reported to and investigated by NOAA's Office of Law Enforcement's Alaska Division and prosecuted by NOAA's Office of General Counsel's Enforcement Section. The maximum civil penalty under the Northern Pacific Halibut Act is $200,000 for each violation. OLE Special Agents and Enforcement Officers conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, review sales of wildlife products on the internet and conduct patrols on land, in the air and at sea. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL).*

12. *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.*

13. *Regulations are in place to address waste, discard, bycatch, and endangered species interactions in the halibut fisheries. Management actions are in place in respect to increasing knowledge on the bycatch dynamics of the directed halibut longline fishery (i.e. methods for the estimation of non-target species catch in the unobserved halibut IFQ fleet and restructuring the observer program for inclusion of the halibut fleet). Benthic longline gear is not considered to have serious nor irreversible impacts on marine habitats. Bycatch of seabirds has been addressed by specific regulations put in place to reduce the incidental mortality of the short-tailed albatross, a listed species under the Endangered Species Act (ESA), and other seabird species in 1998, then revised in 2008. None have been taken in the commercial halibut fishery in 2011, 2012 or 2013. Bird avoidance measures now include the use of streamer (tory) lines, night setting, lineshooters and lining tubes, to reduce seabird interactions when setting or retrieving gear. Seabird occurrence data have been collected during the 2013 IPHC annual setline survey. Bycatch data were also collected this year, indicating that the majority of the bycatch is made up by Pacific cod and spiny dogfish. These*

species are managed by the NPFMC under tier 3 and 5 respectively, using OFL and ABC recommendations and catch limits. It is expected that with the implementation of the restructured observer coverage in a part of the halibut fleet, bycatch data collection will improve and allow management to make better informed decisions, especially for species like sharks and skates that generally tend to have low reproductive rates.

6. Conformity Statement

The Assessment Team recommended that continued certification under the FAO Based Responsible Fisheries Management Program is granted to the Pacific halibut (*Hippoglossus stenolepsis*) commercial fishery employing benthic longline gear within the IPHC's Regulatory Areas 2C, 3A, 3B, 4B and 4CDE, within Alaska jurisdiction (200 nautical miles EEZ), under international [International Pacific Halibut Commission (IPHC)], federal [National Marine Fisheries Services (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG)] 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

The IPHC is a bilateral, international treaty based organization, composed of representatives from the USA and Canada. Its mandate is research (on stock assessment and halibut biology research) and management (allocation between regulatory areas in US and Canada, developing various harvest regulations and setting annual harvest levels) of the stocks of Pacific halibut (Hippoglossus stenolepis) within the convention waters of both nations. The Northern Pacific Halibut Act of 1982 (Halibut Act) at 16 U.S.C 773-773k provides the Secretary of State of the US, with the concurrence of the Secretary of Commerce, the authority and general responsibility to carry out the requirements of the Convention and the Halibut Act. Following IPHC apportionments, the halibut fisheries in the American EEZ off Alaska are managed by the North Pacific Fishery Management Council (NPFMC), the National Marine Fisheries Service (NMFS) and the Alaska Department for Fish and Game (ADFG). The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Pacific halibut fisheries laws and regulations in federal waters. The Alaska Wildlife Troopers (AWT) take part in enforcement activities in state waters.

The IPHC is a bilateral, international treaty based organization, composed of representatives from the USA and Canada. Its mandate is research (on stock assessment and halibut biology research) and management (allocation between regulatory areas in US and Canada, developing various harvest regulations and setting annual harvest levels) of the stocks of Pacific halibut (*Hippoglossus stenolepis*) within the convention waters of both nations. Specifically the IPHC main objective is to conserve the biological viability of the stock, while allowing for maximum sustainable yield harvests from commercial, sport and subsistence users. The Northern Pacific Halibut Act of 1982 (Halibut Act) at 16 U.S.C 773-773k provides the Secretary of State of the US, with the concurrence of the Secretary of Commerce, the authority and general responsibility to carry out the requirements of the Convention and the Halibut Act.

Following IPHC apportionments, the halibut fisheries in the American EEZ off Alaska are managed by the North Pacific Fishery Management Council (NPFMC), the National Marine Fisheries Service (NMFS), and the Alaska Department for Fish and Game (ADFG).

The NPFMC recommends regulations to govern the directed halibut fisheries in waters off Alaska and makes allocation decisions among halibut users and user groups fishing off Alaska. The NMFS works closely with the NPFMC and the IPHC, performing scientific research and being responsible for developing, implementing, and enforcing regulations pertaining to management of halibut fisheries in US waters. NMFS also manages the halibut subsistence program for Native, rural, ceremonial and educational purposes. Additionally, ADFG licenses halibut anglers, sport anglers, fishing businesses and guides, monitors and reports on sport and subsistence halibut harvests, and assists federal agencies with preparation of regulatory analyses. These agencies, and all of their activities and decisions regarding halibut, are subject to the North Pacific Halibut Act.
The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Pacific halibut fishery laws and regulations. The Alaska Wildlife Troopers (AWT) take part in enforcement activities in state waters.

The primary purpose of IPHC is to conduct research on the halibut stock for the biological conservation of the halibut resource for fishery use in the area through which the species migrates during its life cycle, by taking into account the whole stock unit over its entire area of distribution (from California to the Bering Sea). The halibut within the IPHC convention area are considered to be one stock, which is studied, managed and enforced by IPHC, NPFMC, NMFS, ADFG and the US coast guard (USCG)/Alaska Wildlife Troopers (AWT). The NMFS Alaska Region and the NPFMC gather data on all sources of halibut removals and mortality off Alaska: fishing (directed and incidental) and natural mortality. All IFQ share holders must report their catches via an electronic filing (“e-landing”) method.

Sport charter vessels keep and submit a Charter Logbook to ADFG. The operators must submit their harvest information weekly, and ADFG summarizes the data in October and submits it to the NPFMC and NMFS. In addition, ADFG collects data from halibut sport fishermen (both guided/charter and un-guided), through an annual survey. Subsistence halibut data are gathered by NMFS under its Subsistence Halibut Registration Certificate (SHARC) program. Those data are reported to IPHC which also collects its own data through employment of port samplers and at-sea sampling agents for the commercial harvest.

Halibut management is an active public process. The IPHC receives extensive input and guidance from stakeholders and researchers. Also, the NPFMC and the NMFS provide a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The NPFMC actively encourages stakeholder participation, and all NPFMC deliberations are conducted in open, public sessions.

IPHC 2014 Annual Meeting

The International Pacific Halibut Commission (IPHC) completed its Ninetieth (January, 2014) Annual Meeting in Seattle USA. The Commission recommended to the governments of Canada and the United States catch limits for 2014 totalling 27,515,000 pounds, a 11.3% decrease from the 2013 catch limit of 31,028,000 pounds.

In addition to setting catch limits for 2014, the Commission addressed a wide range of regulatory issues and took important actions regarding the IPHC performance review, management strategy evaluation, the structure of its advisory bodies, and bycatch management.

Stock Assessment and Harvest Rates

During 2013, a thorough exploration of all available data sources was completed. This analysis provided several new avenues for stock assessment modeling. The IPHC's scientific peer review process also continued with a Scientific Review Board (SRB, http://www.iphc.info/srb) evaluation of the stock assessment data and modeling conducted since the 2012 assessment. This evaluation improved the 2013 assessment, and SRB recommendations will be used to help structure the 2014 assessment.

For the 2013 stock assessment, an ensemble of three alternative models was developed to produce the stock biomass estimates and harvest decision table results. This resulted in estimates of stock size and management reference points that are substantially more robust to current or future technical changes to the underlying models. The 2013 stock assessment indicates that the Pacific halibut stock has been declining continuously over the last decade, with recruitment strengths that are much smaller than those observed through the 1980s and 1990s, and more typical of those seen during the last century. Decreasing size at age has also been a contributing factors. In recent years, the estimated female spawning biomass appears to have stabilized near 200 million pounds. An executive summary of the 2013 stock assessment is posted on the IPHC website at http://iphc.int/meetings-and-events/interim-meeting.html, and the complete report of the 2013 stock assessment is available at http://iphc.int/publications/rara/2013/rara2013_12_2013assessment.pdf.

As in 2013, the IPHC staff harvest advice was presented in the form of a decision table that estimates the consequences to stock and fishery status and trends from different levels of harvest. The final version of the decision table for 2014, incorporating the adopted catch limits, is posted on the IPHC website at http://www.iphc.int/meetings-and-events/annual-meeting.html.

http://www.iphc.int/news-releases/364-nr20140124.html

As described in Information Bulletin 70 (http://iphc.int/library/bulletins/300-ib0070.html) and the IPHC Interim Meeting news release (http://www.iphc.int/news-releases/306-nr20121218.html), the IPHC staff harvest advice was reformatted this year into a decision table which provides the probabilities of risks associated with specific harvest choices. This decision table allowed a comparison of alternative stock biomass and fishery outcomes at different increments of total removals, providing more information for consideration by the Commissioners as they set the annual catch limits.

Regulatory Changes and Issues

Control of Charter Harvest in Area 2C

The Commission received a request from the NPFMC to adopt charter halibut sector management measures in accordance with the Catching Sharing Plan (CSP) implemented by NMFS for 2014. This proposal is designed to keep removals by the charter fishery within the limits of the CSP. After consideration of the advice of the Council, Commission staff, Canadian and United States harvesters

and processors, and other fisheries agencies, the Commission recommended to the Parties the following measures:

In Area 2C, 1) a one-fish daily bag limit, and 2) a reverse slot size limit restriction (≤ 44 inches or ≥ 76 inches).

In Area 3A, 1) a two-fish daily bag limit, 2) a maximum size limit for the second fish of 29 inches, and 3) a vessel limit of one trip per calendar day.

In both Areas 2C and 3A charter fisheries, if a halibut is filleted, the entire carcass, with head and tail connected as a single piece, must be retained on board the vessel until all fillets are offloaded.

http://www.iphc.int/index.php/news-releases/312-nr20130204a.html

Halibut Retention in Sablefish Pots in Area 4A

The Commission reviewed documentation from the NPFMC to allow retention of Area 4A halibut caught incidentally in the sablefish pot fishery in the areas of overlap with the NMFS Bering Sea and Aleutian Island regulatory areas. The initial proposal for a legal gear change for the area had been directed to IPHC and the Commission referred the matter to the NPFMC. The Commission supported the proposal and agreed that the NPFMC should continue to explore the issue and begin to develop the appropriate regulations. The Commission noted that this may be a good way to address bycatch, but also stressed its desire that removals be limited to incidental catch and not lead to a directed halibut pot fishery. The Commission asked the NPFMC to include in its analysis methods to limit the directed fishing for halibut using pot gear, and to consider appropriate methods for the timing of pot removal and the marking of buoys (such as with radar reflectors).

Abundance-Based Management of all Halibut Removals

The Commission noted that a management proposal for managing all halibut removals – under the 32-inch commercial fishery size limit (U32) as well as over the limit (O32) – had been submitted but subsequently withdrawn during the meeting. Noting the questions raised by the original recommendation, the Commission directed the Staff to prepare a discussion paper on the biological and management issues surrounding such a concept, in order to inform future discussions of the feasibility of managing U32 removals.

Sport Fishery Management

The Commission forwarded proposals for developing an Alaska sport harvest ticket and an Oregon charter tag to the respective state agencies for their consideration, since these proposals should be appropriately considered by these agencies.

Other Proposals

The Commission reviewed other proposals concerning hook requirements, preserved fish aboard

vessels, careful release of fish, direct assessment of U32 fish, hook and release mortality, Area 2A biomass, and halibut in Prince William Sound, but took no regulatory action concerning these proposals. The Commission directed staff to work with proponents of several of these proposals to accommodate the intents of the proposals to the extent practicable.

Other Actions

Survey Expansion

The Commission approved the expansion of the IPHC's annual setline survey to include previously unsurveyed areas between 10 and 400 fathoms' depth. The setline survey currently samples at depths from 20 to 275 fathoms in most areas, and there are some gaps within that range. The expansion is designed to provide better data for the stock assessment through more complete coverage of all halibut habitat. The expansion is proposed to occur over a period of five years, until the whole range has been surveyed, and will be initiated with Areas 2A and 4A in 2014. Further analysis of the proposed expansion will occur this year, and will be used to guide implementation in future years. Additional details of the survey expansion plan are available in this year's Bluebook: (http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2014.pdf).

Performance Review

The Commission reviewed the implementation of recommendations from the 2012 Performance Review (http://iphc.int/meetings-and-events/review.html). Action taken since the review has produced increased openness and transparency in Commission meetings and operations, and the recommendations have been incorporated into ongoing work to improve the Commission's procedures and processes, including the development of scientific advice, planning and review of research, and operation of the advisory bodies.

The Commission reviewed draft revisions to its rules of procedure and financial regulations, which were developed in response to the performance review, and expects to approve them within the next two months. The Commission also reviewed a draft progress report on the performance review and its follow-up actions, and directed the report to be posted for the public. Performance review information, including the progress report, can be found on the Commission website at http://iphc.int/meetings-and-events/review.html.

Management Strategy Advisory Board and Scientific Review Board

At the 2013 Annual Meeting, the International Pacific Halibut Commission advanced the development of a Management Strategy Evaluation (MSE) program for the halibut resource. The Commission approved the formation of a Management Strategy Advisory Board (MSAB) to oversee the MSE process and to advise the Commission and Staff on the development and evaluation of candidate objectives and strategies for managing the fishery. The MSE process will help the Commission develop and thoroughly test alternative management procedures, prior to actually implementing any management changes for the fishery.

The MSAB held its second meeting at the IPHC offices in Seattle 16-17 October, 2013.

The primary objectives for the MSAB's second meeting were to:

- Review and revise as needed the draft working objectives and performance metrics developed at the first meeting, based on Board members' discussions with colleagues.
- Present details of the operating model being developed by Steve Martell and demonstrate how it will be used to evaluate management strategies.
- Prioritize the investigation of objectives according to management and harvester needs
- Establish timelines for delivery of products.
- Develop the best means to communicate the output of the process and receive feedback from stakeholders on results and future steps.

Halibut Bycatch

In 2011, the Commission began an initiative aimed at better understanding the implications of current halibut bycatch and to explore possible actions to address those concerns. The initiative created a Bycatch Project Team, composed of the IPHC Commissioners, to direct the work and lead the effort. Additionally, a Bycatch Working Group was created to provide analytic support to the Project Team. The IPHC staff also participates by providing analytic and editorial support.

The Project Team has recently completed the latest draft of a report which includes a review of bycatch across all areas, the effects of bycatch on the resource and fishery yields, and actions recently taken to reduce the overall level of bycatch. The report also contains discussion of the intermediate and long term options presented to stakeholders at the 2013 Annual Meeting. The report (http://iphc.int/documents/bycatch/Halibut_Byc_Work_Group_rept_v9.pdf) was released for public comment in November-December, 2013.

The Project Team summarised the impacts of bycatch on conservation of the stock and on allocation, e.g.,

- Reduced yield, spawning biomass, and egg production
- Upstream bycatch reducing available harvest in downstream areas

Project Team outlined a series of outstanding issues and gaps related to bycatch, e.g.,

- Bycatch amounts remain high in some regulatory areas, even when corrected for the size of the bycatch fisheries.
- Lack of national party / regulatory area accountability for U26 bycatch.
- Lack of national party / regulatory area accountability for uncertainty associated with bycatch estimates.
- As a result of limited understanding of migration, area-specific impacts due to migration are not fully accounted for.

Commissioners agreed to implement several "immediate term" actions to improve understanding of bycatch:

1. Identify and analyze options for incorporating uncertainty arising from bycatch estimates in the stock assessment, and factoring uncertainty into the catch levels established for each regulatory area.
   - *Current Status – In progress. Sensitivity analyses were conducted for stock assessment. Inclusion of bycatch-related uncertainty in regulatory area catch levels not complete – staff have proposed this be addressed through the MSE process*
2. Develop simulation studies examining uncertainty in the estimated downstream impacts of bycatch
   - *Current Status - In progress. Staff have proposed this be addressed through the MSE process*
3. Account for U26 bycatch mortality in the development of harvest scenarios at a coastwide and regulatory area level
   - *Current Status - in progress. Staff have proposed this be addressed through the MSE process*
4. IPHC staff review the 2013 monitoring program implemented for Alaska
   - *Current Status – Pending. Awaiting NMFS summary of program information in June 2014.*
5. Determine monitoring levels and bycatch estimates for shrimp trawl and crab pot fisheries in 2B
   - *Current Status – Complete. Results summarised in bycatch report.*

Commissioners also agreed to discuss a series of longer term options for reducing and mitigating bycatch:

1. Establishing updated Canada and US bycatch reduction targets
2. Authorising currently prohibited gear types to retain and sell halibut
3. Defining minimum standards for catch monitoring and reporting / implementing 100% monitoring
4. Establishing individual vessel accountability for all halibut bycatch
5. Time and area closures – e.g., identifying areas which might be designated as nursery grounds

6.(a) Defining areas with high bycatch as "areas of special concern" and reducing their catch limits accordingly
(b) Adjusting catch limits upwards in areas that have minimised bycatch and implemented high standards of monitoring
7. "Other options to reduce halibut bycatch mortality in Alaska"

http://www.iphc.int/index.php/news-releases/312-nr20130204a.html

Evidence
http://www.iphc.int/about-iphc.html
http://www.adfg.alaska.gov/index.cfm?adfg=halibut.main
http://www.fakr.noaa.gov/npfmc/halibut/sablefish-ifq-program.html
http://www.fakr.noaa.gov/ram/ifq.htm
http://www.iphc.int/index.php/news-releases/312-nr20130204a.html

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

NMFS and NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. The state of Alaska is a cooperating agency in the NEPA process for federal actions, giving it a seat at the table for federal actions. The assessment team considers that the collectivity of: the NEPA process, existing agencies and processes (e.g. ADFG, DEC, 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. The IPHC annual meeting, regular meetings of the NPFMC and the Board of Fisheries (BOF) public meetings provide forums for resolution of potential fisheries conflicts.

NEPA

The NMFS and NPFMC, cooperating with the IPHC in Alaska to effectively manage halibut stocks within state and federal jurisdiction (200 mile EEZ), participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. Virtually every development affecting the natural environment, by regulation, has to go through the NEPA environmental impact assessment process which identifies its potential environmental, social and economic impacts and/or benefits. The NEPA process is essentially a biological/environmental, and socio-economic impact assessment where proposed options for significant developments and/or changes in current management practices are evaluated, before a final decision is taken. The NEPA processes provide public information and opportunity for public and agencies involvement that are robust and inclusive at both the state and federal levels.

The state of Alaska is a cooperating agency in the NEPA process for federal actions, giving it a seat at the table for federal actions. The NEPA process includes decision-making processes and activities relevant to the fishery resource and its users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. A very recent example of the NEPA process concerning the halibut fishery is the restructuring of the observer program that started January 2013, partially covering the previously unobserved Alaska halibut fleet.

DEC

The Alaska Department of Environmental Conservation (DEC) implements statutes and regulations affecting air, land and water quality. DEC is the lead state agency for implementing the federal Clean Water Act and its authorities provide considerable opportunity to maintain high quality fish and wildlife habitat through pollution prevention (http://dec.alaska.gov/).

ADFG

ADFG 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). Some marine species also receive special consideration through the

state's Endangered Species program.

DNR
The Alaska 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 Program to preserve natural habitat of species or subspecies of fish and wildlife that are threatened with extinction (http://dnr.alaska.gov/).

USFWS
The U.S. Fish and Wildlife Service (USFWS) is a 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 fish and 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. Additionally, the USFWS distributes hundreds of millions of dollars, collected through the Sport Fish and Restoration Program. These funds are derived from an excise taxes on fishing equipment, motorboat and small engine fuels and import duties. Funds are distributed to State fish and wildlife agencies for fishery projects, boating access and aquatic education (http://www.fws.gov/help/about_us.html).

ANILCA
The Alaska National Interest Lands Conservation Act (ANILCA) conveyed large sections of federal land to settle Alaska native lands claims and provide the State of Alaska title to other large sections promised under Statehood. Additionally, it enclosed large swaths of land into federal parks and monuments for ecological protection for future generations. ANILCA directs federal agencies to consult and coordinate with the state of Alaska. State agencies responsible for natural resources, tourism, and transportation work as a team to provide input throughout federal planning processes (http://dnr.alaska.gov/commis/opmp/anilca/anilca.htm).

OPMP
The Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP) coordinates the review of larger scale projects in the state. Because of the complexity and potential impact of these projects on multiple divisions or agencies, these projects typically benefit from a single primary point of contact. A project coordinator is assigned to each project in order to facilitate interagency coordination and a cooperative working relationship with the project proponent. The office deals with a diverse mix of projects including transportation, oil and gas, mining, federal grants, ANILCA coordination, and land use planning. Every project is different and involves a different mix of agencies, permitting requirements, statutory responsibilities, and resource management responsibilities (http://dnr.alaska.gov/commis/opmp/).

BOEM
The Bureau of Ocean Energy Management (BOEM) (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. The activities of BOEM and the process for application and approval of oil exploration permits overlaps extensively with evaluations by ADNR, ADFG and ADEC given the potential impacts of such activities on anadromous and other marine resources and their habitat. An example of this is provided by the *Cook Inlet Offshore Oil & Gas Exploration Permit Application & Approval Process* available at:
http://dog.dnr.alaska.gov/Permitting/Documents/Arcadis/Arcadis_Flowchart_CookInletOffshore_Draft.pdf
http://www.boem.gov/uploadedFiles/Proposed_OCS_Oil_Gas_Lease_Program_2012-2017.pdf

The assessment team considers that the collectivity of: the NEPA process, existing agencies and processes (e.g. ADFG, ADEC, DNM, 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. However, effects of the failure to re-establish a formal coastal management program previously in place 30 years have yet to be determined.

IPHC and NPFMC meetings

The IPHC annual meeting, and the regular meetings of the NPFMC provide forums for resolution of potential international and national fisheries conflicts. The IPHC accepts regulatory proposals in the fall of each year, and users can testify in person or in writing at IPHC and NPFMC meetings. In addition, stakeholders may review and submit written comments to the NMFS on proposed rules published in the Federal Register. The NPFMC works closely with ADFG and the BOF to coordinate fishery management programs in state and federal waters off Alaska to address fish habitat concerns, catch limits, allocation issues and other conservation management issues. (http://www.adfg.alaska.gov/index.cfm?adfg= halibut.getinvolved).

The NPFMC is responsible for allocation of the halibut resource among user groups in Alaska waters. In addition, the Board of Fisheries (BOF) public meetings process provides a regularly scheduled public forum for all interested individuals, fishermen, fishing organizations, environmental organizations, Alaskan Native organizations and other governmental and non-governmental entities that catch halibut off Alaska to participate in the development of legal regulations for the commercial and sport fisheries.

Advisory Committees (AC) are local "grass roots" citizen groups intended to provide a local voice for the collection and expression of public opinions and recommendations on matters relating to the management of fish and wildlife resources in Alaska. ADFG staff regularly attends the AC meetings in their respective geographic areas to provide information to the public and hear local opinions on fisheries related activities. Currently, there are 82 advisory committees in the state. Of these, approximately 80% to 85% are "active", meaning they regularly meet, write proposals, comment and attend BOF meetings. The enabling statute for the AC system is AS 16.05.260. Regulations governing the ACs are found in the Alaska Administrative Code (AAC) Title 5, Chapters 96 – 97 http://www.boards.adfg.state.ak.us/bbs/what/prps.php.

The IPHC has already taken action on several recommendations concerning increased openness and transparency in Commission meetings and operations. Action on other recommendations will be incorporated into ongoing work to improve the Commission's procedures and processes, including the development of scientific advice, planning and review of research, and operation of the advisory bodies. The 2011 CONCUR Performance Review final report on IPHC structure and performance can be found on the Commission's website at:

http://www.iphc.int/documents/review/FINAL_IPHC_Performance_Review-April30.pdf

An update on the IPHC performance review and how the Commission was instituting some of the suggested changes was made at the Interim Meeting in November, 2012. Items addressed include the adoption of clear protocols, rules and roles, the improvement of Commission transparency and inclusion of the public, developing a strategic approach to research and strengthening the stock assessment process.
http://www.iphc.int/meetings/2012im/im2012_performance_review.pdf

The 2013 Annual Meeting was the first opportunity for the Commission to make substantial decisions based on the recommendations from the 2012 performance review. At the meeting, the national panelists presented an update on the review and the implementation of its recommendations (http://iphc.int/meetings/2013am/documents/IPHCperfreview.pdf).

In the course of the Annual Meeting, the Commission took the following actions related to performance review recommendations:
- Approved implementation of the MSE process and formation of the MSAB.
- Approved the long-term scientific review process and formation of the Scientific Review Board (SRB).
- Requested the advisory bodies (Conference Board [CB], Processor Advisory Group [PAG], and Research Advisory Board [RAB]) develop or refine their rules of procedure, and provided examples for their use.
- Directed the IPHC staff to review the Commission's own rules of procedure and financial regulations and develop recommendations for changes.
- Directed the IPHC staff regarding research planning.
- Approved plans to improve public communication of the activity of the Commission and its advisory bodies.
- Approved changes made to the formats of the Interim Meeting and Annual Meeting, and invited public comment on the changes, as well as ideas for further improvements.

At its September 2013 work meeting, the Commission reviewed the progress made in implementing performance review recommendations. Major milestones achieved during the year included:

- The first meeting of the MSAB and inauguration of the MSE process (June 2013).
- The first meeting of the SRB and inauguration of the standing scientific peer review process (August 2013).
- Completion of draft rules of procedure and financial regulations for the Commission to consider at the 2013 Interim Meeting
- Completion of draft rules of procedure by CB and PAG for consideration at the 2013 Interim Meeting.

The Commission discussed preparations for the 2013 Interim Meeting and the 2014 Annual Meeting, incorporating experience with changes made during the previous meeting cycle and inviting the advisory bodies to discuss further changes at the 2013 Interim Meeting.

To mark the progress made in the performance review process to date, the Commission directed preparation of this report for consideration during the 2013-2014 meeting cycle, with a view to making it public after the 2014 Annual Meeting.

http://www.iphc.int/documents/review/PerformancereviewprogressreportJan2014.pdf

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 objectives of the initial US and Canada Agreement for the management, conservation and sustainable utilization of Pacific halibut in the North Pacific, signed in 1923 pointed to the first basic regulations for closure of the fishery in determinate periods, halibut bycatch in other fisheries and the need for reporting such removals, enabling prosecutions for violation of the provisions and investigation into the life history of the Pacific halibut. Amendment 15 and 20 to the Fishery Management Plan (FMP) for the Groundfish Fishery of the BSAI and GOA in 1992 established an individual fishing quota (IFQ) limited access system in commercial fixed gear fisheries for Pacific halibut and sablefish in and off Alaska and implemented a Western Alaska Community Development Quota (CDQ) program for halibut and sablefish fixed gear fisheries. These amendments effectively provide a framework for the management of halibut resources in the BSAI and GOA. These actions were intended by the NMFS to promote the conservation and management of halibut and sablefish resources, and to further the objectives of the Northern Pacific Halibut Act of 1982 (Halibut Act) and the Magnuson Fishery Conservation and Management Act (Magnuson Stevens Act or MSA) that provided authority for regulating these fisheries.

The initial US and Canada Agreement for the management, conservation and sustainable utilization of Pacific halibut in the North Pacific, signed in 1923 stated that "*The Commission (IPHC) shall report the results of its investigation to the two Governments and shall make recommendations as to the regulation of the halibut fishery of the North Pacific Ocean, including the Bering Sea, which may seem desirable for its preservation and development.*" Objectives of this agreement pointed to the first basic regulations for closure of the fishery in determinate periods, halibut bycatch in other fisheries and the need for reporting such removals, enabling prosecutions for violation of the provisions and investigation into the life history of the Pacific halibut.

Control of removal rate, or the amount of fishing on each stock, was made possible by amendments in the Treaties of 1930 and 1937, which authorized the division of the coast into areas and the limitation of the catch in each area. In 1953, a further Agreement of the Commission expanded on previous objectives of the IPHC as follows: "*The Contracting Parties agree that for the purpose of developing the stocks of halibut of the Northern Pacific Ocean and Bering Sea to levels which will permit the maximum sustained yield from that fishery and for maintaining the stocks at those levels, the IPHC, with the approval of the President of the United States of America and of the Governor General in Council of Canada, may, after investigation has indicated such action to be necessary, in respect of the nationals and inhabitants and fishing vessels and boats of the United States of America and of Canada, and in respect of halibut:*

***(a)** divide the Convention waters into areas;*
***(b)** establish one or more open or closed seasons, as to each area;*
***(c)** limit the size of the fish and the quantity of the catch to be taken from each area within any season during which fishing is allowed;*
***(d)** during both open and closed seasons, permit, limit, regulate or prohibit, the incidental catch of halibut that may be taken, retained, possessed, or landed from each area or portion of an area, by*

vessels fishing for other species of fish;
(e) *prohibit departure of vessels from any port or place, or from any receiving vessel or station, to any area for halibut fishing, after any date when in the judgment of the IPHC the vessels which have departed for that area prior to that date or which are known to be fishing in that area shall suffice to catch the limit which shall have been set for that area under section (c) of this paragraph;*
(f) *fix the size and character of halibut fishing appliances to be used in any area;*
(g) *make such regulations for the licensing and departure of vessels and for the collection of statistics of the catch of halibut as it shall find necessary to determine the condition and trend of the halibut fishery and to carry out the other provisions of this Convention;*
(h) *close to all taking of halibut such portion or portions of an area or areas as the IPHC finds to be populated by small, immature halibut and designates as nursery grounds.*

In November 1993, the NMFS issued a final rule to implement Amendment 15 to the Fishery Management Plan (FMP) for the Groundfish Fishery of the BSAI Area and Amendment 20 to the FMP for Groundfish of the GOA Area. These are regulatory amendments affecting the fishery for Pacific halibut in and off Alaska. These regulations established an individual fishing quota (IFQ) limited access system in commercial fixed gear fisheries for Pacific halibut and sablefish in and off Alaska.

In addition, this action implemented a Western Alaska Community Development Quota (CDQ) program for halibut and sablefish fixed gear fisheries. These actions were intended by the NMFS to promote the conservation and management of halibut and sablefish resources, and to further the objectives of the Northern Pacific Halibut Act of 1982 (Halibut Act) and the Magnuson Fishery Conservation and Management Act (Magnuson Stevens Act or MSA) that provided authority for regulating these fisheries. The IFQ program was intended to resolve various conservation and management problems that stemmed from the "open access" regulatory regime in place at that time. The CDQ program was intended to help develop commercial fisheries in Western Alaskan communities on the Bering Sea coast by allowing them exclusive access to specified amounts of halibut and sablefish in the BSAI. Amendments 15 and 20 implemented halibut and sablefish IFQ program to the Groundfish FMPs of Alaska. These amendments effectively provide a framework for the management of halibut resources in the BSAI and GOA.

New regulations on observer deployment for the fisheries of Alaska became effective on 1 January 2013. Amendment 86 to the Fisheries Management Plan (FMP) of the Bering Sea and Aleutian Islands and Amendment 76 to the FMP of the Gulf of Alaska established the new North Pacific Groundfish and Halibut Observer Program (Observer Program). The new regulations modify observer coverage funding and observer coverage requirements for vessels and processors. These changes will increase the statistical reliability of data collected by the program, address cost inequality among fishery participants, and expand observer coverage to previously unobserved fisheries.

http://www.afsc.noaa.gov/Quarterly/jfm2013/JFM2013-Feature.pdf

The Alaska halibut fishery is managed cooperatively by the IPHC, NMFS and the NPFMC.
The NPFMC and NMFS manage the halibut fishery in the Alaska region of the American EEZ. Management decisions are made by the NPFMC, and implemented and enforced by NMFS. The NPFMC has developed Pacific halibut regulations that are in addition to, and not in conflict with, the regulations of the IPHC. These NPFMC regulations generally address domestic allocation concerns (e.g., individual fishing quotas, catch sharing between sectors, subsistence, local area management planning), some of which had profound management and conservation impact. For example, the IFQ program regulations developed by the NPFMC facilitated the maintenance of total commercial harvest within the catch limits specified by the IPHC while addressing domestic allocation concerns

in the fishery. Similarly, bycatch limits of Pacific halibut (a Prohibited Species Catch species) distributed among other commercial fisheries in Alaska (e.g. groundfish) essentially function as a bycatch cap that closes these fisheries once the cap is reached.

The NPFMC develops its Pacific halibut fishery regulations pursuant to the authority in section 5(c) of the Northern Pacific Halibut Act of 1982 (Halibut Act). The NPFMC's Halibut Act regulations are implemented only after review and rulemaking conducted by the NMFS.

The IPHC outputs (Annual Reports, Reports of Assessment and Research Activities, Scientific Reports, Technical Reports, Regulations, Information Bulletins, Annual Meeting Reports) seek to address the fishery development and conservation objectives set out in the various Agreements between US and Canada to manage the Pacific halibut stock. The Commission's Annual Report details the performance of the fisheries (commercial, sport, and personal use), with emphasis on the biological considerations, stock assessment, management issues (e.g. bycatch), and scientific research. The Report also presents the results of the Commission's annual meeting (usually held in January), at which the catch limits for upcoming season are determined.

Evidence

www.iphc.washington.edu/home.html
http://www.fakr.noaa.gov/frules/76fr14300.pdf
http://iea.uoregon.edu/pages/view_treaty.php?t=1923-Halibut.EN.txt&par=view_treaty_html
http://iea.uoregon.edu/pages/view_treaty.php?t=1953-Halibut.EN.txt&par=view_treaty_html
www.iphc.washington.edu/library/annual-reports.html
www.fakr.noaa.gov/npfmc/default.htm
http://www.fakr.noaa.gov/regs/summary.htm
www.nmfs.noaa.gov/sfa/magact
www.fakr.noaa.gov/ram/ifq.htm
http://www.iphc.washington.edu/papers/sa10.pdf
http://alaskafisheries.noaa.gov/frules/fr59375.pdf
http://www.afsc.noaa.gov/Quarterly/jfm2013/JFM2013-Feature.pdf

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 IPHC collects yearly data from a variety of sources to characterize the fishery, status and population trends in all regulatory areas, and assist in fitting a population assessment model. Some of the key datasets collected include IFQ e-landings catch, sport catch, bycatch, personal use and wastage data. Every year, the IPHC places a sampler aboard the NMFS EBS groundfish/crab trawl survey. The sampler collects biological data on the halibut catches, taking lengths of almost all halibut caught and selecting a subsample for ageing. The biennial GOA survey was conducted in 2013. The biennial AI survey was conducted in 2012, and the IPHC participated in the survey for the first time since 2000. The swept-area estimates of abundance derived from the three NMFS trawl surveys (BS, GOA, AI) are a valuable independent indicator of long-term trends in halibut biomass. Eleven commercial longline vessels, seven Canadian and four U.S., were chartered by the IPHC for survey operations in 2013. On the 1,289 stations planned for the 2013 survey, 1,279 survey stations were effective for stock assessment analysis. Seabird occurrence data have also been collected during IPHC stock assessment surveys since 2002. Bycatch data collected during the IPHC surveys are used as proxy to estimate total bycatch in the halibut fishery. However, from January 2013, there are also new partial coverage observer requirements for halibut vessels fishing hook and line gear. Halibut vessels are registered with the NMFS and can be selected on a vessel or trip basis.

Observations from the survey, commercial and other fisheries

The IPHC collects yearly data from a variety of sources to characterize the fishery, status and population trends in all regulatory areas, and assist in fitting a population assessment model. Some of the more important datasets are summarized below.

Halibut fishery removals

Total removals from the halibut populations come from five categories (Figure 1, 2, 3):

1) commercial catch (IFQ e-landings & IPHC port survey data are included in this category),
2) sport catch (Charter boat logbook, ADFG port samplers and annual mail-in survey),
3) bycatch (observer data and logbooks from a variety of fisheries targeting species other than halibut),
4) personal use (port samplers, subsistence interviews and SHARC reports), and
5) wastage from the commercial fishery (on board observers).

Bycatch and wastage are subdivided into O26 (over 26 inches) and U26 (under 26 inches) components as the U26 components are not used for purposes of determining fishery CEY (they are factored into the harvest rate). Detailed descriptions of each category are contained in the Fishery Removals section of the annual Report of Assessment and Research Activities (Stewart et al. 2013).
http://www.iphc.int/publications/rara/2013/rara2013_12_2013assessment.pdf
http://www.iphc.int/publications/rara/2013/rara2013_26_2013ssa.pdf
http://www.iphc.int/publications/rara/2013/rara2013_11_sadatasources.pdf

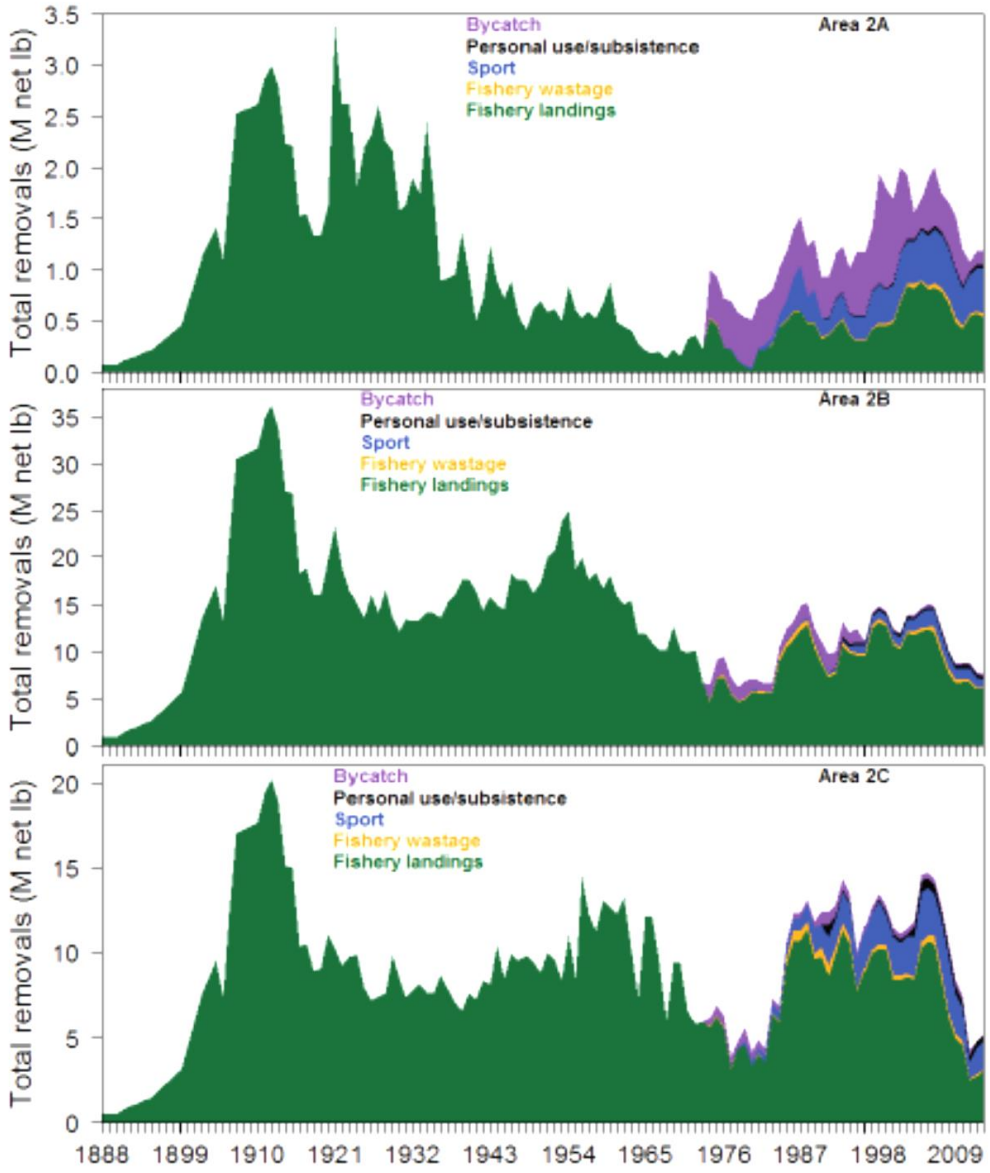


Figure 1. Total estimated removals by source in Areas 2A, 2B, 2C since 1888. Note that bycatch, personal use, sport and wastage were not measured in the earlier years.

