US North Pacific Halibut
MSC Fishery 2nd Re-assessment Report

Public Certification Report

2000 Powell Street, Ste. 600
Emeryville, CA 94608 USA
+1.510.452.8000 main
+1.510.452.8001 fax

Authors
1 Dr. Sian Morgan
2 Mr. Tom Jagielo
3 Mr. Todd Hallenbeck
4 Mrs. Jenn Humberstone

Client: Eat on the Wild Side/Fishing Vessel Owners Association
Name: Robert Alverson
Address: 4005 20th Ave, Seattle, WA 98199
Email/Phone: RobertA@fvoa.org

DATE: August 18, 2016

Contents

Glossary

ABC	Allowable Biological Catch
ADP	Annual Deployment Plan
ADF&G	Alaska Department of Fish and Game
AFSC	Alaska Fishery Science Center
BSAI	Bering Sea & Aleutian Islands
CAS	Catch Accounting System
CDQ	Community Development Quota
CEY	Constant Exploitation Yield
CITC	Individual Transferable Catch Quotas
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPUE	Catch Per Unit Effort
CSP	Catch-Sharing Plan
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EM	Electronic Monitoring
EOWS	Eat on the Wild Side
ESA	Endangered Species Act
ETP	Endangered, Threatened or Protected species
DPS	Distinct Population Segment
FAO	Food and Agriculture Organization of the United Nations
FCM	Fisheries Certification Methodology
FEP	Fishery Ecosystem Plan
FMP	Fishery Management Plan
Ft	feet
FVOA	Fishing Vessel Owners Association
GOA	Gulf of Alaska
GHL	Guideline Harvest Levels
HAPC	Habitat Areas of Particular Concern
IFQ	Individual Fishing Quota
IFC	International Fisheries Commission
IPHC	International Pacific Halibut Commission
ITQ	Individual Transferable Quota
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unregulated, Unreported
Kg	kilogram
Lb.	Pound, equivalent to roughly 2.2 kg
LME	Large Marine Ecosystem
LOA	Length Over-All
LTL	Low Trophic Level
M	Million (lbs.), Mortality
MSA	Magnusson Stevens Act
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation
MSAB	Management Strategy Advisory Board
MSY	Maximum Sustainable Yeild
NEPA	National Environmental Protection Act
nm	nautical mile
NMFS	National Marine Fisheries Service
NPFMC	North Pacific Fishery Management Council

OAC	Observer Advisory Committee
ODDS	Observer Declare and Deploy System
OFL	Over-Fishing Level
OLE	Office of Law Enforcement
OSC	Observer Science Committee
PBR	Potential Biological Removal
PPA	Preferred Preliminary Alternative
PFMC	Pacific Fishery Management Council
SCS	SCS Global Services
SRB	Scientific Review Board
SSB	Spawning Stock Biomass
SSC	Science and Statistical Committee
TAC	Total Allowable Catch
t and mt	metric ton
TAC	Total Allowable Catch
UoA	Unit of Assessment
UoC	Unit of Certification
USCG	United Stated Coast Guard
USFWS	US Fish and Wildlife Service
VMS	Vessel Monitoring System
WCGOP	West Coast Groundfish Observer Program
WPUE	Weight Per Unit Effort
WWF	World Wildlife Fund

1 Executive Summary

This report discloses the results of a Marine Stewardship Council 2nd re-assessment of one Unit of Assessment (UoA): US North Pacific halibut (*Hippoglosus stenlolepis*) harvested with bottom-set longline gear permitted under the federally managed IFQ program in the US Alaskan EEZ or permitted under the IPHC Area 2a in Washington EEZ waters.

Unit of Assessment	Species & Stock (FCR V2.0 7.4.7.1)	Fleets or groups of vessels (FCR V2.0 7.4.7.3)	Method of Capture (FCR V2.0 7.4.7.2)
1	US North Pacific halibut (*Hippoglosus stenlolepis*)	*IFQ* permitted quota holding vessels fishing in the US North Pacific: Bering Sea & Aleutian Islands (BSAI), Gulf of Alaska (GOA) in the Alaskan EEZ & permitted fishers in waters found in IPHC Halibut area 2A, Washington state waters only.*	Bottom-set longline hook and line

**IFQ considered to include the Community Development Quota allocation portion, permitted separately as a CDQ permit. According to the NMFS Fisheries Catch and Landings Reports in 2015, CDQ landings accounted for around 4% of the total CDQ and IFQ landings.*

History of US North Pacific Halibut Fishery and MSC Certification

The Pacific commercial halibut fishery began in the late 1880s. As an industry led initiative, Canadian and US governments provided the first framework for international management in 1924 under a signed convention by creating the International Fisheries Commission (IFC) to manage the Pacific halibut resource. In 1953 the Convention was modified and the IFC became the International Pacific Halibut Commission (IPHC). Today the IPHC performs assessments and research on the Pacific halibut stocks, recommends total allowable catches (TACs) by fishing area, and determines regulatory measures related to conservation issues.

The North Pacific Halibut Act and the Magnuson-Stevens Act (MSA), in combination with other laws, currently form the legal framework governing management of the Pacific halibut fishery in the US. Two regional councils, the North Pacific Fishery Management Council (NPFMC) and the Pacific Fishery Management Council (PFMC), play an active role in the management of Pacific halibut. The NPFMC developed and approved an individual fishing quota (IFQ) program – implemented in 1995 – for the commercial Pacific halibut fishery to allocate portions of the IPHC's catch limits in the regulatory areas off Alaska (Pautzke and Oliver 1997). In addition to the IPHC regulations, the PFMC developed and approved a catch sharing plan for halibut that allocates the IPHC's catch limit for Area 2A (waters off Washington, Oregon, California) among all user groups (non-Treaty Indian commercial and sport users, and Treaty Indian commercial, ceremonial and subsistence users). The unit of assessment includes all IFQ (and CDQ) permitted halibut fishers as well as IPHC Area 2a fishers operating in Washington State waters.

The first MSC assessment of the US North Pacific halibut was initiated in 2003, with the fishery achieving certification in April of 2006. The fishery was re-certified in August 2011, at which time five conditions were placed on the fishery certification (2.2.1, 2.2.3, 2.3.1, 2.3.2, 2.3.3), all due to be closed out by the third annual surveillance audit in 2014. After the second annual surveillance audit, based on a multi-party stakeholder submission and discussion with assessment team members for Principle 1 on both the US Pacific Halibut and BC

Pacific Halibut assessment teams, 2013 changes in stock assessment and understanding of stock status were determined to have the potential to constitute "major changes." As a result, Principle 1 for US Halibut was re-scored outside the second annual surveillance (July 2013). (BC halibut was also re-scored.) As a result of the re-scoring of Principle 1, an additional condition was placed on the fisher under PI 1.2.3.

At the third annual surveillance audit, the assessment team closed the open conditions on PIs 2.2.1, 2.3.1, and 2.3.2. The three remaining three open conditions (1.2.3, 2.2.3, 2.3.3) are all based information needed from the observer program, germane to both P1 and P2 requirements that depend on sufficient observer coverage to inform stock assessment, and to manage impacts the fishery on of non-target and ETP species. The team accepted a revised action plan targeting these three remaining open conditions and extended timelines into year 2 of the next certificate cycle (2017-2018). As of the 4th annual surveillance, which was announced in October 2015 to coincide with the current second re-assessment, all remaining conditions were considered open and on target. For more detail regarding previous assessments, see section: "Previous Assessments."

2nd Re-assessment Overview

SCS Global Services (SCS) is an independent third party certification body that has undertaken the 2nd MSC re-assessment of the US North Pacific halibut from Alaskan and Washington EEZ waters with bottom-set longline gear in accordance with the MSC Principles and Criteria for sustainable fishing. The assessment complies with the MSC Certification Requirements V1.3 Annex CB [Default Assessment Tree] (January 2013) and the MSC General Certification Requirements V2.1 (September 2015) and Fisheries Certification Requirements [processes] V2.0 (April 2015).

The team selected to undertake the assessment includes four team members that collectively meet the requirements for MSC assessment teams. These are:

- Dr Sian Morgan, Team Leader
- Mr. Tom Jagielo, Principle 1 and 3 Expert
- Mr. Todd Hallenbeck, Principle 2 Expert

The original announcement for the assessment (posted to MSC on October 1, 2015), indicated that the Risk based framework (RBF) would not need to be used and this was confirmed from information provided prior to and during the site visit. The re-assessment proceeded without the RBF. The announcement of the fishery re-assessment coincided with the announcement of the 4th annual surveillance audit under the current certificate, and the 4th annual surveillance and 2nd re-assessment of the US North Pacific sablefish fishery.

The team met with fishery representatives, scientists and stakeholders in Seattle, Washington, and Juneau, Alaska, November 3-7th, 2015. On the evening of November 3rd, the team held an in-person meeting with the client representative Robert Alverson, and other members of the client group – the Fishing Vessel Owner's Association. In the days following, the team held meetings focusing on the observer program, seabird bycatch, stock assessments, catch accounting, permitting, and compliance and enforcement, among other pertinent fishery topics. Meetings were held primarily with NOAA staff responsible for science and management at the Alaska Fisheries Science Center and Alaska Regional Office, and also included a meeting with International Pacific Halibut Commission staff. In addition, the team held a meeting focused on seabird bycatch that included NMFS agency staff Shannon Fitzgerald, Farron Wallace, Dr. Ed Melvin of Washington Sea Grant. For a detailed on-site visit itinerary and meeting attendee list please see the Evaluation Procedure section.

Summary of Findings

In this report we provide the rationales for all scores proposed, which support the assessment that the fishery is recommended for certification. A summary of recommended scores are as follows:

Table 1: Summary of scores for the US North Pacific halibut fishery

Final Principle Scores	
Principle	**Score**
Principle 1 – Target Species	86.9
Principle 2 – Ecosystem	83.3
Principle 3 – Management System	95.1

Overall, the North Pacific halibut fishery continues to perform strongly against the MSC Standard, particularly so in regards to Principles 1 and 3. The Pacific halibut stock has been declining over much of the last decade as a result of decreasing size-at-age and poor recruitment strengths. Total removals have likewise declined, and the status of the Pacific halibut stock relative to reference points indicates that the stock continues to be harvested sustainably. Sustainable management of the stock is supported by extensive management related research by IPHC staff, which incorporates both fishery dependent data and fishery independent research and data to support data rich stock assessment and management. Current IPHC research activities fall into four chief areas: 1) stock identification, monitoring and assessment, 2) harvest policy and management, 3) biology, physiology, and migration, and 4) ecosystem interactions and environmental influences.

The data rich fishery is bolstered by multi-level governance infrastructure including national management via the NPFMC and PFMC (in area 2a) and associated NOAA regional offices and science centers, and international management via the IPHC. There are clearly defined and inclusive decision-making processes, as well as recognition of traditional access rights via the Community Development Quota (CDQ), subsistence, and tribal halibut permit programs (see: Access Rights to Pacific Halibut in the UoA). The fishery information management system via the NMFS Catch Accounting System (CAS) is robust, incorporating multiple forms of data- observer data, enforcement records, vessel and shore-side production reports, and fish tickets- into a consolidated database to provide consistent information on fisheries in Alaskan waters.

During re-assessment a previously open condition pertaining to information on short-tailed albatross (PI 2.3.3) was closed based on updated information from the Alaska Fisheries Science Center (AFSC) and an expert ornithologist (*Melvin pers. comm).* Two remaining open conditions pertaining to PI1.2.3 and PI2.2.3 have remained open.

The open conditions pertain to a lack of information from the <40ft fleet, which has been excluded from observer coverage requirements, and subsequent uncertainty in halibut discard and bycatch estimates from this portion of the fishery. The previous client action plan focused on NPFMC plans to implement electronic monitoring within the <40ft fleet (see Observer Programs), but discussions during and after the 2nd re-assessment on-site visit spurred generation of an alternative action plan to provide sufficient information from the <40ft fleet. During the Peer Review stage the team was provided with further detail regarding available data on fishing patterns and methods used by NMFS to estimate fishery removals by the <40ft fleet (Appendix 1.1a). The team revised the condition milestones to request expanded information on currently available data and

methods in use by NMFS to estimate halibut and non-halibut discards by the <40ft fleet at the Year 1 Surveillance. Timelines, conditions, and the associated action plan have been revised accordingly (Appendix 1.1).