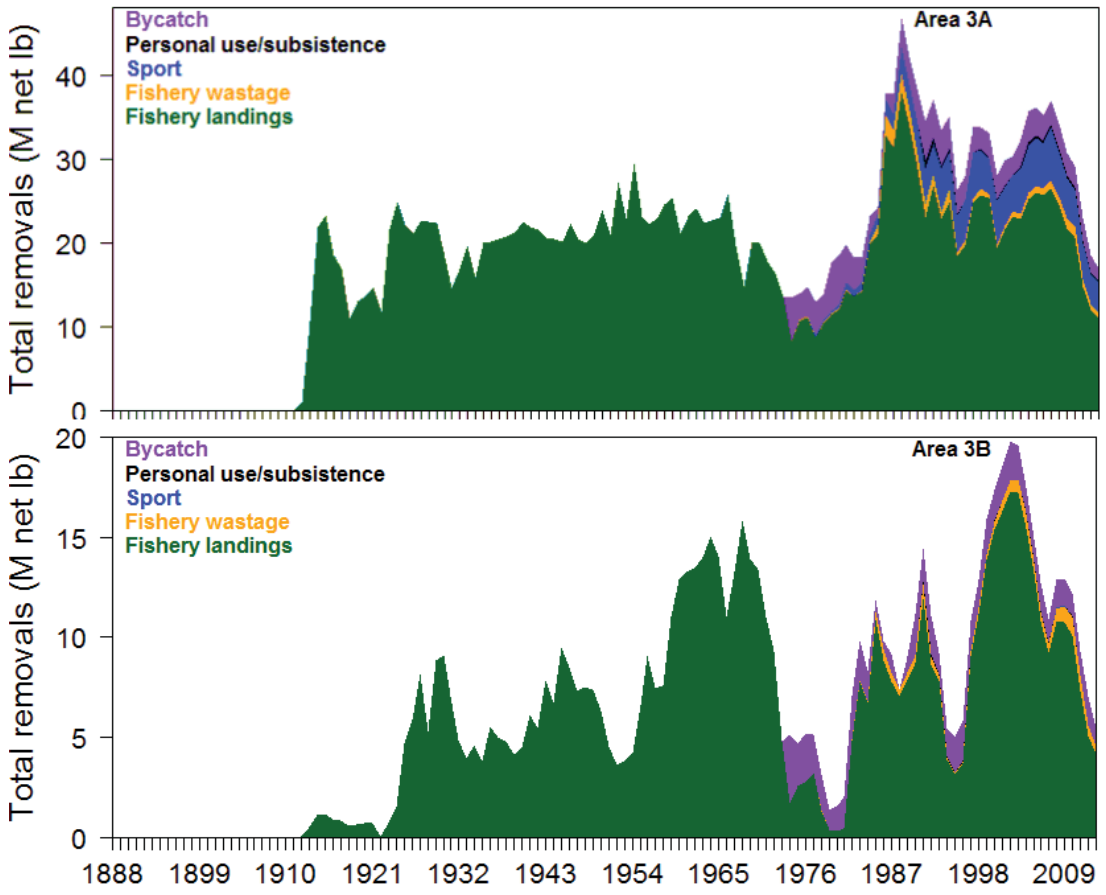


Figure 2. Total estimated removals by source in Areas 3A and 3B since 1888. Note that bycatch, personal use, sport and wastage were not measured in the earlier years.

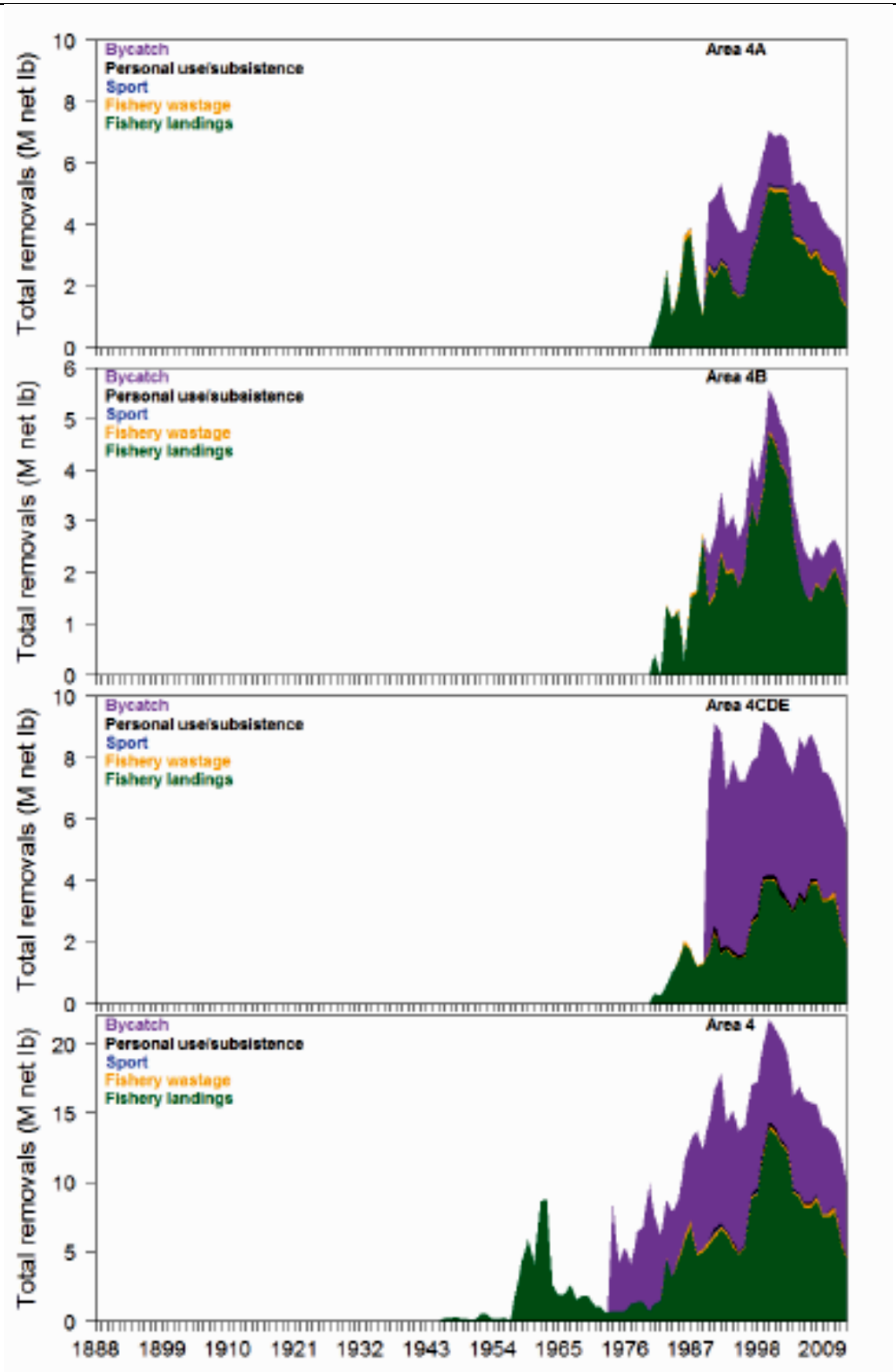


Figure 3. Total estimated removals by source in Areas 4A, 4B 4CDE and all of Area 4 combined since 1888. Note that bycatch, personal use, sport and wastage were not measured in the earlier years.

Fishery-independent data

NMFS and ADFG trawl surveys
Bering Sea

Every year, the IPHC places a sampler aboard the NMFS Eastern Bering Sea (EBS) groundfish/crab trawl survey. The sampler collects biological data on the halibut catches, taking lengths of almost all halibut caught and selecting a subsample for aging. The EBS groundfish trawl survey is used to assess halibut because of the high cost, and very low catch rate when conducting setline survey for halibut in the EBS. For this reason, the IPHC does not conduct the Standardized Stock Assessment (SSA) grid survey in that region. While the IPHC survey does operate along the Area 4D shelf edge, that region is not indicative of densities and trends across the broad shelf.

The traditional NMFS survey (i.e., as operated from 1982-present) generates swept area estimates of abundance for the southern part of the EBS shelf (equivalent to operational IPHC area 4S, the southern part of the EBS shelf). Beginning in 2010, Area 4S comprises the part of the shelf covered by the traditional NMFS EBS shelf survey, including the southern parts of IPHC regulatory areas 4D and 4E. This differs from the definition of Area 4S utilized in 2009. The reason for the change is that starting in 2010 the NMFS expanded the EBS trawl survey north to 65.5 ˚N and covering the entire remainder of the EBS shelf. ADFG also conducts trawl surveys that are included in the IPHC assessment.

From the NMFS trawl survey IPHC obtains swept area estimates of abundance at length and can then apply the stock assessment estimated survey selectivity at length schedule to the full catch to provide an index of survey catch rate, comparable to the SSA survey fishing gear.

In 2013, the International Pacific Halibut Commission (IPHC) participated in the National Marine Fisheries Service (NMFS) annual Bering Sea shelf trawl survey for the 16th straight year. The survey is a continuation of a time series started in 1975, and continued annually since 1979. Data collected on the trawl survey along with IPHC setline survey data and commercial catch information are used to create abundance estimates and to map year-class strengths. A total of 1081 Pacific halibut were sampled for length, age structures, sex, and maturity.

Aleutian Islands
The biennial Aleutian Islands survey was not conducted in 2013. The IPHC participated in the NMFS Aleutian Islands trawl survey in 2012 for the first time since 2000. A total of 630 Pacific halibut were sampled for length, age structures, sex, and maturity. In the Aleutian Islands, swept area estimates of total biomass show that the halibut population index peaked in 1997 with a biomass estimate of 146 million pounds and has been steadily declining since that time. The 2012 estimate of 69.6 million pounds is the lowest since 1986.

Gulf of Alaska
The National Oceanographic and Atmospheric Administration Fisheries Service, Alaska Fisheries Science Center, conducted a bottom trawl survey of Gulf of Alaska groundfish and invertebrate resources in 2013 as a continuation of a series started in 1984. This survey is the eighth since changing the series from triennial to biennial in 1999. One IPHC biologist was deployed on one vessel for the duration of the survey to sample Pacific halibut for length, gender, maturity, otoliths, and prior hooking injuries. A total of 1,051 Pacific halibut were sampled for the general collection and an additional 67 were sampled for the clean otolith archive collection. With the exception of the 2009 estimate which was higher, the total estimated Pacific halibut abundance has steadily declined since 2003 to 105 million halibut in 2013. The 2004 and 2005 year-classes continued to show strongest in the 2011 aging data.

Alaska trawl swept-area estimates of abundance

The swept-area estimates of abundance derived from the three NMFS trawl surveys (Bering Sea, Gulf of Alaska, Aleutian Islands) are a valuable independent indicator of long-term trends in halibut biomass. While the survey regions do not correspond precisely to IPHC regulatory areas nor are the trawl surveys each conducted in all years, they provide a useful estimates of abundance trends.

IPHC setline survey

In 2013, eleven commercial longline vessels, seven Canadian and four U.S., were chartered by the International Pacific Halibut Commission for survey operations. During a combined 68 trips and 659 charter days, these vessels fished 28 charter regions, covering habitat from northern California to the island of Attu in the Aleutian Islands, and north along the Bering Sea continental shelf edge. All 1,289 survey stations as well as eight rockfish stations planned for the 2013 survey season were completed. Of the survey stations, 1,279 (99.2%) were considered successful for stock assessment analysis. Approximately 602,191 pounds of halibut, 114,735 pounds of Pacific cod, and 45,650 pounds of rockfish were landed from the standardized survey stations. Compared to the 2012 survey, weight per unit effort (WPUE) increased in Regulatory Areas 2C and 4B. WPUE decreased in areas 2A, 2B, 3A, 3B, 4A, 4C, and 4D (Figure 4).

http://www.iphc.int/publications/rara/2012/rara2012503_ssa_survey.pdf

http://www.iphc.int/publications/rara/2013/rara2013_26_2013ssa.pdf

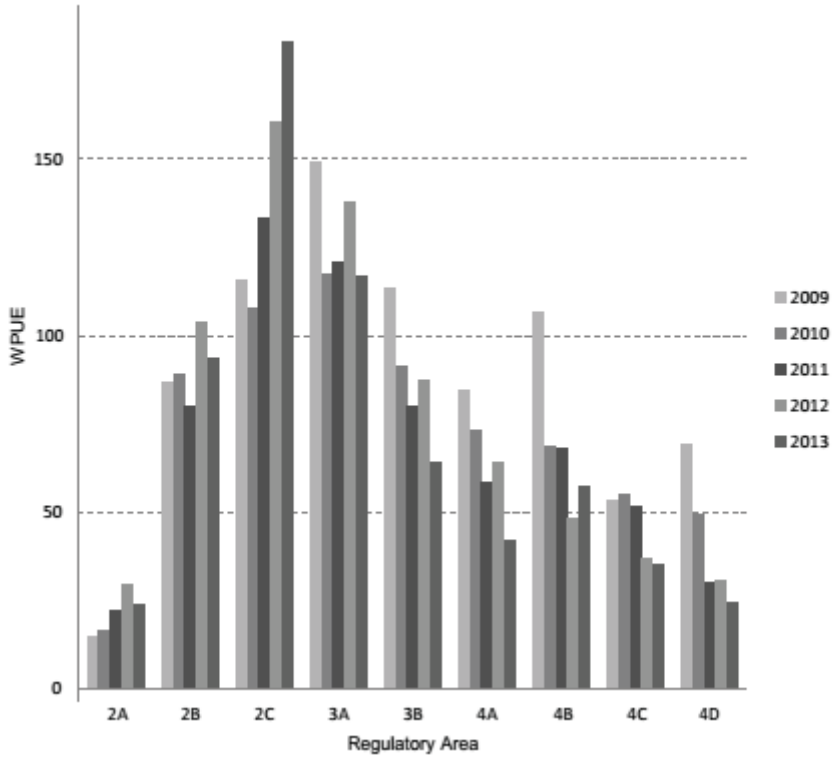


Figure 4. Average WPUE (lbs/skate) of halibut by IPHC regulatory area from effective SG stations occupied on 2009 (left)-2013 (right) setline surveys.

Some interesting trends can be seen when NPUE is observed by region (Fig. 5). In particular, Areas 2C, 4B, and 4C all had a slight increase in the rate of capture of both large and small halibut. In 2013, Area 3A showed its first decrease since 2010 of both O32 and U32 halibut NPUE. Area 3B also showed a

decline in both small and large halibut and continues to have the largest gap between U32 and O32 catch rates, with roughly 45% more U32 than O32 animals.

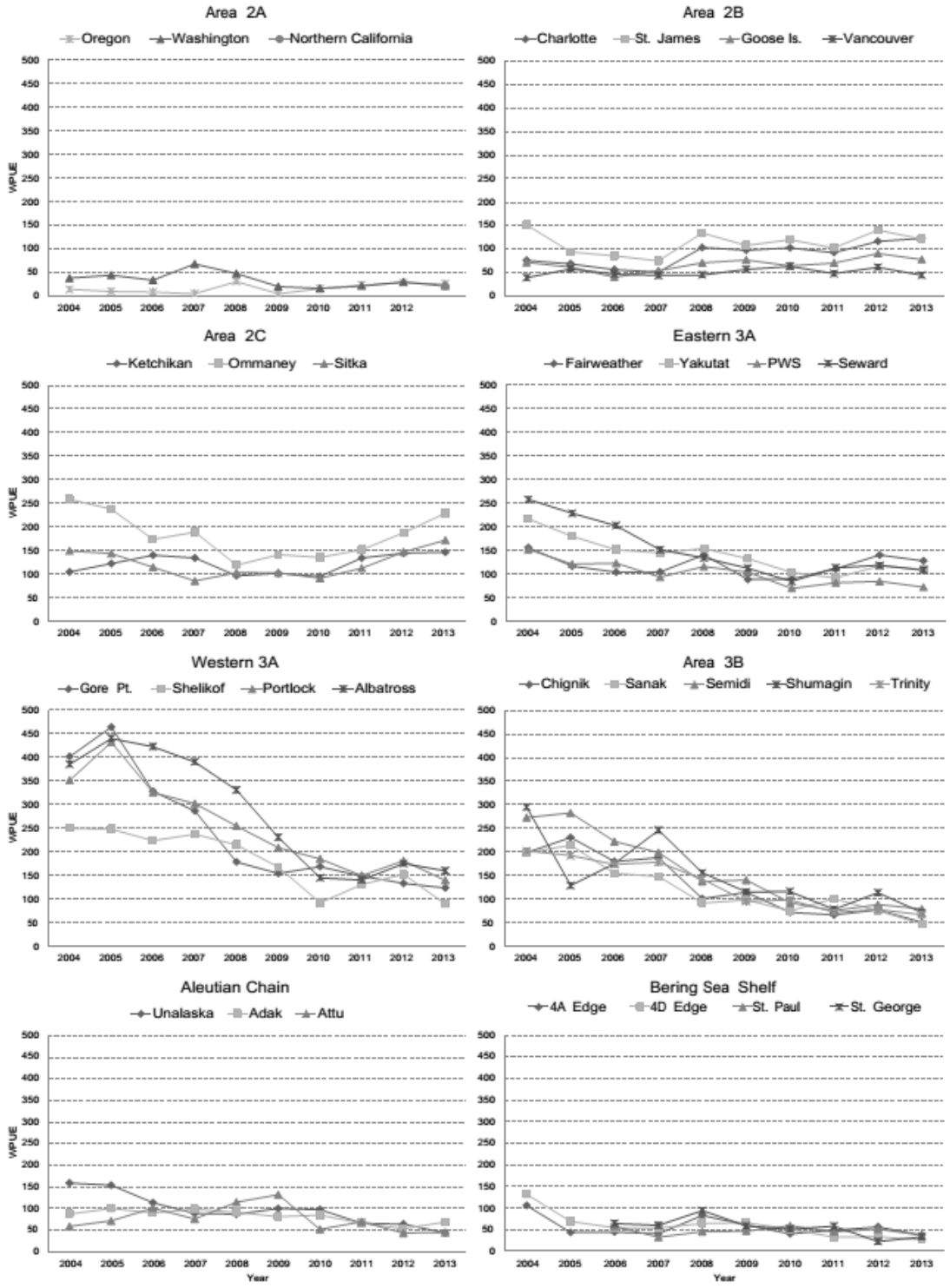


Figure 5. Survey NPUE (halibut/skate) by IPHC regulatory area from 2004 to 2013.

The survey catch of halibut is sampled to obtain biological information about the stock including sex and age distribution and is described in Forsberg (2013a). In 2012, as in the last several years, there

is a general tendency for an older age structure in the western areas, relative to the eastern areas. The age-specific catch rates are affected by the change in size at age thus the survey indexes numbers of fish selected to the gear and not necessarily total numbers of fish in the population compared across years. The 2002 year class (11-year-olds) accounted for the largest proportion (in numbers) of sampled halibut for all areas and sexes combined (Table 1). The next most abundant year classes were the ones from 2004, 2003 and 2002 (nine, ten and eleven years old).

Table 1. Age distribution of all halibut (male, female, and unknown sex combined) collected in the 2013 setline survey.

Age	Regulatory Area									
(years)	2A	2B	2C	3A	3B	4A	4B	4C	4D	Total
4		**1**							**1**	**2**
5		3	1	1	1	2	2	1		**11**
6	2	13	5	9	4	1	18	4	3	**59**
7	13	51	63	28	32	13	88	11	3	**302**
8	96	190	207	81	145	68	319	45	20	**1,171**
9	150	260	243	129	181	124	373	70	38	**1,568**
10	136	199	204	151	133	155	324	107	76	**1,485**
11	186	236	270	154	181	184	231	101	110	**1,653**
12	156	200	257	178	194	149	249	40	56	**1,479**
13	137	225	289	207	227	132	160	24	55	**1,456**
14	86	151	274	214	170	78	82	15	34	**1,104**
15	38	94	134	124	86	53	52	9	41	**631**
16	14	51	76	97	60	26	46	4	27	**401**
17	9	38	61	85	41	17	48	2	20	**321**
18	6	36	44	66	41	13	38		15	**259**
19	4	16	16	38	14	6	36		15	**145**
20	1	11	13	14	7	5	44		19	**114**
21		4	9	23	7	5	27	2	9	**86**
22		3	5	15	2	5	9	1	13	**53**
23	2	9	7	14	4	8	18		7	**69**
24	2	4	6	13	5	11	17	3	8	**69**
25	1	3	4	6	5	7	28	1	8	**63**
≥26		7	5	17	10	14	124	3	36	**216**
Total	**1,039**	**1,805**	**2,193**	**1,664**	**1,550**	**1,076**	**2,333**	**443**	**614**	**12,717**

http://www.iphc.int/publications/rara/2013/rara2013_29_2013surveyage.pdf

Bycatch data collection

Approximately 107 species of fish and invertebrates were caught as bycatch during the survey. No marine mammals or birds were caught on IPHC charters in 2013.

Hook occupancy of species-groups varied by regulatory area (Fig. 6). Halibut were the most commonly-caught species in Areas 2B and 2C. The most frequently incidentally-captured species overall was Pacific cod, followed by sharks.

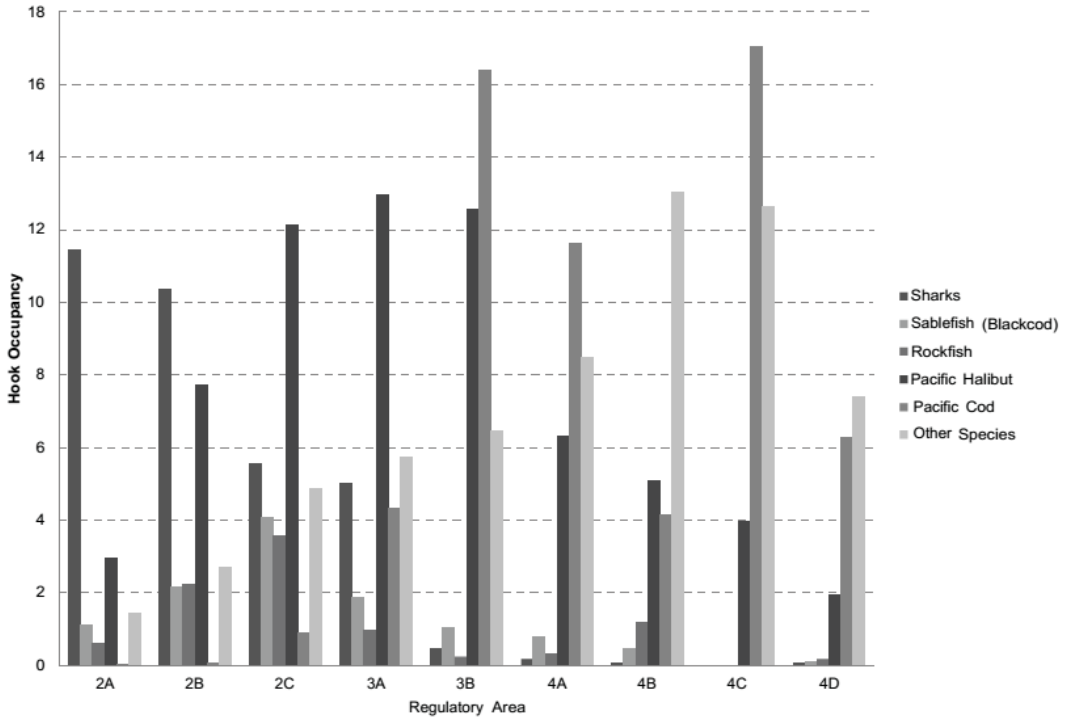


Figure 6. Percent hook occupancy by major species categories from catches in the 2013 setline survey by regulatory area.

Trends in seabird occurrence on stock assessment surveys (2002-2013)

Seabird occurrence data have been collected during International Pacific Halibut Commission (IPHC) stock assessment surveys since 2002 from the coasts of California, Oregon, Washington, British Columbia (B.C.), southeast Alaska (inside and outside waters), the central and western Gulf of Alaska, Aleutian Islands, and the southeastern Bering Sea continental shelf edge. A total of 15,130 observations were conducted over the last eleven years, and the number of stations where bird counts were performed ranged from a low of 1,218 to a high of 1,293 per year. More than 690,000 birds were recorded since 2002. Start dates for each year's survey ranged from May 25 to June 7 and the end dates from August 27 to September 14, but the bulk of observations took place from June through August.

The most frequently observed species during all years was the northern fulmar (*Fulmarus glacialis*), making up 72% of the sightings. Glaucous-winged gulls (*Larus glaucescens*) made up nine percent of the overall sightings, with black-footed albatross (*Phoebastria nigripes*) and fork-tailed storm petrels (*Oceanodroma furcata*) representing eight and two percent of sightings, respectively. Over time, the observed number of unidentified gulls has continually decreased, inversely correlated with an increased number of observations of glaucous-winged gulls and herring gulls (*L. argentatus*), the most common of the gull species on the eastern Pacific coast. This shift is likely the result of increased focus on gull identification during annual IPHC sampler training. Overall, the number of unidentified birds has decreased, indicating that the IPHC sea samplers have improved their identification skills. Black-footed albatross were more commonly observed in Washington/Oregon and northward into the Gulf of Alaska, whereas Laysan albatross (*Phoebastria immutabilis)* were seen in greatest numbers in the central and western Aleutian Islands and only rarely east of Kodiak Island. A total of 242 endangered short-tailed albatross

(*Phoebastria albatrus)* sightings were made in Area 3A and regions westward over the 11-year period.

The survey is not conducted at the same time in each area within and between years, and this may affect the bird sighting information. Further work is needed to more fully examine the potential influence of charter timing on bird observation trends. Because of the large geographic scope and consistent spatial pattern of the surveys, these data are helpful to scientists studying populations of threatened and endangered birds commonly seen during the counts.

http://www.iphc.int/publications/rara/2013/rara2013_30_2013seabirds.pdf

Fishery-dependent data

Commercial catch

The second major component of the annual IPHC data collection is sampling the commercial catch. The port sampling program is detailed in Erikson and MacTavish (2013) and age sampling in Forsberg (2013b).

http://www.iphc.int/publications/rara/2013/rara2013_08_2013commsampling.pdf
http://www.iphc.int/publications/rara/2013/rara2013_10_2013commage.pdf
http://www.iphc.int/publications/rara/2013/rara2013_11_sadatasources.pdf

From commercial fishing logs, commercial CPUE is computed for each regulatory area. As with the survey WPUE, there has been a consistent coastwide decline in commercial WPUE though not quite as pronounced. This is not unexpected however, as commercial fishers tend to move their effort to maintain their catch rate, whereas the survey maintains the same fishing locations every year. Approximately 1500 otoliths are collected and aged from each regulatory area (smaller samples in Areas 2A). Because these fish have been gutted at sea the sex cannot be determined at the time of sampling. Sex-ratios observed in the setline survey generally show a tight relationship with size within a given age, due to the pronounced sexually dimorphic growth pattern of females attaining much larger sizes than males. Because of this consistency, the relationship between sex ratio and size by age has historically been estimated from the survey and then applied to the fishery biological samples in order to infer the ages and lengths-at-age by sex. Although representing a very reasonable approach, this processing step has implications for calculation of uncertainty and was recommended for revisiting in the future by the Scientific Review Board Meeting (Stewart et al. 2013). Logbooks collected from the commercial fishery generate indices of both WPUE and NPUE. These indices indicate very similar trends to those observed in the setline survey (Figure 7).

As has been observed over several previous stock assessments, in 2013 there was a change in the 2012 WPUE relative to the dataset available for the 2012 annual stock assessment. Specifically, the final verified record of logbooks available approximately 10-12 months after the end of the annual fishing season (August to September of the following year) have tended to show a lower catch rate than the preliminary data available in November and used in the stock assessment each year. The final 2012 logbook data indicated a 2% decline from 2011 to 2012 in the total WPUE series, as compared to a 0% change in the preliminary data available during November of 2012. Area-specific differences were variable, but generally larger for regulatory areas with few logbook records (e.g., Areas 2A, 4C). These differences reflect the inclusion of log books that were not collected by port samplers during the year of fishing (and subsequently mailed into the IPHC, or collected by port samplers during the 2013 fishing season), as well as log books that had been collected but were not available for analysis in 2012 (the fishing season extended until early November; the stock assessment data were finalized the day the fishery closed). A potential contributing factor could be the combination of a decline in WPUE during the fishing season, and a higher probability of logs from later in the season being unavailable at the time of the assessment. Given this pattern, the variance of the terminal year of the WPUE series should be routinely inflated to reflect this additional

uncertainty, and the interpretation of small changes tempered by previous trends.

Commercial WPUE series are quite variable among regulatory areas, with Areas 2A, 2B and 2C increasing trends in recent years, and Areas 3A through 4 the greatest declines. Sustained higher catch rates during the 1980s and 1990s are evident in many areas (Fig. 8).

The most dramatic change in the commercial WPUE time series corresponds to the transition from "J" to circle hooks in 1984, although there have been many other changes in the definition of effort over the time series. Changes in catch rates prior to the 1980s also reflect the areas over which fishing was conducted; given the geographic patterns in landings (Fig. 9) it is quite clear that these have shown a strong pattern of moving south to north over much of the time-series. Despite these caveats, it is clear that catch rates were quite low around the time of the formation of the Halibut Commission (in fact, this was the motivation for the original convention), and again in the late 1970s (Fig. 10). Additional uncertainty throughout the historical series is reflected by increased CVs (fixed at 0.1) for all years prior to 1996.

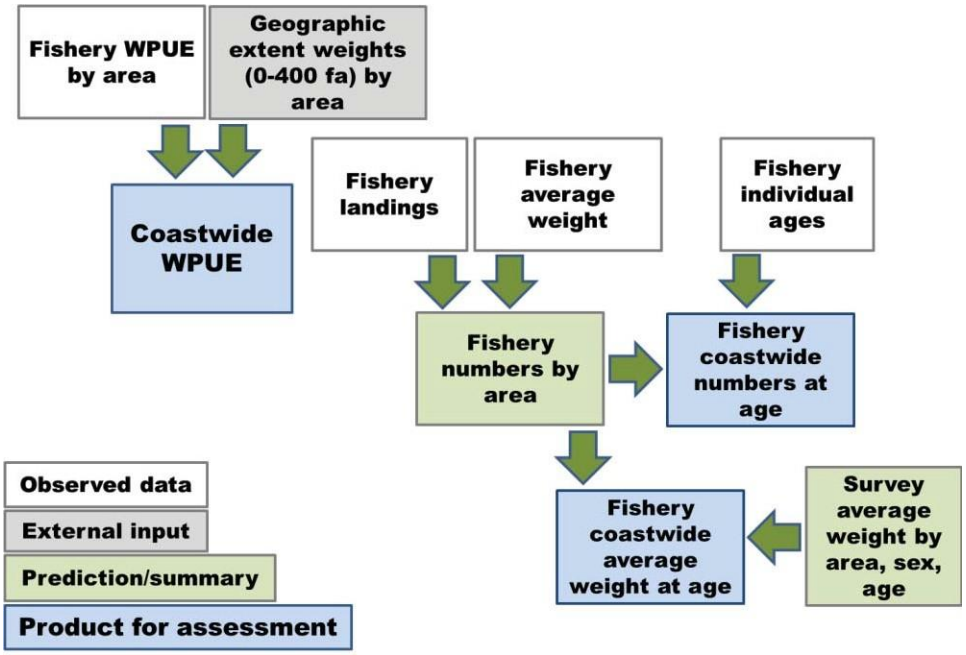


Figure 7. Relationships among fishery-dependent catch-rate and biological data sources.

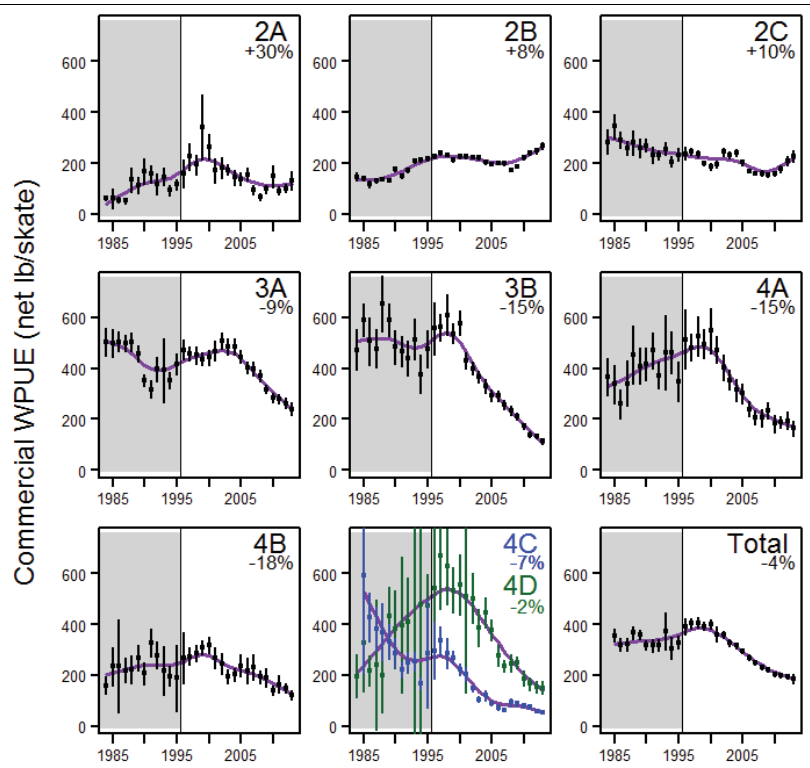


Figure 8. Commercial WPUE summarized by regulatory area and year. Percentages for each Area indicate the change from 2012 to 2013; lines represent a smoother for visualization purposes only.

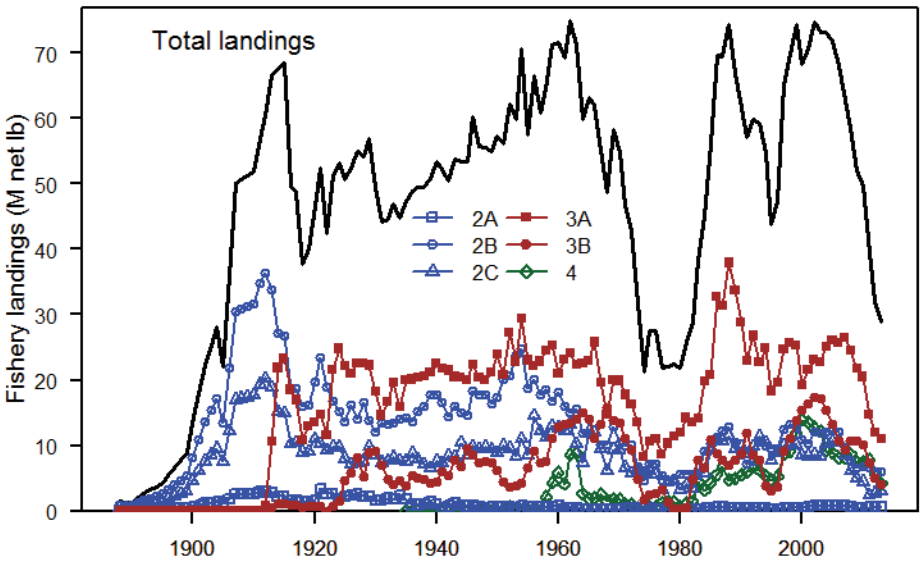


Figure 9. Landings of halibut by the directed commercial fishery by regulatory Area.

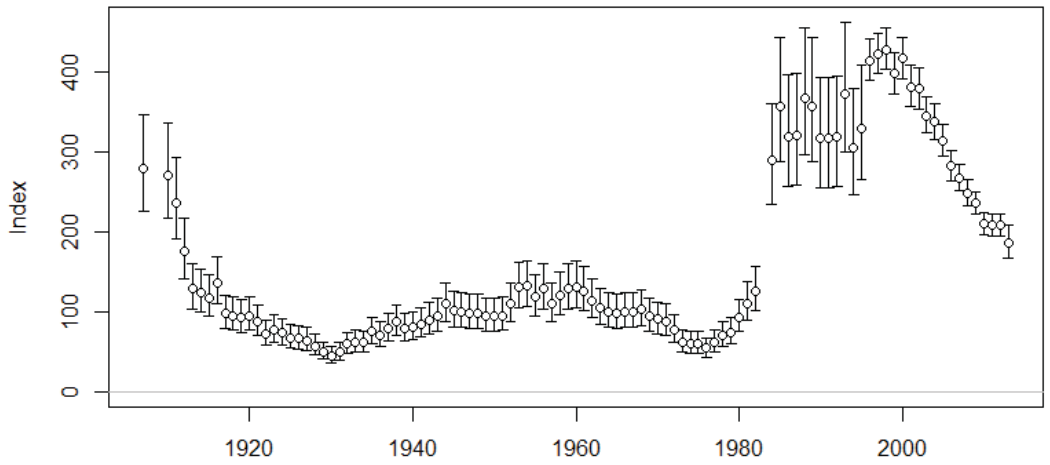


Figure 10. Coastwide commercial WPUE from historical records of effort and catch, as well as more recent direct logbook processing. The large change between 1982 and 1984 coincides with the adoption of circle hooks.

Fishery age distributions

Recent fishery ages are created from otoliths collected by port samplers in proportion to the landings in the ports that are annually staffed by the IPHC (Erikson and MacTavish 2013). Because of this method, the raw ages can be directly aggregated within each area and year to estimate the age composition of the catch. Because port samplers also collect individual lengths, the average weight within each area can also be directly estimated via the length-weight relationship. Dividing the total commercial catch for each regulatory area and year by the average fish weight gives an estimate of the number of fish captured. To aggregate the proportions-at-age from each area into a coast wide total, each area is weighted by the numbers of fish in the catch relative to the total number of fish captured over all areas. For the period included in recent stock assessments, the coast wide age distribution displays a very similar pattern to that of the setline survey ages: a very strong 1987 cohort moving through the stock (Fig. 11).

Commercial fishery ages prior to 1991 have been summarized by several previous analysts, in some cases processed originally by one analyst and then subsequently by another (Clark et al. 2000). For this summary, a file produced for the analysis by Clark et al. (2000) was obtained, which included proportions at age by regulatory area from 1935 to 1990. Additional work could be done to verify which of these proportions can and can't be recreated from the current IPHC database.

Weighting of the area-specific proportions followed the method applied to the more recent data, first obtaining an average individual weight (in this case by multiplying the proportions at age by the estimated average weight at age from the historical records), and then dividing the total landings by that weight to get an estimate of the number of fish in the landings by year and area. Again, following the survey analysis methodology, the numbers in the landings by area were used to weight the proportions-at-age for a coast wide total.

The resultant fishery age-frequency distributions reveal that halibut in the commercial landings from the 1930s to 1973 (when the current minimum size limit was implemented) have been predominantly age 6 to 14 (Fig. 12). Several strong cohorts can be observed in the data, but none more conspicuous than the 1987 cohort.

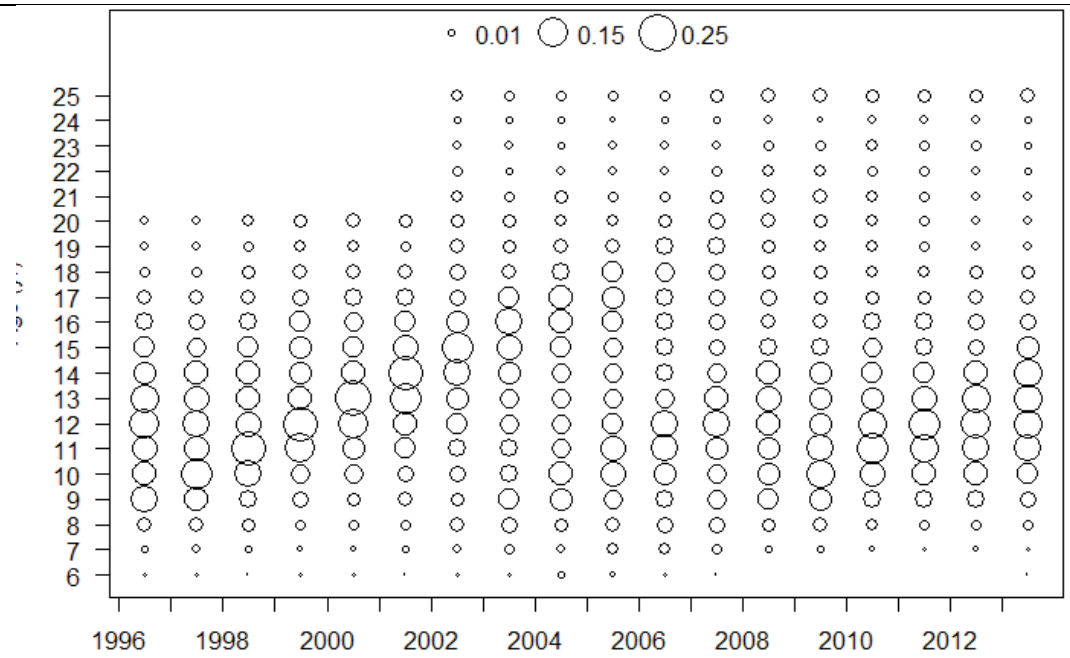


Figure 11. Estimates of recent commercial fishery numbers-at-age.

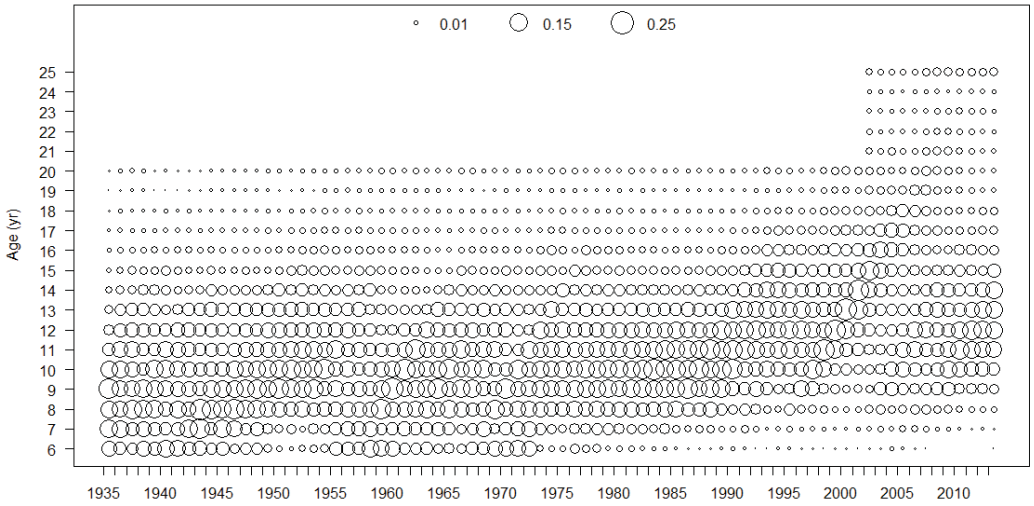


Figure 12. Commercial fishery proportions-at-age from the retained catch (male and female halibut combined). Note that the current 32 inch minimum size limit was implemented in 1973.

Fishery weight-at-age

Both lengths and otoliths are collected by port samplers, and the lengths can be converted into individual weight estimates. No sex information is available from port samples. The average weight of a landed halibut has shown relatively flat trends over Areas 2A, 2B, and 2C, steep declines in Areas 3A and 3B and somewhat less pronounced declines in area 4 (Fig. 13). Several areas showed an increase in average weight in 2013 resulting in an increase at the coast wide level.

These observations accurately reflect the fishery landings, but combine the relative influences of weight-at-age, age- and sex-structure, as well as selectivity relative to the underlying population.

Historical observations of average weight are more problematic. Specifically, from 1963-1990 the IPHC did not collect individual lengths from the commercial landings. It was thought at the time that

otoliths measurements could be used to adequately estimate the body size of the fish (Southward 1962), and therefore the weight. Subsequent investigation of the relationship between otolith measurements and individual length (Clark 1992) resulted in the resumption of length sampling in 1991. For this reason, the weights-at-age for most of the historical period should be considered much more uncertain than recent observations. In addition, there has yet been no detailed evaluation of surface ageing bias or precision for the period prior to the 1990s (although this work is currently underway at the IPHC). Despite these considerations, there is a clear pattern of increasing fish size in the landings from the 1930s through the 1970s, followed by a subsequent decline to the present (Fig. 14). Also clearly visible is the effect of the implementation of the 32 inch minimum size limit in 1974.

Following the same method applied to the age-composition data (weighting the historical weight-at-age for each regulatory area by the number of fish in the landings for that area), a coast wide weight-at-age can be constructed for the entire time-series. Unfortunately, this series is not sex-specific due to the dressing of fish at sea prior to sampling by port samplers. However, there are similar trends for the best represented ages (8-16) over the historical period. One way to investigate these patterns is to divide the time series of weight-at-age for each age relative to the first year in which we have a coast wide estimate from survey data (1997). Only legal-sized fish from the survey catch are included in these weights-at-age in order to make them comparable to fishery landings. These deviations show very similar temporal patterns, despite expected differences on an absolute scale (Fig.15).

As a proxy for sex-specific weights-at-age for the time-series, the survey weights-at-age from 1997 were scaled by the time series of annual deviations calculated from the fishery data. This implicitly assumes that male and female halibut have experienced similar trends in size-at-age; recent data that are available by sex support this assumption.

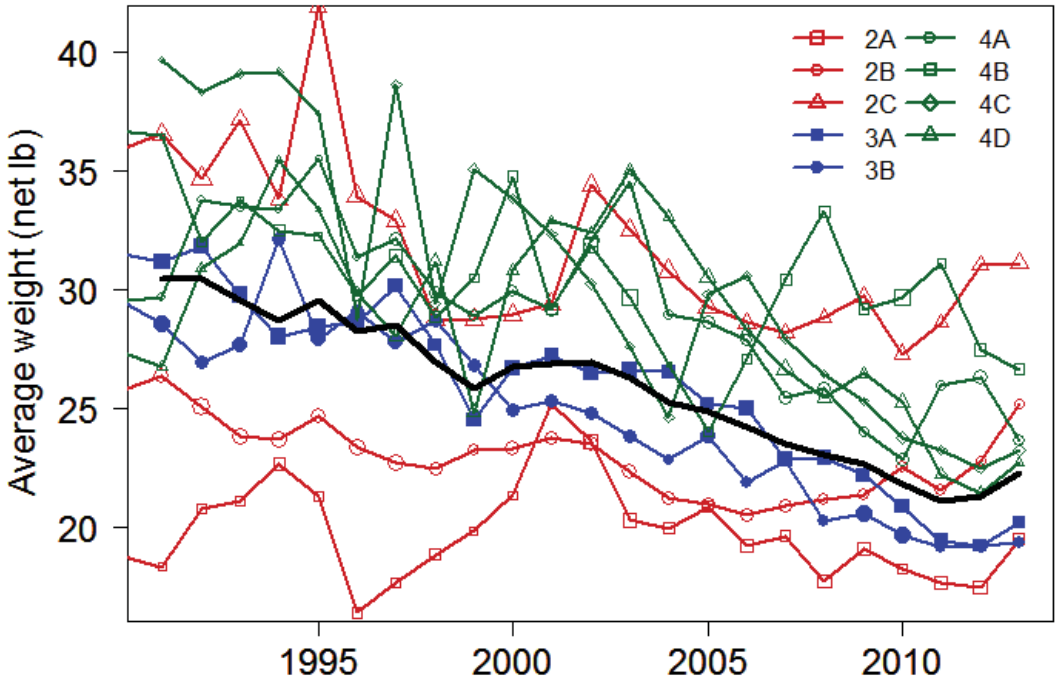


Figure 13. Recent average halibut weight in the directed fishery landings

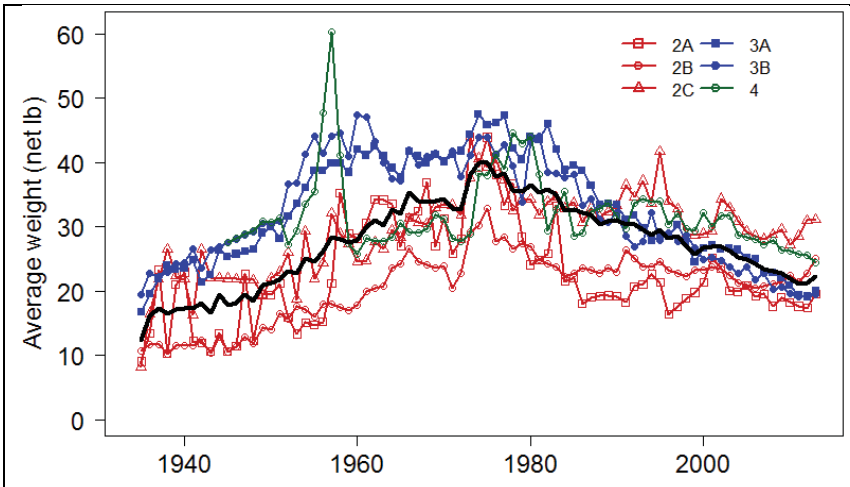


Figure 14. Trends in average individual halibut weight in the commercial fishery landings. The current 32-inch minimum size limit went into effect in 1974.

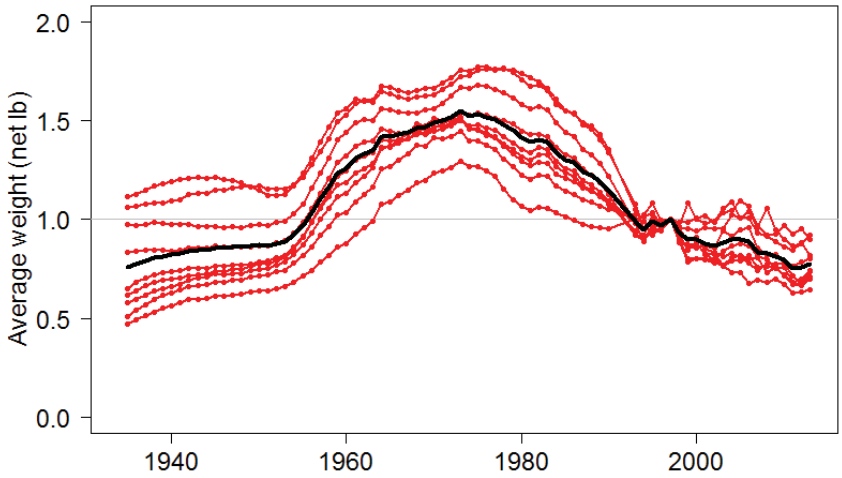


Figure 15. Trends in average individual halibut weight as deviations from 1997 in the commmercial fishery landings for halibut aged 8-16 years old (red lines). The black line represents average trend among the nine ages included. The current 32-inch minimum size limit went effect in 1974.

http://www.iphc.int/publications/rara/2013/rara2013_11_sadatasources.pdf

Incidental mortality of halibut in the commercial halibut fishery (wastage)

Commercial fishery wastage includes a proportion of U32 halibut that must be released by regulation but subsequently die, and O32 halibut that die from lost or abandoned gear. From 1997 through 2009, only commercial fishery wastage from O32 halibut was deducted and the estimated mortality of discarded U32 halibut was accounted for when setting exploitation rates instead of being treated as a direct removal. Starting in 2010, for the IPHC staff catch limits recommendations, wastage mortality of O32 halibut and halibut between 26 and 32 inches were directly deducted to determine the fishery CEY and the mortality of U26 halibut was accounted for when setting exploitation rates. The intent of this modification was to standardize the treatment of removals, given that sport and personal use fishery removals, included U26 halibut, are directly deducted when setting catch limits.

Information on the amount of gear lost or abandoned in the halibut longline fishery was collected through logbook interviews or from fishing logs received via mail. Fishery-wide estimates were then extrapolated to total catch values using standardized logbook catch and effort statistics.

Because the directed commercial halibut fishery did not carry fisheries observers until January 2013, the weight of U32 halibut discarded must be estimated by indirect methods. In 2007, U32 halibut mortality was re-estimated for all years back to 1974 using catch-per-skate data from IPHC SSA survey stations that ranked in the top third for catch rate (by weight) in each regulatory area. A mortality rate of 16% was applied in years since the beginning of individual quota fisheries. To estimate the pounds of U32 halibut captured in the commercial halibut fishery, the area-specific U32:O32 ratio was multiplied by the estimated commercial catch in each regulatory area, for each year. The resulting poundage was then multiplied by the discard mortality rate to obtain the estimated poundage of U32 halibut killed in the commercial fishery. The mortality of U32 halibut needed to be further subdivided to standardize the treatment of halibut between the sizes of 26 and 32 inches in the determination of catch limits (Table 2).

Wastage for O32 halibut was calculated from the ratio of effective skates lost to effective skates hauled, multiplied by total landed catch. Effective skates are skates for which no data (skate length, hook spacing, number of hooks per skate) are missing and gear type meets the standardization criteria. Wastage from lost gear was first calculated in 1985 and estimates are provided by regulatory area in Table 3. The amount of gear lost varies by year but it is much lower with the quota share fisheries, and in some instances very few skates are reported lost, which was the case in Areas 2C and 3B in 2013.

In terms of total wastage from the commercial fishery it is estimated to have been highest in the early 1980s, subsequently declining (particularly in Area 3A in 1995 when the derby fishery was converted to a quota system), and then increasing from 1995 to 2010 as the size-at-age of halibut declined and more fish at older ages remained below the minimum size limit. The estimates of wastage cannot be delineated within Regulatory Area 4 prior to 1981 (Table 4), but there is very little wastage estimated prior to that time

http://iphc.int/publications/rara/2012/rara2012053_commwastage.pdf
http://www.iphc.int/publications/rara/2013/rara2013_05_2013commwastage.pdf

Table 2. Estimated U32 halibut discard mortality in thousands of net pounds , killed in the commercial halibut fishery by IPHC regulatory area and year 1974-2013

	Regulatory Area											
Year	2A	2B	2C	3A	3B	4	4A	4B	4C	4D	4E	Total
1974	0.002	0.081	0.042	0.061	0.013	0.002	NA	NA	NA	NA	NA	0.201
1975	0.004	0.143	0.048	0.091	0.021	0.002	NA	NA	NA	NA	NA	0.309
1976	0.002	0.164	0.044	0.107	0.025	0.002	NA	NA	NA	NA	NA	0.344
1977	0.002	0.135	0.026	0.093	0.032	0.004	NA	NA	NA	NA	NA	0.292
1978	0.001	0.113	0.036	0.115	0.014	0.004	NA	NA	NA	NA	NA	0.283
1979	0.001	0.119	0.039	0.130	0.004	0.004	NA	NA	NA	NA	NA	0.297
1980	0.000	0.136	0.029	0.132	0.003	0.002	NA	NA	NA	NA	NA	0.302
1981	0.002	0.152	0.036	0.147	0.006	NA	0.004	0.002	0.002	0.000	0.000	0.351
1982	0.002	0.163	0.033	0.124	0.067	NA	0.010	0.000	0.002	0.000	0.000	0.401
1983	0.003	0.192	0.064	0.117	0.114	NA	0.023	0.009	0.004	0.000	0.000	0.526
1984	0.005	0.363	0.065	0.162	0.104	NA	0.010	0.008	0.006	0.001	0.000	0.724
1985	0.006	0.440	0.129	0.284	0.198	NA	0.021	0.012	0.009	0.004	0.000	1.101
1986	0.007	0.492	0.173	0.517	0.190	NA	0.048	0.002	0.011	0.011	0.000	1.452
1987	0.007	0.513	0.175	0.525	0.172	NA	0.050	0.015	0.014	0.005	0.001	1.479
1988	0.005	0.508	0.179	0.652	0.145	NA	0.024	0.016	0.009	0.002	0.000	1.540
1989	0.004	0.397	0.160	0.644	0.172	NA	0.014	0.028	0.009	0.004	0.000	1.432
1990	0.004	0.320	0.182	0.583	0.198	NA	0.038	0.015	0.010	0.008	0.001	1.359
1991	0.003	0.166	0.173	0.523	0.293	NA	0.035	0.018	0.012	0.011	0.001	1.237
1992	0.004	0.167	0.191	0.587	0.207	NA	0.039	0.028	0.013	0.004	0.001	1.241
1993	0.006	0.224	0.219	0.513	0.185	NA	0.038	0.024	0.013	0.004	0.001	1.227
1994	0.002	0.202	0.215	0.632	0.095	NA	0.028	0.025	0.012	0.004	0.002	1.217
1995	0.002	0.189	0.102	0.292	0.049	NA	0.016	0.013	0.006	0.001	0.001	0.672
1996	0.004	0.182	0.133	0.358	0.061	NA	0.019	0.013	0.014	0.015	0.003	0.800
1997	0.005	0.254	0.148	0.455	0.192	NA	0.031	0.019	0.023	0.023	0.005	1.157
1998	0.006	0.276	0.189	0.522	0.233	NA	0.048	0.035	0.018	0.018	0.003	1.347
1999	0.006	0.281	0.170	0.429	0.251	NA	0.033	0.046	0.015	0.016	0.002	1.249
2000	0.007	0.162	0.160	0.416	0.326	NA	0.066	0.036	0.004	0.004	0.001	1.183
2001	0.011	0.199	0.193	0.391	0.449	NA	0.099	0.047	0.007	0.008	0.002	1.407
2002	0.009	0.168	0.146	0.507	0.481	NA	0.083	0.020	0.003	0.004	0.001	1.423
2003	0.028	0.309	0.171	0.608	0.611	NA	0.085	0.026	0.004	0.008	0.002	1.852
2004	0.009	0.275	0.331	0.682	0.701	NA	0.063	0.022	0.005	0.009	0.002	2.100
2005	0.034	0.298	0.309	0.568	0.546	NA	0.127	0.011	0.005	0.025	0.004	1.927
2006	0.043	0.569	0.404	0.690	0.465	NA	0.095	0.009	0.006	0.031	0.005	2.318
2007	0.030	0.500	0.338	0.913	0.436	NA	0.127	0.019	0.009	0.045	0.010	2.427
2008	0.036	0.432	0.288	0.943	0.672	NA	0.138	0.018	0.018	0.063	0.015	2.623
2009	0.051	0.334	0.292	1.131	0.775	NA	0.145	0.011	0.015	0.050	0.010	2.813
2010	0.026	0.275	0.246	1.429	0.883	NA	0.130	0.030	0.020	0.053	0.010	3.102
2011	0.020	0.256	0.074	0.901	0.763	NA	0.134	0.035	0.041	0.112	0.024	2.359
2012	0.018	0.208	0.082	0.581	0.516	NA	0.090	0.035	0.017	0.044	0.011	1.602
2013	0.014	0.192	0.081	0.498	0.406	NA	0.063	0.032	0.016	0.030	0.009	1.339

Table 3. Estimated U32 halibut discard mortality in thousands of net pounds , killed by lost or abandoned longline gear in the commercial halibut fishery by IPHC regulatory area and year 1974-2013

	Regulatory Area										
Year	2A	2B	2C	3A	3B	4A	4B	4C	4D	4E	Total
1985	0.002	0.111	0.236	1.019	0.219	0.065	0.046	0.025	0.027	0.001	1.749
1986	0.004	0.221	0.472	2.036	0.439	0.195	0.014	0.041	0.074	0.002	3.499
1987	0.003	0.188	0.401	1.732	0.373	0.147	0.058	0.037	0.029	0.004	2.974
1988	0.001	0.053	0.225	1.651	0.134	0.030	0.024	0.011	0.008	0.000	2.137
1989	0.007	0.050	0.211	1.599	0.212	0.029	0.072	0.017	0.020	0.000	2.217
1990	0.016	0.127	0.357	1.217	0.237	0.117	0.060	0.026	0.049	0.003	2.209
1991	0.002	0.078	0.378	1.253	0.458	0.098	0.064	0.031	0.066	0.004	2.434
1992	0.007	0.058	0.267	0.705	0.198	0.054	0.046	0.017	0.016	0.001	1.369
1993	0.009	0.104	0.209	0.374	0.069	0.049	0.036	0.017	0.017	0.001	0.886
1994	0.001	0.075	0.249	0.918	0.043	0.038	0.041	0.016	0.016	0.002	1.399
1995	0.003	0.042	0.059	0.138	0.009	0.009	0.009	0.003	0.003	0.001	0.276
1996	0.001	0.032	0.048	0.196	0.024	0.026	0.030	0.011	0.011	0.002	0.382
1997	0.006	0.042	0.044	0.082	0.061	0.028	0.031	0.011	0.011	0.002	0.318
1998	0.001	0.060	0.046	0.173	0.063	0.022	0.018	0.008	0.009	0.001	0.400
1999	0.007	0.045	0.074	0.129	0.079	0.036	0.030	0.015	0.016	0.002	0.433
2000	0.007	0.031	0.042	0.067	0.065	0.028	0.024	0.009	0.010	0.002	0.286
2001	0.003	0.051	0.042	0.072	0.037	0.037	0.031	0.011	0.012	0.003	0.301
2002	0.005	0.039	0.029	0.157	0.040	0.022	0.016	0.005	0.007	0.002	0.323
2003	0.002	0.041	0.028	0.079	0.043	0.022	0.017	0.004	0.008	0.002	0.246
2004	0.000	0.041	0.037	0.089	0.019	0.017	0.013	0.004	0.007	0.001	0.228
2005	0.006	0.042	0.038	0.177	0.033	0.015	0.007	0.002	0.010	0.001	0.330
2006	0.002	0.044	0.026	0.059	0.014	0.008	0.004	0.001	0.005	0.001	0.166
2007	0.003	0.036	0.036	0.064	0.023	0.010	0.004	0.002	0.009	0.002	0.190
2008	0.001	0.026	0.015	0.075	0.006	0.014	0.007	0.003	0.011	0.002	0.163
2009	0.001	0.024	0.014	0.058	0.030	0.016	0.007	0.003	0.011	0.002	0.168
2010	0.001	0.033	0.012	0.030	0.031	0.011	0.008	0.003	0.009	0.001	0.139
2011	0.005	0.031	0.006	0.040	0.012	0.013	0.009	0.004	0.012	0.003	0.134
2012	0.004	0.014	0.013	0.016	0.016	0.007	0.003	0.001	0.001	0.001	0.077
2013	0.002	0.013	0.001	0.029	0.002	0.016	0.005	0.001	0.002	0.001	0.072

Table 4. Millions of pounds net weight in the commercial halibut fishery 1974-2013

	Regulatory Area											
Year	2A	2B	2C	3A	3B	4	4A	4B	4C	4D	4E	Total
1974	0.002	0.081	0.042	0.061	0.013	0.002	NA	NA	NA	NA	NA	0.201
1975	0.004	0.143	0.048	0.091	0.021	0.002	NA	NA	NA	NA	NA	0.309
1976	0.002	0.164	0.044	0.107	0.025	0.002	NA	NA	NA	NA	NA	0.344
1977	0.002	0.135	0.026	0.093	0.032	0.004	NA	NA	NA	NA	NA	0.292
1978	0.001	0.113	0.036	0.115	0.014	0.004	NA	NA	NA	NA	NA	0.283
1979	0.001	0.119	0.039	0.130	0.004	0.004	NA	NA	NA	NA	NA	0.297
1980	0.000	0.136	0.029	0.132	0.003	0.002	NA	NA	NA	NA	NA	0.302
1981	0.002	0.152	0.036	0.147	0.006	NA	0.004	0.002	0.002	0.000	0.000	0.351
1982	0.002	0.163	0.033	0.124	0.067	NA	0.010	0.000	0.002	0.000	0.000	0.401
1983	0.003	0.192	0.064	0.117	0.114	NA	0.023	0.009	0.004	0.000	0.000	0.526
1984	0.005	0.363	0.065	0.162	0.104	NA	0.010	0.008	0.006	0.001	0.000	0.724
1985	0.008	0.542	0.345	1.213	0.398	NA	0.082	0.056	0.031	0.028	0.001	2.702
1986	0.011	0.695	0.606	2.374	0.591	NA	0.231	0.016	0.048	0.077	0.002	4.652
1987	0.010	0.686	0.543	2.105	0.513	NA	0.188	0.071	0.047	0.031	0.005	4.201
1988	0.006	0.557	0.385	2.158	0.267	NA	0.052	0.039	0.019	0.009	0.000	3.492
1989	0.011	0.443	0.353	2.102	0.366	NA	0.041	0.098	0.024	0.022	0.000	3.460
1990	0.019	0.437	0.509	1.693	0.414	NA	0.148	0.073	0.033	0.052	0.004	3.382
1991	0.005	0.238	0.520	1.666	0.711	NA	0.127	0.080	0.040	0.070	0.005	3.464
1992	0.011	0.220	0.436	1.230	0.388	NA	0.090	0.072	0.028	0.018	0.002	2.495
1993	0.021	0.320	0.411	0.854	0.248	NA	0.084	0.059	0.028	0.019	0.002	2.047
1994	0.009	0.271	0.443	1.477	0.134	NA	0.064	0.065	0.026	0.018	0.004	2.511
1995	0.009	0.228	0.156	0.420	0.058	NA	0.024	0.022	0.009	0.004	0.002	0.932
1996	0.011	0.211	0.177	0.535	0.083	NA	0.043	0.042	0.024	0.025	0.005	1.154
1997	0.014	0.291	0.188	0.529	0.246	NA	0.057	0.049	0.033	0.033	0.007	1.448
1998	0.019	0.329	0.230	0.676	0.289	NA	0.068	0.052	0.025	0.026	0.004	1.717
1999	0.018	0.321	0.237	0.546	0.322	NA	0.067	0.074	0.029	0.031	0.004	1.649
2000	0.025	0.190	0.198	0.475	0.384	NA	0.092	0.059	0.013	0.014	0.003	1.453
2001	0.026	0.245	0.230	0.456	0.481	NA	0.132	0.076	0.018	0.020	0.005	1.690
2002	0.023	0.204	0.172	0.646	0.515	NA	0.103	0.036	0.008	0.011	0.003	1.722
2003	0.046	0.344	0.196	0.676	0.646	NA	0.105	0.042	0.008	0.016	0.004	2.083
2004	0.017	0.311	0.362	0.758	0.716	NA	0.078	0.034	0.009	0.016	0.003	2.305
2005	0.040	0.335	0.341	0.724	0.572	NA	0.139	0.018	0.007	0.034	0.005	2.215
2006	0.050	0.605	0.425	0.741	0.476	NA	0.102	0.013	0.007	0.036	0.006	2.463
2007	0.041	0.529	0.367	0.966	0.454	NA	0.135	0.023	0.011	0.053	0.012	2.591
2008	0.045	0.454	0.300	1.004	0.676	NA	0.149	0.025	0.021	0.073	0.017	2.764
2009	0.052	0.354	0.302	1.175	0.796	NA	0.157	0.018	0.018	0.060	0.012	2.944
2010	0.028	0.302	0.255	1.450	0.903	NA	0.138	0.037	0.023	0.061	0.011	3.208
2011	0.025	0.283	0.079	0.930	0.770	NA	0.144	0.043	0.044	0.121	0.026	2.464
2012	0.025	0.220	0.093	0.593	0.526	NA	0.095	0.038	0.018	0.045	0.012	1.666
2013	0.031	0.203	0.082	0.521	0.407	NA	0.075	0.036	0.017	0.032	0.010	1.412

Incidental catch (bycatch) and mortality in non-directed fisheries

IPHC relies upon information supplied by at-sea monitoring programs run by domestic agencies for bycatch estimates in most fisheries. Research survey information is used to generate bycatch estimates where fishery observations are unavailable. Estimates of bycatch off Alaska for 2012 were based on bycatch reported from fishing conducted through mid-October and projections by IPHC staff for the remainder of the year. Observer coverage in the GOA groundfish fisheries in 2013 remained at lower than necessary levels, therefore estimates for some of these fisheries can be considered to be only minimum estimates of halibut mortality. Fine tuning of the program due to extensive tendering activities has been discussed to reach target levels of coverage in the GOA. Across Alaska, bycatch has been attributed to a few fisheries conducted in state waters and/or under state management. The lack of comprehensive observer coverage to provide bycatch data for these fisheries led IPHC to estimate bycatch using data collected on research surveys. Analyses to update estimates of bycatch taken by fishing within state waters or those managed by the State are not yet completed.

Discard mortality rates (DMRs), used to determine the fraction of estimated bycatch that dies, vary by fishery and area. Where observers are used for fishery monitoring, DMRs are calculated from data collected on the release viability or injury of halibut.

Table 5. Estimates (thousands of pounds, net weight) of bycatch mortality of Pacific halibut (*Hippoglossus stenolepis*) by year, area, and fishery, for 2004 through 2013. Estimates for 2013 are preliminary and subject to change as new information becomes available.

Region and	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
AREA 2A										
Groundfish	221	475	402	346	345	416	300	-	-	-
IFQ bottom	-	-	-	-	-	-	-	52	67	67
Other gfish	-	-	-	-	-	-	-	1	1	1
Groundfish	-	-	-	-	-	-	-	1	1	1
Shrimp Trawl	0	0	0	0	0	0	0	0	0	0
Hook & Line	-	-	-	-	-	-	-	52	59	59
Fixed gear	67	61	178	41	78	93	46	-	-	-
Total	288	536	580	387	423	509	346	107	129	129
AREA 2B										
Groundfish n Trawl	251	346	294	320	143	213	181	232	189	225
Total	251	346	294	320	143	213	181	232	189	225
AREA 2C										
Crab Pot/Shrimp	303	303	303	303	303	303	303	303	n/a	n/a
Groundfish Trawl	0	0	0	0	0	0	0	0	0	0
Hook & Line (non-	23	1	2	3	7	5	4	3	7	5
Hook & Line (IFQ)	3	3	3	3	3	3	3	3	3	3
Chatham Str.	8	8	8	8	8	8	8	8	n/a	n/a
Clarence Str.	25	25	25	25	25	25	25	25	n/a	n/a
Total	362	340	341	342	346	344	343	342	10	8
AREA 2 Subtotal	**901**	**1,222**	**1,215**	**1,049**	**912**	**1,066**	**870**	**681**	**328**	**362**
AREA 3A										
Crab Pot/Shrimp	250	250	250	250	250	250	250	250	n/a	n/a
Groundfish Trawl	3,033	2,664	2,339	2,347	2,381	2,141	2,030	2,232	1,649	1,157
Hook & Line (non-	244	149	239	102	293	197	111	92	218	155
Hook & Line (IFQ)	119	119	119	119	119	119	119	119	119	119
Groundfish Pot	15	28	18	15	13	5	12	23	34	6
Pr Wm Sd Sablefish	10	10	10	10	10	10	10	10	n/a	n/a
Total	3,671	3,220	2,975	2,843	3,066	2,722	2,532	2,726	2,020	1,437
AREA 3B										
Crab Pot/Shrimp	50	50	50	50	50	50	50	50	n/a	n/a
Groundfish Trawl	866	862	926	795	979	865	676	806	1,192	666
Hook & Line (non-	205	69	299	136	190	256	269	172	116	81
Hook & Line (IFQ)	116	116	116	116	116	116	116	116	116	116
Groundfish Pot	37	29	9	18	18	7	36	21	36	18
Total	1,274	1,126	1,400	1,115	1,353	1,294	1,147	1,165	1,460	881
AREA 3 Subtotal	**4,945**	**4,346**	**4,375**	**3,958**	**4,419**	**4,015**	**3,679**	**3,891**	**3,480**	**2,318**
AREA 4										
Crab Pot/Shrimp	300	300	300	300	300	300	300	300	n/a	n/a
Groundfish Trawl	5,499	6,454	6,269	5,841	4,897	4,774	4,668	4,185	5,148	4,501
Hook & Line (non-	617	666	593	659	936	1,160	1,045	820	1,018	639
Hook & Line (IFQ)	60	60	60	60	60	60	60	60	60	60
Groundfish Pot	6	2	8	7	7	3	9	17	10	6
CDQ Trawl	176	128	187	309	223	-	-	-	-	-
CDQ Hook & Line	77	82	74	86	131	-	-	-	-	-
CDQ Pot	0	0	0	0	1	-	-	-	-	-
AREA 4 Subtotal	**6,735**	**7,692**	**7,491**	**7,262**	**6,555**	**6,297**	**6,082**	**5,382**	**6,236**	**5,206**
GRAND TOTAL	**12,581**	**13,260**	**13,081**	**12,269**	**11,886**	**11,378**	**10,631**	**9,953**	**10,044**	**7,886**

Sport catch

The IPHC depends on state and federal agencies for estimates of halibut sport fishery harvests. Management and data collection methods vary by area. For the Alaska sport fishery, different methodologies are used for estimating harvests in the current year versus the previous year, and also vary between the unguided (private) and guided (charter) fisheries. Charter vessel operators are required to record client catches in a daily logbook. In addition, a sample of licensed anglers receives a post-season mail survey, administered by ADFG. Data on the size of halibut caught are collected by an ADFG dockside creel sampling program in major ports, but excludes many lodges in Area 2C due to the remoteness of their locations.

Preliminary coast-wide sport harvest estimates for 2013 indicate a slight decrease (3%) in the sport harvest from 2012, to 6.66 Mlbs (Table 6). Coast wide harvest remains below the historic high levels seen during 2004-2008. Harvests in Areas 2C and 3A increased, whereas decreases were observed in Areas 2A, 2B, 3B, and 4, although the changes in the latter two areas were minor.

Table 6. Harvest of Pacific halibut by sport fishers (millions of pounds, net weight) by IPHC regulatory area, 1977-2013. Estimates for 2013 are preliminary.

Year	Area 2A	Area 2B	Area 2C	Area 3A	Area 3B	Area 4	Total
1977	0.013	0.008	0.072	0.196	-	-	0.289
1978	0.010	0.004	0.082	0.282	-	-	0.378
1979	0.015	0.009	0.174	0.365	-	-	0.563
1980	0.019	0.006	0.332	0.488	-	-	0.845
1981	0.019	0.012	0.318	0.751	-	0.012	1.112
1982	0.050	0.033	0.489	0.716	-	0.011	1.299
1983	0.063	0.052	0.553	0.945	-	0.003	1.616
1984	0.118	0.062	0.621	1.026	-	0.013	1.840
1985	0.193	0.262	0.682	1.210	-	0.008	2.355
1986	0.333	0.186	0.730	1.908	-	0.020	3.177
1987	0.446	0.264	0.780	1.989	-	0.030	3.509
1988	0.249	0.252	1.076	3.264	-	0.036	4.877
1989	0.327	0.318	1.559	3.005	-	0.024	5.233
1990	0.197	0.381	1.330	3.638	-	0.040	5.586
1991	0.158	0.292	1.654	4.264	0.014	0.127	6.509
1992	0.250	0.290	1.668	3.899	0.029	0.043	6.179
1993	0.246	0.328	1.811	5.265	0.018	0.057	7.725
1994	0.186	0.328	2.001	4.487	0.021	0.042	7.065
1995	0.236	0.887	1.751	4.511	0.022	0.055	7.462
1996	0.229	0.887	2.129	4.740	0.021	0.077	8.083
1997	0.355	0.887	2.172	5.514	0.028	0.069	9.025
1998	0.383	0.887	2.501	4.702	0.017	0.096	8.586
1999	0.338	0.859	1.843	4.228	0.017	0.094	7.379
2000	0.344	1.021	2.251	5.305	0.015	0.073	9.009
2001	0.446	1.015	1.923	4.675	0.016	0.029	8.104
2002	0.399	1.260	2.090	4.202	0.013	0.048	8.012
2003	0.404	1.218	2.258	5.427	0.009	0.031	9.347
2004	0.487	1.613	2.937	5.606	0.007	0.053	10.703

2005	0.484	1.841	2.798	5.672	0.014	0.050	10.859
2006	0.516	1.752	2.526	5.337	0.014	0.046	10.191
2007	0.504	1.556	3.049	6.283	0.025	0.044	11.461
2008	0.487	1.536	3.264	5.320	0.026	0.040	10.673
2009	0.487	1.098	2.382	4.758	0.030	0.024	8.778
2010	0.392	1.156	1.971	4.285	0.024	0.016	7.844
2011	0.399	1.224	1.029	4.408	0.014	0.017	7.091
2012	0.455	1.156	1.583	3.626	0.022	0.028	6.870
2013[a]	0.445	0.830	1.627	3.715	0.020	0.025	6.662
2012-2013 change							
Pounds	-0.010	-0.326	0.044	0.089	-0.002	-0.003	-0.208
Percent	-2.2%	-28.2%	2.8%	2.5%	-9.1%	-10.7%	-3.0%

http://www.iphc.int/publications/rara/2013/rara2013_04_2013sportreview.pdf

The personal use harvest through 2013

In Alaska, personal use harvests are taken in the federal subsistence fishery and the U32 halibut retained in Areas 4D/4E CDQ fishery under IPHC regulations.

Estimates of the coast-wide personal use harvest in 2012, the most recent year for which data for all areas are available, totaled 1.14 million pounds, unchanged from 2011. Data for 2013 are only available for Areas 2A, 2B, and 4D/4E Community Development Quota operations from the November 2013 report. The 2013 personal use harvest in Area 2A was up 31%, relative to 2012. The estimate for Area 2B remains unchanged. The Alaskan subsistence fishery harvest has been declining since 2004, reaching 0.7 Mlbs in 2012 (Table 7).

http://www.iphc.int/publications/rara/2012/rara2012061_personaluse.pdf
http://www.iphc.int/publications/rara/2013/rara2013_06_2013personaluse.pdf

Table 7. Estimates of the personal use harvest (thousands of pounds, net weight) of Pacific halibut by IPHC regulatory area since 2003.

Year	2A	2B	2C	3A	3B	4A	4B	4C	4D	4D/4E CDQ	Total
2003	27.0	300.0	628.0	279.6	27.6	20.7	2.5	23.8	4.4	14.3	1,382.4
2004		54.5								16.2	1,528.7
2005	19.4	300.0	677.1	403.6	33.5	28.9	0.9	9.7	10.9	23.2	1,537.3
2006		28.5								19.7	1,480.6
2007	36.0	300.0	598.1	429.3	46.2	35.6	1.4	7.7	5.8	19.0	1,489.0
		54.0									
2008	30.0	405.0	458.4	337.4	42.2	19.6	4.7	5.7	3.1	21.8	1,343.8
2009		15.9								10.3	1,305.6
2010	29.0	405.0	457.0	328.5	25.5	33.5	1.2	6.3	0.6	9.5	1,242.6
2011	30.4	405.0	424.8	312.7	23.0	14.5	0.5	10.9	1.2	16.9	1,144.8
2012		10.1								20.2	1,136.7
	25.3	405.0	387.0	266.1	22.0	13.6	0.5	1.6	0.6		
2013[a]	32.2	405.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10.0	n/a

[a] Estimates are preliminary.