A third condition was opened during the 2nd re-assessment pertaining to an information deficiency regarding bait usage in the fishery. In the UoA, bait type and volume are not recorded or quantified in a systematic way. During on-site meetings the assessment team was able to ascertain typical bait species used in the fishery as well as a ball-park volume estimate from fishery managers and industry members. However, this information was anecdotal and qualitative in nature, not verifiable, and not sufficient to determine whether bait in aggregate or on a species-specific level qualifies as 'main.' According to CR V1.3 CB3.5.5 and MSC guidance bait is to be treated as a 'retained' species, regardless of provenance. The assessment team has determined that the species will be classified as 'main' as a precautionary measure and to ensure that scoring on the "information PI 2.1.3" may reflect the deficiency in information on bait. For further detail see: Bait Considerations.

Peer Review of the assessment was conducted by Dr. Susan Hanna and Dr. John D. Neilson. Peer Reviewers were selected through the Peer Review College as part of a pilot of the emerging Peer Review College program. Peer Reviewers were provided the assessment on May 16th, and responses were received by the assessment team on June 1, 2016. No scores were changed as a result of Peer Reviewer comments, but the commentary provided useful feedback to increase report clarity and strengthen rationales.

The report was posted for Public Comment to the MSC website on June 23, 2016, with the public comment period closing on July 24, 2016. No comments were received. The positive certification determination was finalized, and final report posted to MSC on July 26, 2016 with an objection period open through August 18, 2016. No objections were received, and the certification decision is now final. Over this time period the current certificate was set to expire, and a variation request from SCS was granted in order to extend the certificate until September 9, 2016, such that there would be no lapse.

2 Authorship and Peer Reviewers

Audit Team

Dr. Sian Morgan, SCS Global Services, Team Leader

Dr. Morgan has more than a decade of experience in marine ecology and fisheries science with particular expertise in markets-based fisheries reform, certification and quantitative methods for decision analysis. She has worked in non-governmental, academic and consulting settings and brings to the team a strong background in cross-sectoral consultation. Her doctoral research at the Fisheries Center, University of British Columbia/McGill examined the population dynamics and management of a small-scale, data poor multi-species fishery in Asia. Dr. Morgan has participated standards setting and revision processes for both fisheries and aquaculture, was a past member of the MSC Stakeholder Council (public chamber) and is a current member of the Technical Advisory Group for the Aquaculture Stewardship Council. Examples of SCS client fisheries that Sian has managed include US Pacific halibut, Gulf of California Mexico low trophic levels fisheries for sardine and thread herring as well as various pre-assessment and international reform projects in data-deficient developing world fisheries. Past projects managed by Dr. Morgan include developing SeaChoice, a national seafood program for Canada, conceiving pragmatic trade tools for CITES and researching species responses to area-based management for WWF.

Sian is trained to audit the MSC standard, various ASC standards, MSC/ASC CoC, ISO 9001 and SA 8000. She has prior experience as a surveillance team member for this sablefish fishery, is an active team leader and program manager for MSC Americas assessments, and has no conflict of interest in performing the re-assessment.

Mr. Tom Jagielo, Tom Jagielo Consulting, Principles 1 & 3

Tom formed his own firm in 2008 to provide consulting services in quantitative fisheries science. Previously, he served for 24 years with the Washington Department of Fish and Wildlife (WDFW), and 6 years with the Fisheries Research Institute at the University of Washington in Seattle. At WDFW, Tom specialized in groundfish research, stock assessments, and survey design; adapting state of the art tools and methods to assess marine fish populations for sustainable fisheries management. He has produced stock assessments used by the Pacific Fishery Management Council (PFMC), including analysis of lingcod and rockfish populations. Tom has received appointments to the Scientific and Statistical Committee of the PFMC, the Technical Subcommittee of the US-Canada Groundfish Committee, the Pacific Coast Ocean Observation System, and various other workshop panels and review bodies. Tom has published in peer-reviewed journals and presented papers at national and international meetings. Tom received a B.S. degree in Biology from the Pennsylvania State University and a M.S. degree in Fisheries from the University of Washington, where he also conducted post M.S. graduate studies in fisheries population dynamics and parameter estimation.

With his demonstrated expertise in stock assessment and management systems for finfish in the Pacific Northwest, background as a surveillance team member for this fishery, and MSC team member training and experience, Tom is highly qualified to serve on the re-assessment team. He affirms he has no conflict of interest.

Mr. Todd Hallenbeck, Independent Consultant, Principle 2

Todd Hallenbeck has extensive experience collecting, analyzing, and managing data for research, ocean planning, and policy making. For the last three years, Todd has worked as an independent contractor helping to analyze and share geospatial data related to renewable energy planning, fishery management, and other West Coast regional ocean health priorities. Todd's background is in coastal and marine science and policy with

original published research in seafloor habitats and benthic ecology to inform fishery management. Prior to his graduate work, Todd worked as a groundfish sampler and fishery observer in both Alaska and California, collecting catch and landings data, documenting fishery practices, and reporting to National Marine Fisheries Service and CA Dept. of Fish and Wildlife staff. He has localized experience highly relevant to Principle 2 evaluation, and has recently completed the MSC Training Modules to qualify as a team member for this re-assessment, and affirms he has no conflict of interest in performing the assessment.

Peer Reviewers

The North Pacific sablefish and halibut UoAs were selected for participation in the MSC Peer Review College pilot. In this process, SCS provided MSC the project timeline and stakeholder information. MSC selected 5 peer reviewer candidates from a shortlist of peer reviewers enrolled in the College that were deemed to hold appropriate qualifications relevant to the UoA. From the shortlist of five, two peer reviewers were selected:

Dr. Susan Hanna

Susan Hanna is professor emeritus of marine economics at Oregon State University. Her research and publications are in the area of marine economics and policy, with an emphasis on fishery management, ecosystem-based fishery management, property rights and institutional design. Dr. Hanna has served as a scientific advisor to the U.S. Commission on Ocean Policy, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Minerals Management Service, Northwest Power and Conservation Council and the Pacific Fishery Management Council. She served on the Ocean Studies Board of the National Research Council (NRC), National Academy of Sciences, and several NRC Committees, including the Committee to Review Individual Quotas in Fisheries and the Committee on Protection and Management of Pacific Northwest Anadromous Salmonids. She has conducted reviews for the Center for Independent Experts (CIE) and is a current member of the CIE Steering Committee. Dr. Hanna has been a member of Marine Stewardship Council assessment teams for West Coast Dungeness crab, Oregon pink shrimp, West Coast groundfish, Alaska Pollock, Alaska flatfish, and Alaska Pacific cod fisheries, and has served as a peer reviewer of several MSC assessment reports.

Dr. John D. Neilson

John D. Neilson is an internationally-recognized fisheries scientist, who has published more than 200 scientific and technical papers. His studies have taken place on all three of Canada's coasts, as well as throughout the Atlantic Ocean, and the Caribbean Sea. His work is highly cited (eight papers cited > 100 times), with one included in the top 100 cited papers in fisheries science.

His specialties include population ecology, age and growth, and stock assessment. He is considered by his peers to have good skills in consensus building, and he have taken on demanding and high profile roles chairing Canada's National Marine Mammal Peer Review Committee (2000-2003), and coordinating all swordfish stock assessments conducted by the International Commission for the Conservation of Atlantic Tunas (2003 - 2013). He also has experience as a scientific editor. He also has considerable experience with fisheries development work, having conducted a two year long mission in St. Vincent and the Grenadines, where he mentored national biologists, and helped to establish a regional program of data collection and stock assessment in the Eastern Caribbean. Thus, he has a broad range of experience with stock assessments ranging from data rich to data poor situations.

Although now retired from the Canadian federal government after a 30 year long career, he remains involved with voluntary scientific work (including serving on Canada's national committee dealing with species at risk (marine fish), community initiatives, and fisheries consultancies with clients including the International

Commission for the Conservation of Atlantic Tunas, the European Community, and the US Center for Independent Experts.

Acknowledgements

The Assessment team would like to acknowledge several people who provided information, data, and guidance which greatly helped team members to conduct a quality assessment with best available information. NMFS and IPHC were key in providing many of the scientific analyses, figures, as well as operational and regulatory information: both were helpful and cooperative throughout the process. Ed Melvin of the Washington Sea Grant Extension also provided data analysis and meeting space at the University of Washington campus in Seattle, novel data were also shared by Shannon Fitzgerald. Mary Furuness of NMFS-ARO provided generous time and effort to ensure the team had the appropriate and most thorough data available from the catch accounting system. Farron Wallace provided the team ongoing explanation of the observer program design and evolution, as he has every year since the new observer program began. FVOA members kindly hosted the team the first night of the onsite visit and provided ongoing support throughout the audit.

3 Description of the Fishery

3.1 Unit(s) of Assessment (UoA) and Scope of Certification Sought

3.1.1 UoA and Unit of Certification (UoC)- Final at Public Certification Report

The Unit of Assessment includes the US North Pacific halibut (*Hippoglosus stenlolepis*) caught by the IFQ permit holders in Alaskan EEZ waters and IPHC Area 2a permit holders in Washington State EEZ using bottom-set longline hook and line gear.

In compliance with section 7.4 in FCR V2.0 April 2015 SCS confirms that the US North Pacific halibut bottom-set longline fishery conforms to the scope elements defining eligibility for full assessment against the MSC standard. The fishery:

- Does not operate under a controversial unilateral exemption to an international agreement, use destructive fishing practices, target amphibians, birds, reptiles or mammals and is not overwhelmed by dispute; (FCR 7.4.1.1, 7.4.1.2, 7.4.1.3, 7.4.2)
- The fishery does not engage in shark finning, has mechanisms for resolving disputes (FCR 7.4.2.1), and has not previously failed assessment or had a certificate withdrawn.
- Is not an enhanced or IPI fishery, is not based on an introduced species (FCR 7.4.3, 7.4.4, 7.4.13-15)
- And does not include an entity successfully prosecuted for violating forced labor laws (7.4.1.4)
- The units of assessment, certification, and eligible fishers have been defined, traceability risks characterized, and certificate sharing mechanisms decided (7.4.6-7.4.12)

The unit does partially overlap with the scope of several currently certified fisheries (7.4.16) including: Canada Pacific halibut and North Pacific Sablefish. All units relevant to harmonization considerations are given in Section 3.1, as Units of Assessment that share P1 species or P3 management via the IPHC or NPFMC.

Table 2. Unit of Assessment (UoA) and Unit of Certification (UoC). Considered Final at Public Certification Report stage.

Unit of Assessment 1	
Species (FCR V2.0 7.4.7.1)	*Halibut (Hippoglosus stenlolepis)*
Method of Capture (FCR V2.0 7.4.7.2)	*Bottom-set longline (fixed hook and line)*
Fleets or groups of vessels (FCR V2.0 7.4.7.3)	*IFQ* permitted quota holding vessels fishing in the US North Pacific: Bering Sea & Aleutian Islands (BSAI), Gulf of Alaska (GOA) in the Alaskan EEZ & permitted fishers in waters found in IPHC Halibut area 2A, Washington state waters only.*

Unit of Certification	
Certificate Includes	*All UoA product landed at processors approved by the Client (as given in the certificate addendum on the MSC website) is considered included in the certificate and permitted to use the MSC ecolabel.*
Client	*Fishing Vessel Owner's Association and Deep Sea Fishermen's Union of the Pacific: for MSC purposes, Eat on the Wild Side*
Other Eligible Fishers	*Eligible (UoA) product landed at processors not currently included in certificate addendum.*

*IFQ program includes the CDQ allocation portion, thus product landed under a CDQ permit is also considered eligible for the eco-label. For more information on the CDQ permit portion of the fishery, see Principle 3 background.

Table 3. TAC and Catch Data. TAC data taken from http://www.iphc.int/news-releases/396-nr20150130.html and catch data from page 110 of http://www.iphc.int/publications/rara/2014/rara2014_10sadatasources.pdf (Stewart 2015)

TAC	**Year**	2015	**Amount**	29,223,000 lbs[1]
UoA share of TAC	**Year**	2015	**Amount**	18,638,529 lbs [2]
UoC* share of TAC	**Year**	2015	**Amount**	18,638,529 lbs [2]
Total green weight catch by UoC	**Year (most recent)**	2014	**Amount**	17,810,000 lbs
	Year (second most recent)	2013	**Amount**	23,000,000 lbs

[1]*Includes total IPHC TAC (including Canada and other non IFQ)*
[2]*Includes total IPHC TAC (including only AK IFQ and WA directed commercial)*
**UoC eligible product equivalent to the UoA*

3.1.2 Scope of Assessment in Relation to Enhanced Fisheries

There is no enhancement in this fishery.