Developments of the observer program in regards to non-halibut bycatch in the directed halibut fishery.

Beginning January 1, 2013, amendment 86 (BSAI) and amendment 76 (GOA) were added to the Federal Fisheries Regulations 50 CFR Part 679: Fisheries of the Exclusive Economic Zone Off Alaska. There are new partial coverage observer requirements for halibut vessels fishing hook and line gear. Halibut vessels are registered with the NMFS and can be selected on a vessel or trip basis. The program is covered by fees assessed on landings from both the CDQ and IFQ fisheries.

Despite one year of deployment there are no current reports or analysis data available on non-halibut bycatch in the directed halibut fishery. Reports are to be scheduled around June 2014. (Ian Stewart IPHC personnal communication).

http://www.fakr.noaa.gov/regs/679e55.pdf
http://www.fakr.noaa.gov/regs/679e51.pdf

Ecosystem considerations

To better understand factors driving fluctuations in growth and recruitment of fish populations, researchers are paying increasing attention to climatic and oceanic conditions.

In 2013, each of the 11 fishing vessels chartered to complete the IPHC setline survey was outfitted with a profiling unit collecting oceanographic data (dissolved oxygen, temperature, salinity, pH, chlorophyll concentration). Coupling oceanographic observations with catch estimates from the IPHC setline survey over time is a necessary step in understanding the impacts of the environmental changes on the halibut resource. There is evidence that both dissolved oxygen and temperature play a role in halibut distribution within the survey area.

In addition, ecosystem characteristics of the BS, AI and the GOA are assessed annually by the NMFS in the Ecosystem Considerations appendix to the BSAI and GOA SAFE report. Since 1995, this document has been prepared in order to provide information about effects of fishing from an ecosystem perspective, and the effects of environmental change on fish stocks.

Mushy Syndrome in Halibut

In recent years (2011-2012) In the Gulf of Alaska, there has apparently been a decline in forage fish and an increase in mushy halibut syndrome. The condition is considered a result of nutritional myopathy/deficiency, and thus may be indicative of poor prey conditions for halibut. According to ADFG, the Cook Inlet and Homer/Seward areas are nursery grounds for large numbers of young halibut that feed primarily on forage fish that have recently declined in numbers. Stomach contents of smaller halibut now contain mostly small crab species. Whether this forage is deficient, either in quantity or in essential nutrients is not known. However, mushy halibut syndrome is similar to that described for other animals with nutritional deficiencies in vitamin E and selenium. This muscle atrophy would further limit the ability of halibut to capture prey possibly leading to further malnutrition and increased severity of the primary nutritional deficiency. However The decrease in mushy" halibut, particularly relative to 2011 and 2012, may indicate that foraging conditions for young halibut were favourable during the past year.

http://www.iphc.int/publications/rara/2012/rara2012401_environ_haldist.pdf

http://www.afsc.noaa.gov/REFM/docs/2012/ecosystem.pdf
http://www.iphc.int/publications/rara/2013/rara2013_20_2013oceanographicmonitoring.pdf
http://www.iphc.int/publications/rara/2013/rara2013_20_profilerappendix.pdf

Research project (Steve Martell , *pers. comm.* during site visit)

Project title: Fishery, Climate and Ecological effects on Pacific halibut Size-at-Age (SAA).
In the past two decades, the size-at-age (SAA) of halibut has undergone an extensive reduction. Reduction in SAA could reflect demographic, trophic, and genetic fishery impacts or may be the result of changing environmental and ecological conditions. This study proposes a comprehensive investigation and analysis of candidate causes for SAA changes in Pacific halibut, as well as an integrated approach to incorporating SAA dynamics into the assessment and management of the halibut stock. The project develops new understanding of ecosystem influences on growth, assesses the impact of fishery-induced changes, and creates a flexible modeling framework to integrate SAA changes into development of optimum harvest policies for Pacific halibut. Regarding climate change, the project will analyze the effects of climate-driven changes in temperature on halibut SAA through bioenergetic modeling and an integrated growth model.

During the Alaska Fisheries Science Center 2013 summer groundfish survey, 1,359 halibut stomachs were collected in the Gulf of Alaska and 1,116 halibut stomachs were collected in the eastern Bering Sea. These samples were returned to the lab for analysis, which will begin in February 2014 and will be completed by May 2014. To date references on flatfish and halibut physiological rates have been assembled; these references will form the basis of the bioenergetics model parameterization. Newly processed stomach samples will be integrated into the bioenergetics work beginning in April-May 2014.

During 2013, 3,466 otoliths from 1998 samples were re-aged using the break and bake technique in order to provide a comparison to survey ages. Surface aging was used exclusively prior to 2002, and this re-aging component of the project is necessary for standardizing all ages to ensure accurate and unbiased size-at-age information in the entire time series. Additional sample from prior decades will also be re- aged after this year annual assessment cycle is complete. An otolith grinder was purchased in the fall of 2013, and has been used to prepare thin sections for growth increment data. Size-at-age back to the mid 1930s has also been reconstructed for the commercial fishery and has been integrated into the 2013 stock assessment (Figure 16).

Reconstruction of the historical size-at-age data sampled from the commercial fisheries shows that the mean size-at-age of halibut was small back in the 1930-1950s, then increased to above sizes above the long-term average between 1960 and 1990s. Starting in the mid 1990s, halibut mean size-at-age in the commercial fisheries and in samples collected from fishery-independent surveys have declined to levels that are at or below sizes observed in the 1930s (Figure 17).

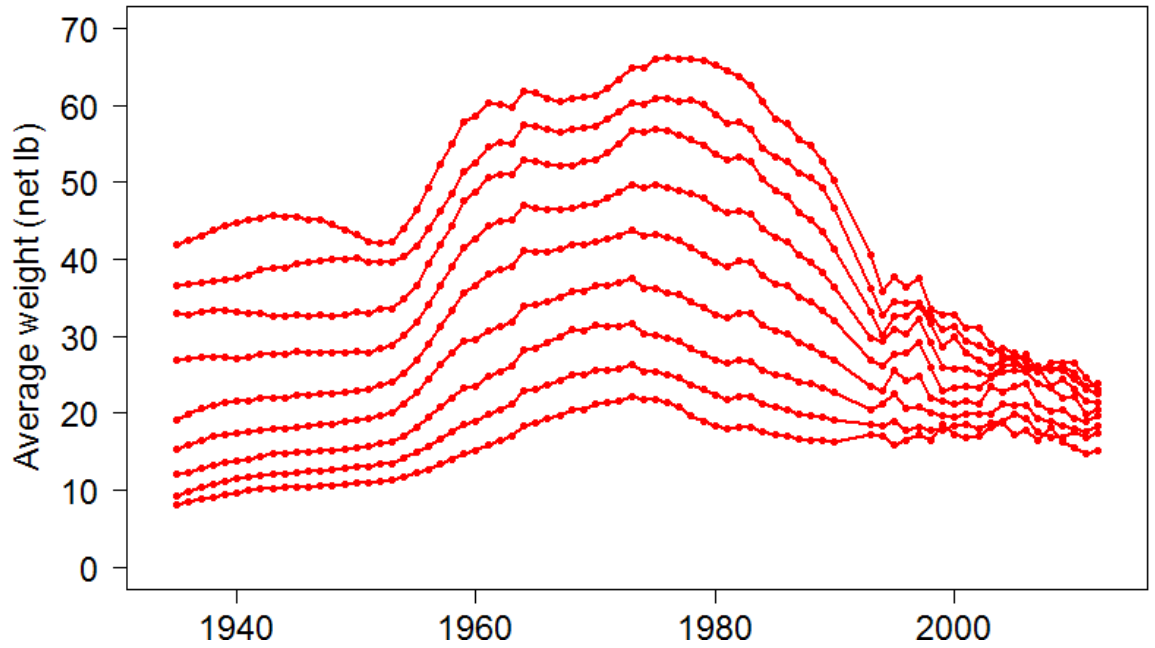


Figure 16. Historical average weight-at-age for ages 8-16 years for Pacific halibut harvested in commercial fisheries coastwide.

The re-aging of the 1998 samples was used to examine both aging precision and age-bias associated with surface aging versus brake and bake methods. No significant biases were found out to age-15 in these results. Beyond age-15, there tends to be a downward bias in estimated surface age relative to the age obtained through the brake and bake method. Previous studies on this subject indicated that this bias occurs in individuals ages-12 and older.

Additional investigations at the IPHC have also examined the regional differences in the rates of change in size-at-age. The coast-wide phenomenon of smaller size-at-age is largely dominated by halibut sampled in the Gulf of Alaska and Kodiak Island regions (IPHC regulatory areas 3A and 3B), whereas size-at-age has remained relatively stable in the last decade or even increased in other regulatory areas.

The growth model based on mark-recapture data suggests that trends in halibut growth are similar to trends in SAA (Figure 17). In particular, there is a marked decline in growth after 1980. However, the growth model indicates that current growth rates are not similar to levels observed in the 1920s and 1930s, as the size-at-age data seem to suggest.

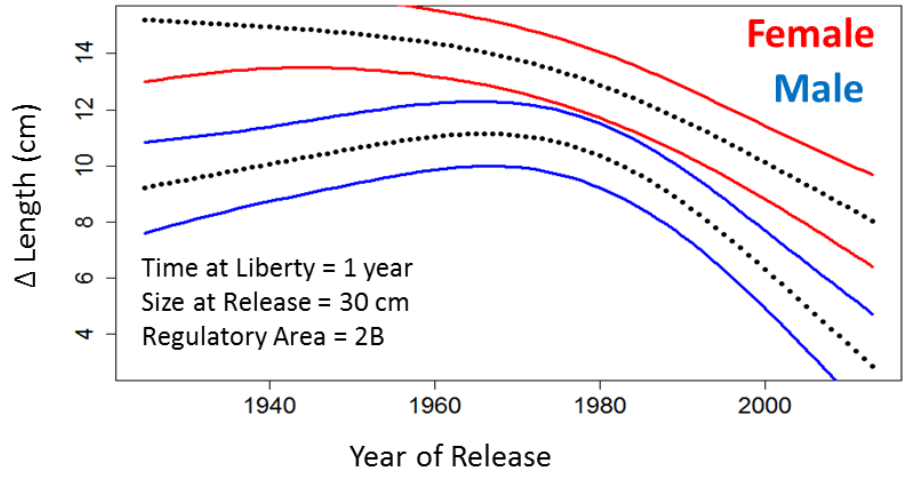


Figure 17. Trends in change in length increments are estimated for males and females from 1925 to 2013 using a mark-recapture growth model under conditions that the time at liberty, size at release, and regulatory area of release are held constant at 1 yr, 30 cm, and regulatory area 2B, respectively. Ninety-five percent confidence bands are shown in red and blue for females and males, respectively.

http://doc.nprb.org/web/13_prjs/1309_prJan14.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

For 2013, there was a full review of the data, specific model equations and general approach used to assess the stock in recent years. Allowing for time-varying availability in the assessment model removed the retrospective bias in recent status estimates and is consistent with observed geographic and demographic trends. The results of the 2013 stock assessment indicate that the Pacific halibut stock has been declining continuously over much of the last decade. The change to the assessment model resulted in a much more pronounced decline in the estimated stock trend in recent years, a large reduction in the scale of current population estimates, and also a decrease in the estimated average level of productivity. Spawning biomass is estimated to have decreased from 198 to 197 million lb from 2012 to 2013, and exploitable biomass to have decreased from 176 to 170 million lb, over the same period. The 2013 stock assessment results indicate that the Pacific halibut stock has been declining continuously over much of the last decade, primarily as a result of recruitment strengths that are much smaller than those observed through the 1980s and 1990s, as well as decreasing size-at-age. In the last few years, female spawning biomass is estimated to have stabilized near 200 million pounds. The 2014 estimate of exploitable biomass consistent with the IPHC's current harvest policy is 170.29 million pounds. The long time-series model provided several alternative reference points for comparison: the stock is currently estimated to be at 38% of the long-term average equilibrium spawning biomass, and 34% of the current stock size projected in the absence of fishing. It is also estimated to be considerably larger (187%) than the spawning biomass estimate from the late 1970s. As in 2013, forecast projections were conducted for a range of alternative management actions; and probabilities of various risk metrics are reported in a decision-making table framework. The application of the current harvest policy results in the Blue Line of the decision table with a coastwide TCEY of 27.515 million pounds.

2013 Pacific Halibut Stock Assessment by the IPHC

This stock assessment reports the status of the Pacific halibut resource in the northeastern Pacific Ocean. A thorough exploration of all data sources was completed and reviewed by the Scientific Review Board (SRB) during 2013. This included the historical record to the early 1900's, as well as updated 2013 information from the survey and commercial fishery. Halibut removals from all sources have totaled 6.9 billion pounds, ranging annually from 34 to 100 million pounds over the last 100 years. After a peak in 2004, annual removals have decreased each year due to management actions in response to declining survey and commercial catch rates and stock assessment estimates. Total removals in 2013 were estimated to be 46 million pounds, down from 52 million pounds in 2012. The 2013 setline survey WPUE decreased by 12% relative to 2012. Observed age distributions continue to indicate a relatively stable stock, but with no evidence of strong recruitments in recent years. Individual size-at-age remains low relative to levels observed in the past several decades, although comparable to those estimated for the early portion of the 20th century. The 2013 SRB meeting produced a number of important recommendations that have been incorporated into the 2013 assessment. The extensive evaluation of data sources, allowed for the development of two additional stock assessment models in 2013, one comparable with the 2012 model, and the other including the full historical time-series. These models produced results that

were very close in scale to those from the 2012 stock assessment for the most recent years, corroborating the final results from 2012. This effort provided estimates of historical trends which generated much needed context for both the recent declines in the stock, and current abundance levels. All three of these models were included in an "ensemble" analysis, an approach endorsed by the SRB, which integrated the uncertainty within each model and among models into the final decision table.

The 2013 stock assessment results indicate that the Pacific halibut stock has been declining continuously over much of the last decade, primarily as a result of recruitment strengths that are much smaller than those observed through the 1980s and 1990s, as well as decreasing size-at-age. In the last few years, female spawning biomass is estimated to have stabilized near 200 million pounds. The 2014 estimate of exploitable biomass consistent with the IPHC's current harvest policy is 170.29 million pounds. The long time-series model provided several alternative reference points for comparison: the stock is currently estimated to be at 38% of the long-term average equilibrium spawning biomass, and 34% of the current stock size projected in the absence of fishing. It is also estimated to be considerably larger (187%) than the spawning biomass estimate from the late 1970s. As in 2012, forecast projections were conducted for a range of alternative management actions; and probabilities of various risk metrics are reported in a decision-making table framework. The application of the current harvest policy results in the Blue Line of the decision table with a coastwide TCEY of 33.49 million pounds.

Summary of the 2013 halibut stock assessment model

Stock assessment for Pacific halibut has undergone many technical changes through many different modeling approaches over the last 30 years (Clark 2003). Some of these changes include improvements in fisheries analysis methods, changes in model assumptions, and responses to recurrent retrospective biases). The 2012 stock assessment resolved the most recent retrospective bias (Stewart et al. 2013), and produced estimates of stock size that were considerably lower than previous analyses. However, this type of annual change, although necessary, is undesirable from a management perspective.

The IPHC's Scientific Review Board (SRB) on October 2013 met to evaluate the stock assessment data and modeling conducted since the 2012 assessment. This meeting produced a number of important recommendations incorporated into the 2013 assessment.

The recommendations were as follow

- *develop an assessment model that could accommodate all of the historical information from the commercial fishery and setline survey, accounting for changes in the fishery, introduction of size limits, spatial expansions, transition from "J" to circle hooks, and many other technical details of these series.*
- *recreate the existing stock assessment model 'from scratch', using independently coded software (Stock Synthesis; 2013).*
- *Although similar in structure to the 2012 assessment model, alternative modelling approaches from the groundfish fishery were introduced in this assessment*
- *Exploration of linkages of environmental conditions in the Northwest Pacific and halibut recruitment success was introduced in the analysis.*
- *Exploration of modelling behavior based on different input of natural mortality were introduced*

Previously, halibut stock assessment efforts has been primarily centered on the technical aspects of a single stock assessment model, rather than on the more general goals of understanding the dynamics of the halibut resource, gaining perspective on where the stock is relative to past status, and evaluating how management actions influence the stock trends. Changes in annual assessment models, due to technical improvements (different interpretations or assumptions about biological

data (e.g., natural mortality)), and other modifications have led to variable yield estimates, unproductive debate about technical details during management deliberations, and a reduction in confidence about the annual assessment results.

A solution to this dilemma, called "ensemble modeling", was endorsed by the SRB, This approach recognizes that there is no "perfect" assessment model, and that robust risk assessment can only be achieved via the inclusion of multiple models in the estimation of management quantities and the uncertainty about these quantities. For the 2013 stock assessment, an ensemble of all three alternative models was used to produce the stock estimates and decision table results. As in 2012, arbitrary but reasonable weights were assigned to each alternative model: for 2013 each of the three models were assigned equal probabilities. The result are combined estimates of stock size and reference points that are substantially more robust to current or future technical changes to any one of the underlying models and a decision table provided in exactly the same manner as in 2012.

Results: Ensemble

The results of the 2013 stock assessment indicate that the Pacific halibut stock has been declining continuously over much of the last decade as a result of recruitment strengths that are much smaller than those observed through the 1980s and 1990s. Recruitments after 2007 do not yet have information available in the fishery or survey data, and therefore remain highly uncertain. Observed decreases in size-at-age have also been an important contributor to recent stock declines. In the last few years, the estimated female spawning biomass appears to have stabilized near 200 million pounds (Table 7.1. and Fig. 18). The 2014 estimate of exploitable biomass consistent with the IPHC's current harvest policy is 170.29 million pounds.

Table 7.1. Median population estimates (million lb) from the 2013 ensemble.

Year	*Spawning biomass*	*Exploitable biomass*
1997	*570.3*	*796.8*
1998	*573.2*	*749.5*
1999	*563.2*	*739.7*
2000	*531.2*	*683.1*
2001	*489.0*	*597.8*
2002	*441.6*	*527.6*
2003	*390.5*	*458.6*
2004	*347.5*	*403.1*
2005	*307.7*	*353.7*
2006	*274.3*	*308.6*
2007	*248.9*	*268.4*
2008	*229.1*	*235.2*
2009	*206.3*	*202.7*
2010	*197.6*	*185.3*
2011	*193.5*	*174.6*
2012	*193.6*	*168.9*
2013	*194.9*	*168.4*
2014	*196.8*	*170.3*

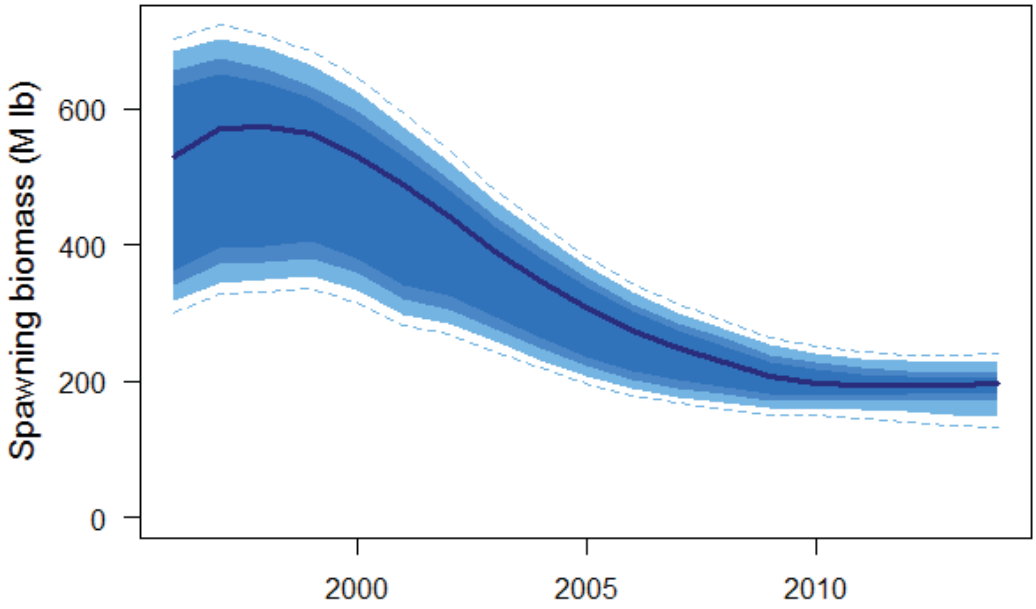


Figure 18. Trend in spawning biomass estimated in the 2013 stock assessment. The dark line indicates the median (or "50:50 line") with an equal probability of the estimate falling above or below that level; colored bands moving away from the median indicate the intervals containing 50/100, 75/100, and 95/100 estimates; dashed lines indicating the 99/100 interval.

Long time-series model

The long time-series model provides, for the first time in recent years, historical estimates that are integrated with the current stock assessment results. This model was able to recreate the population age structure, and match the patterns in survey and commercial catch rates observed during the historical period (Fig. 19). Using the estimates produced from the long time-series model, halibut recruitment is estimated to be 37% higher, on average, during favorable Pacific Decadal Oscillation (PDO) regimes, a standard indicator of productivity in the North Pacific. This is very consistent with the results of Clark and Hare (2002, 2006). Historically, these regimes have lasted approximately 30 years with positive conditions prior to 1947, poor conditions from 1947-1977, positive conditions from 1978-2006 and now poor conditions from 2007 to the present. Recruitment during the period from 1977 to 2006 was estimated to have been far higher than observed during any portion of the historical record (Fig. 20), leading to much larger stock sizes (Fig. 21, and therefore fishery yields available during this period.

The longer time-series model also provides a comparable estimate to these values, suggesting the stock is at approximately 38% of the average condition expected in a poor recruitment period with relatively poor size-at-age (Fig. 22).

This analysis suggests that stock increases in the 1980s and 1990s as well as the recent stock declines would likely have occurred even in the absence of anthropogenic removals: changes in average recruitment and size at-age have been largely dictating stock trends (Fig. 23). The spawning biomass is currently estimated to be at 34% of the level projected from that analysis.

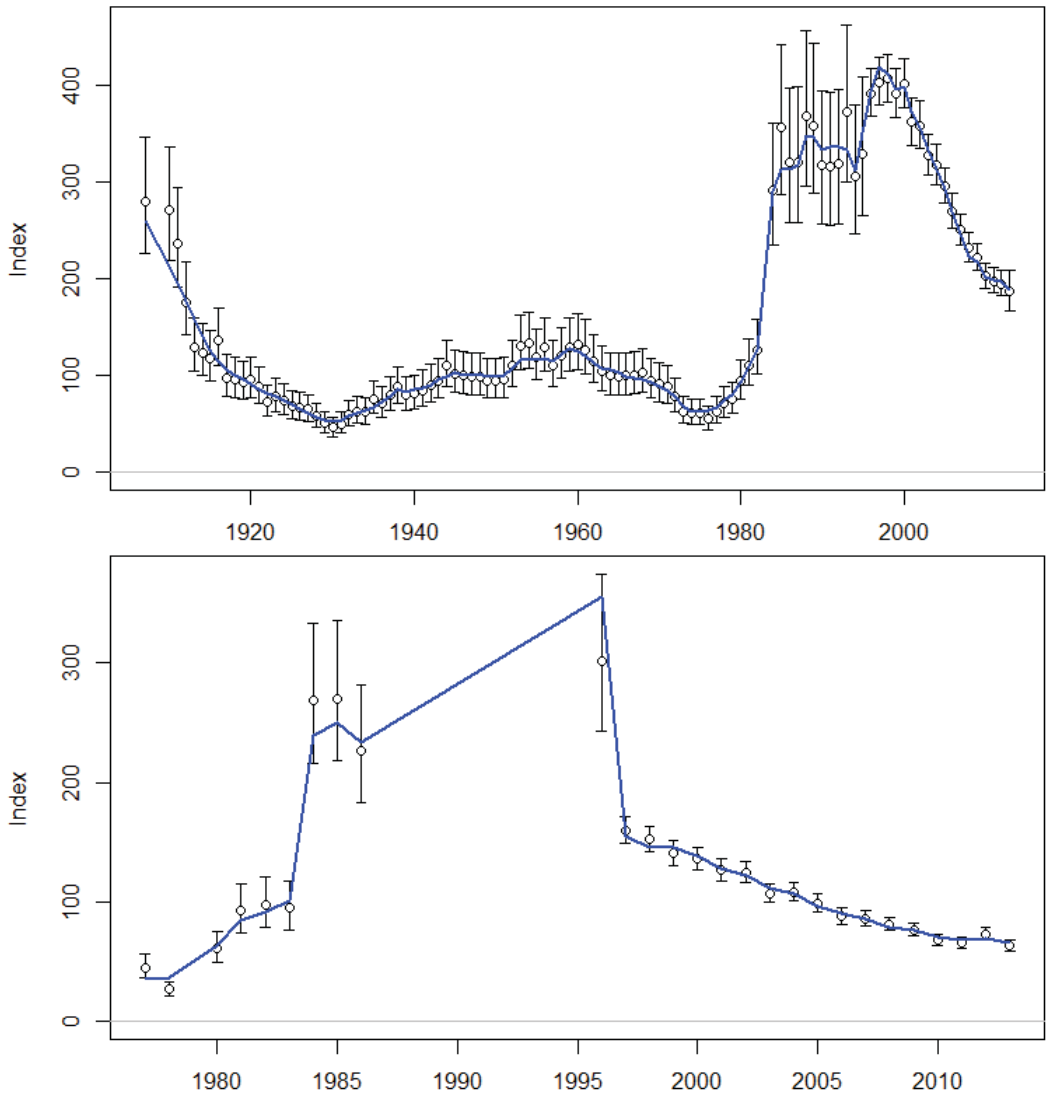


Figure 19. Observed (points with 95% confidence intervals) and predicted (lines) fishery (upper panel) and survey (lower panel) catch-rates. Note that the abrupt change in scale from 1983-1984 is a result of the switch to circle hooks.

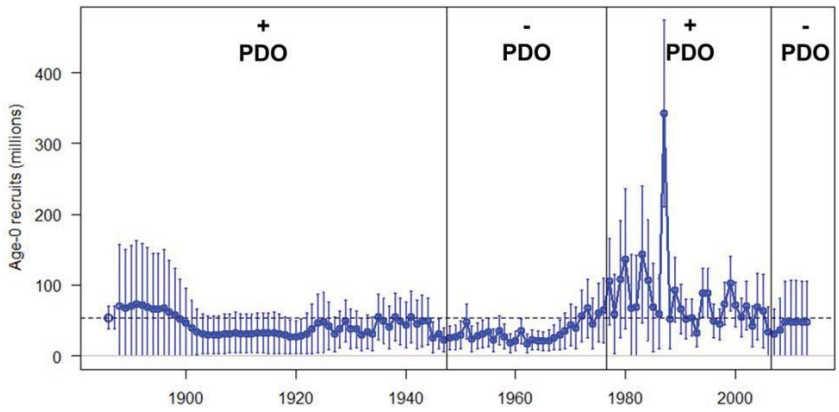


Figure 20. Trend recruitment strengths (by birth year) estimated by the long time-series model. Dashed horizontal line indicates the average level in the absence of fishing and under poor recruitment conditions. Vertical lines indicate the Pacific Decadal Oscillation (PDO) regimes estimated from environmental data. Note that estimates after 2008 are highly uncertain, as they are not yet informed by any direct observations.

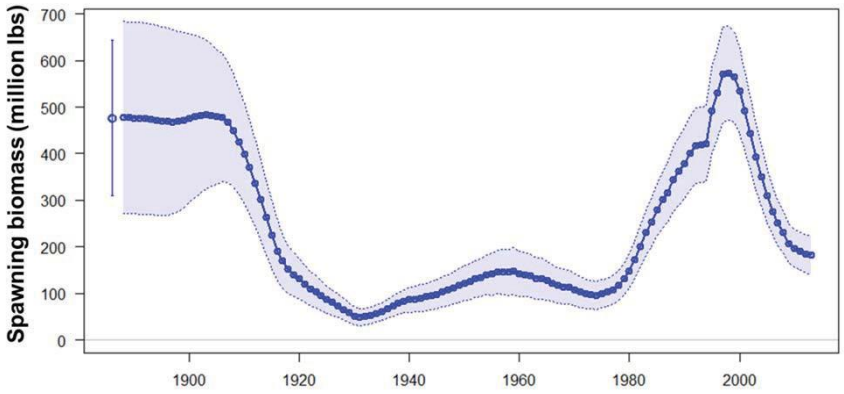


Figure 21. Spawning biomass estimates from the long time-series model.

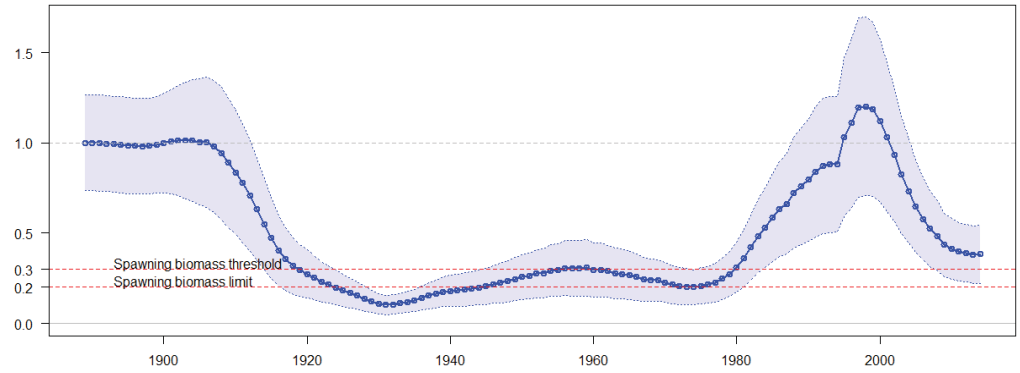


Figure 22. Time-series of relative spawning biomass estimates from the long time-series model.

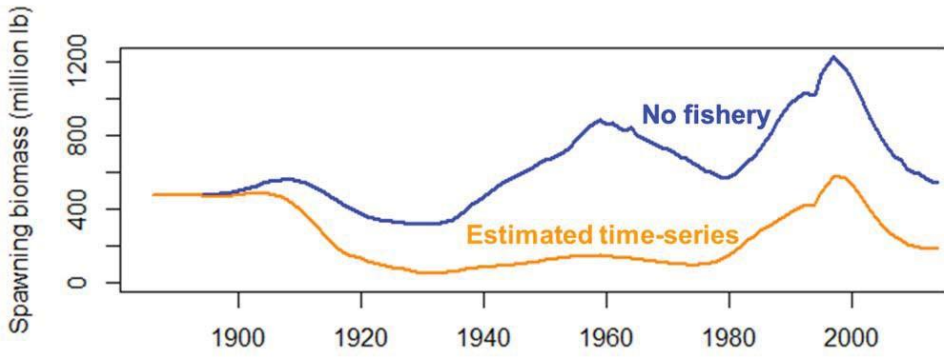


Figure 23. Estimated spawning biomass time-series from the long time-series model (lower, orange line) and recreated time-series in the absence of fishery removals (upper, blue line).

Future research

Building upon the work completed for 2013, and following the guidance of the Scientific Review Meeting, future efforts will focus on several key aspects of the stock assessment:

1) Development of methods for sampling the sex-ratio of the commercial catch. The current assessment assumes that the setline survey sex-ratio is indicative of the commercial catch, but there are currently no direct observations to test this assumption. The results of the stock assessment are sensitive to the sex-ratio, and therefore this source of uncertainty is a high priority for future data collection.

2) Continued expansion of the ensemble of models used in the stock assessment. Specifically, implicit and explicit spatial models will be developed that will allow for incorporation of the uncertainty due to spatial processes such as migration and recruitment distribution among regulatory areas.

3) Bayesian methods for fully integrating parameter uncertainty may provide improved uncertainty estimates within models contributing to the ensemble.

4) Further investigation of the factors contributing to recruitment strength and observed size-at-age in order to better project trends in these quantities.

5) Exploration of methods for estimating wastage and bycatch in the assessment model as a function of effort, in order to better capture these sources of uncertainty.

6) Analysis of projection methods for weight-at-age to determine if alternatives to recent trends might provide better estimates of likely future values and the uncertainty associated with these values.

7) Integration of the assessment results in the decision table with ongoing developments in the harvest policy arising through the MSE process.

Additional work during 2014 will address the specific items relating to data processing and model details listed in the report form the Scientific Review.

http://www.iphc.int/publications/rara/2013/rara2013_12_2013assessment.pdf

Management Strategy Evaluation and Management Strategy Advisory Body

The objective of this body is to develop a formal process in which to evaluate the performance of alternative management procedures for the Pacific halibut stock against a range of scenarios that encompass observation and process uncertainty in stock assessments, alternative hypotheses about

stock dynamics and structural assumptions. The MSE process will be overseen by a Management Strategy Advisory Body (MSAB) that is comprised of harvesters (commercial, sport, and subsistence), fisheries managers (DFO and NMFS), processors, IPHC staff, commissioners and academia.

The MSE framework was introduced at the Commission's interim meeting in November 2012, and the process of forming the MSAB has been initiated at the Annual meeting in January 2013. For the initial formation of the MSAB, the IPHC solicited nominations from existing Commission advisory bodies (RAB, CB, PAG) and direct application from the public. The list of nominations will be categorized (processors, harvesters, managers, etc.) and ranked by the IPHC staff, and then submitted for final selection by the IPHC Commissioners. The initial meeting will also serve the purpose of defining objectives for the halibut fishery, scoping out performance measures in which to compare alternative harvest policies, and flush out key operating model components that will be required to address alternative management procedures.

The development of an operating model is currently underway by IPHC staff, and this work will evolve continuously with the development and revisions of the MSE framework. Input from the MSAB, as well as the available historical data, will help shape the structure of the reference and observation models to be used in the MSE efforts. In addition to the current coast-wide assessment model, alternative assessment models will also undergo simulation testing using the MSE framework. The reference and observation model platforms provide "known" state variables in which to evaluate alternative assessment models, or changes to the current assessment model. Prior to the second MSAB meeting, it is anticipated that the "alpha" version of the MSE software will have the capability of exploring alternative estimators (or structural assumptions), alternative harvest control rules, and establish base-line metrics based on "perfect information" over a range of alternative hypotheses about stock structure.

Applications for the MSAB have been accepted until 15th March 2013 and the first meeting was scheduled for May, 2013.

The MSAB held its second meeting at the IPHC offices in Seattle 16-17 October, 2013.

The primary objectives for the MSAB's second meeting were to:

- *Review and revise as needed the draft working objectives and performance metrics developed at the first meeting, based on Board members' discussions with colleagues*
- *Present details of the operating model being developed by Steve Martell and demonstrate how it will be used to evaluate management strategies*
- *Prioritize the investigation of objectives according to management and harvester needs*
- *Establish timelines for delivery of products*
- *Develop the best means to communicate the output of the process and receive feedback from stakeholders on results and future steps*
- *Dr. Martell reviewed the framework of the Management Strategy Evaluation (MSE) (Management Strategy Evaluation Framework) in terms of the elements that can be controlled in fisheries management (Procedures, e.g. size limits, landings levels) vs. those that cannot be controlled (Scenarios, e.g. recruitment variation) The MSE is a process of defining management objectives and exploring the performance of various Procedures in achieving those objectives, in the face of a suite of Scenarios about how the halibut stock behaves. The Board first reviewed the draft working objectives (Intro Brief) based on their discussions with colleagues after the June MSAB meeting, and then re-visited the objectives after reviewing the existing IPHC harvest policy and the tools being developed by Dr. Martell to examine the effects of various Procedures.*
- *The review of working objectives clearly identified the overriding importance of stock conservation in assuring that yield from the stock was available. Avoiding a minimum female spawning biomass and having a low probability of either harvest rate restrictions or fishery*

closures were also important objectives. Achievement of economic objectives was viewed as largely resulting from achievement of yield objectives, although it was noted that not all removals are under IPHC control. Restricting the variation in annual landings was an objective used for subsequent detailed examinations. The review also highlighted the inherent conflicts and tradeoffs in the draft objectives, e.g., requiring a very high probability of not dropping below particular spawning biomass levels while also requiring the maintenance of relatively high levels of average landings.

- *Dr. Leaman reviewed the existing IPHC harvest policy (IPHC Harvest Policy). It is based on an objective of maintaining female spawning biomass above the threshold reference point (30% of unfished spawning biomass) at least 80% of the time. The objective is achieved through control of the harvest rate, fishing below Fmsy, and applying lower harvest rates if the spawning biomass drops below the threshold reference point.*
- *Dr. Martell presented the MSE framework (Management Strategy Evaluation Framework) and the two fishery decision paradigms that are currently in use: (1) the best assessment method approach and, (2) the management procedure approach. The IPHC, as well as many other institutions, has relied on the best assessment approach for setting annual catch limits. However, this approach is sensitive to both annual structural changes to the model (e.g., closed area vs. coastwide assessments), and to fixed assumptions that imply certainty (e.g., a fixed natural mortality rate). The new paradigm of evaluating a candidate set of management procedures against a suite of operating models that brackets the range of uncertainties, offers the opportunity to test each procedure and determine how robust it is with respect to achieving fisheries objectives. The key to the process is the specification of clear objectives, where each objective must define a state (e.g., biomass or landings), the timeframe to achieve the state (e.g., each year or within 10 years), and the probability of achieving that state (i.e., how desirable each objective is). This provides a rank order for decision makers to consider when evaluating alternative yield options.*
- *Dr. Martell then showed some simulation tools (Objectives & Metrics) developed to allow the exploration management procedure performance (e.g., the 30:20 control rule), using an example of one management objective (restricting variation in annual removals), against a background of observations where we have both relative certainty (recruitment variation) and uncertainty (natural mortality or bycatch levels) for simulated data. This Management Strategy Evaluation Explorer (http://shiny.iphc.int/QDF) will be a primary tool to explore alternative procedures and how robust each procedure is to alternative scenarios. The example clearly illustrated the tradeoffs among conflicting objectives (e.g., high average landings and low inter-annual variation in landings) and how performance of each procedure was based largely on variables that cannot be managed, such as recruitment variation or population growth rates.*
- *The Board then identified a reduced suite of objectives to be examined more fully with a simulated coastwide stock. However, stock conservation, maximizing available yield, and maintaining target spawning biomass levels continued to be the dominant objectives. Restricting the variation in yield was not universally endorsed as an overriding objective. It was noted that specific details of each management procedure (e.g., the target harvest rate) could be tuned to achieve stated objectives. An additional goal of maintaining "opportunity" for sectors including subsistence and recreational users was also discussed. The existing harvest policy was used as a starting point for further development (Alternative Harvest Policies).*
- *The coastwide, spatially-implicit, age- and size-structured, and fishing fleet specific operating model of the halibut stock, upon which to base MSE investigations, is anticipated to be ready in the late summer/early fall of 2014. A model that is fully spatially-explicit to Regulatory Areas is anticipated to be ready for use in the late spring of 2015. Progress during 2013 will be detailed on the MSAB website, in the Report of Assessment and Research Activities*

document, and reported at the 2014 Annual Meeting.

- *A third meeting of the MSAB to review progress, identify additional objectives, and consider the implications of the 2013 stock assessment will be held in late April/early May, 2014. In the interim, Board members will continue dialogue with constituents, provide feedback on performance metrics and objectives, and explore the effectiveness and impacts of management procedures, reference points, and control rules using the Management Strategy Evaluation Explorer.*

http://www.iphc.info/Pages/MSAB---Previous-Meetings.aspx
http://www.iphc.int/news-releases/314-nr20130205.html
http://www.iphc.int/meetings/2013am/documents/P02_MSEFramework.pdf
http://www.iphc.int/meetings/2013am/documents/3.4_MSAB_FL.PDF

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

IPHC's harvest policy is to harvest 20% of the coastwide exploitable biomass when the spawning biomass is estimated to be above 30% (B30 threshold level) of a level defined as the unfished level. The harvest rate is linearly decreased towards a rate of zero as the spawning biomass approaches 20% (B20 limit level) of this estimated unfished level. The unfished female spawning biomass (Bunfished) is computed by multiplying spawning biomass per recruit (SBR, from an unproductive regime) and average coastwide age-six recruitment (from an unproductive regime).