3.1.5 Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)

The fishery under assessment is not an Introduced Species Based Fishery (ISBF).

3.2 Overview of the Fishery

The scope of this report includes US EEZ waters off the coast of Alaska including the Gulf of Alaska, Bering Sea, and the Aleutian Islands as well as the water off the coast of Washington state. The fishery targets Pacific halibut, (*Hippoglossus stenolepis*), a flatfish which inhabits the continental shelf of the United States and Canada, ranging from California to the Bering Sea, and extends into Russia and Japan. The fishing fleet deploys bottom set longline hook and line. The main non-target species include Pacific cod as a main discard species, and skates, grenadiers, sharks, and albatross' as main discarded vulnerable species groups.

The North Pacific Halibut Act and the Magnuson-Stevens Act (MSA), in combination with other laws, currently form the legal framework governing management of the Pacific halibut fishery in the US. The North Pacific Halibut Act of 1982 implements the Convention for the Preservation of the Halibut Fishery of the Northern

Pacific Ocean and Bering Sea between Canada and the US. The Convention established the International Fisheries Commission, now known as the International Pacific Halibut Commission (IPHC). The Halibut Act provides for the appointment of US Commissioners to the IPHC, specifies the responsibilities of that the US Secretary of Commerce has for carrying out the treaty, and provides for the regulation of the US portion of fishery by the North Pacific and Pacific Fishery Management Councils.

In 2014, The US operated 1,445 commercial halibut vessels in all IPHC-managed areas. Canadian vessels composed 10% of the total commercial halibut fleet (including all Alaska state IPHC areas, Washington-Oregon-California Area 2a, and Canada), all vessel classes included. There are 4 vessel classes reported by the IPHC: Unknown, <41ft, 41-55ft, and >55ft. In the 2014 US Pacific halibut fishery, vessels <41ft made up 37% of the commercial fleet by number (Table 16), and accounted for 19% of the commercial catch (Table 17). Vessels in the <40 ft size class are not presently covered by on-board fishery observers (NMFS 2014). More information on fleet composition and observer coverage can be found in the following section: Vessel Size Composition of the Commercial Fleet.

Description of gear

Longline gear in Alaska is fished on-bottom. Longline gear features hooks on short leaders, or gangions, usually set at intervals of 3-25 feet. Lines may have 50-200 hooks each. (Clark 2005) The gear is baited by hand or by machine, with smaller boats generally baiting by hand and larger boats generally baiting by machine. Circle hooks are usually used, except for modified J-hooks on some boats with machine baiters. The gear usually is deployed from the vessel stern with the vessel traveling at 5-7 knots. Some vessels attach weights to the longline, especially on rough or steep bottom, so that the longline stays in place on bottom (Hanselman *et al.* 2014).

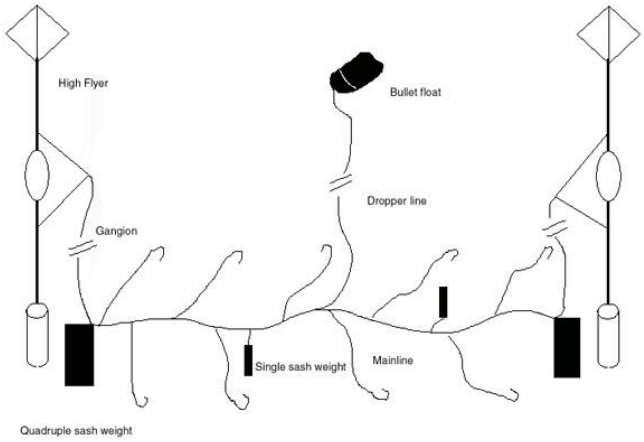


Figure 1. Typical demersal long-line gear set-up
http://www.nmfs.noaa.gov/pr/interactions/gear/bottomlongline.htm

Two regional councils, the North Pacific Fishery Management Council (NPFMC) and the Pacific Fishery Management Council (PFMC), play an active role in the management of Pacific halibut. The Halibut Act allows the two Fishery Management Councils to develop regulations, including limited access regulations, that do not conflict with the regulations adopted by the Commission (16 U.S.C. §§ 773c, (c)). Although neither Council has developed a Pacific halibut fishery management plan, each Council has approved provisions that supplement IPHC regulations. Their principal actions to date have centered on allocating the IPHC's area-based catch limits to commercial, sport, tribal, and community user groups.

The NPFMC developed and approved an individual fishing quota program – implemented in 1995 – for the commercial Pacific halibut fishery, to allocate portions of the IPHC's catch limits in the regulatory areas off Alaska (Pautzke and Oliver 1997).

Commercial fisheries in Area 2A (WA-OR-CA) include 1) tribal commercial, 2) non-tribal directed commercial, 3) incidental non-tribal commercial (sablefish and salmon), and 4) tribal ceremonial and subsistence. In addition to the various commercial fisheries, guided and non-guided recreational fisheries operate coastwide.

3.3 Principle One: Target Species Background

Target Stock.

Taxonomic classification

Class: *Actinopterigii*

Order: *Pleuronectiformes*

Family: *Pleuronectidae*

Genus: *Hippoglossus*

Species: *stenolepis*

The fishery targets Pacific halibut, (*Hippoglossus stenolepis*), a flatfish which inhabits the continental shelf of the United States and Canada, ranging from California to the Bering Sea, and extends into Russia and Japan. They are among the largest teleost fishes in the world, and have been documented to reach 500 pounds and up to eight feet in length. They are a popular food fish, with few bones and firm flesh, prized by both recreational and commercial fisheries. Pacific halibut is not a low trophic level (LTL) species, and therefore MSC LTL fishery considerations are not addressed in this report.

Biology and Life History

Information on the general biology, development, behavior, and ecology of Pacific halibut may be found on the International Pacific Halibut Commission (IPHC) website (http://www.iphc.int/research/biology.html). Much of the information below was obtained from this source, unless otherwise noted.

Mature halibut concentrate annually, from November to March, on spawning grounds along the edge of the continental shelf at depths from 183 to 457 m (600 to 1,499 ft). A 50 pound female will spawn close to a half a million eggs while a female over 200 pounds will spawn several million eggs. The eggs and larvae are heavier than the surface seawater and drift passively in deep ocean currents. The larva grow and transform into adult form at about 6 months, at which time they settle to the bottom and join the community of demersal fin fish.

Halibut are migratory and move in a predominantly clockwise pattern from settlement areas in the western part of the Gulf of Alaska and Bering Sea towards more southeastern waters (**Figure 2**). Individuals also make regular seasonal migrations from more shallow feeding grounds in summer to deeper spawning grounds in winter. Halibut

are demersal, living on or near the bottom. Halibut are most often caught between 90 and 900 feet (27 and 274 meters), but have been caught as deep as 1,800 feet. One and two-year old Pacific halibut are commonly found in inshore areas, whereas 2 or 3-year olds tend to move further offshore. Pacific halibut enter the commercial fishery at about 8 years old, after most of the extensive counter-migration to balance egg and larval drift has apparently taken place. Adult halibut continue to migrate annually, moving to deeper waters on the edge of the continental shelf during the winter for spawning, and into shallow coastal waters in the summer months for feeding.

Genetic studies in the past using protein electrophoresis have shown differences between halibut stocks on the eastern and western sides of the North Pacific, and also between Atlantic halibut (*Hippoglossus hippoglossus*) and Pacific halibut, but no differences within the northeast Pacific (Grant *et al.* 1984). Further research on this question is being conducted with modern methods (Hauser *et al*. 2006). At present, halibut in the northeast Pacific is considered to be a single spawning stock (Clark and Hare 2006).

Halibut are a carnivorous, top order predator (Livingston *et al*. 1999). Larval halibut feed on plankton, while halibut from 1 to 3 years old feed on small shrimp-like organisms and small fish. Larger halibut feed on fish, with the percent of the diet occupied by fish increasing with size and age. Species found in the diet of halibut include cod, sablefish, pollock, rockfish, sculpins, turbot, flatfish, and a variety of crustaceans.

Pacific halibut have undergone marked changes in growth over the 20th century. The most recent trend has been a substantial and continuing decline in growth since the 1980s that has continued through at least 2011 (Hare 2012). Hare and Clark (2009) put the recent declines in historical perspective, noting: *"Mean size at age for older fish is lower than at any point since size data has been collected. For example, a 20 year old female halibut from the Kodiak Island area weighs, on average, about 32 pounds. Ten years ago, a 20 year old female from the same area averaged about 60 pounds; 20 years ago the average was over 150 pounds. Compared to 20 years ago, mean size at age has decreased at least 50% for all ages over 10. The decline has occurred in all areas though it is greatest for Area 3A".*

Sexual dimorphism is clearly evident in the life histories of male and female Pacific halibut. On average, females: 1) grow faster, 2) become substantially larger, 2) mature later, and 3) live longer than males. Biological samples collected from surveys and the commercial fishery show that female halibut grow faster and reach larger sizes compared to males; weight at age 30 ranged from 75.0-124.0 lbs for females and 29.9-57.5 lbs for males (Hare and Clark 2005). Bell and St. Pierre (1970) reported that the average age of first maturity was 12 for females, whereas it was 7 to 8 for males. Clark and Hare (2006) reported that the average age at maturity of females did not change substantially from that value despite large changes in size at age since the 1980s; however, maturity at length shifted to smaller sizes with the observed changes in growth. Bell and St. Pierre (1970) reported that the maximum age observed was 42 years for females, compared to 27 years for males. Clark and Hare (2006) reported that halibut of both sexes were substantially smaller than halibut of the same sex and age 30 years prior; showing the relationship between males and females remained essentially the same following the overall decline in growth rates.

Despite its influence in estimating abundance and yield, natural mortality has been difficult to quantify for even the best studied species, including Pacific halibut (Brodziak *et al.* 2011, Clark *et al*. 2004). For many years, the value of natural mortality for female halibut was fixed at M=0.15 in stock assessments (Clark and Hare 2006). In recent years, the sensitivity of model results to natural mortality has been included as an important source of uncertainty in the stock assessment. For example, in the model ensemble for 2014, both fixed and estimated values of natural mortality were explored (Stewart 2015). Depending on the particular model structure, the values

estimated for female natural mortality ranged from M=0.14 to M=0.21, and this wide range contributed greatly to differences in the scale and productivity of the models in the ensemble. Stewart (2015) noted that although this uncertainty is directly incorporated into the ensemble results, it is not easily explained at present, and thus remains an avenue for future investigation.

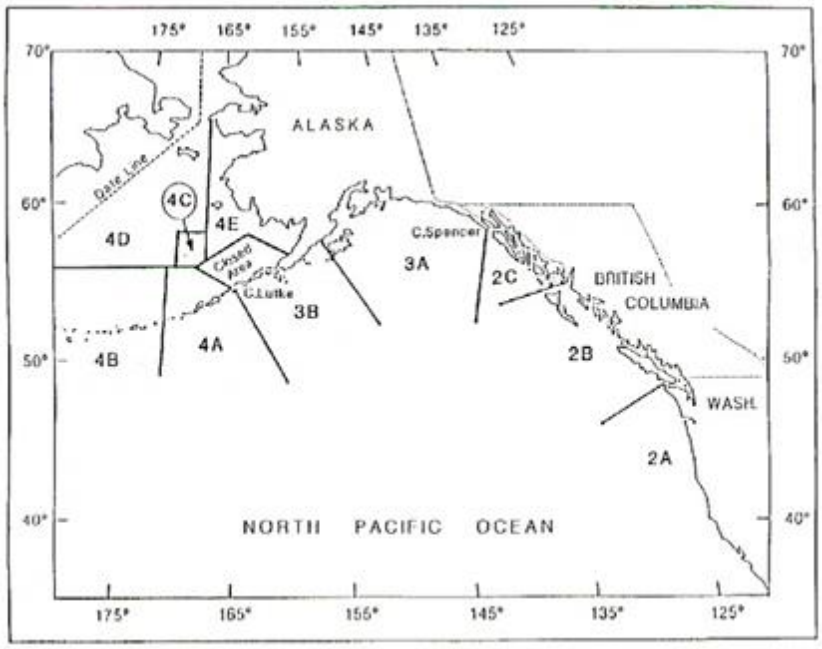


Figure 2. IPHC managed areas. All areas are considered in the unit of certification except area 2B (Canada), which is covered under a separate certificate. (Source IPHC)

History of Fishing and Management

The Pacific halibut fishery has been closely managed for nearly 100 years, and much is known about the history of fishery removals, population trends, and biological characteristics. A brief history of early management was recounted by Leaman (2007). Resource declines in the early 1900's led US and Canadian harvesters to petition their respective governments, and the International Fisheries Commission ((IFC) later re-named the International Pacific Halibut Commission (IPHC)) was created in 1923. Early management acted primarily through season restrictions. Pacific halibut conventions followed in 1930, 1937, and in 1953, when stock management goals (i.e. MSY management) were introduced. The 1979 protocol to the Convention of 1953 defined national areas of participation, and revised the stock management goal to Optimum Yield (OY). The North Pacific Halibut Act of 1982 was the enabling U.S. legislation for the 1979 protocol. The major features of Pacific halibut management have historically included: 1) accommodation of the underlying biology of the fish, 2) accounting for all removals, 3) implementation of evolving assessment methodologies, 4) development and evaluation of harvest policy, and 5) the fostering of a consultative management process (Leaman 2007). Minimum size limits were originally introduced in 1940, and have been continually in place in varying form to the present. Commercial vessel-based (IVQ) management has operated in Canada since 1991, and individual-based (IFQ) management in Alaska has been in place since 1995. Management of Pacific halibut in the

Washington State portion of the UoA (Area 2A) operates through a limited access licensing system, and a Pacific halibut catch sharing plan.

Current Management Practice
The IPHC conducts an annual coast wide stock assessment of Pacific halibut and sets the Total Allowable Catch (TAC) for all Pacific halibut fisheries in US and Canadian waters. Coast wide exploitable biomass is first determined for the entire stock, and is then apportioned to 10 IPHC management areas (Figure 2).

The IPHC uses a Constant Exploitation Yield (CEY) harvest policy; a procedure that applies a fixed harvest rate to the estimate of exploitable biomass to determine the TAC. Stewart (2016) reported how this harvest policy is implemented by the IPHC. First, a coastwide estimate of exploitable biomass from the stock assessment is apportioned to the individual management areas. Information to make this apportionment is obtained from an annual setline survey conducted by the IPHC. Area-specific target harvest rates are then used to determine the area-specific catch limits. For example, in the 2016, the target harvest rates were 21.5% in Areas 2A, 2B, 2C and 3A, and 16.125% in Areas 3B, 4A, 4B, and 4CDE. Finally, the area-specific catch limits are aggregated back to the coastwide level to establish the TAC for the entire stock (Stewart 2016).

The harvest policy described above is implemented with a Harvest Control Rule (HCR), using target and limit spawning biomass reference points. The HCR does not change the distribution of harvest among regulatory areas, but reduces the target harvest rates (for all areas) at low stock sizes (Stewart 2016). Specifically, if the coastwide stock is estimated to have fallen below 30% of the equilibrium stock size in the absence of fishing (B30%) the target harvest rates are decreased linearly such that there would be no fishing mortality below 20% relative spawning biomass (B20%). This policy was designed to provide a constant harvest rate that would avoid decreasing the stock below B30% with a relatively high frequency, and still provide a large fraction of the maximum sustainable yield available (Stewart 2016). As calculated by the IPHC, the value of B30% is intended to be precautionary; this is because it is defined relative to historically good size-at-age and recruitment in a relatively unproductive environmental regime (Clark and Hare 2006).

Status of Stocks

Stock Assessment

The information needed to assess stock status relative to the limit reference points, and to apply the harvest control rule, is obtained from quantitative stock assessments based on fitting population dynamics models to fishery and survey data. The assessment of Pacific halibut has a long and rich history (Clark 2003). The IPHC has set catch limits on the basis of quantitative stock assessments since 1932, and assessments of Pacific halibut based on fitting age-structured population dynamics models have been produced annually since the 1980s (Clark and Hare 2006).

In recent years, the IPHC has taken the approach of putting several separate models together into an ensemble to characterize stock status and uncertainty (Stewart and Martell 2015). The ensemble for 2014 included four individual models, each of both short and long time-series, based on coastwide and Areas-As-Fisheries (AAF) data structures. The coastwide models treat the stock as one homogeneous unit, while the AAF models use fishery area-specific information to examine the stock on a finer spatial scale. The combination of models included a broad suite of structural and parameter uncertainty, including natural mortality rates (estimated in the long time-series models, fixed in the short time-series models), environmental effects on recruitment

(estimated in the long time-series models), fishery and survey selectivity (by region in the AAF models) and other model parameters. These sources of uncertainty have historically been very important to the understanding of the stock, as well as the annual assessment results.

Each of the models in the ensemble was equally weighted, and differences in uncertainty within models propagated in the integration of results. A retrospective analysis was also conducted to look for evidence of potential bias in parameter estimates for each of the individual models. All models of the ensemble showed robust performance, and estimates for the terminal three years of the retrospective analysis were included in the currently estimated confidence intervals (Stewart and Martell 2015).

Current Status

The status of the Pacific halibut stock relative to reference points indicates that the stock continues to be harvested sustainably. Reference points are reported for the entire stock residing in the waters of US and Canada, combined. The 2014 stock assessment reported that the spawning stock biomass at the beginning of 2015 was 215.1 Mlbs, corresponding to 42% of the unfished spawning biomass reference point (B0). The median values for B30% and B20% are 153 Mlb, 102 Mlb., respectively (Figure 3). The probability of 2015 spawning biomass being below the target reference point (B30%) was estimated to be 10%; and the probability of it being below the limit reference point was estimated to be less than 1% (Stewart and Martell 2015).

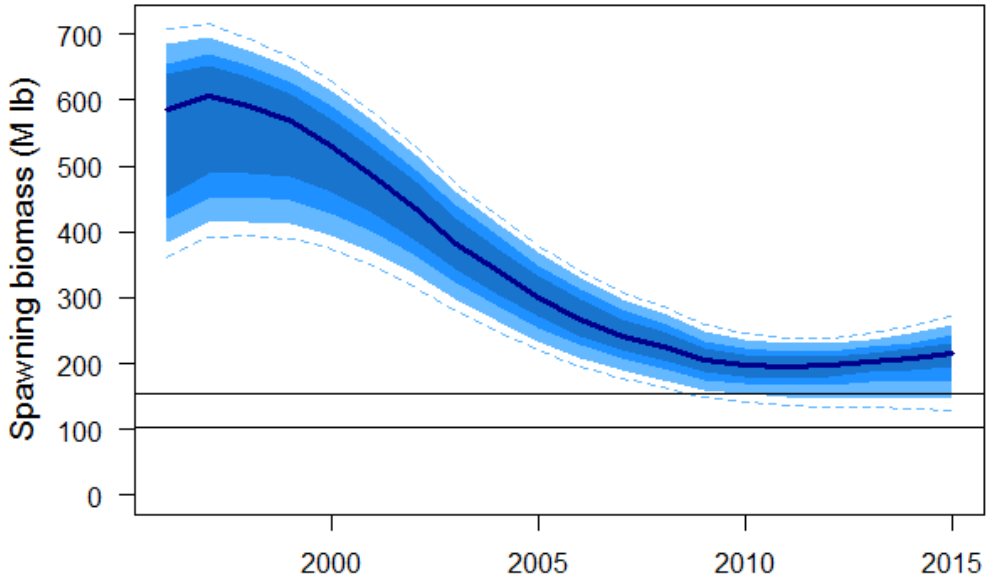


Figure 3. Time-series of recent spawning biomass estimates relative to harvest policy reference points. The horizontal lines correspond to $B_{30\%}$ (153 M lbs) and $B_{20\%}$ (102 M lbs), respectively. Source: Stewart and Martell (2015).

For fishery management in 2015, the IPHC staff again prepared a risk-benefit decision analysis (Table 4). The final approved fishery CEY for 2015 was 29.2 M lbs, with assumed total removals from all sources of 42.8 M lbs. This decision corresponded to fishing at a level consistent with a 78% probability of overfishing. This level of removals is more aggressive than a CEY of 25.0 M lbs. (the blue line), which corresponded to a 50% probability of overfishing. Under the final approved fishery CEY, the estimated probability of the spawning stock biomass

(SSB) being below the target reference point (B30%) in 2016 is 8%., and the probability of being below the limit threshold (B20%) is less than 1%.

Table 4. Final decision table of 2015 yield alternatives (rows) and risk metrics (columns). Values in the table represent the probability, in "times out of 100" of a particular risk. Table produced following the IPHC Annual Meeting on 30 January, 2015. Source: IPHC. Available at http://www.iphc.int/meetings/2015am/Final_Adopted_catch_limits_1_30_15.pdf

				Stock Trend				Stock Status				Fishery Trend				Fishery Status
				Spawning biomass				Spawning biomass				Fishery CEY from the harvest policy				Harvest rate
				in 2016		in 2018		in 2016		in 2018		in 2016		in 2018		in 2015
2015 Alternative	Total removals (M lb)	Fishery CEY (M lb)	Fishing intensity	is less than 2015	is 5% less than 2015	is less than 2015	is 5% less than 2015	is less than 30%	is less than 20%	is less than 30%	is less than 20%	is less than 2015	is 10% less than 2015	is less than 2015	is 10% less than 2015	is above target
No removals FCEY = 0	0.0	0.0	$F_{100\%}$	<1/100	<1/100	<1/100	<1/100	5/100	<1/100	1/100	<1/100	<1/100	<1/100	<1/100	<1/100	0/100
	13.1	0.0	$F_{73\%}$	<1/100	<1/100	<1/100	<1/100	5/100	<1/100	2/100	<1/100	<1/100	<1/100	<1/100	<1/100	<1/100
	20.0	7.7	$F_{64\%}$	<1/100	<1/100	1/100	<1/100	6/100	<1/100	3/100	<1/100	<1/100	<1/100	<1/100	<1/100	<1/100
Blue Line *status*	30.0	16.5	$F_{54\%}$	3/100	<1/100	17/100	4/100	7/100	<1/100	5/100	<1/100	3/100	2/100	3/100	2/100	4/100
quo Final adopted	38.7	25.0	$F_{46\%}$	19/100	<1/100	40/100	23/100	8/100	<1/100	8/100	<1/100	37/100	22/100	36/100	23/100	50/100
Maintain 2014 SPR	41.4	27.5	$F_{45\%}$	26/100	1/100	47/100	30/100	8/100	<1/100	9/100	1/100	57/100	37/100	51/100	38/100	50/100
	42.8	29.2	$F_{44\%}$	30/100	1/100	54/100	34/100	8/100	<1/100	10/100	1/100	69/100	47/100	60/100	46/100	78/100
	43.3	29.5	$F_{43\%}$	[a]31/100	[b]1/100	[c]56/100	[d]36/100	[e]8/100	[f]<1/100	[g]10/100	[h]1/100	[i]73/100	[j]51/100	[k]63/100	[l]49/100	[m]88/100
	50.0	36.0	$F_{39\%}$	44/100	5/100	75/100	51/100	9/100	1/100	13/100	1/100	99/100	91/100	95/100	84/100	>99/100
	60.0	45.8	$F_{34\%}$	65/100	22/100	96/100	82/100	11/100	1/100	23/100	2/100	>99/100	>99/100	>99/100	>99/100	>99/100

Recent Trends

The Pacific halibut stock has been declining over much of the last decade as a result of decreasing size-at-age and poor recruitment strengths. Total removals have declined substantially since the mid 2000's, and the level of removals in 2014 was well below the long term average (Figure 4). Observed age distributions continued to indicate a relatively stable stock, but with no evidence of strong recruitments in recent years (Figure 5.). The IPHC conducts a setline survey in all management areas, and reports changes in Weight-Per-Unit-Effort (WPUE) annually (Stewart 2015). The coast wide estimate of WPUE from the 2014 setline survey was 2% higher than the value observed in 2013 (Figure 6.) (Stewart and Martell 2015).