Since 1985, the IPHC has followed a constant harvest rate (CHR) policy to determine annual available yield, termed the Constant Exploitation Yield (CEY). A biological target level for total removals from each regulatory area is calculated yearly by applying a fixed harvest rate to the estimate of exploitable biomass in each IPHC regulatory area. IPHC's harvest policy is to harvest 20% of the coastwide exploitable biomass when the spawning biomass is estimated to be above 30% (threshold level) of a level defined as the unfished level. The harvest rate is linearly decreased towards a rate of zero as the spawning biomass approaches 20% (limit level) of this estimated unfished level. That is, fishing ceases completely if the stock is below 20% of the unfished biomass.

This combination of harvest rate and precautionary levels of biomass protection have, in simulation model studies, provided a large fraction of maximum available yield minimizing risk to the spawning biomass, while allowing for the quickest stock recovery to at least, threshold levels. The minimum observed spawning biomasses for the three IPHC core areas all occurred in the mid-1970s, approximately 9 million pounds in 2B, 13 million pounds in 2C and 42 million pounds in 3A. By definition, these become the observed spawning biomass limits. The current harvest policy for Pacific halibut utilizes a ramp from target harvest rates to no fishing between 30% relative spawning biomass and 20% relative spawning biomass.

The 2013 stock assessment results indicate that the Pacific halibut stock has been declining continuously over much of the last decade, primarily as a result of recruitment strengths that are much smaller than those observed through the 1980s and 1990s, as well as decreasing size-at-age. In the last few years, female spawning biomass is estimated to have stabilized near 200 million pounds. The 2014 estimate of exploitable biomass consistent with the IPHC's current harvest policy is 170.29 million pounds. The long time-series model provided several alternative reference points for comparison: the stock is currently estimated to be at 38% of the long-term average equilibrium spawning biomass, and 34% of the current stock size projected in the absence of fishing. It is also estimated to be considerably larger (187%) than the spawning biomass estimate from the late 1970s. As in 2012, forecast projections were conducted for a range of alternative management actions; and probabilities of various risk metrics are reported in a decision-making table framework. The application of the current harvest policy results in the Blue Line of the decision table with a coastwide TCEY of 33.49 million pounds.

Forecasts and decision table

As in 2012, stock projections were conducted using the coastwide stock assessment (all three models in the ensemble), summaries of the 2013 fishery, and other sources of mortality, as well as the results of apportionment calculations and harvest policy application. The steps included:

1) apportioning the coastwide estimate of exploitable biomass according to the survey catch rates in each regulatory area, adjusted for hook competition and survey timing (Webster and Stewart 2014),

2) applying the area-specific harvest rates to estimate the total CEY, and all other removals associated with a given level of harvest, and

3) calculating the total mortality and projecting the stock trends one and three years into the future.

The current harvest policy for Pacific halibut utilizes a ramp from target harvest rates down to no fishing between 30% and 20% relative spawning biomass (Fig. 24). Target harvest rates are 21.5% in Areas 2A, 2B, 2C and 3A, and 16.125% to Areas 3B, 4A, 4B, and 4CDE. Because the harvest policy is defined at the area-specific level, the results of apportionment calculations (Webster and Stewart 2014) are needed to evaluate the harvest intensity, even though the assessment is conducted at a coast wide scale. Specifically, in order to compare the coast wide harvest rate estimated in the stock assessment to a target level, exploitable biomass must be apportioned to area, and then area-specific catch limits aggregated back to the coast wide level (Fig. 25). Using this method, harvest rates are estimated to have been above target levels for the last decade, although mortality reductions in the most recent three years (2010-2013) have brought the realized rate much closer to the target (Fig. 26). This calculation is based on the 2013 stock assessment results, and therefore does not correspond to the estimates and targets available as historical management decisions were being made.

The decision table (Table 8) provides a comparison of the relative risk, using a number of different stock and fishery metrics (columns) for a range of harvest levels in 2014 (rows). The decision table for 2013 is very similar in format to that reported in 2012, with a few changes to improve the clarity of the results. These changes include reporting probabilities as "times out of 100", integrating one- and three-year projection for all quantities into a single table, organizing all row descriptions clearly outside the table contents, and more clearly delineating the metrics associated with the current harvest policy from those relating only to stock trend.

The block of columns entitled Stock Trend (a-d) provides an evaluation of the risks of various harvest levels to the short term trend in spawning biomass, without reference to a particular harvest policy. The remaining columns portray these risks relative to the spawning biomass reference points (e-h) and fishery performance (i-m) consistent with the current harvest policy. The 2014 alternative harvest levels (rows) provided include: no mortality (useful to evaluate the stock trend due solely to population processes), no directed mortality (but accounting for bycatch and non- scaling sport and personal use removals), the Blue Line (consistent with the current harvest policy and, historically, IPHC staff advice), the status quo removals (O26 mortality at the same level estimated in 2013), as well as a number of arbitrary values intended to foster the evaluation of the relative change in risk probability across a range of total mortality levels. As in 2012, additional alternatives were produced during management deliberations.

The stock is projected to increase slightly in the absence of any mortality during 2014, and all levels of harvest above 30 million pounds of total mortality resulted in declines in the current stock size by 2015 (Table 8; Fig. 27), although there is considerable uncertainty associated with these projections. There is estimated to be only a 1/100 chance of greater than a 5% decline in spawning biomass from 2014 to 2015 for the Blue Line removals. The status quo removals correspond to an 8/100 chance of at least a 5% decline in spawning biomass, and 60 million pounds of total mortality a 38/100 chance.

There is a higher probability of stock decline over the three year projections due to the delayed effects of recent recruitment, trends in size-at-age and compounding removals. As the stock stabilizes to biomass levels consistent with more recent recruitment levels (following the decline from much higher levels), it is reasonable to expect a greater response in stock trend to annual management decisions.

The metrics directly based on the current harvest policy (stock status, fishery trend, and fishery status), show a relatively small chance (<26/100) that the stock will decline below the 30% or 20% reference points in both the one- and three-year projections and under all alternatives presented. For removals in excess of the Blue Line, there is a greater than 50/100 probability that the fishery CEY would be smaller in 2015 and 2017 than if the current harvest policy were applied. The Blue Line removals correspond exactly to the application of the current harvest policy, and therefore the coastwide harvest rate target (Fig. 26). Because of the small decrease in the estimate of exploitable biomass relative to the value estimated in 2012, repeating the status quo removals would result in a slightly higher harvest rate than realized in 2013. A total mortality of 40 million pounds corresponds to an intermediate harvest rate, still above the Blue Line, but representing a reduction from 2013 (Fig. 26).

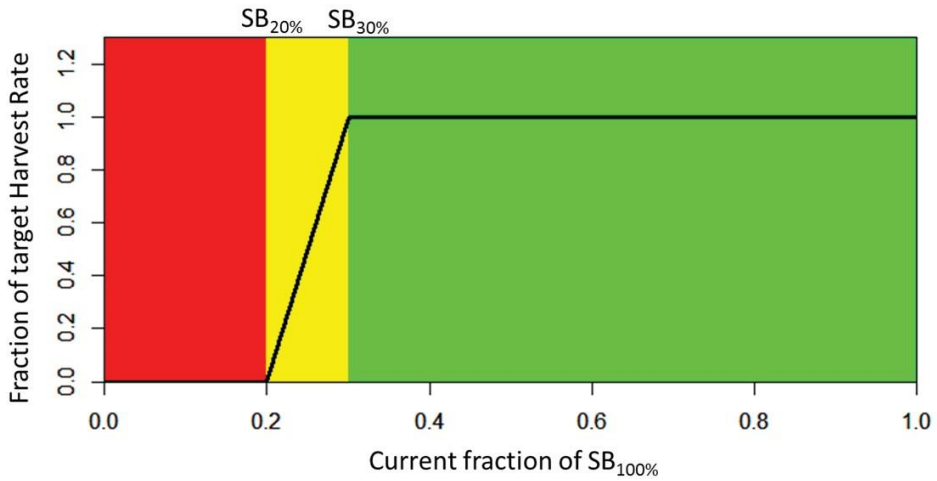


Figure 24. Illustration of the current IPHC harvest control rule for determining the relative target harvest rate as a function of relative spawning biomass, consistent with the IPHC's overall harvest policy.

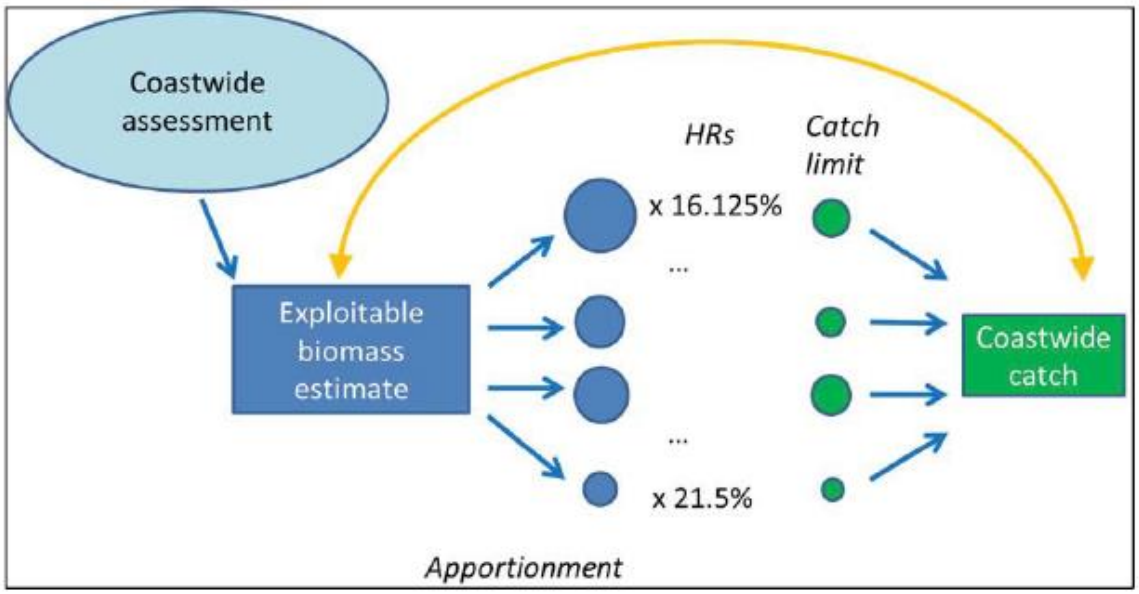


Figure 25. Illustration of the method for calculating the coastwide harvest rate consistent with the IPHC's harvest policy

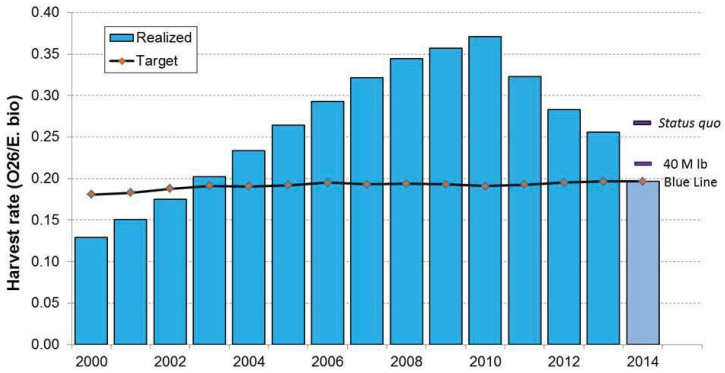


Figure 26. Time series of estimated coastwide harvest rates (bars) and hindcast harvest rate targets (line). Hindcast annual harvest rate targets correspond to the current estimate of exploitable biomass, not the estimate in that year. Values for 2014 represent alternatives from the decision table

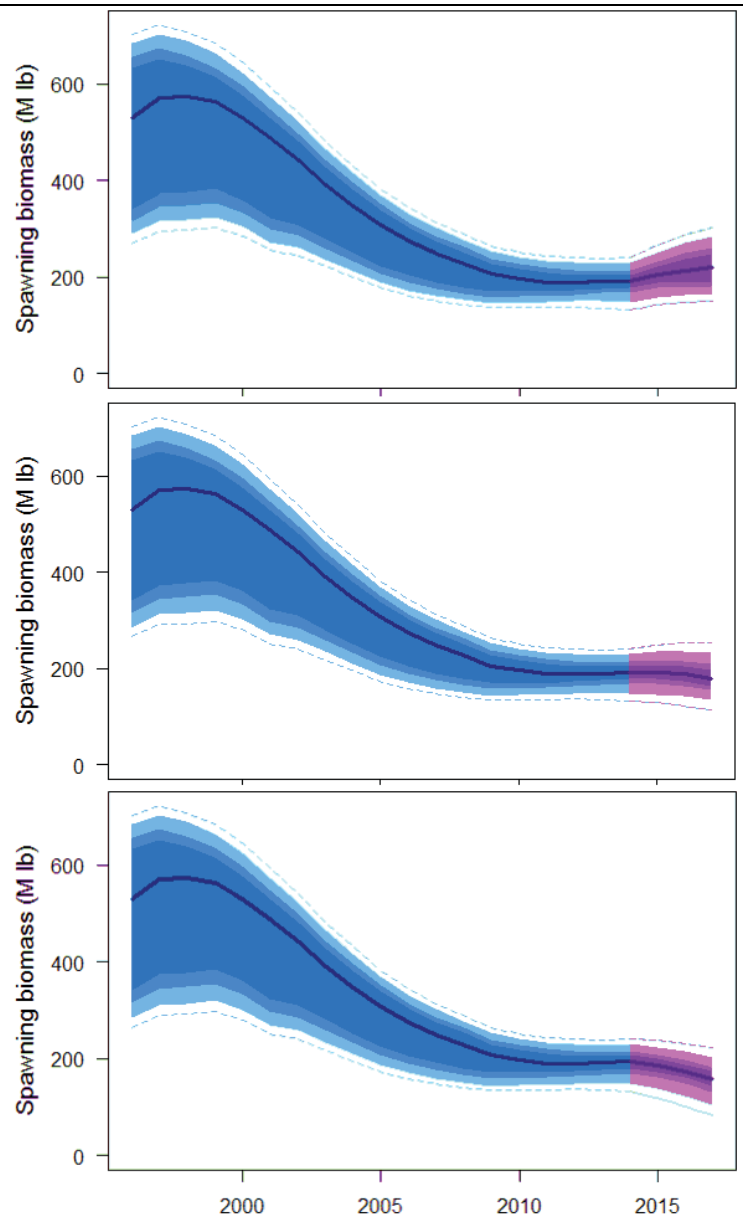


Figure 27. Three-year projections under alternative levels of mortality: no removals (upper panel), Blue Line removals (middle panel) and 60 million lbs removals (lower panel).

Table 8. Decision table of yield alternatives (rows) and risk metrics (columns). Values in the table represent the probability, in "times out of 100" of a particular risk

				Stock Trend				Stock Status				Fishery Trend				Fishery Status
				Spawning biomass				Spawning biomass				Fishery CEY from the harvest policy				Harvest rate
				in 2015		in 2017		in 2015		in 2017		in 2015		in 2017		in 2014
2014 Alternative	Total removals (M lb)	Fishery CEY (M lb)	Harvest rate	is less than 2014	is 5% less than 2014	is less than 2014	is 5% less than 2014	is less than 30%	is less than 20%	is less than 30%	is less than 20%	is less than 2014	is 10% less than 2014	is less than 2014	is 10% less than 2014	is above target
No removals	0.0	0.0	0.0%	5/100	<1/100	23/100	4/100	3/100	<1/100	1/100	<1/100	0/100	0/100	0/100	0/100	0/100
FCEY = 0	11.4	0.0	5.0%	31/100	<1/100	32/100	18/100	3/100	<1/100	2/100	<1/100	0/100	0/100	0/100	0/100	<1/100
	20.0	8.5	10.1%	33/100	<1/100	37/100	24/100	4/100	<1/100	3/100	<1/100	<1/100	<1/100	<1/100	<1/100	<1/100
	30.0	18.2	15.9%	39/100	<1/100	66/100	41/100	4/100	<1/100	5/100	<1/100	5/100	2/100	8/100	4/100	7/100
Blue Line	36.4	24.5	19.7%	56/100	1/100	82/100	63/100	5/100	<1/100	6/100	1/100	43/100	20/100	74/100	47/100	50/100
	40.0	28.0	21.8%	68/100	1/100	87/100	73/100	5/100	<1/100	8/100	1/100	85/100	52/100	96/100	84/100	92/100
	45.0	32.8	24.7%	82/100	4/100	93/100	83/100	6/100	1/100	10/100	1/100	>99/100	95/100	>99/100	99/100	>99/100
status quo	48.5	36.1	26.7%	88/100	8/100	95/100	87/100	6/100	1/100	13/100	1/100	>99/100	>99/100	>99/100	>99/100	>99/100
	55.0	42.6	30.5%	95/100	23/100	98/100	94/100	6/100	1/100	19/100	2/100	>99/100	>99/100	>99/100	>99/100	>99/100
	60.0	47.5	33.5%	98/100	38/100	99/100	97/100	7/100	1/100	26/100	2/100	>99/100	>99/100	>99/100	>99/100	>99/100
				a	b	c	d	e	f	g	h	i	j	k	l	m

Evidence

http://www.iphc.int/publications/rara/2012/rara2012093_assessment.pdf
http://iphc.int/publications/rara/2012/rara2012187_apportionment.pdf
http://www.iphc.int/publications/rara/2013/rara2013_13_2013apportionment.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

Although this is common for many fisheries stock assessment, the degree of pre-model processing and redundancy in the halibut data set likely result in a substantial underestimation of the source of uncertainty. Nonetheless, it is included in the decision-making framework described below. Additional sources of uncertainty include choices made in structuring the assessment model, steps taken during data processing, and many other sources that are not included in the results. During the 2013 assessment process, there was substantial discussion regarding estimates of total removals used in the halibut stock assessment. The IPHC has expressed concern over continued declining catch rates in several areas and has taken aggressive action to reduce harvests and recommended to the governments of Canada and the United States catch limits for 2014 totalling 27,515,000 pounds, a 11.3% decrease from the 2013 catch limit of 31,028,000 pounds. For 2014, the IPHC adopted a 19.7% effective coastwide harvest rate, down from the 2012 effective coastwide harvest rate of 24.4%. For 2013 assessment, significant improvements to methods used to forecast future stock size and to calculate the uncertainty associated with these predictions were made. For the 2013 stock assessment, an ensemble of three alternative models was developed to produce the stock biomass estimates and harvest decision table results. This resulted in estimates of stock size and management reference points that are substantially more robust to current or future technical changes to the underlying models. The 2013 stock assessment indicates that the Pacific halibut stock has been declining continuously over the last decade, with recruitment strengths that are much smaller than those observed through the 1980s and 1990s, and more typical of those seen during the last century, as well as decreasing size at age, being contributing factors. In recent years, the estimated female spawning biomass appears to have stabilized near 200 million pounds. An element clearly illustrating the precautionary nature of the IPHC management actions is the SUFullD harvest policy currently in place. This harvest policy, allowing full decrease in catch limits when the stock is projected to decline, but only a third increase in catches (from the previous year) when the stock is projected to increase is clearly a long term management measure aimed at increasing halibut harvestable and spawning biomass.

Major sources of uncertainties, Stock Assessment and Harvest Rates

The 2013 stock assessment includes significant uncertainty associated with estimation of model parameters, treatment of the data sources (e.g., short and long time-series, redundancy vs. orthogonality), structuring of selectivity (length vs. age-based), natural mortality (fixed vs. estimated) and other differences among the three models included in the ensemble. Although this is a substantial improvement over the 2012 assessment, there are other important sources of uncertainty that are not included. A critical source of uncertainty is the sex-ratio of the commercial catch. There is no direct information available (due to dressing of fish at sea prior to observation by IPHC port samplers), and so the 2013 assessment relies on sex-ratios observed in the setline survey (either directly applied to estimate the size and age composition of the catch, or informing

the relative selectivity for the commercial fishery), as has been done in recent assessments. Results were found to be very sensitive to this choice: a +/- 10% change in the relative selectivity for males vs. females (and therefore the sex-ratio of the catch) resulted in a 50 million pound range in the estimate of spawning biomass. Efforts are underway to evaluate methods for direct sampling via collaboration with industry such that this assumption can be explored further in future assessments. Future assessments may be able to include alternative models to represent this uncertainty within the ensemble.

Another important source of uncertainty is the spatial structure of the assessment model. The SRB endorsed the staff's plans to develop additional alternative models using both implicit and explicit spatial structure for future stock assessments and these efforts may provide alternate models for inclusion into the ensemble approach.

The recent trends of reduced recruitment appear consistent with the transition from a positive to a negative PDO regime, however the link between halibut recruitment and environmental conditions remain poorly understood, and there is no guarantee that it will remain constant in the future. Therefore, recruitment variability remains a significant source of uncertainty in current stock estimates (due to the substantial lag between birth year and direct observation in the fishery and survey data) as well as even short-term stock projections. The 2013 assessment includes substantially better estimates of uncertainty in stock levels than recent assessments. This can be seen in the distribution for exploitable biomass, a quantity created for the current harvest policy that is used to generate the harvest rates and for apportionment. The 2014 value shows considerable uncertainty, such that the small differences between the estimate from the 2013 assessment and the 2012 model (Table 9) are insignificant (Fig. 28).

The IPHC has expressed concern over continued declining catch rates in several areas and has taken aggressive action to reduce harvests. In addition, the staff has noted a continuing problem of reductions in previous estimates of biomass as additional data are obtained, which has the effect of increasing the realized historical harvest rates on the stock.

The IPHC recommended to the governments of Canada and the United States catch limits for 2014 totalling 27,515,000 pounds, a 11.3% decrease from the 2013 catch limit of 31,028,000 pounds .For 2014, the IPHC adopted a 19.7% effective coastwide harvest rate, down from the 2013 effective coastwide harvest rate of 24.4%. In addition to setting catch limits for 2014, the IPHC dealt with a wide range of catch limit and regulatory issues, and also took important actions regarding bycatch management, scientific assessment review, and the IPHC performance review.

The halibut fleet is highly regulated and subjected to defined fishery data collection systems, operating under an IFQ system, with conservatively defined catch quotas, gear specifications and restrictions, size limits, and closed seasons and areas. In addition, if halibut bycatch limits (Prohibited Species Catch) are reached in the groundfish fisheries, or if areas with high concentrations of juvenile halibut are recorded, fishery and area closure measures are adopted respectively.

New Format for IPHC Staff Harvest Advice

The IPHC staff harvest advice is being restructured to present more information and more options for consideration by Commissioners as they set the annual catch limits. This change is in response to the IPHC direction at the 2012 Annual Meeting, reinforced by the 2012 Performance Review and stakeholder feedback. Although this restructured advice format is new to the IPHC, it is becoming common practice in world fishery management. This procedural approach provides a more transparent delineation between scientific results and management/policy decisions, ultimately enabling a better understanding of the risks associated with different fishery harvest options.

In the past, IPHC staff harvest advice centered on point biomass estimates and catch limit

recommendations (i.e., single numbers for each). This format does not adequately convey the uncertainties around stock estimates and the risks of various possible outcomes at different catch levels. Since 2013 , the IPHC staff harvest advice were summarized in a table which integrates uncertainty surrounding the stock assessment as it relates outcomes to estimates of risk (Table 8). This new format is giving the Commissioners a wider range of advice to consider as they set catch limits for subsequent years. For example, different catch levels (outcomes) can be evaluated and presented in terms of their impact (risk) on the stock and harvest rates. With this new management tool, Commissioners are able to examine a range of harvest options and the probable impacts on the stock as they deliberate. Figure 29 illustrates the structure of how the staff will be providing advice to the Commission and stakeholders. The stock is projected to increase slightly in the absence of mortality during 2013, and all identified levels of harvest above 30 million pounds of total mortality resulted in declines in the current stock size by 2015 (Table 8), although there is considerable uncertainty associated with these projections. Only a 1/100 chance of greater than 5% decline in spawning biomass is estimated for the Blue Line removals, with the status quo corresponding to an 8/100 chance, and 60 million pounds of mortality a 38/100 chance. There is a higher probability of stock decline over the three year projections due to the delayed effects of recent recruitment and trends in size-at-age.

For metrics directly based on current harvest policy (stock status, fishery trend, and fishery status), there is a relatively small chance (<26/100) that the stock will decline below the 30% or 20% reference points in both the one- and three-year projections under the levels of removals compared. For removals in excess of the Blue Line, there is a greater than 50/100 probability that the fishery CEY would be smaller in 2015 and 2017 than if the current harvest policy were applied

Table 9. Comparison of 2014 biomass point estimates (millions of net pounds) from the 2012 assessment model and the 2013 ensemble analysis.

Quantity	2012 Assessment model	2013 Ensemble
2014 Exploitable biomass	176	170
2014 Spawning biomass	198	197

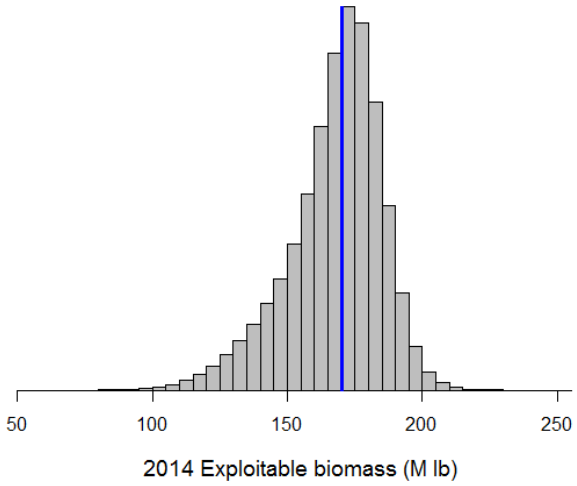


Figure 28. Distribution of 2014 exploitable biomass estimates including only model and estimation uncertainty.

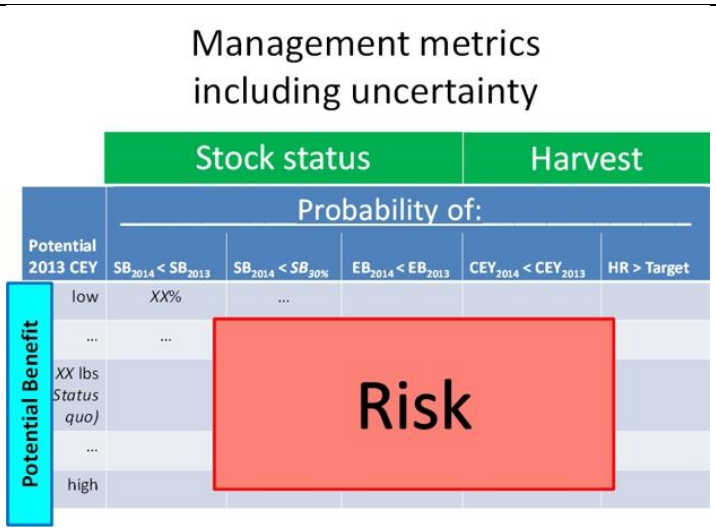


Figure 29. Decision-making table enables transparent risk-benefit evaluation based on specific performance metrics.

Table 10. Extended decision-making table. Values indicate the probability of the outcome in each column given the level of removals for that row. The grey line represents FCEY=0; the Blue Line represents projected removals consistent with the current harvest policy; the red line represents 2014 adopted catch limits; and the green line represents 2013 catch limits.

				Stock Trend				Stock Status				Fishery Trend				Fishery Status
				Spawning biomass				Spawning biomass				Fishery CEY from the harvest policy				Harvest rate
				in 2015		in 2017		in 2015		in 2017		in 2015		in 2017		in 2014
2014 Alternative	Total removals (M lb)	Fishery CEY (M lb)	Harvest rate	is less than 2014	is 5% less than 2014	is less than 2014	is 5% less than 2014	is less than 30%	is less than 20%	is less than 30%	is less than 20%	is less than 2014	is 10% less than 2014	is less than 2014	is 10% less than 2014	is above target
No removals	0.0	0.0	0.0%	5/100	<1/100	23/100	4/100	3/100	<1/100	1/100	<1/100	0/100	0/100	0/100	0/100	0/100
FCEY = 0	11.4	0.0	5.0%	31/100	<1/100	32/100	18/100	3/100	<1/100	2/100	<1/100	0/100	0/100	0/100	0/100	<1/100
	20.0	8.5	10.1%	33/100	<1/100	37/100	24/100	4/100	<1/100	3/100	<1/100	<1/100	<1/100	<1/100	<1/100	<1/100
	30.0	18.2	15.9%	39/100	<1/100	66/100	41/100	4/100	<1/100	5/100	<1/100	5/100	2/100	8/100	4/100	7/100
Blue Line	36.4	24.5	19.7%	56/100	1/100	82/100	63/100	5/100	<1/100	6/100	1/100	43/100	20/100	74/100	47/100	50/100
	40.0	28.0	21.8%	68/100	1/100	87/100	73/100	5/100	<1/100	8/100	1/100	85/100	52/100	96/100	84/100	92/100
	45.0	32.8	24.7%	82/100	4/100	93/100	83/100	6/100	1/100	10/100	1/100	>99/100	95/100	>99/100	99/100	>99/100
status quo	48.5	36.1	26.7%	88/100	8/100	95/100	87/100	6/100	1/100	13/100	1/100	>99/100	>99/100	>99/100	>99/100	>99/100
	55.0	42.6	30.5%	95/100	23/100	98/100	94/100	6/100	1/100	19/100	2/100	>99/100	>99/100	>99/100	>99/100	>99/100
	60.0	47.5	33.5%	98/100	38/100	99/100	97/100	7/100	1/100	26/100	2/100	>99/100	>99/100	>99/100	>99/100	>99/100
				a	b	c	d	e	f	g	h	i	j	k	l	m

SUFullD Harvest Policy

An element clearly illustrating the precautionary nature of the IPHC management actions is the SUFullD harvest policy currently in place. Given the last decade of decreasing trends in halibut harvestable biomass, the IPHC staff recommended in 2010 the incorporation of the existing harvest policy of a 33% increase from previous year's catch limits when stock yields was projected to increase but the use a 100% decrease in recommended catch, when stock yields where projected to decrease. The SUFullD policy was adopted in January 2011 and is now on the third year of

implementation. This harvest policy, allowing full decrease in catch limits when the stock is projected to decline, but only a third increase in catches (from the previous year) when the stock is projected to increase is clearly a long term management measure aimed at increasing halibut harvestable and spawning biomass.

http://www.iphc.int/publications/rara/2012/rara2012093_assessment.pdf
http://iphc.int/publications/rara/2012/rara2012187_apportionment.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 IPHC has developed, refined, and utilized a constant harvest rate policy since the 1980's. The policy was initially designed to harvest 20% of the coastwide exploitable biomass when the spawning biomass is estimated to be above 30% of the unfished level. The harvest rate is linearly decreased towards a rate of zero as the spawning biomass approaches 20% of the unfished level. This combination of harvest rate and precautionary levels of biomass protection have, in simulation studies, provided a large fraction of maximum available yield while minimizing risk to the spawning biomass. Following the 2008 Committee of Independent Experts (CIE) review of the assessment and harvest policy, the simulations on which the harvest policy was based were modified to incorporate "assessment error". Under the individual fishing quota share system in place for the Pacific halibut fishery, fishing capacity (vessels and gear) has been reduced, seasons were extended and wastage was reduced. Longline is the principal gear utilized for this fishery. In 1983, industry made the operational switch from J-hooks to circle hooks in the commercial fishery. Regulations are in place to address discards. General spawning areas have been mapped in Alaska. The halibut fishery is closed during peak spawning times, by regulation. The NPFMC has established Marine Protected Areas and additional trawl closures that benefit juvenile fish and adult spawners. Bycatch of seabirds were addressed by specific regulations now including the use of streamer (tory) lines, night setting, lineshooters and lining tubes. Management actions are in place in respect to increasing knowledge on the halibut and non-halibut bycatch dynamics in the directed halibut longline fishery. Moreover, in June 2012, the NPFMC took action to reduce halibut bycatch limits in GOA groundfish fisheries.

A fishery management plan amendment, "Amendment 95," came into effect in 2014 and is intended to minimize halibut bycatch in the GOA groundfish fisheries. NOAA Fisheries annually sets limits to minimize halibut bycatch in Federal groundfish fisheries in the Gulf of Alaska, and those limits are divided annually and seasonally among different groundfish sectors. If a sector reaches its halibut bycatch limit before it catches the amount of groundfish available for it to harvest, vessels participating in the sector must stop fishing for groundfish. There are two broad sectors that harvest groundfish in the Gulf of Alaska that will be directly affected by the amendment — vessels using hook-and-line gear and vessels using trawl gear. The hook-and-line gear sector is further divided into catcher vessels and catcher/processor vessels. Under the amendment, the bycatch limit reductions for each sector are:
Hook-and-line catcher/processor — 7 percent; implemented in 2014;
Hook-and-line catcher vessel — 15 percent; phased in over 3 years by 2016;
Trawl vessel — 15 percent; phased in over 3 years by 2016.

The jig gear and pot gear sectors are not affected by this rule, as they historically have been exempt from halibut bycatch limits.

http://alaskafisheries.noaa.gov/newsreleases/2014/amd95halibut021914.htm

Nearly all of the research done by the Commission staff is directed toward one of three continuing objectives of the IPHC. These are improving the annual stock assessment and quota recommendations, developing information on current management issues, and adding to knowledge of the biology and life history of halibut. Management of the fishery is based upon this, and other research. The fishery continues to harvest only those fish surplus to sustaining reproductive capacity.

Harvest rate policy and catch limits management

The IPHC has developed, refined, and utilized a constant harvest rate policy since the 1980's. The policy was fully described in Clark and Hare (2006) and further modified as described in Hare and Clark (2008), and Hare (2011b). Stated succinctly, the policy was initially designed to harvest 20% of the coastwide exploitable biomass when the spawning biomass is estimated to be above 30% of the unfished level. The harvest rate is linearly decreased towards a rate of zero as the spawning biomass approaches 20% of the unfished level. This combination of harvest rate and precautionary levels of biomass protection have, in simulation studies, provided a large fraction of maximum available yield while minimizing risk to the spawning biomass.

Following the Committee of Independent Experts (CIE) review of the assessment and harvest policy (Francis 2008, Medley 2008), the simulations on which the harvest policy was based were modified to incorporate "assessment error" (Hare and Clark 2008). This was implemented by adding autocorrelated error in estimation of the SBio, and having the harvest rates set according to the "perceived" state, as opposed to the "true" state, of the SBio. This form of robustification of the harvest policy is designed to protect the stock in the common situation where assessments tend to be consistently too high or too low for a sequence of years, which corresponds to the current situation regarding the halibut assessment.

Total and fishery yield calculations were performed using methods consistent with recent analyses. This process begins with the estimated 2013 coastwide exploitable biomass from the stock assessment. Based on results of the survey apportionment calculations described above, the estimated proportions from 2013 are used to infer the distribution of the EBio among areas at the beginning of 2014. The differences from last year's results reflect the reduction in the estimated coastwide exploitable biomass, as well as a change in the apportionment results. The current harvest policy uses different target exploitation rates by regulatory area. These rates are 21.5% for Areas 2A, 2B, 2C, and 3A and 16.125% for Areas 3B, 4A, 4B, and 4CDE. Based on the observed distribution of biomass in 2013, application of these target rates results in an effective coastwide harvest rate of 19.7%. The coastwide TCEY is therefore 33.49 M lb, based on the coastwide EBio estimate of 170.29 M lb.

The IPHC staff harvest advice is being restructured to present more information and more options for consideration by Commissioners as they set the annual catch limits. This change is in response to the IPHC direction at the 2012 Annual Meeting, reinforced by the 2012 Performance Review and stakeholder feedback (See Clause 7).

http://iphc.int/publications/rara/2012/rara2012187_apportionment.pdf

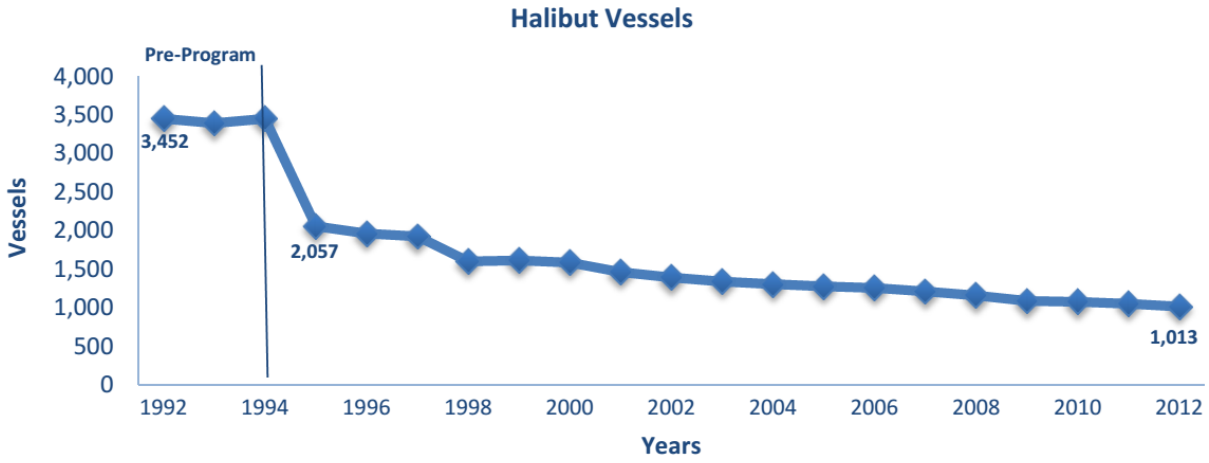
http://www.iphc.int/publications/rara/2013/rara2013_13_2013apportionment.pdf
http://www.iphc.int/publications/rara/2012/rara2012093_assessment.pdf

Regulations

Individual fishing quota program

Under the individual fishing quota (IFQ) share program in place for the Pacific halibut and sablefish

fishery since 1995, fishing capacity (vessels and gear) has been significantly reduced in Alaska (see below).



With the implementation of IFQs in the fishery, the derby type fishery was eliminated, seasons were extended and wastage was reduced in the halibut fishery. Regulations in place address waste, discard, bycatch, and endangered species interactions in the halibut fisheries. The IPHC, the NMFS, and ADFG promulgate these regulations through the Commission, the NPFMC, and the Alaska Board of Fisheries.

http://www.fakr.noaa.gov/regs/679d42.pdf
http://www.alaskafisheries.noaa.gov/ram/ifq/rtf12.pdf
http://www.iphc.int/publications/regs/2014iphcregs.pdf

In-season actions

The IPHC recommends for the establishment and authorization to establish or modify regulations during the season. In-season actions may include, but are not limited to, establishment or modification of the following:

(a) Closed areas;
(b) Fishing periods;
(c) Fishing periods limits
(d) Gear restrictions
(e) Recreational bag limits
(f) Size limits; or
(g) Vessel clearances

http://www.fakr.noaa.gov/regs/679d42.pdf

Gear

Fishing gear is regulated to longline gear.

In the early 1980s the IPHC conducted research on capture efficiency of circle vs **J** hooks and determined that using circle hooks lowered the mortality of undersized halibut caught and released during fishing. In 1983, industry made the operational switch from J-hooks to circle hooks in the commercial fishery.

Bycatch of seabirds were addressed by specific regulations put in place to reduce the incidental mortality of the short-tailed albatross, a listed species under the Endangered Species Act (ESA), and other seabird species in 1998, then revised in 2008. These measures now include the use of

streamer (tory) lines, night setting, lineshooters and lining tubes, have been shown to reduce seabird interactions when setting or retrieving gear.

http://www.fakr.noaa.gov/protectedresources/seabirds/national.htm
http://www.iphc.int/publications/bulletins/ib0028.pdf

In a NMFS report on a working group reviewing ghost fishing, the group determined that longline fishing under IFQ management garnered a "Low Priority Recommendations" when compared to pot and net gears.
http://www.fakr.noaa.gov/regs/summary.htm

Size limits

The commercial halibut fishery is limited to retention of fish, with head on, of 32 inches (81.3 cm) or greater in length (with head removed, 24 inches or 61 cm). Biologically, and for continued sustainability, this is the preferred portion of the spawning population available for harvest, in terms of halibut maturity at age.

http://www.iphc.int/publications/regs/2014iphcregs.pdf

Time restrictions

Seasons are recommended in regulation by the IPHC. Open and closed periods, as well as fishing period limits are set in regulation. The halibut fishery is closed during peak spawning times. The fishing period in Areas 2B, 2C, 3A, 3B, 4A, 4B, 4C, 4D, and 4E usually begins at 1200 hours local time around March 17 and terminate at 1200 hours local time around November 7, with the Commission deciding on the specific dates each year.

http://www.iphc.int/publications/regs/2014iphcregs.pdf

Geographical closures

Regulations are in placed to address discards. General spawning areas have been mapped in Alaska. The NPFMC has established Marine Protected Areas that benefit juvenile fish and adult spawners. The Halibut Longline Closure Area is 36,300 square miles in size. Additional trawl closures for areas in the waters of Bristol Bay (19,000 sq mi), the Pribilof Island Habitat Conservation Area (7,000 sq mi), the Aleutian Island (277,000 sq mi), the Northern Bering Sea Research Area (85,000 sq mi), the Eastern Gulf of Alaska (53,000 sq miles) and Cook Inlet (7,000 sq mi) closed thousands of square miles of sea bottom to bottom trawling which provides a significant degree of refuge for juvenile halibut.

http://www.iphc.int/publications/regs/2014iphcregs.pdf

Observer program

In the directed longline fisheries for Pacific halibut, bycatch of other fish species is not well documented. However, management actions are in place in respect to increasing knowledge on the bycatch dynamics of the directed halibut longline fishery.

Beginning January 1, 2013, amendment 86 (BSAI) and amendment 76 (GOA) were added to the Federal Fisheries Regulations 50 CFR Part 679: Fisheries of the EEZ Off Alaska. There are new partial coverage observer requirements for halibut vessels fishing hook and line gear. Halibut vessels are registered with the NMFS and can be selected on a vessel or trip basis. The program is covered by fees assessed on landings from both the CDQ and IFQ fisheries. At the beginning of 2014, one year of reliable data accrued from the restructured observer program and will help undertand the halibut

and non-halibut bycatch dynamics in the directed halibut IFQ fleet of Alaska. Until now this was only estimated from survey bycatch and later extrapolated to commercial catches in the various IPHC regulatory areas. A semiannual report has been completed documenting activities of the new observer program on June 2013. A more detailed report is expected in June 2014

http://www.fakr.noaa.gov/regs/679e55.pdf
http://www.fakr.noaa.gov/regs/679e51.pdf
https://alaskafisheries.noaa.gov/sustainablefisheries/observers/overview.pdf
http://www.iphc.int/publications/regs/2014iphcregs.pdf
https://alaskafisheries.noaa.gov/sustainablefisheries/observers/adp2014.pdf

Electronic monitoring

It is the intention of NMFS to initiate a program for the implementation of electronic monitoring of the Alaska fleets (including halibut and sablefish) to improve data collection. The NMFS Policy on Electronic Monitoring Technologies and Fishery Dependent Data Collection published in May 2013 provides guidance on the adoption of electronic technology solutions in fishery-dependent data collection programs. Electronic technologies include the use of vessel monitoring systems (VMS), electronic logbooks, video cameras for electronic monitoring (EM), and other technologies that provide EM and electronic reporting (ER). The policy also includes guidance on the funding for electronic technology use in fishery-dependent data collection programs.

The implementation of fisheries management regulations that require near real-time monitoring of catch by species at the vessel level have challenged the methodological and budgetary limits of data collection methods such as self-reporting, at-sea monitoring, and dockside monitoring. A policy and process to consider the adoption of electronic technology options may help ensure the agency's fishery-dependent data collection programs are cost-effective and sustainable.

http://www.fakr.noaa.gov/regs/679e55.pdf
http://www.fakr.noaa.gov/regs/679e51.pdf
https://alaskafisheries.noaa.gov/sustainablefisheries/observers/overview.pdf
http://www.nmfs.noaa.gov/op/pds/documents/30/30-133.pdf

Halibut Prohibited Species Catch (PSC)

The Pacific halibut longline fishery was one of the first fully domestic fisheries to become established off Alaska. As the groundfish fisheries developed, regulations were implemented to limit bycatch of halibut, so as to minimize impacts on the domestic halibut fisheries. Interception of halibut often occurs in trawl fisheries targeting other groundfish species (such as rock sole, pollock, yellowfin sole, and Pacific cod). Incidental catch of halibut also occurs in groundfish hook and line and pot fisheries. Regulations require that all halibut caught incidentally must be discarded, regardless of whether the fish is living or dead.

GOA Halibut PSC

The NPFMC voted in June 2012 to reduce the halibut bycatch cap in the GOA groundfish fisheries, and adopted the following alternative:

Alternative 2. Amend the GOA Groundfish FMP to remove setting GOA halibut PSC limits from the annual groundfish harvest specifications process. GOA halibut PSC limits would be established (and amended) in federal regulation.

The halibut PSC limit was reduced by 7%, 15%, and 15% for hook and line gear catcher processor (CP) vessels, for hook and line gear catcher vessels (CV), and for trawl gear, respectively.

The 15% reduction for the trawl and non-demersal shelf rockfish hook and line CV sectors would be phased in over three years, as follows: 7% (first year); additional 5% (second year); and additional 3% (third year). In the third year and after, the revised total non-demersal shelf rockfish (DSR) hook and

line halibut PSC limit would be reduced and the total trawl limit would be 1,705 mt.

BSAI Halibut PSC

Amendment 61 in 2000 to the BSAI Groundfish FMP Established halibut and crab PSC sideboard limits for AFA catcher vessels and AFA catcher/processors operating in the BSAI pollock fishery. Later on in 2008, Amendment 80 to the same GFMP established a halibut PSC limit for the non-AFA trawl catcher/processor (Amendment 80) sector of 2,525 mt in 2008, 2,475 mt in 2009, 2,425 mt in 2010, 2,375 mt in 2011 and 2,325 mt in 2012 and thereafter established an 875 mt PSC limit halibut for the trawl limited access sector.

Halibut excluder device to reduce halibut bycatch in the groundfish trawl fisheries

Research has shown that the groundfish trawl industry in Alaska can deploy halibut excluder devices in their gear with success. A project, implemented in Oregon and California, entitled "Improving the Selectivity of Bottom Trawls to Reduce Bycatch of Pacific Halibut in the West Coast Groundfish Trawl Fishery" responded to fishermen's concern for Pacific halibut bycatch. The NMFS, in collaboration with the Pacific States Marine Fisheries Commission (PSMFC) and the fishing industry, tested the efficacy of a flexible sorting grate bycatch reduction device (BRD) designed to reduce halibut bycatch. The results showed that halibut bycatch was reduced numerically by 57% and by 62% by weight. Target species loss ranged from 9% to 22%.

While halibut excluder usage already occurs in many BS bottom trawl fisheries, GOA trawlers represent a challenge because the rigid halibut excluder devices used in the BS were developed for large vessels with ample deck space, while GOA vessels have relatively short decks and the widespread use of aft net reels.

Practically speaking, GOA trawlers need an excluder that can withstand being rolled onto a net reel. Such a device must therefore be made of flexible materials that allow it to regain its original shape and function during fishing.

When this collaborative (between NMFS and industry associations) development process was originally initiated, the performance goal for the excluder device was to reduce halibut bycatch in the GOA cod fisheries by at least 40% (by weight) while minimizing loss of target catch (cod catch per hour) compared to an unmodified net.

The result of this collaborative effort is that vessel tows with the excluder had 57% less halibut bycatch by weight on average than tows without the excluder. At the same time, the overall catch of groundfish measured by the groundfish trip weights delivered to the plant was 39% lower on average for vessel trips with the excluder compared to those without.

http://www.nmfs.noaa.gov/by_catch/docs/brep_report_2012.pdf
http://www.marineconservationalliance.org/?p=1362

Evidence

http://www.fakr.noaa.gov/npfmc/PDFdocuments/newsletters/NEWS612.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/GOAPSCmotion612.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/halibut/BSAIPSC_discpaper512.pdf

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

FAO CCRF 7.1.8/7.6.3/7.6.6/8.4.5/8.4.6/8.5.1/8.5.3/8.5.4/8.11.1/12.10

FAO Eco 29.2bis

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating determination

The IPHC and NPFMC objectives for fisheries management are based on the long term maintenance of MSY levels. The policy for achieving this is based on setting biological reference points that determine the annual CEY for the Pacific halibut stock. Under the individual fishing quota share system in place for the Pacific halibut fishery, fishing capacity (vessels and gear) has been reduced and is now stable. In 1983, industry made the operational switch from J-hooks to circle hooks in the commercial fishery, lowering the mortality of undersized halibut caught and released during commercial fishing. Discards of Pacific halibut, considered a Prohibited Species Catch (PSC) by the groundfish fisheries in Alaska are regulated, and the NPFMC voted in June 2012 to further reduce the halibut bycatch cap in the GOA groundfish fisheries. A fishery management plan amendment, "Amendment 95," came into effect in 2014 and is intended to minimize halibut bycatch in the GOA groundfish fisheries.

The IPHC and NPFMC objectives for fisheries management are based on the long term maintenance of MSY levels. The policy for achieving this is based on setting biological reference points that determine the annual CEY for the Pacific halibut stock.
http://www.iphc.int/publications/rara/2013/rara2013_13_2013apportionment.pdf
http://www.iphc.int/publications/rara/2013/rara2013_12_2013assessment.pdf

The IPHC has developed, refined, and utilized a constant harvest rate policy since the 1980's. The policy was fully described in Clark and Hare (2006) and further modified as described in Hare and Clark (2008), and Hare (2011b). Stated succinctly, the policy was initially designed to harvest 20% of the coastwide exploitable biomass when the spawning biomass is estimated to be above 30% of the unfished level. The harvest rate is linearly decreased towards a rate of zero as the spawning biomass approaches 20% of the unfished level. This combination of harvest rate and precautionary levels of biomass protection have, in simulation studies, provided a large fraction of maximum available yield while minimizing risk to the spawning biomass. This, in combination with the SUFullD harvest policy that allows a 33% rise in catch limit from the previous year when the exploitable biomass is projected to increase, and a full 100% decrease when the projections are for a biomass decrease, should result in a long term increase in available biomass, and therefore more reliable MSY levels.

Further to the CHR and the SUFullD harvest policy there are other technical measures in place to minimize halibut mortality in line with achieving MSY levels. In 1983, industry made the operational switch from J-hooks to circle hooks in the commercial fishery, lowering the mortality of undersized halibut caught and released during commercial fishing.
Under the IFQ share program in place for the Pacific halibut fishery, fishing capacity (vessels and gear deployed) has been reduced; less longline sets have been lost (contributing to ghost fishing of halibut and other species); and the fishery was generally allowed to proceed at a slower pace allowing for increased selectivity and decreased bycatch and discards. The number of vessels, and the class of those vessels, established qualifications for a fishing fleet with less capacity and with ownership in the resource.
http://www.fakr.noaa.gov/regs/679d42.pdf
http://www.iphc.int/publications/regs/2012iphcregs.pdf

http://www.iphc.int/publications/bulletins/ib0028.pdf

Discards of Pacific halibut, considered a Prohibited Species Catch (PSC) by the groundfish fisheries in Alaska, are regulated. When PSC limits are reached, groundfish target species closures result. In the most recent change in regulation, the NPFMC voted in June 2012 to reduce the halibut bycatch cap in the GOA groundfish fisheries (see Clause 7). Halibut PSC limits are also set in the BSAI fisheries.
http://www.fakr.noaa.gov/npfmc/PDFdocuments/newsletters/NEWS612.pdf
http://alaskafisheries.noaa.gov/sustainablefisheries/amds/amd95/goaamd95fmp.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

Any aspirant halibut fisherman must have 150 days of halibut fishing experience before being able to purchase halibut IFQs. Obtaining halibut IFQ share most often will require the purchaser to enter into loan capital arrangements with banks that will require comprehensive fishing business plans supported by competent, professional fishermen with demonstrable fishing experience. Several training opportunities are available to train crew members in Alaska.

To increase communications and understanding between the regulated users and enforcement personnel and to minimize harm to fishery resources, the Alaska Enforcement Division (AKD) of NOAA Fisheries Office of Law Enforcement (OLE) strives to maintain a positive and productive relationship with all harvesters and industry personnel. In addition to daily personal interactions on the water, docks, and in processing facilities, AKD contacted thousands of harvesters and industry personnel at organized events, including trade shows, and responded to email and telephone inquiries, providing current regulatory information and guidance to promote compliance and communications.

Any aspirant halibut fisherman must have 150 days of halibut fishing experience before being able to purchase halibut IFQs. Obtaining halibut IFQ share most often will require the purchaser (aspirant halibut fisherman) to enter into loan capital arrangements with banks that will require comprehensive fishing business plans supported by competent, professional fishermen with demonstrable fishing experience. This competence and professionalism is a learned experience with the culmination of entrants into the fishery starting at deck hand level working their way up through proof of competence.
http://www.nmfs.noaa.gov/sfa/management/catch_shares/about/documents/ak_halibut_sablefish.pdf

The State of Alaska, Department of Labor & Workforce Development (ADLWD) includes AVTEC (formerly called Alaska Vocational Training & Education Center, now called Alaska's Institute of Technology). One of AVTEC's main divisions is the Alaska Maritime Training Center. The goal of the Alaska Maritime Training Center is to promote safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry.
The Alaska Maritime Training Center is a United States Coast Guard (USCG) approved training facility located in Seward, Alaska, and offers USCG/STCW-compliant maritime training (STCW is the international Standards of Training, Certification, & Watchkeeping). In addition to the standard courses offered, customized training is available to meet the specific needs of maritime companies. Courses are delivered through the use of their world class ship simulator, state of the art computer based navigational laboratory, and modern classrooms equipped with the latest instructional delivery technologies.
The Center's mission is to provide Alaskans with the skills and technical knowledge to enable them to be productive in Alaska's continually evolving maritime industry. Supplemental to their on-campus classroom training, the Alaska Maritime Training Center has a partnership with the Maritime Learning System to provide mariners with online training for entry-level USCG Licenses,

endorsements, and renewals.

The University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training in several sectors, including fisheries management, in the forms of seminars and workshops. In addition, MAP conducts sessions of their Alaska Young Fishermen's Summit (AYFS). Each Summit is an intense, 2/3-day course in all aspects of Alaska fisheries, from fisheries management & regulation, to seafood markets & marketing. The target audience for these Summits is young Alaskans from coastal communities. The 2013 AYFS was held in December 10 through December 15 in Anchorage. The conference aimed at providing crucial training and networking opportunities for fishermen entering the business or wishing to take a leadership role in their industry.
Only one gear type may be used to harvest halibut in the GOA and BSAI – benthic longline (a passive gear type). All longline fishing gear must be marked and operated in accordance with federal fisheries regulations – 50 CFR Part 679: Fisheries of the Exclusive Economic Zone off Alaska.

Evidence
http://www.avtec.edu/AMTC.htm
http://www.stcw.org/
http://seagrant.uaf.edu/map/
http://seagrant.uaf.edu/map/fishbiz/index.php
http://www.sfos.uaf.edu/fitc/academicprograms/
http://seagrant.uaf.edu/map/workshops/2013/ayfs/
http://www.nmfs.noaa.gov/sfa/management/catch_shares/about/documents/ak_halibut_sablefish.pdf

E. Implementation, Monitoring and Control

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

FAO CCRF 7.1.7/7.7.3/7.6.2/8.1.1/8.1.4/8.2.1
FAO Eco 29.5

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating determination

The Northern Pacific Halibut Act, governs the commercial, sport, charter, and subsistence halibut fisheries in the U.S.. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations, especially 50CFR679. The Alaska Wildlife Troopers enforce halibut regulations in state waters. The violations in this fishery are reported to and investigated by NOAA's Office of Law Enforcement's Alaska Division and prosecuted by NOAA's Office of General Counsel's Enforcement Section. The maximum civil penalty under the Northern Pacific Halibut Act is $200,000 for each violation. 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).

The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations, especially 50CFR679.

The *Northern Pacific Halibut Act* governs the commercial, sport, charter, and subsistence halibut fisheries in the U.S. The violations in this fishery are reported to and investigated by NOAA's Office of Law Enforcement's Alaska Division and prosecuted by NOAA's Office of General Counsel's Enforcement Section. The maximum civil penalty under the *Northern Pacific Halibut Act* is $200,000 for each violation.

Patrols, Partnerships, and Inspections

The U.S. Coast Guard and NMFS's OLE enforce the regulations that govern fishing under the IFQ Program. The Alaska Division patrols provide compliance inspections, a visible deterrent to would-be violators, and availability to stakeholders to receive information and guidance. NOAA OLE works closely with the State of Alaska Wildlife Troopers (AWT) and the US Coast Guard to maximize compliance by sharing information, intelligence, knowledge, and resources. The formalized Cooperative Enforcement Agreement and Joint Enforcement Agreement with the Alaska Wildlife Troopers provide the state with federal funding for personnel, equipment, operations, and authorization for State Troopers to enforce federal fishing regulations while engaged in their regular duties.

USCG

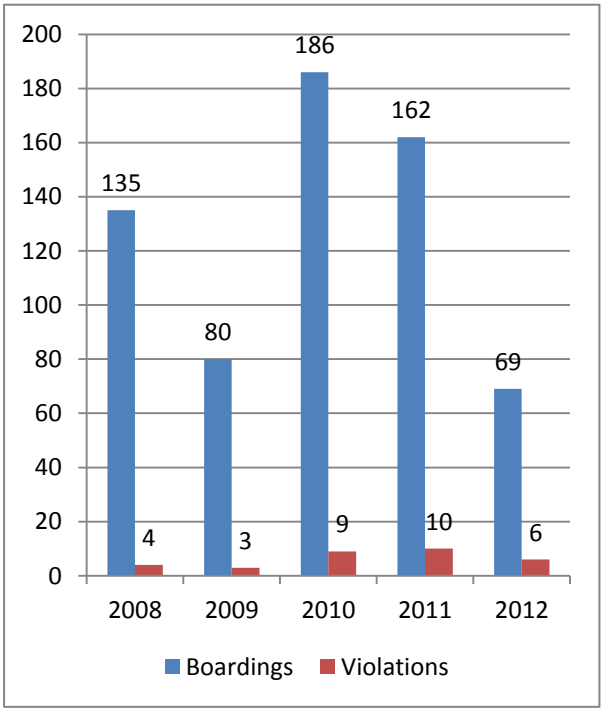
The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations, especially 50CFR679. The U.S. Coast Guard (USCG) is the lead federal maritime law enforcement agency for enforcing national and international law on the high-seas, outer continental shelf and inward from the U.S. Exclusive Economic Zone (EEZ) to inland waters. The

USCG also patrols US waters to reduce foreign poaching, and inspects fishing vessels for compliance with safety requirements. The U.S. Coast Guard now focuses its efforts at sea. Since 2006 NMFS'OLE Alaska Division (AKD) has monitored offloads and provided after-hours surveillance.

IFQ/CDQ halibut is only permitted to be harvested with hook and line gear. In general, this means longline gear, although it is permissible for salmon trollers with IFQ halibut permits to retain troll caught halibut, and jig vessels with IFQ can also retain halibut if they hold IFQs as these are all considered hook and line gear. The active fleet size is a difficult number to quantify as IFQ permits are not allocated to a vessel but to an individual, and those individuals may fish on any boat that meets their specific permit size or lower. The USCG works with the NOAA Alaska Region Restricted Access Management (RAM) division to determine the number of vessels that landed IFQ halibut in the previous year to determine the active fleet size.

IFQ At-Sea and Dockside Effort

The USCG eliminated shoreside enforcement in 2006, protecting resources through at-sea boardings. This focus was possible because of OLE AKD's increased capacity to monitor offloads with their personnel and with the State of Alaska. Historically, shoreside violations detected by the USCG have consistently been minor and generally administrative. Consequently, the USCG determined that more significant resource protection was possible by at-sea boardings conducted jointly with NOAA. For fiscal year 2012, the active vessel fleet size for IFQ halibut was 1879 vessels, and the USCG had a goal to board 386 of these vessels. For the most part (GOA) IFQ halibut vessels are not on VMS, so determining their locations is difficult, and requires a significant amount of effort from law enforcement assets to facilitate at-sea boardings. From fiscal year 2008 through the end of fiscal year 2013, the USCG conducted 690 boardings on IFQ/CDQ halibut vessels, noting 39 violations on 32 vessels resulting in a detected violation rate for this fleet of 4.64%. Also, details of the boardings and violations detected by fiscal year 2008/12 is provided below.



- Annual Averages
  - 115 boardings
  - 6.5 violations
  - 4.27% of vessels had fisheries violations
- Violations (Over 6 years)
  - Logbook errors (8)
  - Permits not on board (8)
  - Fishing without an IFQ Permit (4)
  - Failure to use required logbooks (8)
  - Bycatch (3)
  - Closed Areas (3)
  - Seabird Avoidance Gear (1)
  - Vessel Monitoring System (1)
  - Buoy Markings (1)
  - Uncareful Release Methods(1)

In 2013, the USCG conducted 58 boardings on IFQ/CDQ halibut vessels, noting 7 violations on 6 vessels. Violations included 1 for No Permit, 1 for No Buoy marking, 2 for failure to maintain catch logs / fish tickets, 1 for not being careful on release methods, 1 for fishing in a closed zone, 1 for no having a federal permit while fishing and 1 for not possessing an IFQ permit.

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 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 agencies.

In any given year, OLE Agents and Officers spend an average 10,000-11,000 hours conducting patrols and investigations, and an additional 10,000-11,000 hours on outreach activities. The OLE maintains 19 patrol boats around the country to conduct a variety of patrols including Protected Resources Enforcement Team (PRET) boardings, protection of National Marine Sanctuaries and various undercover operations.

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

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

All landings of halibut must be reported to NMFS via its mandatory "e-landings" reporting system. Commercial harvests of halibut are the primary enforcement responsibilities of OLE. The Individual Fishing Quota (IFQ) Observer and Record Keeping/Reporting programs are the foundations of the Alaska Division program responsibilities.

Alaska Division: NMFS OLE 2013 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.
- Outreach and education.

MEDIUM PRIORITY

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

LOW PRIORITY

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

The Alaska Enforcement Division (AKD) uses Enforcement Officers (EO's), Special Agents (SA's) and partnerships with other agencies to provide effective enforcement for over 842,000 square miles of ocean, 6,600 miles of coastline and 2,690 islands off of Alaska. EO's conduct patrols and inspections and provide compliance assistance and SA's investigate civil and criminal violations of marine resource laws.

Compliance Assistance

During FY2013, AKD personnel spent over 2,280 hours providing compliance assistance, outreach/education and public relations with marine resource users. This includes staffing booths at major organized events in Alaska and Washington as well as daily contacts in communities, ports and harbors and at-sea to ensure that the most current and accurate regulatory information is widely distributed and understood.

Patrol, Monitoring, and Inspections

During this reporting period, AKD personnel spent over 3,515 hours conducting patrols to provide a visible deterrence to potential violators; to monitor fishing and other marine activities; to detect violations; to conduct compliance inspections, and to provide compliance assistance.

Investigations

During this reporting period, AKD personnel opened approximately 596 cases that documented approximately 1,042 violations. Of the 1,042 violations, 304 violations (29%) were halibut related and 738 violations (71%) were non-halibut related. This compares to approximately 439 cases and approximately 802 violations documented in 2012. 244 were halibut related violations (30%) and 558 were non-halibut related violations (70%).

Examples of halibut related violations documented in 2013:

37 Subsistence halibut fishing violations were documented.

- Unqualified person applying for SHARC
- Improperly or unmarked subsistence halibut fishing gear
- Subsistence halibut fishing without SHARC
- Subsistence halibut fishing with too many hooks
- Unlawful sale of, or attempted unlawful sale of subsistence halibut
- Exceeding bag / possession limits

176 Commercial IFQ or CDQ halibut violations were documented.

- 10 IFQ halibut overages. There were 24 in 2012, 31 in 2011 and 41 in 2010.
- Discarding legal sized halibut when required to retain

- Area 4 clearance violations
- Record keeping or reporting violations
- Gear marking violations
- Undersized halibut
- Filleting, mutilating halibut onboard vessel
- Hired Skipper and Permit Holder violations
- Vessel Cap Overages
- Misreporting IFQ area fished or fishing in area with no IFQ available

47 Charter halibut fishing violations were documented.

- Logbook violations
- Filleting, mutilating or skinning halibut onboard a vessel
- Exceeding bag or possession limits
- Charter fishing without valid CHP

Halibut Violations

	2010 Violations Documented by NOAA OLE in Alaska	**2011** Violations Documented by NOAA OLE in Alaska	**2012** Violations Documented by NOAA OLE in Alaska	**2013** Violations Documented by NOAA OLE in Alaska
Subsistence Halibut Fishing	15	21	39	37
Commercial Halibut Fishing	122	156	95	176
Charter Halibut Fishing	25	59	75	47
Sport Halibut Fishing	14	24	13	18
Other Halibut Related Commercial	22	19	22	26
TOTAL	**198**	**279**	**244**	**304**

Endangered Species Act and Marine Mammal Protection Act

HIGH PRIORITY

• Violations wherein responsible subject and species are identifiable.
• Lethal Takes, Level "A" Harassment with the potential to injure marine mammal stock.
• Species of interest are Cook Inlet Beluga, other whale species, Northern fur seal, or Steller sea lion.
• Any violation involving injury or potential injury to people, such as a vessel-whale collision.
•Outreach and education.

MEDIUM PRIORITY

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

LOW PRIORITY

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

International/Lacey Act

HIGH PRIORITY

• Felony and major civil violations. For example, interstate or foreign trafficking of commercial quantities of illegally harvested fish or marine resources.
• Harvest or transhipment of marine resources by foreign fishing vessels.
• Domestic or international violations involving seafood safety; substantive mislabeling of product in domestic or international commerce.
• IUU listed vessels.

MEDIUM PRIORITY

• Misdemeanor and civil violations. 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.

In addition to enforcing legislation for the commercial halibut fishery, OLE has responsibility for enforcement of the crab rationalization program, subsistence halibut fishing and charter halibut fishing. In addition, OLE's officers inspect and cross check landings and processors records for reconciliation, and closely monitor Prohibited Species Catch in non halibut fisheries.

AWT

The Department of Public Safety, Division of Alaska Wildlife Troopers (AWT) is the primary state fish and wildlife resource enforcement agency in the state of Alaska. AWT is the only state enforcement agency with jurisdiction of state and federal lands as well as state waters. AWT also has a Joint Enforcement Agreement (JEA) with NOAA Fisheries Office of Law Enforcement (NOAA/OLE).

AWT has 97 sworn positions stationed throughout Alaska broken into 4 regions. The southeastern panhandle region is headquartered in Juneau; south central Alaska, including the Kenai Peninsula, Prince William Sound and the northeastern and the northwestern Gulf of Alaska coast is headquartered in Palmer; western Alaska, including the Aleutian chain, Bering Sea and Bristol Bay is headquartered in Kodiak. Interior Alaska is managed from Fairbanks.

Over the last two years the JEA with NOAA/OLE went under some significant changes. Historically

AWT supplemented commissioned trooper patrols with 14 civilian Public Safety Technicians (PST). These positions were primarily funded by the JEA. Currently the JEA now only funds 3 PST positions. The primary function of these PSTs is still conducting dockside monitoring and inspection of commercial fish off-loads. PSTs monitor for both state and federal regulatory requirements, but are not commissioned to take any law enforcement action; they simply report the documented violations to the appropriate agency. The PSTs focus is not limited to IFQ halibut; they also monitor other fisheries including rockfish, sablefish, pollock, cod and crab fisheries

Halibut Enforcement:

AWT actively enforces commercial, sport and subsistence halibut fisheries through vessel patrols, dockside monitoring and other investigative processes. AWT conducts boardings at sea for all three halibut fisheries; mostly checking for proper licenses, registrations, logbooks, size and limit restrictions. Dockside monitoring focuses on license and registration verification, size requirements, logbooks and accuracy of catch reports. PSTs are the primary resource used to monitor commercial fish off-loads. With the restructuring of the JEA an increased effort was made to monitor sport fish off-loads using AWT troopers.

Enforcement Activity:

With the changes in how the JEA is administered AWT better tracks sport/charter/subsistence halibut enforcement efforts, particularly dockside monitoring. These numbers include both dockside checks and at-sea boardings using smaller day skiffs. Patrols using larger, longer distance platforms are not fishery or species specific so halibut enforcement efforts cannot be extrapolated from the data

Activity of Halibut Enforcement is documented as follows:

DOCKSIDE/NEARSHORE AND MEDIUM CLASS VESSEL PATROLS JEA Sport/Charter/Subsistence

Violations Noted (State):
Misc. Halibut violations – 28
Mutilate/Disfigure Halibut fillets – 4

Violations Noted (Federal):
Subsistence halibut fish with sportfish halibut – 2
Subsistence halibut residency violation – 1

JEA COMMERCIAL IFQ Halibut and Sablefish (statewide)

- Boarding/offloads –247
- Contacts – 933
- State violations noted –4
- Federal violations noted - 22

IFQ Violations (State) – 4
Failure to have vessel ID - 1
No Crewmember license in possession – 2
Employ unlicensed crew – 1

IFQ Violations (Federal) – 22

Permit holder not present – 1
Permit issues – 6
Undersized halibut – 6
Overage of halibut – 2
Failure to correctly report PNOL – 1
VMS issues – 1
Failure to careful release of halibut – 1
No Observer onboard – 1
Record keeping and Log book issues – 2
Assist NMFS with retrieval of log books – 1

The Alaska Wildlife Troopers conduct undercover operations in the sport charter fleet. Fines are high and revocation of sport fishing license as well as sport guide licence for several years are occuring penalties in this program.

Evidence

www.fakr.noaa.gov/regs/default.htm
www.nmfs.noaa.gov/ole/ak_alaska.html
www.uscg.mil/d17/
www.fakr.noaa.gov/ram/ifq.htm
www.fakr.noaa.gov/ram/webapps.htm
http://elandings.alaska.gov/
http://www.fakr.noaa.gov/frules/76fr14300.pdf
http://www.gc.noaa.gov/enforce-office3.html
http://www.nmfs.noaa.gov/ole/docs/2013/ole-division-priorities-2013-final.pdf
http://www.nmfs.noaa.gov/ole/investigations.html
http://www.alaskawaypoints.com/trooper-report
http://www.iphc.int/meetings/2014am/documents/060703_ASTreport.pdf
http://www.iphc.int/meetings/2014am/documents/060702_NOAAOLEReport%20.pdf

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 *Northern Pacific Halibut Act* governs the commercial, sport, charter, and subsistence halibut fisheries in the U.S. The violations in this fishery are reported to and investigated by NOAA's Office of Law Enforcement's Alaska Division and prosecuted by NOAA's Office of General Counsel's Enforcement Section. The maximum civil penalty under the *Northern Pacific Halibut Act* is $200,000 for each violation

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

(1) Issuance of a citation (a type of warning), usually at the scene of the offense (see 15 CFR part 904, subpart E).

(2) Assessment by the Administrator of a civil money penalty.

(3) For certain violations, judicial forfeiture action against the vessel and its catch.

(4) Criminal prosecution of the owner or operator for some offenses.

In some cases, the Magnuson-Stevens Act requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In sum, the Magnuson-Stevens Act treats sanctions against the fishing vessel permit to be the carrying out of a purpose separate from that accomplished by civil and criminal penalties against the vessel or its owner or operator.

Magnuson-Stevens 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
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/U_OLE.pdf

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

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

NOAA's OLE Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL). GCEL can then assess a civil penalty in the form of a Notice of Permit Sanctions (NOPs) or Notice of Violation and Assessment (NOVAs), or they can refer the case

to the U.S. Attorney's Office for criminal proceedings. For perpetual violators or those whose actions have severe impacts upon the resource criminal charges may range from severe monetary fines, boat seizures and/or imprisonment may be levied by the United States Attorney's Office.
There are very few repeat offenders. Sanctions include the possibility of temporary or permanent revocation of fishing privileges. Withdrawal or suspension of authorizations to serve as masters or officers of a fishing vessel are also among the enforcement options. Within the USA EEZ, penalties can range up through forfeiture of the catch to forfeiture of the vessel, including financial penalties and prison sentences.

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

Evidence
50CFR600.740 Enforcement policy
http://www.nmfs.noaa.gov/ole/investigations.html
http://www.noaanews.noaa.gov/stories2011/pdfs/Penalty%20Policy%20--%20FINAL.pdf
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/U_OLE.pdf

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

Regulations are in place to address waste, discard, bycatch, and endangered species interactions in the halibut fisheries. Management actions are in place in respect to increasing knowledge on the bycatch dynamics of the directed halibut longline fishery (i.e. methods for the estimation of non-target species catch in the unobserved halibut IFQ fleet and the restructuring the observer program for inclusion of the halibut fleet). Benthic longline gear is not considered to have serious nor irreversible impacts on marine habitats. Bycatch of seabirds has been addressed by specific regulations put in place to reduce the incidental mortality of the short-tailed albatross, a listed species under the Endangered Species Act (ESA), and other seabird species in 1998, then revised in 2008. None have been taken in 2013. These measures now include the use of streamer (tory) lines, night setting, lineshooters and lining tubes, and have been shown to significantly reduce seabird interactions when setting or retrieving gear. Seabird occurrence data have been collected during the 2013 IPHC annual setline survey. Bycatch data were also collected this year, indicating that the majority of the bycatch is made up by Pacific cod and spiny dogfish. These species are managed by the NPFMC under tier 3 and 5 respectively, using OFL and ABC recommendations and catch limits. It is expected that with the implementation of the restructured observer coverage in a part of the halibut fleet, bycatch data collection will improve and allow management to make better informed decisions, especially for species like sharks and skates that generally tend to have low reproductive rates.

Impacts of fishing gear on the habitat

Benthic longline is considered a passive gear (not towed). There are no serious, irreversible concerns of halibut gear interaction on the habitat that are presented in the recent (2010) NPFMC Essential Fish Habitat review.
http://www.fakr.noaa.gov/habitat/efh/review/efh_5yr_review_sumrpt.pdf
http://www.fakr.noaa.gov/habitat/efh/review.htm

Regulations

Regulations are in place to address waste, discard, bycatch, and endangered species interactions in the halibut fisheries. The IPHC, the NMFS, and ADFG promulgate these regulations through the Commission, the NPFMC, and the Alaska Board of Fisheries. In the directed longline fisheries for Pacific halibut, bycatch of other fish species has not been well documented until the end of 2012. Since January 2013, the halibut fleet is partially covered by the newly restructured North Pacific Groundfish Observer Program. Bycatch data from this program were not analyzed in time for the third surveillance audit. Currently bycatch is extrapolated for the commercial fishery based on the yearly IPHC setline survey.

Bycatch of seabirds has been addressed by specific regulations put in place to reduce the incidental

mortality of the short-tailed albatross, a listed species under the Endangered Species Act (ESA), and other seabird species in 1998, then revised in 2008. These measures now include the use of streamer (tory) lines, night setting, lineshooters and lining tubes, have been shown to reduce seabird interactions when setting or retrieving gear. In the early 1980s the IPHC conducted research on capture efficiency of circle vs J hooks and determined that using circle hooks lowered the mortality of undersized halibut caught and released during fishing. In 1983, industry made the operational switch from J-hooks to circle hooks in the commercial fishery.

General spawning areas have been mapped in Alaska. The halibut fishery is closed during peak spawning times, by regulation. The NPFMC has established Marine Protected Areas that benefit juvenile fish and adult spawners. The Halibut Longline Closure Area is 36,300 square miles in size. Additional trawl closures for areas in the Bering Sea, Aleutian Islands and Gulf of Alaska provide a significant degree of refuge for juvenile halibut.

Impact of fishing gear on seabirds

The short-tailed albatross (*Phoebastria albatrus*) is a listed species under the Endangered Species Act (ESA). As such, incidental takes in the longline fishery are regulated and limits are set. The limit set by NMFS under the current ESA biological opinion is a maximum of four birds in a two- year cycle. If that level is exceeded, it automatically initiates an ESA Section 7 Consultation, which involves a consultation between the US Fish and Wildlife Service and the National Marine Fisheries Service.

Trends in seabird occurrence on stock assessment surveys (2002-2013)

Seabird occurrence data have been collected during IPHC stock assessment surveys since 2002 from the west coast of Washington, Oregon, British Columbia (B.C.), southeast Alaska (inside and outside waters), the central and western Gulf of Alaska, Aleutian Islands, and the southeastern Bering Sea Edge. Samplers aboard research vessels counted the number of seabirds in the vicinity of the vessel's stern immediately following gear retrieval (i.e., haul). Sampling seabird occurrence after the haul addresses the question of where and when certain seabird species occur. It also aids in the assessment of individual species at risk by providing information that may reflect population trends over time. Seabird counts were performed within a 50-meter hemisphere (count zone) at the stern, immediately after the longline gear was hauled.

A total of 15,130 observations were conducted on the IPHC stock assessment survey over the last eleven years (2002-2013). Seabird counts were taken on 99% of the IPHC setline stations. Annually, the number of stations where bird counts were performed ranged from a low of 1,218 to a high of 1,293 (Table 9). More than 690,000 bird sightings (composed of 36 unique species) were recorded, with the number of species identified each year varying between 17 and 27. The average number of species seen annually was 20 (Table 9). Start dates for each year's survey ranged from May 25 to June 7 and the end dates from August 27 to September 14, but the bulk of the surveys took place from June to August (Fig. 29 and most of the counts took place in the Gulf of Alaska
(Fig. 30).

The most common species observed in the counts during all years was the northern fulmar (*Fulmarus glacialis*), making up 72% of the cumulative sightings. Glaucous-winged gulls (*Larus glaucescens*) and black-footed albatross (*Phoebastria nigripes*) made up nine and eight percent of the overall sightings, respectively. Fork-tailed storm petrels (*Oceanodroma furcata*) represented two percent, and Laysan albatross (*Phoebastria immutabilis*) and shearwater species each one percent of all sightings (Fig. 31).

Counts per year have remained relatively consistent since 2002 (Table 11) and there has been no obvious trend in abundance of the most commonly-observed species. Counts of three of the top five most frequently observed birds, black-footed and Laysan albatross and Fork-tailed storm petrels, are plotted over the 11-year period as an example of this lack of a trend (Fig. 31). The number of glaucous-winged gulls counted has increased while the unidentified gull numbers have decreased (Fig. 32). The ratio of unidentified birds to total number of individual birds (Fig. 33) has also decreased greatly since 2002 and has remained at 0.01 for the last two years.