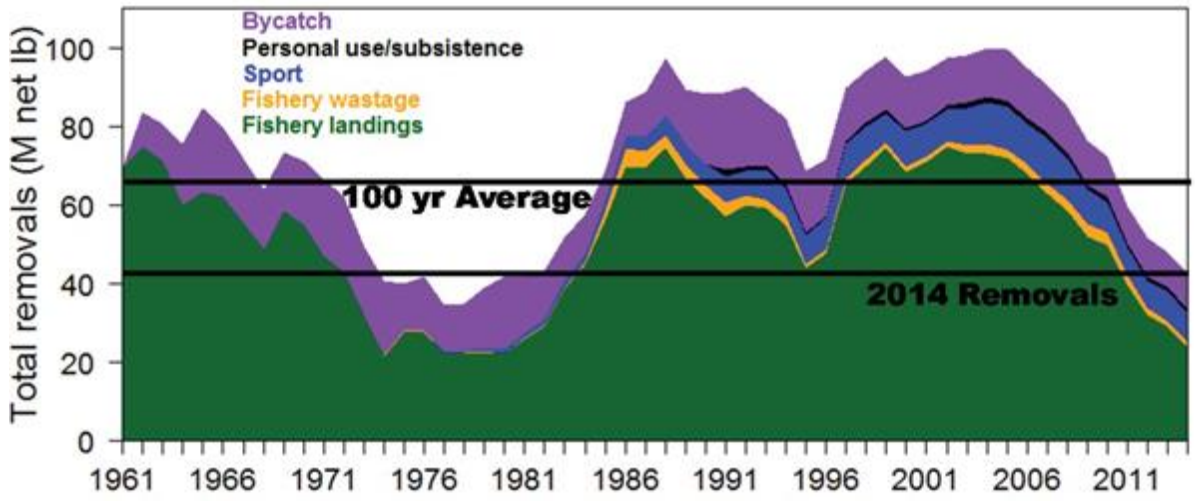


Figure 4. Total halibut removals by source since 1961. Source: (Stewart 2015).

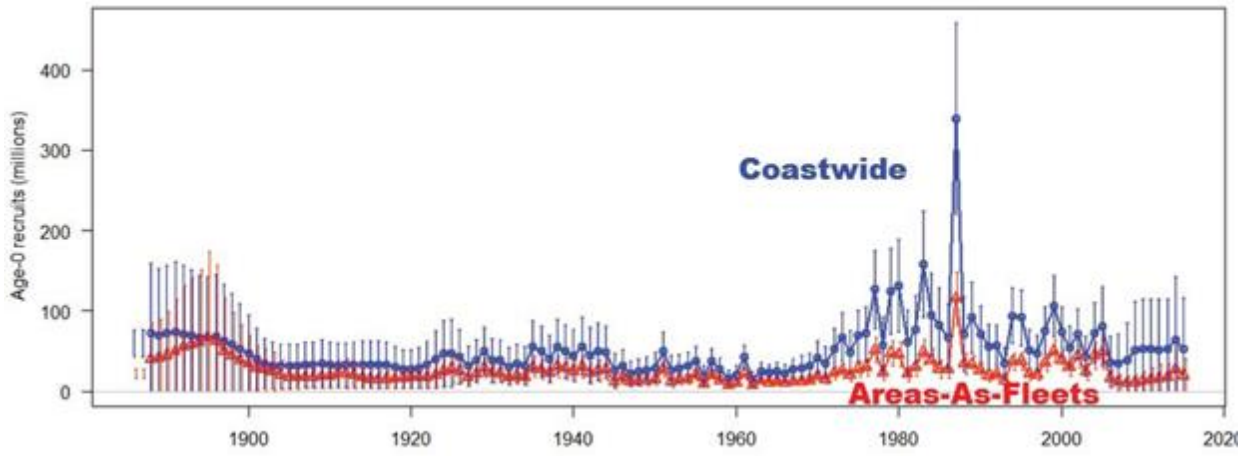


Figure 5. Trend in historical recruitment strengths (by birth year) for two long time series models. Note that estimates after 2008 are highly uncertain, as they are not yet informed by any direct observations. Source: (Stewart and Martell 2015).

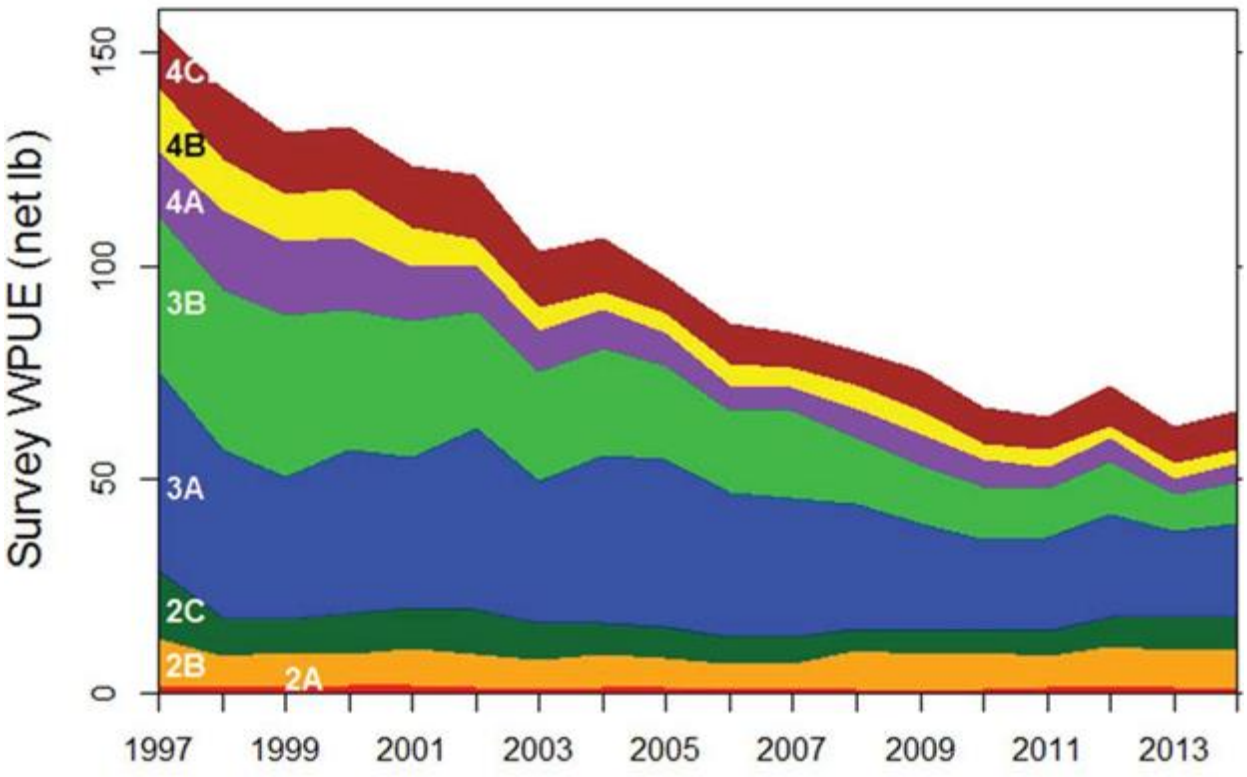


Figure 6. Weighted contributions of the regulatory areas to the coastwide survey total (over 32 inches) weight per unit of effort (WPUE). Source: (Stewart 2015).

Coast wide, IPHC catch limits (Canada and US combined) declined from 54.080 M lbs. in 2009, to 27.515 M lbs. in 2013, and then were increased to 29.223 M lbs. for 2015. In US waters, the total catch limit for 2015 comprised 75.9% of the coastwide catch limit (

Table 5).

All anticipated removals of halibut are taken into account when recommending the annual TAC including: 1) commercial fisheries, 2) recreational fisheries, 3) bycatch in the directed fishery (referred to as "wastage"), 4) bycatch in non-directed fisheries, and 5) personal use (Table 6). Unlike in most fisheries, "bycatch" terminology in publications for this fishery does not refer to catch and retention or discard of non-halibut species. In 2014, wastage in the directed fishery comprised 3.0% of total removals, and bycatch in non-directed fisheries comprised 21.9% of the total removals (Table 6).

Annual removals from US waters (all sources) declined to 34.78 M lbs. in 2014, in response to continued management measures intended to stabilize stock size (Table 7). Fishery removals from US waters totaled 17.8 Mlbs in 2014 (Table 8). A comparison of fishery removals and catch limits from 2009-2014 (Table 9) shows good management performance. Since 2009, the total US catch was managed such that total fishery removals ranged from 0.4 % to 13.8 % less than the catch limit (Table 10).

Table 5. Catch limits set by IPHC by regulatory area, 2009-2015.

Catch Limits (thousands of pounds, net weight)							
Source: http://www.iphc.int/commercial/184-comm-limits.html							
Regulatory Area	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
2A[1]	950	810	910	989	990	960	970
2B[2]	7,630	7,500	7,650	7,038	7,038	6,850	7,038
2C	5,020	4,400	2,330	2,624	2,970	4,160	4,150
3A	21,700	19,990	14,360	11,918	11,030	9,430	10,100
3B	10,900	9,900	7,510	5,070	4,290	2,840	2,650
4A	2,550	2,330	2,410	1,567	1,330	850	1,390
4B	1,870	2,160	2,180	1,869	1,450	1,140	1,140
4CDE	3,460	3,580	3,720	2,465	1,930	1,285	1,285
Total	**54,080**	**50,670**	**41,070**	**33,540**	**31,028**	**27,515**	**29,223**
US Allocation	**46,450**	**43,170**	**33,420**	**26,502**	**23,990**	**20,665**	**22,185**
US percent	**85.9%**	**85.2%**	**81.4%**	**79.0%**	**77.3%**	**75.1%**	**75.9%**

[1]Area 2A includes commercial, sport, and Treaty Tribe catch limits.

[2]Area 2B includes commercial and sport allocations.

3Areas 2C and 3A from 2014 to present include commercial and sport allocations.

Table 6. Total removals of Pacific halibut by source, 2009-2014.

Total Removals by Source (thousands of pounds, net weight)							
http://www.iphc.int/publications/rara/2014/rara2014_10sadatasources.pdf							
Source	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**Percent in 2014**
Commercial Fishery	52050	49720	39510	31990	29040	23690	55.7%
Commercial Wastage	2940	3210	2460	1670	1430	1290	3.0%
Bycatch	11080	10350	9420	10100	8840	9320	21.9%
Sport	8780	7850	7100	6770	7590	7080	16.7%
Personal Use	1310	1240	1140	1140	1140	1140	2.7%
Total[1]	76160	72360	59640	51670	48040	42510	100%

[1]Sum of removals by source for all regulatory areas (Canada and US combined)

Table 7. Total removals of Pacific halibut by regulatory area, 2009-2014.

Total Removals (thousands of pounds, net weight)						
http://www.iphc.int/publications/rara/2014/rara2014_10sadatasources.pdf						
Regulatory Area	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
2A	1570	1210	1100	1220	1170	1070
2B	8710	8770	8830	7850	7710	7730
2C	8150	7200	4000	4800	5750	5980
3A	30740	29080	23000	18520	17470	13600
3B	12930	12210	9300	7070	5500	4530
4	14080	13890	13400	12210	10430	9610
Total[1]	76170	72360	59640	51670	48040	42510
US total	**67,460**	**63,590**	**50,810**	**43,820**	**40,330**	**34,780**
[1]Sum of the area values may disagree due to rounding error						

Table 8. Fishery removals of Pacific halibut by regulatory area, 2009-2014.

Fishery Removals (thousands of pounds, net weight)						
http://www.iphc.int/publications/rara/2014/rara2014_10sadatasources.pdf						
Regulatory Area	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
2A	490	420	540	570	540	540
2B	6,640	6,730	6,690	5,980	6,040	5,880
2C	4,960	4,490	2,450	2,690	3,030	3,440
3A	21,760	20,500	14,670	12,030	11,080	7,630
3B	10,780	10,110	7,320	5,050	4,090	2,930
4A	2,530	2,330	2,350	1,580	1,230	900
4B	1,590	1,830	2,050	1,740	1,250	1,120
4CDE	3,310	3,320	3,430	2,340	1,770	1,260
Total[1]	**52,050**	**49,720**	**39,510**	**31,990**	**29,040**	**23,690**
US Fishery Removals	**45,410**	**42,990**	**32,820**	**26,010**	**23,000**	**17,810**
[1]Sum of the area values may disagree due to rounding error						

Table 9. Catch limits, less fishery removals, of Pacific halibut by regulatory area, 2009-2014.

Catch Limits less Fishery Removals (thousands of pounds, net weight)[1]						
Regulatory Area	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
2A	460	390	370	419	450	420
2B	990	770	960	1,058	998	970
2C	60	-90	-120	-66	-60	720
3A	-60	-510	-310	-112	-50	1,800
3B	120	-210	190	20	200	-90
4A	20	0	60	-13	100	-50
4B	280	330	130	129	200	20
4CDE	150	260	290	125	160	25
Total	**2,030**	**950**	**1,560**	**1,550**	**1,988**	**3,825**
US Fishery	**1,040**	**180**	**600**	**492**	**990**	**2,855**

[1]**Negative values indicate that fishery removals were greater than catch limits**

Table 10. Management performance; negative values indicate percentage overages when catch of Pacific halibut exceeded the management limit.

Catch Limits, less Fishery Removals (as a percentage of catch limit)[1]						
Regulatory Area	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
2A	48.4%	48.1%	40.7%	42.4%	45.5%	43.8%
2B	13.0%	10.3%	12.5%	15.0%	14.2%	14.2%
2C	1.2%	-2.0%	-5.2%	-2.5%	-2.0%	17.3%
3A	-0.3%	-2.6%	-2.2%	-0.9%	-0.5%	19.1%
3B	1.1%	-2.1%	2.5%	0.4%	4.7%	-3.2%
4A	0.8%	0.0%	2.5%	-0.8%	7.5%	-5.9%
4B	15.0%	15.3%	6.0%	6.9%	13.8%	1.8%
4CDE	4.3%	7.3%	7.8%	5.1%	8.3%	1.9%
Total	3.8%	1.9%	3.8%	4.6%	6.4%	13.9%
US Fishery	2.2%	0.4%	1.8%	1.9%	4.1%	13.8%

[1]**Negative values indicate that fishery removals were greater than catch limits**

Management Related Research

IPHC

An extensive amount of Pacific halibut research is conducted on an ongoing basis by the IPHC staff. Nearly all of the research done by the staff is directed toward one of three continuing objectives of the Commission: 1) improving the annual stock assessment and quota recommendations; 2) developing information on current management issues; and 3) adding to knowledge of the biology and life history of halibut. The IPHC research program aims to improve the information and methods used to manage the stock by answering the most important outstanding questions. A detailed review of IPHC research projects is available at: http://www.iphc.int/research.html.

Current IPHC research activities fall into four chief areas: 1) stock identification, monitoring and assessment, 2) harvest policy and management, 3) biology, physiology, and migration, and 4) ecosystem interactions and environmental influences.

Research studies assigned a high priority by IPHC managers presently include: 1) development of a methodology for accurate determination of the sex ratio of the commercial landings, 2) research on the harvest policy through the Management Strategy Evaluation (MSE) effort, 3) investigation into the declining trend in size at age, and 4) studies to describe halibut habitat in order to assess the effect of a changing climate on stock dynamics.

An informative meeting was held with IPHC staff on November 4th, 2015. The staff provided an update on 1) progress in stock assessment model development, 2) longline survey methodology evaluation, 3) Management Strategy Evaluation, and 4) primary areas of research. Following reviews by the Scientific Review Board (SRB), the staff is planning to continue with a coastwide model for the near future, but also plans model improvements including a growth process model and continued development of a spatially explicit model to better capture selectivity and recruitment dynamics. Work on the longline survey methodology has focused on extending coverage to previously un-sampled areas and examining the CPUE of survey gear with respect to modern snap gear used by the fishery. The MSE development process has changed with respect to governance and now incorporates co-chairs and a facilitator; key discussions have focused on the utility of using a spatially explicit model and the resulting challenges anticipated in explaining more complex models to stakeholders. Other important areas of research with respect to improving the stock assessment include 1) genetic techniques to sample fish sex in the commercially fishery (currently this is inferred from survey samples), and 2) modelling that incorporates a space-time analysis for the annual IPHC setline survey.

3.4 Principle Two: Ecosystem Background

All species that are affected by the fishery and that are not part of the Unit of Certification are considered under Principle 2. This includes species that are retained for sale or personal use, including bait, (assessed under Performance Indicator 2.1), bycatch species that are discarded (Performance Indicator 2.2), and species that are considered endangered, threatened or protected by the government in question (U.S) or are listed by the Convention of International Trade of Endangered Species (CITES) (Performance Indicator 2.3). This section contains an evaluation of the total impact of the fishery on all components in P2 and includes both observed and unobserved fishing mortality. Unobserved mortality may occur from illegal, unregulated or unreported (IUU) fishing, biota that are injured and subsequently die as a result of coming in contact with fishing gear, ghost fishing, waste, or biota that are stressed and die as a result of attempting to avoid being caught by fishing gear. This section also considers impacts on marine habitats (Performance Indicator 2.4) and the ecosystem more broadly (Performance Indicator 2.5).

In the MSC system, species are scored as "main" (either bycatch/discards or retained) non-target species if they comprise >5% of the total landings by weight, or may also be scored as main if they comprise <5% >2% but have vulnerable life histories. Species are categorized for scoring purposes as retained versus discarded based on whether they are greater than 50% retained or discarded (Table 11).

Ecosystem

The scope of this report includes waters off the coast of Alaska including the Gulf of Alaska, Bering Sea, and the Aleutian Islands as well as the water off the coast of Washington state. The Gulf of Alaska Large Marine Ecosystem (LME) lies off the southern coast of Alaska and the western coast of Canada. It is separated from the East Bering Sea LME by the Alaska Peninsula. Significant upwelling linked to the presence of the counter-clockwise gyre of the Alaska Current generate cold, nutrient-rich waters that support a diverse ecosystem (Sherman and Hempel 2009). The Gulf of Alaska has a broad continental shelf extending up to 200 km in some areas and contains several deep canyons, known to be good fishing areas. Gulf of Alaska continental shelf habitats include steep rock outcrops, smooth turbidite sediment scapes, and methane seeps. The nature of the seabed on the Gulf of Alaska shelf has been strongly influenced by glaciation and high rates of sediment deposition. The Gulf of Alaska also contains approximately 24 major seamounts (Stone and Shotwell 2007)

The Eastern Bering Sea LME is characterized as a shallow sea with one of the largest continental shelves in the world (Sherman and Hempel 2009). The continental shelf breaks at approximately 170 m depth and seven major canyons, including two of the largest submarine canyons in the world, indent the continental slope. The continental shelf is covered with sediment deposited by the region's major rivers (Johnson 2003) and therefore has limited hard substrate.

The outer coast of Washington state lies within the temperate California Current LME, the part of the northeast Pacific ocean which borders southern British Columbia, Canada, the U.S. states of Washington, Oregon, California, as well as Baja California, Mexico. Washington's outer coast runs for over 250 km from Cape Flattery to the Columbia River. The coast of Washington is highly productive with wind driven coastal upwelling being the dominant nutrient producing feature (Sherman and Hempel 2009). The continental shelf is relatively straight and narrow with the continental slope dropping off steeply. There is considerable freshwater input near the San Juan de Fuca islands as well as the Puget Sound that brings run-off and silt from the surrounding area which contributes to the nearshore soft bottom habitat. Nearshore habitats are characterized by rocky reefs and dense kelp beds (*Nereocystis*) (Skewgar and Pearson 2011).

The physical oceanography of the Alaska region is characterized by waters down to 200 meters that flow easterly across the Pacific Ocean into the southern Gulf of Alaska and then swing counter clockwise through the Central Gulf of Alaska and westerly along the Aleutian Islands. The wind driven surface currents may break through the Aleutians and move northward through the Bering Sea. Deeper water flows on to the west entering the Bering Sea at the western extremities of the Aleutian Island chain. The biological productivity of the region is influenced by the annual variation in these current patterns (Dodimead *et al*. 1963).

The Washington coast is subject to the variable patterns of the California Current System, characterized by strong alongshore winds and the narrow continental shelf. West of the continental shelf break, a southward current (the California Current) dominates year round. The California Undercurrent flows northward over the continental slope and supplies most of the nutrient-rich water that reaches the waters over the shelf during summer upwelling conditions. In fall and winter the Davidson Current flows northward over the continental shelf and slope, along with a southward undercurrent. Along the outer coast of Washington, the Columbia River plume also modifies coastal currents, affecting residence times and transport along the shelf, with biologically important consequences for plankton and larval fish (Simenstad *et al*. 1990). The plume is frequently over the Washington shelf in both summer and winter, and although terrestrial nutrients are usually depleted in the estuary in summer, mixing during upwelling provides nutrients to the photic zone (Hickey *et al*. 2005).

Important biogenic habitat in the Alaska region is associated with deep sea corals and sponges (Stone and Shotwell 2007). Deep corals are widespread throughout Alaska, including the continental shelf and upper slope of the Gulf of Alaska, the Aleutian Islands, the eastern Bering Sea, and extending as far north as the Beaufort Sea. Coral distribution, abundance and species assemblages differ among geographic regions. Gorgonians and black corals are most common in the Gulf of Alaska while gorgonians and stylasterids are the most common corals in the Aleutian Islands. True soft corals are common on Bering Sea shelf habitats (Stone and Shotwell 2007). Overall, the Aleutian Islands have the highest diversity of deep corals in Alaska, including representatives of six major taxonomic groups and at least 50 species or subspecies of deep corals that may be endemic to that region. In the Aleutian Islands, corals form high density “coral gardens” that are similar in structural complexity to shallow tropical reefs and are characterized by a rigid framework, high topographic relief and high taxonomic diversity (Stone 2006).

Alaskan Management Strategy

There is a strategy in place to manage the non-target species which consists of (1) a catch accounting system, (2) observer program to estimate catches of non-target species, that was heavily restructured in 2013 to better sample the full groundfish fleet, including halibut vessels which previously had minimal coverage, (3) fishery independent surveys conducted by NOAA-Fisheries and IPHC, (4) statistical stock assessments for most non-target species (5) a tiered system of assessments that provides for more precautionary annual catch limits when assessments use less precise methods and clear procedures exist for restricting catch limits if stock rebuilding is necessary, (6) mandatory use of seabird avoidance devices on all vessels larger than 55’, and (7) a spatial management strategy that prohibits or restricts vessels from fishing in sensitive habits. This system is expected to keep bycatch species at levels that are highly likely to be within biological limits and minimize impacts to habitat. The evidence for successful implementation of this management strategy is manifest by regular (often annual or bi-annual) stock assessment, in season catch accounting and the healthy stock status for most non-target species relative to reference points.

Washington Management Strategy

In Washington, the strategy to manage non-target species consists of (1) a catch accounting system, (2) observer program to estimate catches of non-target species, (3) fishery independent surveys conducted by NOAA-Fisheries and IPHC, (4) statistical stock assessments for most non-target species, (5) a Seabird Avoidance Program, (5) Spatial management to restrict or prohibit fishing based on depth, species, and habitat (i.e. Groundfish Conservation Areas (GCAs)) The final rule to implement a seabird avoidance program in the Pacific groundfish fleet was implemented in Dec. 2015. This rule mandates the use of streamer lines by vessels >/= 55ft length overall (LOA) using bottom longline gear to harvest groundfish. Members of the client group, the FVOA already voluntarily use streamer lines on their vessels.