The number of unidentified birds within the survey count zones has decreased since the start of the seabird data collection program in 2002, indicating that the IPHC sea samplers have improved their identification skills. The change in glaucous-winged gulls numbers over time demonstrate this learning curve. Observation rates of glaucous-winged gulls were inversely correlated with observation rates of unidentified gulls such that as glaucous-winged gull sightings increased, unidentified gull sightings decreased (Fig. 34). This is likely because IPHC instructors increased their focus on gull field characteristics during annual field staff training and samplers have become better-skilled at identification. The IPHC has also provided samplers with better field guides since 2011.

The survey is not conducted at the same time in each area in a given year, nor for a particular area between years, and this can skew the bird sighting information. Caution should be exercised when using the data, because short-term changes in observed abundance might not necessarily reflect changes in population abundance, but could instead reflect spatio-temporal shifts in distribution that are not captured by the "snapshot" survey. Further work is needed to more fully examine charter timing and its effect on the bird occurrence data

Table 11. Number of individual birds (by species) observed in post-hauling counts 2002-13.

Species	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Northern fulmar	40918	40150	31966	42345	45894	47870	43649	42405	46372	41784	40900	37171	501424
Black-footed albatross	2465	3071	5520	4125	4540	4611	3541	4664	4630	4325	5207	4392	51091
Laysan albatross	964	742	806	487	621	221	612	816	775	1211	461	1008	8724
Short-tailed albatross	6	19	22	10	30	22	30	14	27	24	17	21	242
Glaucous-winged gull	1375	1688	896	2310	4751	7070	6609	6642	8287	6816	7318	4907	58669
Herring Gull	9		20	274	288	98	144	26	686	1228	652	137	3562
Western gull												507	507
Mew gull		100						14			1		115
Glaucous gull					30	3		33		16		30	112
Heermann's gull				4					5	4	74	3	90
Sabine's gull		3				2		5	2	6		1	19
Slaty-backed gull					7								7
Ring-billed gull							5	1					6
Bonaparte's gull						1					5		6

Unidentified gull	4348	6373	8531	9109	2030	250	375	358	782	118	85	78	32437
Arctic tern	1							2					3
Unidentified tern	20	3					5	1				1	30
Ruddy turnstone												8	8
Pomarine jaeger	3		1	2	3	3	3	1	2	2	20	5	45
Parasitic jaeger	3	1	4	1	1		2		6	5	5	4	32
Long-tailed jaeger								3			4		7
Unidentified jaeger	8	5	10					3	12		1	1	40
South polar skua							1						1
Fork-tailed storm petrel	1052	920	1748	1171	1898	776	937	1416	1840	839	1129	1143	14869
Leach's storm petrel	11	5	9	326	34	119	92	10	5	22	2	80	715
Unidentified storm petrel	973	754	541	669	643	512	362	142	32	8	9	233	4878
Black-legged kittiwake	211	271	78	185	817	661	317	357	380	205	614	531	4627
Red-legged kittiwake	3	17	3	5	25	4	9	2	10	21	5	8	112
Unidentifed kittiwake	51	5	271	283	3	5	4	243	1	63	4	3	936
Short-tailed shearwater	15	511		10	47	595	327	38	8	13	4	19	1587
Sooty shearwater	77	90	15	130	305	15	6	88	77	150	126	304	1383
Pink-footed shearwater			62		1				6	3	1	102	175
Flesh-footed shearwater											2		2
Unidentified shearwater	418	174	636	676	1020	751	20	327	381	558	659	590	6210
Common murre							2		2		7	5	16
Thick-billed murre												30	30
Unidentified murre	19	9	9	4	28	67	18	1	13	6	37	21	232
Rhinoceros auklet	1											1	2
Parakeet auklet							2						2
Tufted puffin		5	5	7	11	8	1	15	11	4	2	8	77
Horned puffin		1			3	1			2			1	8

Unidentified puffin	1	15	16	28	7	11	9	13	27	6	26	8	167
Bald eagle		1	1										2
Unidentified alcid	72	1	1										74
Unidentified cormorant	1					1			1	1		2	6
Unidentified bird	32	16	1	53		3		3		10			118
Grand total	53057	54950	51172	62214	63037	63680	57082	57643	64382	57448	57377	51363	693405
Number of counts	1228	1218	1227	1222	1282	1273	1293	1277	1260	1284	1273	1293	15130
Number of unique species	19	19	17	17	20	20	20	20	21	21	22	27	36

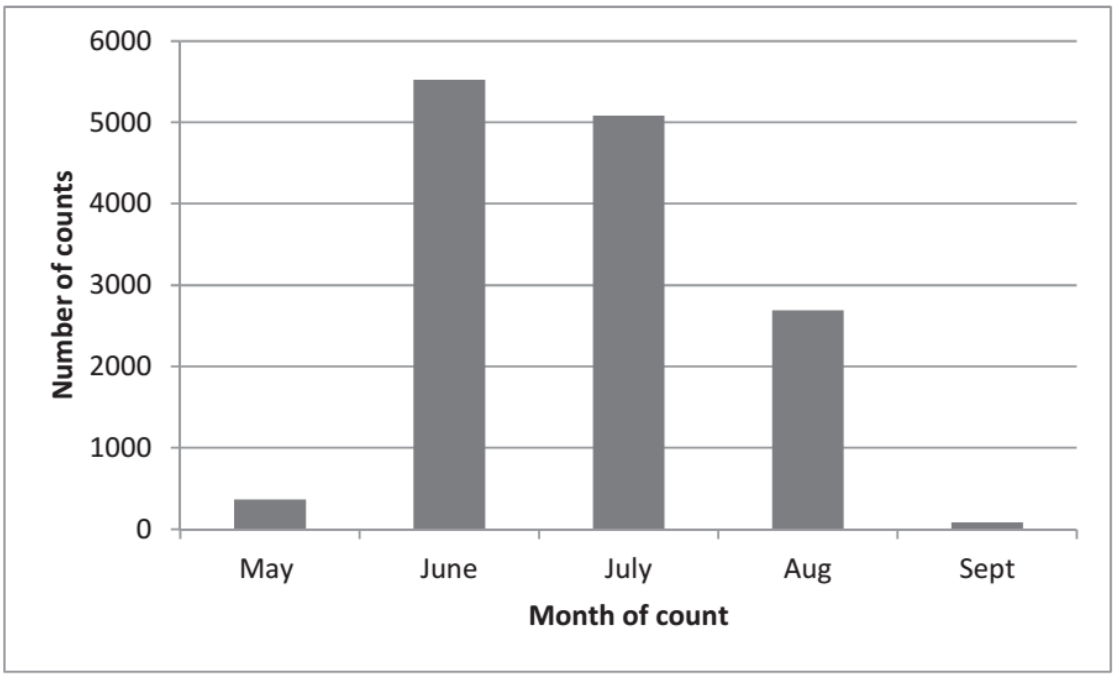


Figure 30. Overall seabird counts conducted on IPHC standardized stock assessment setline survey by month, 2002-2013

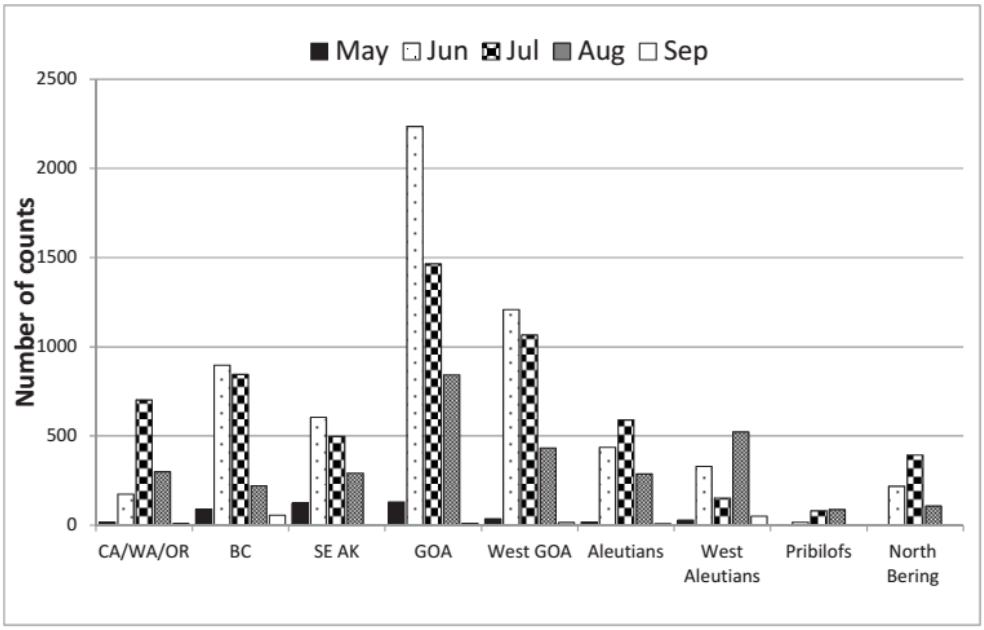


Figure 31. Total number of seabird counts conducted on IPHC standardized stock assessment setline survey, by area and month, 2002-2013. Abbreviated locations are as follows: CA/WA/OR= California, Oregon, and Washington, BC = British Columbia, SE AK = southeast Alaska, GOA = central Gulf of Alaska, West GOA = western Gulf of Alaska

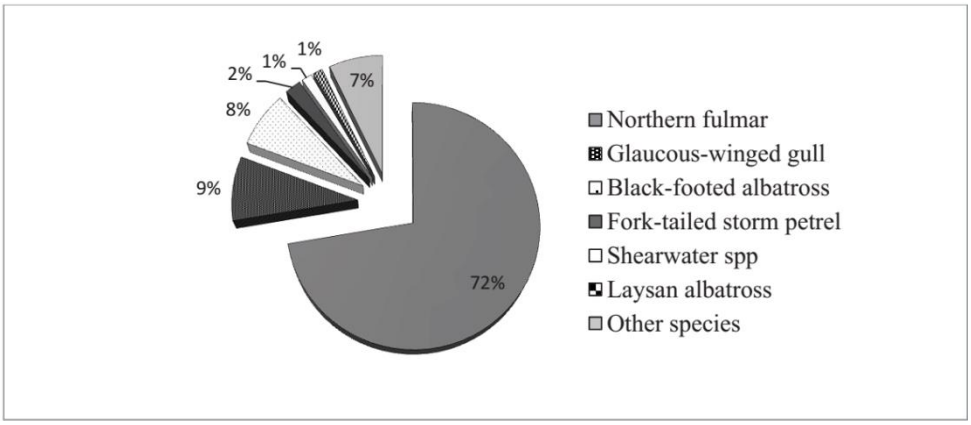


Figure 32. Frequency of observation (%) of common seabird species observed on IPHC standardized stock assessment setline survey, 2002-2013

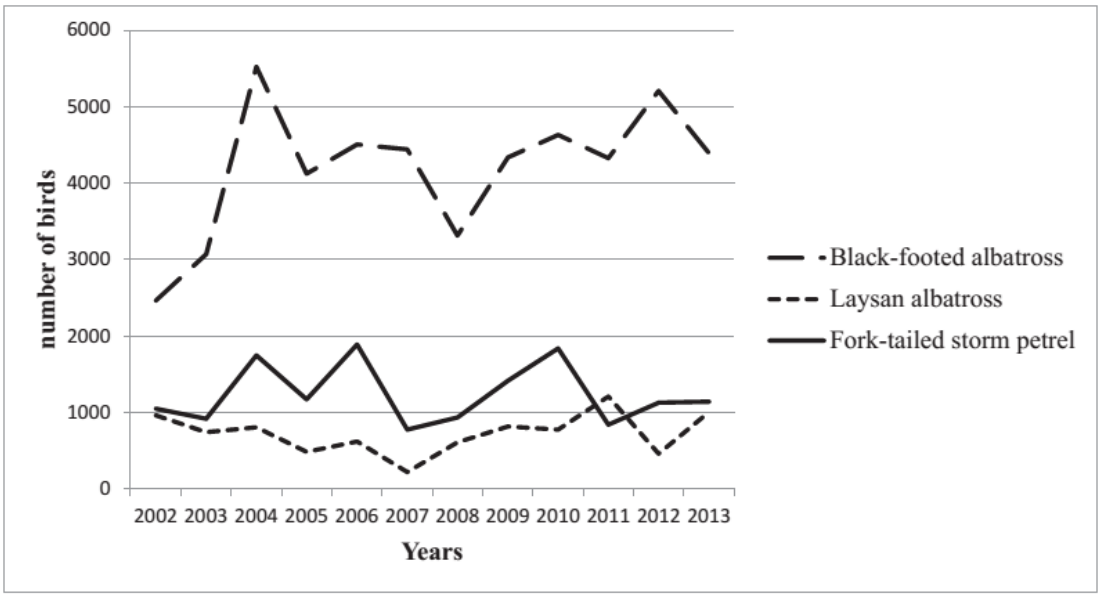


Figure 33. Total number of three of the most common bird species observed on IPHC standardized stock assessment setline survey, 2002-2013

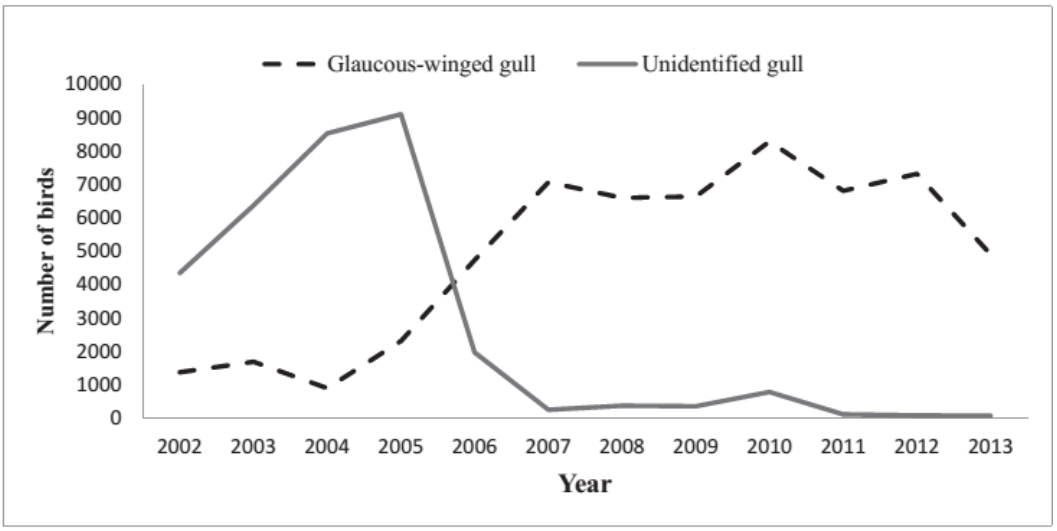


Figure 34. Glaucous-winged gull numbers versus unidentified gull numbers observed on IPHC standardized stock assessment setline survey, 2002-2013

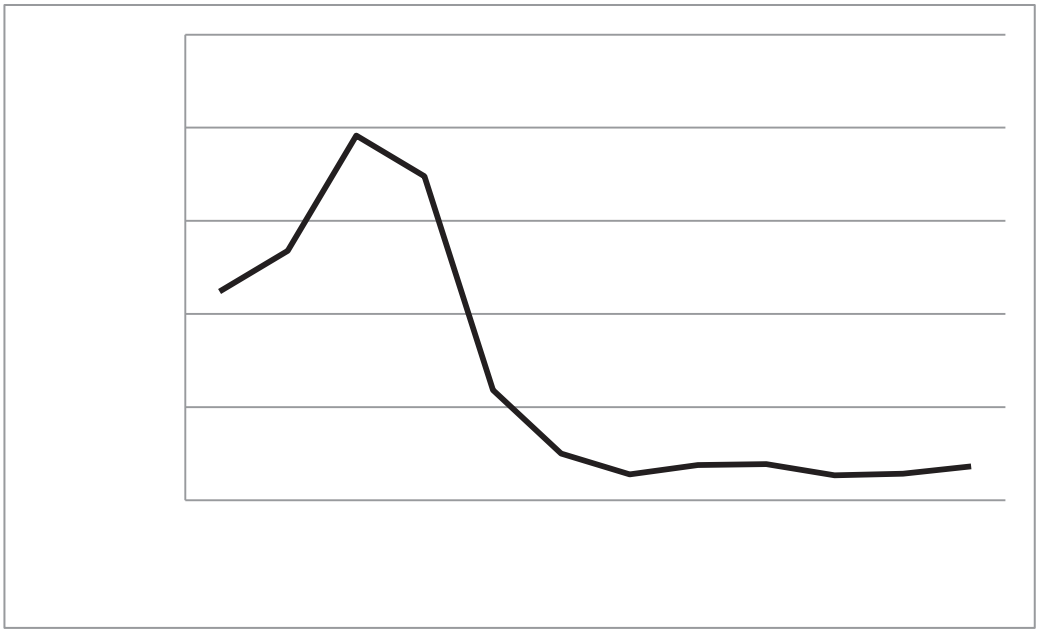


Figure 35. The ratio of number of unidentified birds to total individuals observed on IPHC standardized stock assessment setline survey, 2002-2013

http://iphc.int/publications/rara/2012/rara2012539_ssa_seabird.pdf
http://www.iphc.int/publications/rara/2013/rara2013_30_2013seabirds.pdf

Bycatch data collection

Approximately 107 species of fish and invertebrates were caught as bycatch during the survey. No marine mammals or birds were caught on IPHC charters in 2013.

Hook occupancy of species-groups varied by regulatory area (please see previous Fig. 6). Halibut were the most commonly-caught species in Areas 2B and 2C. The most frequently incidentally-captured species overall was Pacific cod, followed by sharks (please see previous Fig.6). The most common bycatch in Areas 2A, 2B, and 2C was sharks, primarily dogfish. The most frequent bycatch in Areas 3B and 4A was Pacific cod. In Areas 4A, 4B, 4C, and 4D, the "other species," category was comprised primarily of Aleutian skates (*Bathyraja aleutica*), arrowtooth flounder (*Atheresthes stomias)*, Bering skates(*Bathyraja interrupta*), white-blotched skates (*Bathyraja maculata),* Alaska skates *(Bathyrajaparmifera),* grenadiers (*Corypaenoididae* spp.), yellow Irish lord sculpins (*Hemilepidotus jordani*),and great sculpins *(Myoxocephalus polyacanthocephalus).*
Dogfish were the largest component of the shark species category in Areas 2A (99%), 2B (100%), 2C (96%), 3A (94%), and 4A (82%). Sleeper sharks were the largest component of the shark species category in Areas 3B (64%), and 4D (67%).
Trends in bycatch NPUE are presented in Figures 36 through 38.

Bocaccio (*Sebastes paucispinus*), canary rockfish (*S. pinniger*), and yelloweye rockfish (*S. ruberrimus*) populations are of concern in Areas 2A, 2B, and 2C and their numbers often drive catch regulations. Catch rates of bocaccio and canary rockfish are so low on IPHC surveys (Fig. 13) that it is difficult to make any inferences from them. Trends in bycatch NPUE over the last ten years for the other major incidentally-captured species and species groups show that the encounter rate for most remained relatively constant over time.

In Area 4D, arrowtooth flounder are more common than in all other Areas, however Area 4B displayed a 76% decrease in 2012 from 2011. Pacific cod in Area 4D have been generally declining since 2008 but showed a slight increase in 2012. All other Areas that had occurrences of Pacific cod decreased in NPUE for 2012 compared to 2011.
http://iphc.int/publications/rara/2012/rara2012503_ssa_survey.pdf
http://www.iphc.int/publications/rara/2013/rara2013_26_2013ssa.pdf

Bocaccio

Regulatory Area	Trend	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2A		0	0	0	0	0.012	0	0	0.009	0	0
2B		0.024	0.013	0.036	0.019	0.038	0.02	0.011	0.023	0.0138	0.005
2C		0	0.012	0.014	0.008	0.012	0	0	0.054	0	0.007

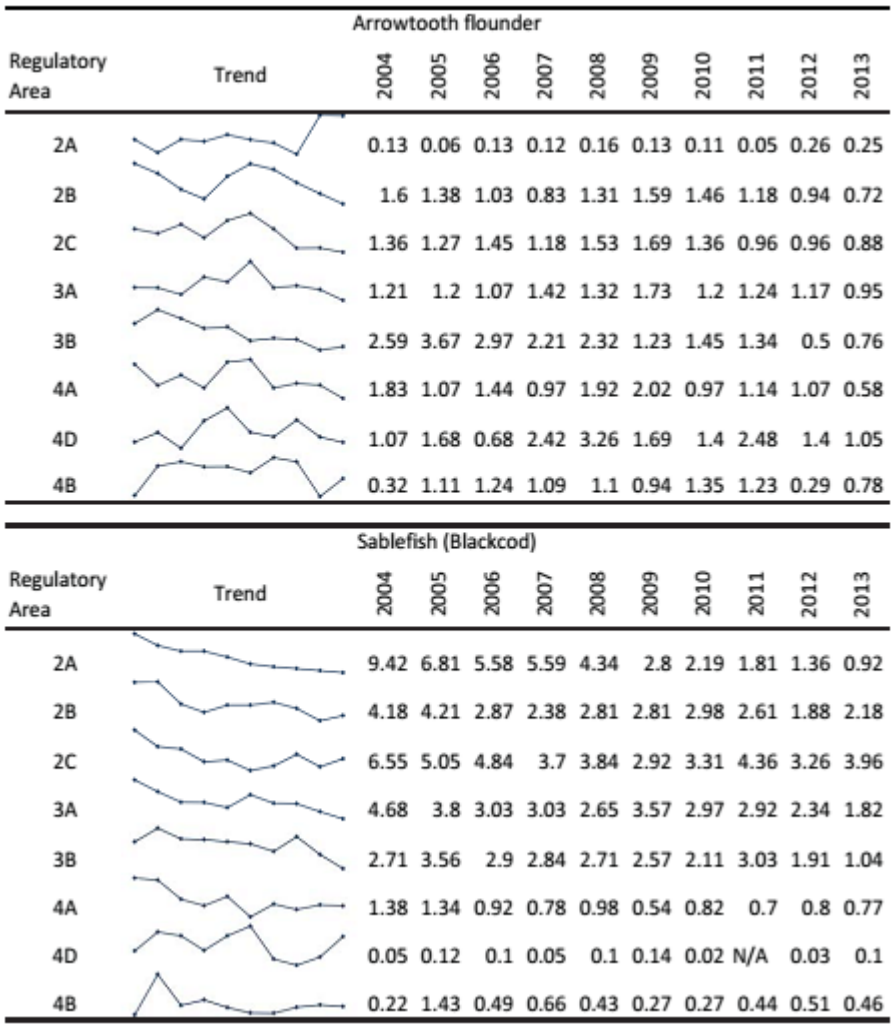
Canary rockfish

Regulatory Area	Trend	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2A		0.08	0.043	0.012	0.024	0.024	0	0.037	0.017	0.006	0.005
2B		0.019	0.058	0.062	0.024	0.044	0.058	0.026	0.034	0.0167	0.059
2C		0.027	0.036	0.02	0.106	0.089	0.071	0.144	0.047	0.0479	0.086

Yelloweye rockfish

Regulatory Area	Trend	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2A		0.418	0.238	0.238	0.238	0.346	0.163	0.179	0.14	0.204	0.171
2B		1.154	1.007	1.016	0.823	1.004	1.158	1.286	0.952	0.8606	0.848
2C		1.985	2.149	1.699	1.496	0.997	1.325	1.614	1.173	1.3813	1.287
3A		0.438	0.377	0.374	0.212	0.609	0.421	0.51	0.543	0.5012	0.323

Figure 36. Ten-years of NPUE (numbers per standardized 100-hook skate) for bocaccio, canary rockfish, and yelloweye rockfish on SSA surveys in Regulatory Areas 2A, 2B, 2C, and 3A. No bocaccio or canary rockfish were captured in Regulatory Area 3A



Arrowtooth flounder

Regulatory Area	Trend	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2A		0.13	0.06	0.13	0.12	0.16	0.13	0.11	0.05	0.26	0.25
2B		1.6	1.38	1.03	0.83	1.31	1.59	1.46	1.18	0.94	0.72
2C		1.36	1.27	1.45	1.18	1.53	1.69	1.36	0.96	0.96	0.88
3A		1.21	1.2	1.07	1.42	1.32	1.73	1.2	1.24	1.17	0.95
3B		2.59	3.67	2.97	2.21	2.32	1.23	1.45	1.34	0.5	0.76
4A		1.83	1.07	1.44	0.97	1.92	2.02	0.97	1.14	1.07	0.58
4D		1.07	1.68	0.68	2.42	3.26	1.69	1.4	2.48	1.4	1.05
4B		0.32	1.11	1.24	1.09	1.1	0.94	1.35	1.23	0.29	0.78

Sablefish (Blackcod)

Regulatory Area	Trend	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2A		9.42	6.81	5.58	5.59	4.34	2.8	2.19	1.81	1.36	0.92
2B		4.18	4.21	2.87	2.38	2.81	2.81	2.98	2.61	1.88	2.18
2C		6.55	5.05	4.84	3.7	3.84	2.92	3.31	4.36	3.26	3.96
3A		4.68	3.8	3.03	3.03	2.65	3.57	2.97	2.92	2.34	1.82
3B		2.71	3.56	2.9	2.84	2.71	2.57	2.11	3.03	1.91	1.04
4A		1.38	1.34	0.92	0.78	0.98	0.54	0.82	0.7	0.8	0.77
4D		0.05	0.12	0.1	0.05	0.1	0.14	0.02	N/A	0.03	0.1
4B		0.22	1.43	0.49	0.66	0.43	0.27	0.27	0.44	0.51	0.46

Figure 37. Ten-years of NPUE (numbers per standardized 100-hook skate) for arrowtooth flounder and sablefish on IPHC surveys

Pacific cod

Regulatory Area	Trend	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2A		0.03	0.02	N/A	0	0	0	0	0	0	0.02
2B		0.25	0.22	0.16	0.07	0.07	0.08	0.11	0.27	0.11	0.09
2C		0.5	0.59	0.52	0.5	0.51	0.7	1.06	1.34	1.07	0.86
3A		2.24	2.43	3.05	3.38	2.5	5.34	4.75	6.02	3.98	4.27
3B		8.39	8.18	7.85	10.2	12.6	16.1	15.3	15.6	10.6	16.1
4A		13.2	11.6	11.6	11.1	11.8	12.2	10.9	13.8	10.1	11.2
4D		7.01	14.4	18.9	11.7	12.2	8.71	6.28	6.48	7.32	6.28
4B		4.59	5.63	10.1	8.48	8.43	7.05	2.98	5.81	2.65	4.18

Spiny dogfish

Regulatory Area	Trend	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2A		2.19	4.11	2.76	5.92	4.17	3.52	3.11	11	8.69	7.31
2B		8.84	12.5	13.8	15.4	10.6	16.2	13	12.8	7.84	10.3
2C		1.86	2.73	4.13	5.36	6.92	6.19	6.49	4.28	4.54	5.2
3A		14.3	14.7	15.6	15.3	16.2	8.35	12.9	7.25	8.68	4.66
3B		0.16	0.14	0.34	0.23	0.25	0.43	0.15	0.15	0.07	0.16
4A		0.08	0.01	0.01	0.02	0.12	0.05	0.05	0.03	0.05	0.11
4D		0	0	0	0	0	0	0.01	0	0	0
4B		0.03	0.01	0.11	0.09	0.23	0.01	0.04	0.04	0.03	0.07

Figure 38. Ten-years of NPUE (numbers per standardized 100-hook skate) for Pacific cod and spiny dogfish on IPHC surveys.

Status of bycatch species

Harbor seal (*Phoca vitulina*): IUCN Red list "Least Concern".

Pacific cod (*Gadus macrocephalus*): From NPFMC SAFE reports: BSAI and GOA stocks above B35% reference points, not overfished.
http://www.afsc.noaa.gov/REFM/Docs/2013/GOApcod.pdf
http://www.afsc.noaa.gov/REFM/Docs/2013/aipcod.pdf
http://www.afsc.noaa.gov/REFM/Docs/2013/EBSpcod.pdf

Shark Complex: The shark complex (spiny dogfish, Pacific sleeper shark, salmon shark and other/unidentified sharks) in the Gulf of Alaska (GOA) is assessed on a biennial stock assessment schedule by NMFS AKFSC . However, for the 2013 assessment cycle, a full assessment was not conducted due to government shutdown and an abbreviated short working period. Therefore a short assessment was done. At the time of the 2014 3rd surveillance report, information on latest numbers of shark by catch by the Halibut fishery could not be found The information provided is from the latest full stock assessment from 2011

Based on the 1997-2011 GOA catch estimates, the halibut fishery caught 21% of the spiny dogfish total catch (Table 12). The majority of vessels fishing in the GOA are smaller vessels that are either unobserved or subject to 30% observer coverage (up until 2012). In making the catch estimates, it is assumed that shark catch aboard observed vessels is representative of shark catch aboard unobserved vessels throughout the GOA. These catch estimates do not include unobserved fisheries in the halibut IFQ fishery. Estimates of shark catch by species in the GOA from the Halibut Fishery Incidental Catch Estimation (HEICE) working group is shown in Table 12.

Table 12. Estimated catch (t) of spiny dogfish in the GOA by fishery. 1990-1996 catch estimated by pseudo-blend estimation procedure. 1997-2001 catch estimated with NMFS new pseudo-blend estimation procedure. Year 2003-2010 from NMFS AKRO using the improved pseudo-blend estimation procedure. Bycatch in the halibut fisheries has been estimated by NMFS AKRO since 2003, but it is based on landed sharks and does not include discarded catch.

Fishery	Pollock	Pacific Cod	Flatfish	Rockfish	Halibut	Sablefish	Grand Total	Year % of Total 97-11
1990	57.6	36.0	13.5	1.8		59.0	170.9	
1991	29.3	52.6	16.2	16.4		26.2	141.2	
1992	84.4	50.5	116.0	22.4		40.7	320.6	
1993	137	10.1	138.5	2.4		95.3	383.4	
1994	22	16.9	83.4	2.5		35.4	160.2	
1995	2.8	28.1	24.1	18.4		50.7	140.6	
1996	2.9	15.3	182.6	19.8		79.5	336.9	
1997	2.8	57.6	137.2	326.2		133.7	657.5	8%
1998	4.9	727.2	69.0	3.1		59.6	864.9	10%
1999	8.6	160.2	56.6	4.8		83.4	313.6	4%
2000	18.7	29.4	66.3	146.6		136.6	397.6	5%
2001	11.6	172.8	162.5	25.1		122.1	494.0	6%
2002	-	-	-	-	-	-	-	
2003	6.1	43.6	166.0	35.5	6.6	17.3	275.0	3%
2004	9.2	19.6	15.5	2.3	13.4	123.2	183.2	2%
2005	15.2	27.9	50.1	2.8	17.3	329.3	442.7	6%
2006	50.0	113.2	122.9	2.0	713.2	147.4	1,148.6	14%
2007	47.6	250.2	151.4	6.2	210.5	165.6	831.4	10%
2008	59.6	289.6	87.3	4.8	0.5	91.1	533.0	7%
2009	17.6	113.7	204.8	7.0	603.2	80.7	1,027.1	13%
2010	19.8	118.1	164.0	3.5	21.4	70.8	397.7	5%
2011	1.5	20.0	46.8	0.7	69.1	248.9	387.1	5%
Fishery % of Total	3%	27%	19%	7%	21%	23%		

Table 13. Estimates of shark catch (t) by species in the GOA from the Halibut Fishery Incidental Catch Estimation (HEICE) working group.

Shark Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Blue	0	4	0	7	9	0	0	1	0	0
Misc	3	46	0	0	128	1	0	0	0	0
Salmon	2	10	0	0	0	41	2	5	0	40
Sixgill	0	19	0	0	0	0	0	0	0	0
Pacific Sleeper	8,406	4,709	5,422	6,108	9,618	5,168	7,375	588	493	165
Soupfin	0	0	0	0	0	0	0	0	0	0
Spiny Dogfish	1,301	876	3,518	1,568	2,453	2,722	2,681	1,818	1,680	1,691
Total	9,712	5,664	8,941	7,682	12,208	7,931	10,057	2,413	2,173	1,896

http://www.afsc.noaa.gov/REFM/docs/2011/GOAshark.pdf

There are currently no directed commercial fisheries for shark species in federally or state managed waters of the GOA, and most incidental catch is not retained. Spiny dogfish are allowed as retained incidental catch in some state managed fisheries, and salmon sharks are targeted by some sport fishermen in Alaska state waters.

Spiny dogfish:
Spiny dogfish are the only species in the complex which uses the swept area biomass estimates in the ABC and OFL calculations. A Tier 5 approach is used, but the species is a Tier 6 species because the biomass estimates are considered “unreliable” and “likely a minimum biomass” estimate. This approach was adopted by the SSC in 2010 and will be reviewed in the next full assessment. Trawl survey data was updated in the Tier 5 calculations for spiny dogfish. The 2013 survey had both a reduced number of stations in all strata and the 700 – 1000 m depth stratum was not sampled. It is unlikely that the skipped depth stratum impacted the spiny dogfish biomass estimate because biomass in that stratum has always been 0 t. The 2013 survey biomass estimate (160,384 t, CV = 40%) is nearly four times greater than the 2011 biomass estimate of 41,093 t (CV = 22%); this variability is typical for spiny dogfish. The 3 – year average biomass from the trawl survey that is used in calculating the ABC and OFL declined from 79,979 t (2007, 2009 and 2011 surveys) to 76,452 t (2009, 2011 and 2013 surveys) with the inclusion of the new survey data. The 2007 survey biomass estimate (161,965 t, CV = 35%) dropped out of the calculations, but because the 2013 estimate was nearly equal to the 2007 estimate, the average had only minimal change.

Shark complex:
Substantial changes to the observer program (referred to as “observer restructuring”) likely affected the catch estimates for shark species. Smaller vessels are now subject to observer coverage, and this includes vessels fishing halibut IFQ, which were previously exempt from coverage. Due to the government shutdown, there was not sufficient time to fully examine and present the impacts of the restructuring on the shark catches in this assessment. Total shark catch in 2013 was 1,019 t, up from 634 in 2012. This is the highest since 2009, but was still below the maximum historical catch of 1,538 t in 2006 (over the years 2003 – 2012). The increase in 2013 can be attributed mostly to an increase in the catch estimate of spiny dogfish in the Pacific halibut target fishery, which was 460 t, up ~300 t from the average catch from 2003 – 2012, but was still within the range of catches from this target group. Pacific sleeper shark catch in the halibut target

group in 2013 (60 t) was significantly greater than the 2003 - 2012 average (7.4 t, SD =18.3).

An additional impact of observer restructuring was that estimated shark catches in NMFS areas 649 (Prince William Sound) and 659 (Southeast Alaska inside waters) for Pacific sleeper shark and spiny dogfish by the halibut target group in 2013 was 126 t and 52 t, respectively, whereas historically it has been small (<1 t for Pacific sleeper sharks and ~14 t average, SD = 23, for spiny dogfish). There was approximately 2 t of salmon shark and other shark estimated in these areas as well. The catch in NMFS areas 649 and 659 does not count against the federal TAC, but if it were included the total catch of sharks in 2013 would be 1,199 t, which is still below the recommended ABC for this complex. It is unknown to what extent the restructuring of the observer program in 2013 may have affected catch estimation in these fisheries; future analyses will aim to investigate shifts in observer coverage and the effects on shark catch estimation.
For 2014 a recommendation was given to have the maximum allowable ABC of 5,989 t and an OFL of 7,986 t for the shark complex. Catch in 2012 was 634 t and in 2013 was 1,019 t (as of October 24). The complex was not being subjected to overfishing last year. The ABC/OFL for the shark complex is the sum of the computations for the individual species. A tier 5 approach is used for calculations of spiny dogfish, where exploitable biomass (B) is equal to the average of the biomass estimates from the last three trawl surveys, 2009, 2011, 2013, OFL = M*B, and ABC = 0.75*OFL. The remaining shark species follow a traditional tier 6 approach with OFL = avg. historical catch (1997 – 2007) and ABC = 0.75*OFL.

http://www.afsc.noaa.gov/REFM/Docs/2012/GOAshark.pdf
http://www.afsc.noaa.gov/REFM/Docs/2013/GOAshark.pdf

Arrowtooth flounder (*Atheresthes stomias)*: From NPFMC SAFE reports: BSAI and GOA stocks above B35% reference points, not overfished.

http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIatf.pdf
and http://www.afsc.noaa.gov/REFM/Docs/2012/GOAatf.pdf
http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIatf.pdf
http://www.afsc.noaa.gov/REFM/Docs/2013/GOAatf.pdf

Skate Complex:
The Gulf of Alaska (GOA) skate complex is managed as three units. Big skates (*Raja binoculata*) and longnose skates (*Raja rhina*) each have separate harvest specifications, with acceptable biological catches (ABCs) specified for each GOA regulatory area (western, central, and eastern). A single gulfwide overfishing level (OFL) is specified for each stock. All remaining skate species are managed as an “Other Skates” group with gulfwide harvest specifications. All GOA skates are managed under Tier 5, where OFL and ABC are based on survey biomass estimates and natural mortality rate.

Gulf of Alaska skates are normally on a biennial stock assessment schedule, with full assessments due in odd years. In 2013 however, the shutdown of the federal government limited the amount of time to prepare assessments and the author was requested to do only an executive summary similar to an “off- year” assessment. The full assessment from 2011 is available on the web (Ormseth 2011, http://www.afsc.noaa.gov/REFM/docs/2011/GOAskate.pdf).

Estimates of incidental catches (including statistical areas 649 and 659) increased substantially for longnose skates and “other skates” in 2013, mainly in the IFQ halibut target fishery (Tables 13,14,15,16). For longnose skates most of the increased catch occurred in the EGOA, and the catch exceeded the ABC for that area (Table 14, Table 15, Table 16). For “other skates” the increased

catches occurred in the CGOA and EGOA. It is likely that this increased level of catch is due to the increased catch reporting from the IFQ halibut fishery as a result of the fishery observer redeployment
from NPFMC SAFE reports: Skate complex is , not overfished or overfishing occurring.

Table 14. Time series of ABC, OFL and catch (t) for skates, beginning in 2004 when skates were first managed separately from the Other Species complex. ABC and catch are divided by GOA regulatory area (Western, Central, Eastern). Eastern GOA catches include statistical areas 649 and 659. Outlined cells with bold text indicate years/areas where the catch exceeded the ABC.

	ABC			OFL	estimated skate catch			management method
	W	C	E		W	C	E	
2004		4,435		10,859		1,569		big/longnose CGOA
		3,709				1,451		o.skates GW, big/longnose W/E
2005	727	2,463	809	5,332	26	811	67	big (ABC by area)
	66	1,972	780	3,757	37	993	173	longnose (ABC by area)
		1,327		1,769		719		other skates gulfwide
2006	695	2,250	599	4,726	72	1,268	359	big (ABC by area)
	65	1,969	861	3,860	57	679	240	longnose (ABC by area)
		1,617		2,156		1,402		other skates gulfwide
2007	695	2,250	599	4,726	69	1,517	9	big (ABC by area)
	65	1,969	861	3,860	76	966	335	longnose (ABC by area)
		1,617		2,156		1,241		other skates gulfwide
2008	632	2,065	633	4,439	132	1,241	48	big (ABC by area)
	78	2,041	768	3,849	34	965	115	longnose (ABC by area)
		2,104		2,806		1,403		other skates gulfwide
2009	632	2,065	633	4,439	73	1,827	128	big (ABC by area)
	78	2,041	768	3,849	77	1,037	277	longnose (ABC by area)
		2,104		2,806		1,341		other skates gulfwide
2010	598	2,049	681	4,438	146	**2,220**	172	big (ABC by area)
	81	2,009	762	3,803	104	843	181	longnose (ABC by area)
		2,093		2,791		1,488		other skates gulfwide
2011	598	2,049	681	4,438	94	**2,075**	126	big (ABC by area)
	81	2,009	762	3,803	62	863	106	longnose (ABC by area)
		2,093		2,791		1,211		other skates gulfwide
2012	469	1,793	1,505	5,023	66	**1,894**	59	big (ABC by area)
	70	1,879	676	3,500	38	771	104	longnose (ABC by area)
		2,030		2,706		1,228		other skates gulfwide
2013*	469	1,793	1,505	5,023	*83*	***1,853***	*167*	big (ABC by area)
	70	1,879	676	3,500	*43*	*995*	***724***	longnose (ABC by area)
		2,030		2,706		*1,572*		other skates gulfwide

Table 16a, 17b, and 18c. Catches (t) of skates in the GOA by target fishery, 2003-2013. Data in Tables 16a-18c are from the Alaska Regional Office Catch Accounting System. The 2013 data are incomplete; retrieved September 18, 2013. ATF = arrowtooth flounder, FHS = flathead sole. Fisheries are arranged separately in each table according to the 2013 estimated catch, in descending order.