Sources of Information

This fishery has significant sources of fishery dependent and fishery independent data that permit stock assessments for retained species, including a catch accounting system, fishery independent surveys, and an observer program.

a. Fishery independent surveys: IPHC and NOAA- Fisheries conducts annual longline and trawl surveys in the Gulf of Alaska and in the Eastern Bering Sea / Aleutian Islands. This information is used directly in assessments.

b. Catch accounting system: The system uses information from multiple sources to provide an estimate of total groundfish catch, including at-sea discards, as well and estimates of prohibited species catch and other non-groundfish bycatch. Observer data, shoreside landing reports (“fish tickets”), vessel and shoreside production reports, and the enforcement database are combined to provide an integrated source for fisheries monitoring and in-season decision making (Figure 6). Participants in the North Pacific groundfish fisheries, including IFQ halibut, are required to use an electronic reporting system. E-Landings is a comprehensive system that inputs all catches, including self-reported discards and landed species. Catches can be submitted on-board the fishing vessel daily, so that the e-Landings system thereby provides real time catch accounting. Landing fish in the state of Alaska requires the use of fish tickets (landing receipts) that describe the amount and composition of all fish sold. Thus, together the fish ticket and e-Landings system provide precise quantitative information on the amount of fish landed. Thus, together the fish ticket and e-Landings system provide precise quantitative information on the amount of fish landed. In the catch accounting system, trips are classified based on the gross weight landed. Therefore, if a trip targeted both sablefish and halibut, but landed more sablefish it would be classified as such.

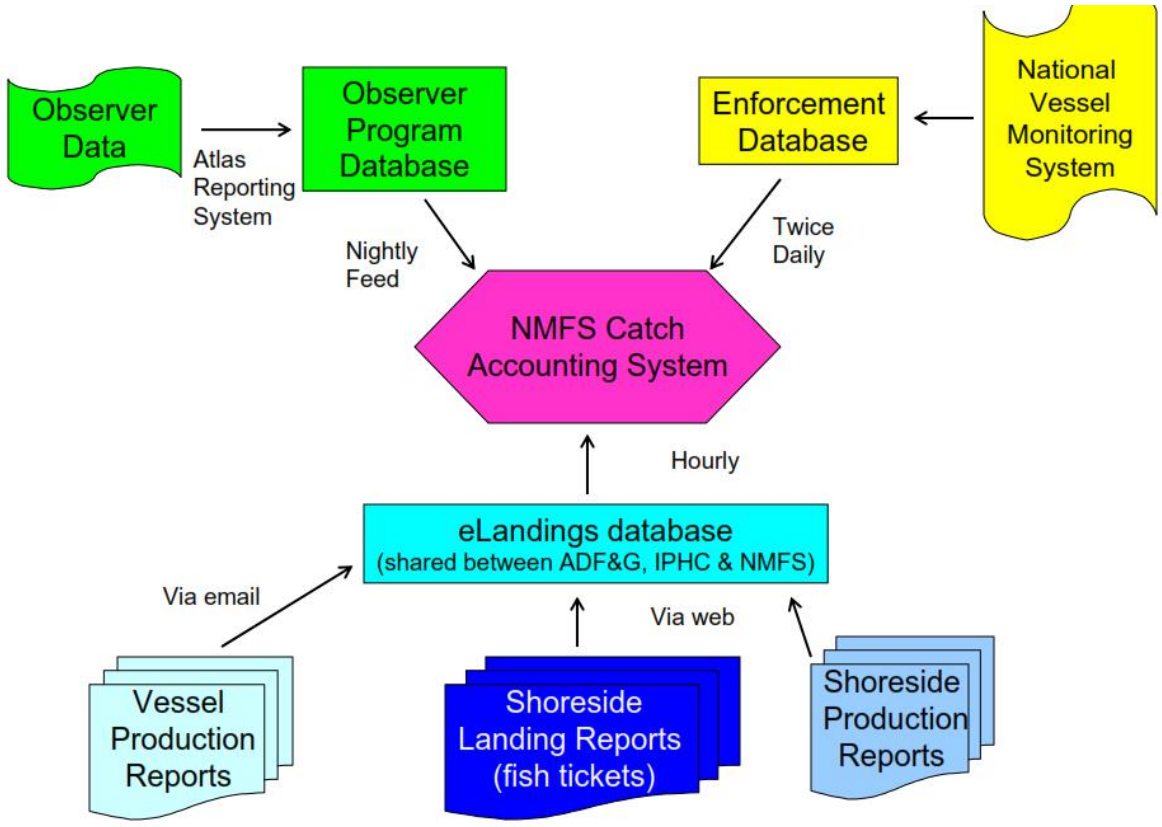


Figure 7. Diagram showing sources of data entering the Catch Accounting System. Source: Alaska Fisheries Science Center.

c. Observers: Vessels >= 40 LOA engaged in these fisheries have trips randomly selected to take on federal observers. The Observer Program underwent a significant restructuring in 2013 to expand observer coverage to nearly all catcher/processor vessels, the halibut and sablefish IFQ fisheries, and vessels between 40 feet and 60 feet length overall (LOA). In 2015, NMFS began testing Electronic Monitoring (EM) systems on vessels 40-57.5' LOA to include vessels that have traditionally been placed in a 'no-selection' pool because of safety or space constraints and get a better estimate of the overall sampling frame for statistical analysis. This restructure and EM testing, increases the amount and reliability of data available to determine fishery impacts on non-target species, though data gaps with vessels < 40 feet still exist. For updated information, see Observer Program section (below). In Washington, the Northwest Fisheries Science Center groundfish observer program observes commercial catches of groundfish as either targets or bycatch, for fisheries managed by the PFMC. The program has two units which are the West Coast Groundfish Observer (WCGOP) and the At-Sea-Hake Observer Program. The program was established in May 2001 by NOAA Fisheries (NMFS) and requires that all vessels in US EEZ waters (3-200 miles offshore) must carry an observer if notified by NMFS. NMFS jurisdiction has subsequently been expanded such that they may require that vessels fishing in state waters also carry observers (Jannot 2012).

The information on retained species can be considered accurate and verifiable, and monitoring of species is sufficient to generally assess mortalities. However, the current limitations in the observer program – central to the estimation of discards an take of non-target species – are important and limit the degree of certainty with

which outcome status and management effectiveness can be known. Because of this several conditions to MSC certification were placed on this fishery and address this issue.

Overview of Non-target Catch

Since the last full assessment, the composition of the non-target species assessed has changed substantially because of the more refined and representative information provided by the restructured observer program. In past assessments, this species composition list was extrapolated from e-landings data alone, but now the more comprehensive catch accounting system is the primary source for quantifying non-target interactions of the fishery.

In the MSC system, species are scored as “main” (either bycatch/discards or retained) non-target species if they comprise >5% of the total landings by weight, or may also be scored as main if they comprise <5%>2% but have vulnerable life histories. Here, species are categorized for scoring purposes as retained versus discarded based on whether they are greater than 50% retained or discarded (Table 11).

In this assessment, the main non-target species for Alaska include Pacific cod as a main discard species by volume, and skates, grenadiers, sharks, and albatross' as main discarded vulnerable species groups (Table 11). While this unit of assessment includes regulatory area 2A, we did not identify any additional main bycatch (retained or returned to sea) species. However, we are including a discussion of one additional ETP species from the Washington coast (yelloweye rockfish). Given the low levels of total halibut quota allotted to regulatory area 2A (540 M lbs), which comprises only 2.2% of the total commercial quota, it is highly unlikely that there are main non-target species impacts that would have detrimental impacts on species populations. There are high level Pacific halibut discards in this fishery (See halibut Wastage section) likely due to minimum size regulations (32 in.), trip limit overages, or issues with how the CAS labels sablefish v halibut trips (Gilroy and Stewart 2014). The full species list and background on the updated species groups is provided below (Table 12).

Table 11. Summary of non-target Species as categorized for evaluation

Performance indicator	Species	Rationale
2.1 Retained non-target	Bait	Main retained: Unknown volume, designated "main" to obtain information.
2.2 Bycatch (retuned to the water)	Pacific Cod	Main discarded. Greater than 5% of catch
2.2 Bycatch (returned to the water)	Skates, Sharks, Grenadiers, Laysan Albatross, Black-Footed Albatross	Main discarded. Less than 5% of catch, but vulnerable
2.3 ETP species	Short-tailed Albatross, Yelloweye Rockfish (WA)	ESA Listed "Endangered"

Table 12. Catch Summary. Average species or species group catch, including retained, and discarded catch, for BSAI and GOA IFQ halibut Longline fishery 2013-1014. Weights are in metric tons and birds are counts, and species in bold are those considered for scoring (may be grouped for scoring purposes). Source: NOAA Catch Accounting System, 2015.

Species	% of Halibut Fishery	% Retained	% Discarded	Average Catch (mt/year)	Average Retained (mt/year)	Average Discarded (mt/year)
Pacific halibut	69.31%	55.23%	44.77%	18982.595	10484.325	8498.27
Pacific Cod	**6.93%**	**9.61%**	**90.39%**	**1897.76**	**182.435**	**1715.325**
Other Skates BSAI	**4.38%**	**0.09%**	**99.91%**	**1199.415**	**1.125**	**1198.285**
Sablefish	3.18%	83.70%	16.30%	870.25	728.42	141.83
Sharks	**2.36%**	**0.01%**	**99.99%**	**646.74**	**0.095**	**646.65**
Giant Grenadier	**2.35%**	**0.00%**	**100.00%**	**643.33**	**0**	**643.33**
Longnose Skate GOA	**2.05%**	**7.00%**	**93.00%**	**562.325**	**39.36**	**522.96**
Big Skate GOA	**1.52%**	**1.03%**	**98.97%**	**416.745**	**4.285**	**412.455**
Sea star	1.23%	0.00%	100.00%	337.6	0	337.6
Misc Fish	1.12%	0.00%	100.00%	307.86	0	307.86
Large Sculpins - Hemilepidotus Unidentified	0.69%	0.00%	100.00%	188.11	0	188.11
Other Rockfish	0.66%	34.88%	65.12%	181.7	63.375	118.32
Large Sculpins - Yellow Irish Lord	0.64%	0.00%	100.00%	176.01	0	176.01
Shortraker Rockfish	0.58%	23.19%	76.81%	159.69	37.035	122.66
Arrowtooth Flounder	0.35%	0.79%	99.21%	95.27	0.75	94.52
Birds - Gull	0.30%	0.00%	100.00%	82.73	0	82.73
Octopus	0.29%	2.06%	97.94%	79.975	1.645	78.33
Birds - Black-footed Albatross	**0.26%**	**0.00%**	**100.00%**	**71.79**	**0**	**71.79**
Grenadier - Ratail Grenadier Unidentified	0.25%	0.00%	100.00%	67.84	0	67.84

Dermersal Shelf Rockfish GOA	0.23%	90.88%	9.12%	63.115	57.36	5.76
Large Sculpins - Great Sculpin	0.21%	0.00%	100.00%	58.845	0	58.845
Rougheye Rockfish	0.14%	68.15%	31.85%	37.505	25.56	11.945
Thornyheads	0.13%	74.68%	25.32%	36.115	26.97	9.145
Other Sculpins	0.11%	0.00%	100.00%	30.195	0	30.195
Large Sculpins - Bigmouth Sculpin	0.09%	0.00%	100.00%	23.5	0	23.5
Birds - Unidentified	0.07%	0.00%	100.00%	18.88	0	18.88
Kamchatka Flounder BSAI	0.06%	0.00%	100.00%	16.36	0	16
Birds - Laysan Albatross	**0.06%**	**0.00%**	**100.00%**	**16.34**	**0**	**16.34**
Greenland Turbot	0.05%	0.00%	100.00%	14.84	0	14.84
Large Sculpins - Red Irish Lord	0.05%	0.00%	100.00%	14.695	0	14.695
Pollock	0.05%	0.00%	100.00%	12.895	0	12.895
Birds Northern Fulmar	0.05%	0.00%	100.00%	13.64	0	14
Dusky Rockfish GOA	0.04%	8.09%	91.91%	11.12	0.9	10.22
Large Sculpins - Myoxocephalus Unidentified	0.03%	0.00%	100.00%	7.72	0	7.72
Snails	0.03%	0.00%	100.00%	7.055	0	7.055
Flatfish BSAI	0.03%	0.00%	100.00%	8.265	0	8.275
Shallow Water Flatfish GOA	0.02%	0.00%	100.00%	4.4	0	4.4
Corals Bryozoans - Corals Bryozoans Unidentified	0.01%	0.00%	100.00%	2.88	0	2.88
Northern Rockfish	0.01%	0.00%	100.00%	3.67	0	3.67
urchins dollars cucumbers	0.01%	0.00%	100.00%	2.915	0	2.915
Dark Rockfish	0.01%	0.00%	100.00%	2.2	0	2.2
Sea anemone unidentified	0.01%	0.00%	100.00%	2.135	0	2.135
Deep Water Flatfish GOA	0.01%	0.00%	100.00%	1.845	0	1.845
Large Sculpins - Plain Sculpin	0.01%	0.00%	100.00%	1.67	0	1.67
Sponge unidentified	0.00%	0.00%	100.00%	1.195	0	1.195
Benthic urochordata	0.00%	0.00%	100.00%	0.11	0	0.11