Table 16a. Big skate catches, GOA, 2003-2013. No data are available for big skates in 2003.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	*2013**
ATF		140	225	163	299	219	433	478	812	677	*918*
Pacific cod		331	222	417	537	586	550	940	919	755	*548*
IFQ halibut		24	37	577	11	36	90	43	132	38	*298*
rex sole		31	49	99	74	70	264	172	106	140	*145*
pollock		1	2	23	38	22	34	47	93	48	*127*
shallow flat		237	251	350	608	413	535	707	190	288	*44*
FHS		38	21	30	23	66	53	112	31	57	*15*
sablefish		6	24	9	6	3	5	11	3	3	*5*
rockfish		16	19	4	0	4	4	14	8	13	*2*
other		376	56	27	0	2	60	14	1	0	*1*
deep flat		4	0	0	0	0	0	1	1	0	*0*
GOA total		**1,204**	**904**	**1,699**	**1,595**	**1,421**	**2,028**	**2,539**	**2,295**	**2,020**	***2,103***

Table 17b. Longnose skate catches (t), GOA, 2003-2013.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	*2013**
IFQ halibut	1	35	106	197	394	109	379	115	171	88	*904*
Pacific cod	10	83	139	165	306	361	325	425	346	329	*347*
ATF	14	63	373	135	165	212	152	166	238	181	*212*
sablefish	16	121	113	306	264	123	79	98	77	111	*152*
rex sole	0	13	19	29	24	36	82	52	44	45	*54*
shallow flat	3	26	278	97	168	227	239	173	78	65	*45*
pollock	0	0	5	13	27	24	35	10	35	9	*22*
rockfish	1	32	20	21	17	12	17	12	25	23	*18*
FHS	9	7	11	11	13	11	24	30	17	60	*8*
other	0	155	137	2	0	0	61	47	0	0	*1*
deep flat	0	3	1	0	0	0	0	1	0	0	*0*
GOA total	**53**	**539**	**1,202**	**976**	**1,377**	**1,114**	**1,392**	**1,129**	**1,032**	**912**	***1,762***

* 2013 catch data are incomplete; retrieved September 18, 2013.

Table 18c. Other skates catches (t), GOA, 2003-2013.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	*2013**
Pacific cod	806	490	175	981	529	958	689	1,059	666	768	*683*
IFQ halibut	191	73	47	78	108	58	253	46	122	51	*607*
sablefish	153	113	129	128	260	134	82	121	116	141	*168*
rex sole	346	46	36	56	103	22	60	41	21	19	*33*
shallow flat	559	65	36	27	70	107	98	36	12	33	*22*
pollock	11	2	1	5	9	6	3	7	2	6	*21*
rockfish	105	19	59	49	20	10	14	28	14	20	*18*
ATF	195	173	194	64	122	88	99	133	243	174	*12*
FHS	191	44	38	12	20	5	13	19	13	17	*8*
other	1,971	251	2	3	0	16	30	0	0	0	*0*
Atka mackerel	0	0	0	0	0	0	0	0	2	0	*0*
deep flat	0	1	0	0	0	0	0	0	0	0	*0*
GOA total	**4,527**	**1,277**	**719**	**1,402**	**1,241**	**1,403**	**1,341**	**1,488**	**1,211**	**1,228**	***1,572***

* 2013 catch data are incomplete; retrieved September 18, 2013.

http://www.afsc.noaa.gov/REFM/Docs/2013/GOASkate.pdf

Grenadiers (*Corypaenoididae* spp.):
From NPFMC SAFE reports: BSAI and GOA stocks above catches are well below ABC, not overfished or overfishing occurring.
http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIgrenadier.pdf

BSAI yellow Irish lord sculpins (*Hemilepidotus jordani*), and Great sculpins *(Myoxocephalus polyacanthocephalus)*. For the 2012 and 2013 fisheries, stock assessment scientists recommended ABCs of 43,718 t. These ABCs are equivalent to last year's ABCs for 2011 (and 2012) set by the Council. The corresponding reference values for BSAI sculpins are summarized below.

Species	Year	Biomass	OFL	ABC	TAC	Catch
Sculpin complex	2011	208,181	58,291	43,718	5,200	4513[1]
	2012	208,181	58,291	43,718		
	2013	208,181	58,291	43,718		

[1]/ Current as of September 17, 2011 http://www.fakr.noaa.gov/2011/car110_bsai_with_cdq.pdf.

http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIsculpin.pdf

Because neither the time series of survey biomass estimates nor the proxy values for *Fabc* and *Fofl* have changed since 2012, the estimated ABC and OFL values for 2014 and 2015 in this update are identical to the values for 2013 and 2014 produced in the 2012 assessment.
http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIsculpin.pdf

Other Slope Rockfish
Rockfish are assessed on a biennial stock assessment schedule to coincide with the availability of new trawl survey data. However, for the 2013 assessment cycle, which would normally be a full assessment, a summary assessment is presented due to government shutdown and the abbreviated working period. Please refer to the last full stock assessment report for further information regarding the assessment calculations (Clausen and Echave 2011, available online at http://www.afsc.noaa.gov/refm/docs/2011/GOAorock.pdf).
http://www.afsc.noaa.gov/REFM/Docs/2013/GOAorock.pdf

Yelloweye rockfish (*Sebastus ruberrimus*) is part of the "other rockfish" complex. To estimate removals in the halibut fishery, methods were developed by the HFICE working group and approved by the Gulf of Alaska and Bering Sea/Aleutian Islands Groundfish Plan Teams and the Scientific and Statistical Committee of the North Pacific Fishery Management Council. A detailed description of the methods is available in Tribuzio et al. (2011). The HFICE estimates should be considered preliminary estimates for what is caught in the IFQ halibut fishery. Improved estimates of groundfish catch in the halibut fishery may become available following restructuring of the Observer Program in 2013. The non-commercial removals for "other slope rockfish" in 2010 showed that only a trace amount totaling 94 kg (<0.1 mt) was taken in the GOA. Estimated catches of "other slope rockfish" in the Pacific halibut longline fishery have been much higher than research catches and other non-commercial removals and range from 81 mt in 2003 to 133 mt in 2004. This level of unaccounted catch, although relatively high compared to the official catch, does not appear to have put stocks of "other rockfish" at risk because the annual catch of these species in the GOA has always been much less than ABC. A full assessment was not conducted in 2013, but 2014 will bring new survey data and a new assessment.

Table 19. Estimated catch (mt) of "other slope rockfish" in the Gulf of Alaska halibut fishery, 2001-2010, from the Halibut Fishery Incidental Catch Estimation working group.

Year	Catch
2001	96
2002	89
2003	81
2004	133
2005	132
2006	126
2007	100
2008	100
2009	93
2010	85

http://www.afsc.noaa.gov/REFM/docs/2011/GOAorock.pdf

Interactions with marine mammals

Sperm whale diets overlap with commercial fisheries harvests more than any other species of toothed whales, but the degree of overlap is at least partly because of direct interactions with longline gear. In addition to consuming primarily medium - to large-sized squid, sperm whales also consume some fish and have been observed feeding off longline gear targeting sablefish and halibut in the GOA. The interactions with commercial longline gear do not appear to have an adverse impact on sperm whales. Much to the contrary, the whales appear to have become more attracted to these vessels in recent years. Killer whales frequently take fish directly from commercial fishing gear as it is retrieved. Interactions with commercial longline fisheries are well-documented throughout the GOA and BSAI. Killer whale (*Orcinus orca*) depredation adversely impacts demersal longline fisheries for Pacific halibut (*Hippoglossus stenolepis*) in the Bering Sea, Aleutian Islands and Western Gulf of Alaska. These interactions increase direct costs and opportunity costs associated with catching fish and reduce the profitability of longline fishing in western Alaska. A study estimating the frequency of killer whale depredation in longline fisheries in Alaska, and depredation-related catch per unit effort reductions, found that in the Bering Sea the percentages of sets depredated for halibut was 6.9%. The estimated reduction in observed fishery CPUE associated with killer whale depredation, averaged across all depredated hauls and accounting for differences among vessels and years as well as for spatial patterns in CPUE for halibut was 36%.

http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0088906

Killer whales fall under the jurisdiction of the NOAA Fisheries PRD, and are protected under the Marine Mammal Protection Act of 1972.

The NMFS 2013 Marine Mammal SAFE report indicates that the halibut commercial fleet didn't cause serious harm or mortality of marine mammal in Alaska.

http://www.nmfs.noaa.gov/pr/sars/pdf/ak2013_draft.pdf

Estimation of bycatch and developments of the observer program in regards to non-halibut bycatch in the directed halibut fishery

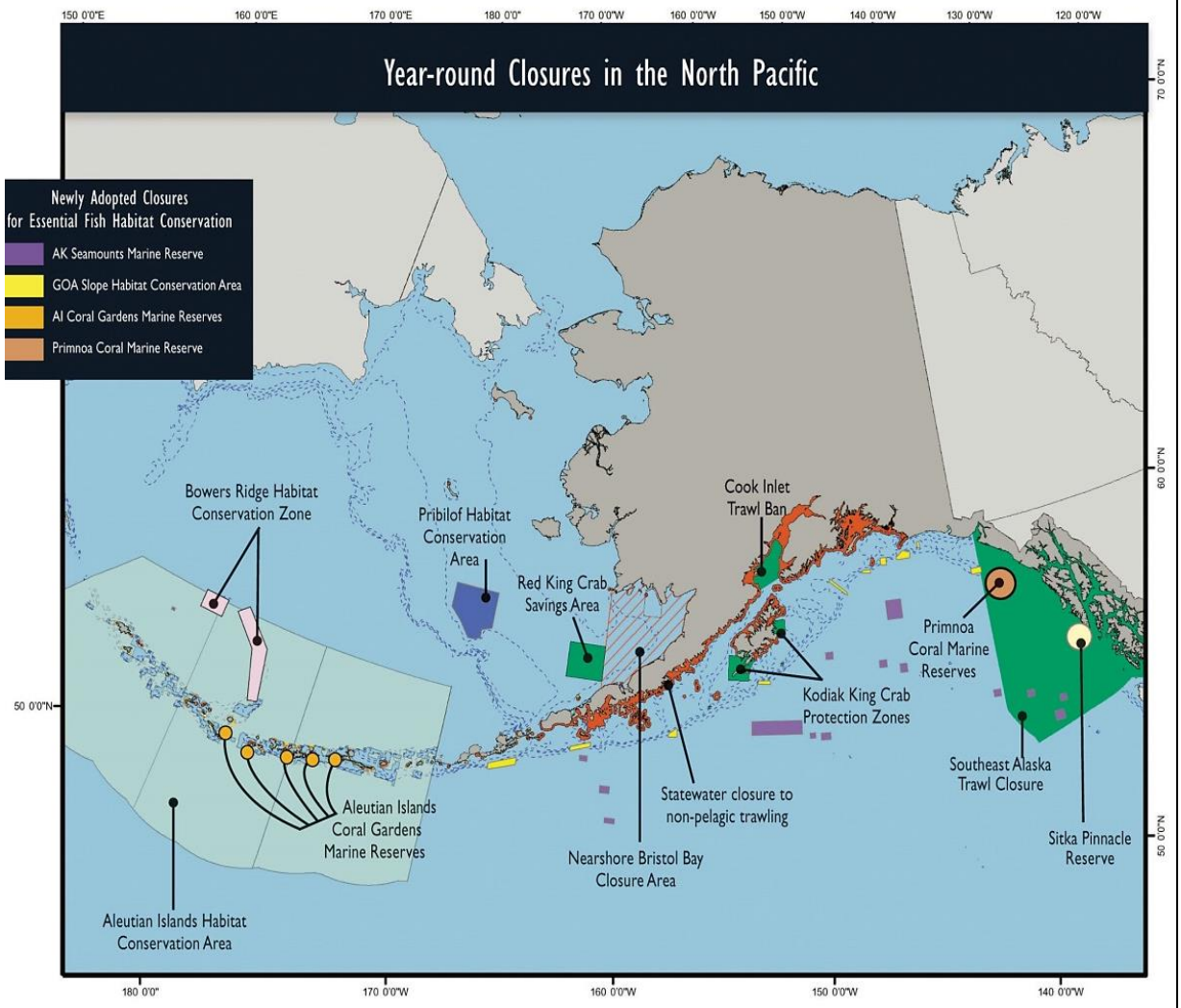
In the directed longline fisheries for Pacific halibut, bycatch of other fish species is not well documented on any sized vessel because of the lack in observer coverage (albeit partial coverage requirements were implemented in January 2013) in this fleet. Management actions are in place in respect to increasing knowledge on the bycatch dynamics of the directed halibut longline.
A paper titled *Methods for the estimation of non-target species catch in the unobserved halibut IFQ fleet* was produced in August 2011 to address the issue and help the accounting of groundfish and other species bycatch in other Alaska fisheries.
ftp://ftp.afsc.noaa.gov/afsc/public/plan_team/Halibut_Fishery_Bycatch_8_2011_final.pdf.

The NMFS announced to 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 and halibut fisheries and include vessels less than 60 ft. In length and halibut vessels in the North Pacific Groundfish Observer Program, in compliance with the MSA.
http://www.fakr.noaa.gov/sustainablefisheries/amds/amds86_76/approval060712.pdf

NOAA Fisheries provided a $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.
http://www.fakr.noaa.gov/newsreleases/2012/observers041212.htm
http://www.fakr.noaa.gov/notice/77fr29961.pdf

Alaska Marine Protected Areas
Fisheries managers have established many marine protected areas (MPAs) in the Federal and state waters off Alaska to protect ecological structure and function, establish control sites for scientific research studies, conserve benthic habitat, protect vulnerable stocks, and protect cultural resources. Many MPAs achieve multiple objectives. Over 40 named MPAs, many of which include several sites, encompass large areas of Federal waters off Alaska and state waters where commercial fisheries occur. All of the MPAs include measures to prohibit a particular fishery or gear type (particularly bottom trawls) on a seasonal or year-round basis, and several MPA's prohibit virtually all commercial fishing. Although the effectiveness of MPAs is difficult to evaluate on an individual basis, as a group they are an important component of the management program for sustainable fisheries and conserving marine biodiversity off Alaska (Witherell and Woodby, 2005).

http://aquaticcommons.org/9716/1/mfr6711.pdf



http://alaskaseafood.org/sustainability/pdf/Marine%20Protected%20Areas%20Brochure.pdf

Clause 14 "where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity" is not relevant to this fishery.

8. Performance specific to agreed corrective action plans

Not Applicable. This is the 3rd FAO RFM Alaska Pacific halibut surveillance assessment report. Non-conformances were issued neither during the full assessment nor the 1st and 2nd surveillance assessments. However, a number of issues were identified for review during surveillance to identify whether management actions were being taken to improve issues relating to estimation of bycatch in the halibut fleet and the restructuring of the observer program. The developments have been positive and proceeded as planned. Details of these points are available under Fundamental Clause 8 and 13.

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

Not applicable. There are no unclosed non conformances or newly issued non-conformances.

10. Future Surveillance Actions

The assessment team will review the following during the 2014 surveillance assessment:

- Alaska Coastal Management Plan.
- Coverage of restructured groundfish observer program.
- Bycatch data collection in the halibut fleet and relative management actions to decrease and manage bycatch as relevant and as needed.

11. Client signed acceptance of the action plan

Not applicable.

12. Recommendation and Determination

Following this 3rd surveillance assessment, in 2014, the assessment team and the certification committee recommends that continued Certification under the FAO-Based Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fishery, the Pacific halibut commercial fishery employing benthic longline gear within the IPHC's Regulatory Areas 2C, 3A, 3B, 4A, 4B, and 4CDE, within Alaska jurisdiction (200 nautical miles EEZ), under international [International Pacific Halibut Commission (IPHC)], federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG)] management.

13. References

ADF&G. 2014. Alaska's Fisheries and Game Board Process. Accessed 2014.	http://www.boards.adfg.state.ak.us/bbs/what/prps.php
ADF&G. 2014. eLandings. Home Page. Accessed 2014.	http://elandings.alaska.gov/
ADF&G. 2014. Pacific Halibut. Species Profile. Accessed 2014.	http://www.adfg.alaska.gov/index.cfm?adfg=halibut.main
Alaska Department of natural Resources. 2014. Alaska National Interest Lands Conservation Act (ANILCA) Program. Accessed 2014.	http://dnr.alaska.gov/commis/opmp/anilca/anilca.html
Alaska Department of Environmental Conservation. Accessed 2014.	http://dec.alaska.gov/
Alaska Department of Natural Resources. 2014. Home Page. Accessed 2014.	http://dnr.alaska.gov/
Alaska Department of Natural Resources. 2014. Welcome to the Office of Project Management & Permitting Homepage. Accessed 2014.	http://dnr.alaska.gov/commis/opmp/
Alaska Waypoints. 2014. Trooper Report. Accessed 2014.	http://www.alaskawaypoints.com/trooper-report
ARCADIS. Cook Inlet Offshore Oil & Gas Exploration Permit Application & Approval Process. Accessed 2014.	http://dog.dnr.alaska.gov/Permitting/Documents/Arcadis/Arcadis_Flowchart_CookInletOffshore_Draft.pdf
ASMI. Responsibly Managing Alaska's Fisheries. Marine Protected Areas. Accessed 2014.	http://alaskaseafood.org/sustainability/pdf/Marine%20Protected%20Areas%20Brochure.pdf
Department of Labor and Workforce Development. AVTEC. Maritime Home Page. Accessed 2014.	http://www.avtec.edu/AMTC.htm
Department of Public Safety. 2013. DIVISION OF ALASKA WILDLIFE TROOPERS REPORT TO THE INTERNATIONAL PACIFIC HALIBUT COMMISSION. Accessed 2014.	http://www.iphc.int/meetings/2014am/documents/060703_ASTreport.pdf
International Environmental Agreements (IEA) Database Project. 1923 Convention for the Preservation of the Halibut Fishery . Accessed 2014.	http://iea.uoregon.edu/pages/view_treaty.php?t=1923-Halibut.EN.txt&par=view_treaty_html
International Pacific Halibut Commission. 1983. Information Bulletin. Circle hooks outfish traditional halibut hooks. Accessed 2014.	http://www.iphc.int/publications/bulletins/ib0028.pdf
International Pacific Halibut Commission. 2010 Pacific halibut stock assessment. Accessed 2014.	http://www.iphc.washington.edu/papers/sa10.pdf
International Pacific Halibut Commission. 2010. IPHC Annual Reports. Accessed 2014.	www.iphc.washington.edu/library/annual-reports.html
International Pacific Halibut Commission. 2012. Apportionment and regulatory area harvest calculations. Accessed 2014.	http://iphc.int/publications/rara/2012/rara2012187_apportionment.pdf
International Pacific Halibut Commission. 2012. Assessment of the Pacific halibut stock at the end of 2012. Accessed 2014.	http://www.iphc.int/publications/rara/2012/rara2012093_assessment.pdf
International Pacific Halibut Commission. 2012. IPHC Information Bulletin No. 70. Accessed 2014.	http://iphc.int/library/bulletins/300-ib0070.html

International Pacific Halibut Commission. 2012. Performance Review. Accessed 2014.	http://iphc.int/meetings-and-events/review.html
International Pacific Halibut Commission. 2012. Regulations. Accessed 2014.	http://www.iphc.int/publications/regs/2012iphcregs.pdf
International Pacific Halibut Commission. 2012. Standardized stock assessment survey. Accessed 2014.	http://www.iphc.int/publications/rara/2012/rara2012503_ssa_survey.pdf
International Pacific Halibut Commission. 2012. The influence of environmental factors on halibut distribution as observed on the IPHC stock assessment survey: A preliminary examination. Accessed 2014.	http://www.iphc.int/publications/rara/2012/rara2012401_environ_haldist.pdf
International Pacific Halibut Commission. 2012. Trends in seabird occurrence on stock assessment surveys (2002-2012). Accessed 2014.	http://iphc.int/publications/rara/2012/rara2012539_ssa_seabird.pdf
International Pacific Halibut Commission. 2012. The personal use harvest of Pacific halibut through 2012. Accessed 2014.	http://www.iphc.int/publications/rara/2012/rara2012061_personaluse.pdf
International Pacific Halibut Commission. 2013. 2013 halibut sport fishery review. Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_04_2013sportreview.pdf
International Pacific Halibut Commission. 2013. 2013 Standardized stock assessment survey. Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_26_2013ssa.pdf
International Pacific Halibut Commission. 2013. Appendix (for website/full color viewing). Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_20_profilerappendix.pdf
International Pacific Halibut Commission. 2013. Apportionment and regulatory area harvest calculations. Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_13_2013apportionment.pdf
International Pacific Halibut Commission. 2013. Assessment of the Pacific halibut stock at the end of 2013. Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_12_2013assessment.pdf
International Pacific Halibut Commission. 2013. Halibut Commission Completes 2013 Annual Meeting. Accessed 2014.	http://www.iphc.int/index.php/news-releases/312-nr20130204a.html
International Pacific Halibut Commission. 2013. Halibut Commission Seeks Nominations for Management Strategy Advisory Board. Accessed 2014.	http://www.iphc.int/news-releases/314-nr20130205.html
International Pacific Halibut Commission. 2013. Interim Meeting 2013. Accessed 2014.	http://iphc.int/meetings-and-events/interim-meeting.html
International Pacific Halibut Commission. 2013. IPHC Harvest Policy. Accessed 2014.	http://www.iphc.int/documents/MSAB/201310/IPHC_HP_MSAB_Oct13_v2.pdf
International Pacific Halibut Commission. 2013. IPHC Management Strategy Evaluation Framework & Management Strategy Advisory Board. Accessed 2014.	http://www.iphc.int/meetings/2013am/documents/P02_MSEFramework.pdf
International Pacific Halibut Commission. 2013. IPHC MANAGEMENT STRATEGY EVALUATION FRAMEWORK. Accessed 2014.	http://www.iphc.int/meetings/2013am/documents/3.4_MSAB_FL.PDF
International Pacific Halibut Commission. 2013. Management Strategy Evaluation Framework. Accessed 2014.	http://www.iphc.int/documents/MSAB/201310/Martell_Presentation_

	1_MP_Approach.pdf
International Pacific Halibut Commission. 2013. MSAB Meeting. Accessed 2014.	http://www.iphc.int/documents/MSAB/201310/MSAB_Meeting_October_2013_agdintro.pdf
International Pacific Halibut Commission. 2013. MSAB Meeting. Developing Alternative Harvest Policies. Accessed 2014.	http://www.iphc.int/documents/MSAB/201310/Developing_Alternative_Harvest_Policies_v2.pdf
International Pacific Halibut Commission. 2013. MSAB Meeting. Review Candidate Fisheries Objectives and Performance Metrics for Investigation. Accessed 2014.	http://www.iphc.int/documents/MSAB/201310/Martell_Presentation_2_Objectives_Metrics.pdf
International Pacific Halibut Commission. 2013. Report of the Halibut Bycatch Work Group. Accessed 2014.	http://iphc.int/documents/bycatch/Halibut_Byc_Work_Group_rept_v9.pdf
International Pacific Halibut Commission. 2013. Scientific Review Board. Accessed 2014.	http://www.iphc.info/srb
International Pacific Halibut Commission. 2013. Trends in seabird occurrence on stock assessment surveys (2002-2013). Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_30_2013seabirds.pdf
International Pacific Halibut Commission. 2013. Age distribution of the commercial halibut catch for 2013. Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_10_2013commage.pdf
International Pacific Halibut Commission. 2013. Commercial catch sampling. Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_08_2013commsampling.pdf
International Pacific Halibut Commission. 2013. Incidental mortality of halibut in the commercial halibut fishery (Wastage). Accessed 2014.	http://iphc.int/publications/rara/2012/rara2012053_commwastage.pdf
International Pacific Halibut Commission. 2013. IPHC oceanographic monitoring program 2013. Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_20_2013oceanographicmonitoring.pdf
International Pacific Halibut Commission. 2013. Overview of data sources for the Pacific c halibut stock assessment and related analyses. Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_11_sadatasources.pdf
International Pacific Halibut Commission. 2013. The personal use harvest of Pacific halibut through 2013. Accessed 2014.	http://www.iphc.int/publications/rara/2013/rara2013_06_2013personaluse.pdf
International Pacific Halibut Commission. 2013. Trends in seabird occurrence on stock assessment surveys. Accessed 2014. (2002-2013).	http://www.iphc.int/publications/rara/2013/rara2013_30_2013seabirds.pdf
International Pacific Halibut Commission. 2014. About Page. Accessed 2014.	http://www.iphc.int/about-iphc.html
International Pacific Halibut Commission. 2014. Annual Meeting 2014. Accessed 2014.	http://www.iphc.int/meetings-and-events/annual-meeting.html
International Pacific Halibut Commission. 2014. Performance Review 2012. A Progress Report. Accessed 2014.	http://www.iphc.int/documents/review/PerformancereviewprogressreportJan2014.pdf
International Pacific Halibut Commission. 2014. Regulations. Accessed 2014.	http://www.iphc.int/publications/regs/2014iphcregs.pdf
International Pacific Halibut Commission. Interim Meeting 2012 And Preliminary Staff Harvest Advice. Accessed 2014.	http://www.iphc.int/news-releases/306-nr20121218.html

International Pacific Halibut Commission. REPORT OF ASSESSMENT AND RESEARCH ACTIVITIES 2013. Assessment of the Pacific halibut stock at the end of 2013. Accessed 2014.	http://iphc.int/publications/rara/2013/rara2013_12_2013assessment.pdf
Magnuson-Stevens Fishery Conservation and Management Act. Public Law 94-265 As amended through October 11, 1996. Accessed 2014.	www.nmfs.noaa.gov/sfa/magact
Marine Conservation Alliance. 2010. The Development of Halibut Excluders to Reduce Bycatch in the Gulf of Alaska Cod Fisheries. Accessed 2014.	http://www.marineconservationalliance.org/?p=1362
NOAA Fisheries Office of Law Enforcement. 2013. Alaska Enforcement Division Report to the International Pacific Halibut Commission. Accessed 2014.	http://www.iphc.int/meetings/2014am/documents/060702_NOAAOLEReport%20.pdf
NOAA. 1993. Federal Register I Vol. 58, No. 215 I Tuesday, November 9, 1993 I Rules and Regulations 59375. Accessed 2014.	http://alaskafisheries.noaa.gov/frules/fr59375.pdf
NOAA. 2010. Essential Fish Habitat (EFH) 5-year Review for 2010. Accessed 2014.	http://www.fakr.noaa.gov/habitat/efh/review/efh_5yr_review_sumrpt.pdf
NOAA. 2011. Policy for Assessment of Penalties and Permit Sanctions. I. Statement of Scope and Purpose. Accessed 2014.	http://www.noaanews.noaa.gov/stories2011/pdfs/Penalty%20Policy%20--%20FINAL.pdf
NOAA. 2011. Update of NOAA Fisheries Enforcement Programs and Operations. Accessed 2014.	http://www.nmfs.noaa.gov/sfa/reg_svcs/Councils/ccc_2011/Tab%20L%20-%20Enforcement%20Issues/Enforcement%20Issues.pdf
NOAA. 2012. Bycatch Reduction Engineering Program Report to Congress. Accessed 2014.	http://www.nmfs.noaa.gov/by_catch/docs/brep_report_2012.pdf
NOAA. 2012. Federal Register /Vol. 77, No. 98 /Monday, May 21, 2012 / Proposed Rules. Accessed 2014.	http://www.fakr.noaa.gov/notice/77fr29961.pdf
NOAA. 2012. Letter to NPFMC regarding approved Amendment 86 to the FMP for the Groundfish of the BSAI and Amendment 76 to the FMP for Groundfish of the GOA. Accessed 2014.	http://www.fakr.noaa.gov/sustainablefisheries/amds/amds86_76/approval060712.pdf
NOAA. 2012. Pacific Halibut–Sablefish IFQ Report. Accessed 2014.	http://www.alaskafisheries.noaa.gov/ram/ifq/rtf12.pdf
NOAA. 2013. § 679.42 Limitations on use of QS and IFQ. Accessed 2014.	http://www.fakr.noaa.gov/regs/679d42.pdf
NOAA. 2013. § 679.51 Observer requirements for vessels and plants. Accessed 2014.	http://www.fakr.noaa.gov/regs/679e51.pdf
NOAA. 2013. § 679.55 Observer fees. Accessed 2014.	http://www.fakr.noaa.gov/regs/679e55.pdf
NOAA. 2013. Alaska Marine Mammal Stock Assessments, 2013. Accessed 2014.	http://www.nmfs.noaa.gov/pr/sars/pdf/ak2013_draft.pdf
NOAA. 2013. NOAA Fisheries Enforcement Programs and Operations. Accessed 2014.	http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/U_OLE.pdf
NOAA. 2013. NOAA's Office of Law Enforcement Division Enforcement Priorities for 2013. Accessed 2014.	http://www.nmfs.noaa.gov/ole/docs/2013/ole-division-priorities-2013-final.pdf

NOAA. 2013. Office of General Counsel. Penalty Policy and Schedules. Accessed 2014.	http://www.gc.noaa.gov/enforce-office3.html
NOAA. 2013. POLICY ON ELECTRONIC TECHNOLOGIES AND FISHERY-DEPENDENT DATA COLLECTION. Accessed 2014.	http://www.nmfs.noaa.gov/op/pds/documents/30/30-133.pdf
NOAA. 2013. The Restructured North Pacific Groundfish and Halibut Observer Program. Accessed 2014.	http://www.afsc.noaa.gov/Quarterly/jfm2013/JFM2013-Feature.pdf
NOAA. 2014. eFISH, eLandings and Subsistence Halibut Permits. Accessed 2014.	www.fakr.noaa.gov/ram/webapps.htm
NOAA. 2014. Federal Fisheries Regulations 50 CFR Part 679: Fisheries of the Exclusive Economic Zone Off Alaska. Accessed 2014.	www.fakr.noaa.gov/regs/default.htm
NOAA. 2014. Federal Fisheries Regulations. Accessed 2014.	http://www.fakr.noaa.gov/regs/summary.htm
NOAA. 2014. Individual Fishing Quota (IFQ) Program. Accessed 2014.	http://www.fakr.noaa.gov/npfmc/halibut/sablefish-ifq-program.html
NOAA. 2014. Individual Fishing Quota (IFQ) Program. Accessed 2014.	www.fakr.noaa.gov/ram/ifq.htm
NOAA. 2014. News release. NOAA tightens halibut bycatch limits for Gulf of Alaska groundfish fisheries. Accessed 2014.	http://alaskafisheries.noaa.gov/newsreleases/2014/amd95halibut021914.htm
NOAA. 2014. NOAA Fisheries' (NMFS) Seabird. Accessed 2014.	http://www.fakr.noaa.gov/protectedresources/seabirds/national.htm
NOAA. Alaska IFQ Halibut and Sablefish Program. Accessed 2014.	http://www.nmfs.noaa.gov/sfa/management/catch_shares/about/documents/ak_halibut_sablefish.pdf
NOAA. Federal Register / Vol. 76, No. 51 / Wednesday, March 16, 2011 / Rules and Regulations. Accessed 2014.	http://www.fakr.noaa.gov/frules/76fr14300.pdf
NOAA. Summary of the North Pacific Groundfish and Halibut Observer Program. Accessed 2014.	https://alaskafisheries.noaa.gov/sustainablefisheries/observers/overview.pdf
NORTH PACIFIC RESEARCH BOARD | SEMIANNUAL PROGRESS REPORT. 2013. Accessed 2014.	http://doc.nprb.org/web/13_prjs/1309_prJan14.pdf
NPFMC. 2011. Chapter 16. Assessment of the "Other Rockfish" Stock Complex in the Gulf of Alaska. Accessed 2014. SAFE.	http://www.afsc.noaa.gov/refm/docs/2011/GOAorock.pdf
NPFMC. 2011. Chapter 20: Assessment of the Shark stock complex in the Gulf of Alaska. Accessed 2014. SAFE.	http://www.afsc.noaa.gov/REFM/docs/2011/GOAshark.pdf
NPFMC. 2012. Chapter 20: Assessment of the Shark stock complex in the Gulf of Alaska (Executive Summary). Accessed 2014. SAFE.	http://www.afsc.noaa.gov/REFM/Docs/2012/GOAshark.pdf
NPFMC. 2012. Chapter 6. Arrowtooth Flounder. Accessed 2014. SAFE.	http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIatf.pdf
NPFMC. 2012. Chapter 7. Assessment of the Arrowtooth Flounder Stock in the Gulf of Alaska (Executive Summary). Accessed 2014. SAFE.	http://www.afsc.noaa.gov/REFM/Docs/2012/GOAatf.pdf
NPFMC. 2012. Ecosystem Consideration Report. Accessed 2014.	http://www.afsc.noaa.gov/REFM/docs/2012/ecosystem.pdf
NPFMC. 2013. 2. Assessment of the Pacific cod stock in the Gulf of Alaska. Accessed 2014. SAFE	http://www.afsc.noaa.gov/REFM/Docs/2013/GOApcod.pdf

NPFMC. 2013. Appendix 1 – Assessment of the Grenadier Stock Complex in the Gulf of Alaska, Eastern Bering Sea, and Aleutian Islands. Accessed 2014. SAFE.	http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIgrenadier.pdf
NPFMC. 2013. Chapter 16. Assessment of the Other Rockfish stock complex in the Gulf of Alaska. Accessed 2014. SAFE.	http://www.afsc.noaa.gov/REFM/Docs/2013/GOAorock.pdf
NPFMC. 2013. Chapter 18. Assessment of the skate stock complex in the Gulf of Alaska. Accessed 2014. SAFE.	http://www.afsc.noaa.gov/REFM/Docs/2013/GOASkate.pdf
NPFMC. 2013. Chapter 19. Assessment of the sculpin complex in the Bering Sea and Aleutian Islands. Accessed 2014. SAFE.	http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIsculpin.pdf
NPFMC. 2013. Chapter 2: Assessment of the Pacific Cod Stock in the Eastern Bering Sea. Accessed 2014. SAFE	http://www.afsc.noaa.gov/REFM/Docs/2013/EBSpcod.pdf
NPFMC. 2013. Chapter 20: Assessment of the Shark stock complex in the Gulf of Alaska (Executive Summary). Accessed 2014. SAFE.	http://www.afsc.noaa.gov/REFM/Docs/2013/GOAshark.pdf
NPFMC. 2013. Chapter 2A: Assessment of the Pacific Cod Stock in the Aleutian Islands. Accessed 2014. SAFE	http://www.afsc.noaa.gov/REFM/Docs/2013/aipcod.pdf
NPFMC. 2013. Chapter 6. Assessment of the arrowtooth flounder stock in the Eastern Bering Sea and Aleutian Islands. Accessed 2014. SAFE.	http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIatf.pdf
Plosone. 2014. Killer Whale Depredation and Associated Costs to Alaskan Sablefish, Pacific Halibut and Greenland Turbot Longliners. Accessed 2014.	http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0088906
Sea Grant. 2014. Alaska Sea Grant Marine Advisory Program. Fish Biz . Accessed 2014.	http://seagrant.uaf.edu/map/fishbiz/index.php
Sea Grant. 2014. Alaska Sea Grant Marine Advisory Program. Home Page. Accessed 2014.	http://seagrant.uaf.edu/map/
Sea Grant. 2014. Alaska Sea Grant Marine Advisory Program. Workshops. Accessed 2014.	http://seagrant.uaf.edu/map/workshops/2013/ayfs/
Standards of Training Certification and Watchkeeping. 2010. Home Page. Accessed 2014.	http://www.stcw.org/
United States Coast Guard. 2014. Mission Statement. Accessed 2014.	www.uscg.mil/d17/
University of Alaska Fairbanks. 2014. Kodiak Seafood and Marine Science Centre. Teaching. Accessed 2014.	http://www.sfos.uaf.edu/fitc/academicprograms/
US Department of the Interior. 2011. Proposed Outer Continental Shelf Oil & Gas Leasing Program 2012-2017. Accessed 2014.	http://www.boem.gov/uploadedFiles/Proposed_OCS_Oil_Gas_Lease_Program_2012-2017.pdf
US Fish and Wildlife Service. 2014. About Page. Accessed 2014.	http://www.fws.gov/help/about_us.html
Wutherell, D., Woodby, D. Witherell, David, and Doug Woodby. 2005. Application of Marine Protected Areas for Sustainable Production and Marine Biodiversity off Alaska. Marine Fisheries Review 67(1):1-27. Accessed 2014.	http://aquaticcommons.org/9716/1/mfr6711.pdf

Appendix 1

Based on the technical expertise required to carry out the above fishery assessment, Global Trust Certification Ltd., is pleased to confirm the 3rd Surveillance assessment team members for the fishery as follows:

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.

Dr. Ivan Mateo, Assessor

Dr. Ivan Mateo has over 15 years' experience working with natural resources population dynamic modeling. His specialization is in fish and crustacean population dynamics, stock assessment, evaluation of management strategies for exploited populations, bioenergetics, ecosystem-based assessment, and ecological statistical analysis. Dr. Mateo received a Ph.D. in Environmental Sciences with Fisheries specialization from the University of Rhode Island. He has studied population dynamics of economically important species as well as candidate species for endangered species listing from many different regions of the world such as the Caribbean, the Northeast US Coast, Gulf of California and Alaska. He has done research with NMFS Northeast Fisheries Science Center Ecosystem Based Fishery Management on bioenergetic modeling for Atlantic cod He also has been working as environmental consultant in the Caribbean doing field work and looking at the effects of industrialization on essential fish habitats and for the Environmental Defense Fund developing population dynamics models for data poor stocks in the Gulf of California. Recently Dr. Mateo worked as National Research Council postdoc research associate at the NOAA National Marine Fisheries Services Ted Stevens Marine Research Institute on population dynamic modeling of Alaska sablefish.

Bruce R. Turris, Assessor

Bruce Turris is the President of Pacific Fisheries Management Inc. (PFMI), a consulting firm that provides policy, strategic planning and management advice to clients involved in the commercial fishing industry, including government agencies, commercial fishing associations, environmental organizations and eco-certification companies. Bruce has been involved in commercial fisheries management for more than 30 years, having worked for the Canadian Department of Fisheries and Oceans from 1984 – 1997, where he was the Groundfish Manager, Pacific Region. During his career

in fisheries, Bruce has been involved in the design, development and implementation of more than a dozen catch share programs throughout North America, including a comprehensive integrated groundfish program in British Columbia consisting of multiple gear types and more than 60 fish stocks. Bruce has been involved with the management of Pacific halibut and Pacific cod throughout his career and continues to be closely involved in the management of west coast groundfish fisheries, serving as an advisor to numerous regional, national and international groundfish advisory committees.

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, cod and flatfish fisheries as well Icelandic cod, saithe, haddock and redfish fisheries. Vito is also a lead, third party IRCA approved auditor.