Atka Mackeral	0.00%	0.00%	100.00%	0.9	0	0.9
Rock Sole	0.00%	0.00%	100.00%	0.615	0	0.615
Bivalves	0.00%	0.00%	100.00%	0.68	0	0.68
Greenlings	0.00%	0.00%	100.00%	0.55	0	0.55
Scypho jellies	0.00%	0.00%	100.00%	0.06	0	0.06
Flathead Sole	0.00%	0.00%	100.00%	0.47	0	0.47
Sea pens whips	0.00%	0.00%	100.00%	0.445	0	0.445
Yellowfin Sole BSAI	0.00%	0.00%	100.00%	0.405	0	0.405
Pacific Ocean Perch	0.00%	0.00%	100.00%	0.27	0	0.27
Stichaeidae	0.00%	0.00%	100.00%	0.47	0	0.47
Large Sculpins - Warty Sculpin	0.00%	0.00%	100.00%	0.32	0	0.32
Brittle star unidentified	0.00%	0.00%	100.00%	0.22	0	0.22
Invertebrate unidentified	0.00%	0.00%	100.00%	0.165	0	0.165
Misc crabs	0.00%	0.00%	100.00%	0.055	0	0.055
Misc Crusaceans	0.00%	0.00%	100.00%	0.04	0	0.04
Squid	0.00%	0.00%	100.00%	0	0	0
Eelpouts	0.00%	0.00%	100.00%	0.07	0	0.07
Corals Bryozoans - Red Tree Coral	0.00%	0.00%	100.00%	0.09	0	0.09
Hermit crab unidentified	0.00%	0.00%	100.00%	0.005	0	0.005

Retained (non-target) Catch

There are no main retained non-target species caught in the unit of assessment; however, bait is considered a main retained species group due to a lack of information to verify otherwise. A background on bait considerations is provided in this section.

Bait Considerations

According to CR V1.3 CB3.5.5: “The team shall consider species used as bait in a fishery, if they are caught by the fishery under assessment or elsewhere under the Retained Species component in P2.” In the UoA, bait type and volume are not recorded or quantified in a systematic way. During on-site meetings the assessment team was able to ascertain typical bait species used in the fishery as well as a ball-park volume estimate from fishery managers and industry members. However, this information was anecdotal and qualitative in nature, not verifiable, and not sufficient to determine whether bait in aggregate or on a species-specific level qualifies as ‘main.’ The assessment team has determined that the species will be classified as ‘main’ as a precautionary measure and to ensure that scoring on the “information PI 2.1.3” could reflect the deficiency in information on bait

However, given the uncertainty surrounding bait type and volume, the team considers that there is not sufficient information to accurately score bait traditionally as a ‘main’ element under PI 2.1.1 pertaining to

outcome status and 2.1.2 pertaining to management considerations. The team has therefore, where relevant, considered the bait element as 'NA' under PIs 2.1.1 and 2.1.2. In order to sum scoring elements and provide an overall PI score in accordance with CRV1.3 Scoring Requirements (27.10.7), the assessment team has considered NA equivalent to Y up to the SG80 level, similar to how 'minor' species are treated in under PIs 2.1.X and 2.2.X.

Bait is scored traditionally as a 'main' species then under 2.1.3, where the baseline information deficiency is most appropriately assessed. This approach permits the assessment team to address the information deficiency regarding bait without nonsensically scoring bait for outcome and management considerations without appropriate information.

In the halibut longline fishery, Market or Argentinian squid, Pacific herring, chum salmon are all used as bait. The emergence of autobaiters on long line vessels has pushed the fishery to use uniformly shaped bait which has shifted use to squid and chum salmon.

Currently, there is no reliable tracking of the volume or source of bait used in the hook and line and pot fisheries. It is possible to estimate ratios of bait used per fish caught to determine relative volumes in the longline hook and line fishery. For example, in typical hook and line operations, a single herring will bait two hooks and a single squid will bait three hooks. Average catch per hook is 0.53 lb. (Skud 1978). For comparison, an age-4 herring weighs roughly 0.22 kg, or 0.11 kg / hook yielding a nearly 5-fold difference between bait and catch mass. Similarly, average squid bait weights are .33kg, or .11kg / hook yielding a similar 5-fold difference between bait and catch mass. However, the lack of reliable information on the type of bait used and the ratio of bait to fish caught, prevents us from reliably estimating the source or volume of bait used via this approach.

Argentine shortfin squid (*Illex argentines*) have a very fast life cycle and only live for about one year. During that time, they grow from tiny (one millimeter) juveniles to their maximum size, reproduce once, and die. This species actively feeds on pelagic crustaceans, other squids, and small bony fishes. Throughout their short lifetime, individuals eat a variety of prey of different sizes. The Argentine Squid is the target of an extremely large fishery, throughout its range. The management framework includes a set of policies and measures designed to promote the sustainability of fishery resources including: (i) establishment and subsequent expansion of the restricted area for protecting juvenile common hake and other species—an area currently comprising nearly 400,000 km2 ; (ii) establishment of a satellite-based Vessel Monitoring System (VMS) for the fishing fleet, designed to oversee compliance at sea with the prohibitions on fishing in the restricted areas; (iii) a requirement to place inspectors and observers aboard the commercial fleet to monitor catches and compliance with fishing regulations; and (iv) instituting Individual and Transferable Catch Quotas (CITC) (IADB 2013). In some recent years, as many as one million metric tonnes (2.2 billion pounds) of this species have been captured in a single fishing season. It is the second largest (by weight) squid fishery in the world. Catch levels have varied significantly in recent years, with some years being much lower than the million tonne maximums, but populations seem to consistently bounce back (likely a result of the very fast life cycle and high number of eggs produced by each female). In a recent analysis of this species, scientists determined it to be of least concern (Clyde *et al.* 1984). There is a formal stock assessment process for this species carried out by the Falkland Islands Fisheries Department.

Market squid (*Doryteuthis opalescens*), range from southeastern Alaska to Baja California, Mexico. The commercial fishery for this squid is consistently one of California's largest commercial fisheries in both volume and revenue. Market squid are harvested for human consumption and as bait in recreational fisheries. The fishery is managed by the state as directed by the Market Squid Fishery Management Plan, which has been in

effect since 2005. The fishery uses either seine or brail gear that is usually combined with attracting lights to capture aggregations of adult squid spawning in shallow water, in areas over sandy substrate. Market squid have short life spans (they have been aged to 10 months), and are extremely sensitive to variable ocean conditions. They play an important role in the food chain as a key forage species for many predatory fish, mammals, and seabirds (CDFW 2005). CDFW manages the fishery by: (1) setting a seasonal catch limit of 107,048 mt (118,000 short tons (st)) to prevent the fishery from over-expanding; (2) maintaining monitoring programs designed to evaluate the impact of the fishery on the resource; (3) continuing weekend closures that provide for periods of uninterrupted spawning; (4) continuing gear regulations regarding light shields and wattage used to attract squid; (5) establishing a restricted access program that includes provisions for initial entry into the fleet, permit types, permit fees, and permit transferability that produces a moderately productive and specialized fleet; and (6) creating a seabird closure restricting the use of attracting lights for commercial purposes in any waters of the Gulf of the Farallones National Marine Sanctuary. The MSY Control Rule for market squid is founded generally on conventional spawning biomass "per recruit" model theory. Specifically, the MSY Control Rule for market squid is based on evaluating (throughout a fishing season) levels of egg escapement associated with the exploited population. In November 2010, the Council adopted an ABC proxy of Fmsy resulting in egg escapement ≥ 30%. Current studies include developing an aging program, sampling reproductive status of squid landed in the fishery, and a collaboration with industry to develop a long-term index of paralarval abundance (PFMC 2014).

Chum salmon (*Oncorhynchus keta*) have wide distribution in the Pacific, and historically have been the most abundant of the salmon along the coast. Chum salmon experience a rapid growth rate during their first few months at sea and reach maturity at around four years old. Although chum salmon has low fecundity and its spawning behaviour makes it vulnerable to net fishing pressure, this is partially offset by the production of large eggs that the fish buries. That strategy, in addition to substantial hatchery production, make it resilient to fishing pressure. The Alaskan chum salmon fishery has extensive management measures in place that include scientific monitoring, gear restrictions, bycatch reduction measures, and a limited entry program to control capacity. The 2014 chum salmon harvest of 6.7 million fish ranks 21st since statehood and was below the recent 10-year average of 10.5 million. Most chum salmon production in the region is attributable to hatchery production. Before hatchery chum salmon production became significant in 1984, the 1962–1983 regional average chum salmon harvest was 1.6 million (Munro 2015). While some chum salmon populations were once overfished, most stocks are currently considered healthy. It is assumed that Alaskan chum is used for bait, versus chum from Canada or elsewhere: no information on provenance was available to the team.

Pacific herring (*Clupea pallasii*) is a coastal schooling species. They are found in large schools in depths from the surface to 1,300 feet (400 m). Herring can live up to 19 years. Adult Pacific herring migrate inshore, entering estuaries to breed once per year, with timing varying by latitude. Herring feed on phytoplankton and zooplankton in nutrient-rich waters associated with oceanic upwelling. Young feed mainly on crustaceans, but also eat decapod and mollusk larvae, whereas adults prey mainly on large crustaceans and small fishes. Herring population abundance trends are very dynamic and are subject to fairly substantial changes on both large and small geographic scales. The primary cause for such fluctuations in abundance is environmental change that affects herring growth and recruitment. In Southeast Alaska, the Alaska Department of Fish and Game (ADFG) manages the herring fishery on a long-term, sustained yield basis. The ADFG Herring Management Plan for the eight other spawning aggregates that comprise the Southeast Alaska Distinct Population Segment (DPS), requires that biomass estimates meet a designated minimum threshold, preset for each of the stocks, before commercial fishing is allowed to begin. Harvest policies are then guided by a maximum exploitation rate of 20% of the mature biomass, which is consistent with other herring fisheries on the west coast of North America. Furthermore, the petition to list the Lynn Canal herring population as endangered under the ESA was denied in

2014 however in recognition of its conservation status The herring fishery in Lynn Canal and the Juneau area has been closed since 1982 (NMFS 2014). It is assumed that Pacific herring fished in AK is used for bait in the halibut fishery, versus Pacific herring from Canada or elsewhere: no information on provenance was available to the team.

Bycatch (Discarded Catch)

Species: Pacific Cod

Biology

Pacific cod (*Gadus macrocephalus*) is a transoceanic species, commonly found on the continental shelf and upper slope, occurring at depths from shoreline to 500 m. Pacific cod is distributed widely over Gulf of Alaska (GOA), as well as the eastern Bering Sea (EBS) and the Aleutian Islands (AI) area. Tagging studies (Shimada and Kimura 1994) have demonstrated significant migration both within and between the EBS, AI, and GOA. Age and size at first maturity vary with areas, the southern stocks maturing at an earlier age. They are given for males and females: 2-3 years and 40 to 44 cm off Washington, 3 years and about 50 cm in the Gulf of Alaska and in the Bering Strait, and 5 years and about 67 cm off Rebun Island, Hokkaido. The diet of adults includes fish, octopuses, and large benthic and bentho-pelagic crustacea such as the Kamchatka crab and shrimps. The fish species consumed include saffron cod, pollock, smelt, and herring, as well as flounders, cottids. salmon and sardines (Cohen *et al.* 1990).

Status

For years 2013-2014, the average annual (total) catch of Pacific cod by the Pacific halibut fishery, estimated in the NOAA Catch Accounting System, was 1898.76 mt / yr. In 2013, the total TAC for both the GOA an BSAI was 320,600 mt and total catch (including incidental catch in other fisheries was 310,347 mt (A'mar and Palsson 2013). Both the Gulf of Alaska Pacific cod stock and the Bering Sea / Aleutian Island populations are not considered overfished and overfishing is not occurring (Thompson 2014). The landings from halibut-directed longline operations therefore constitute a small fraction of the total catch on populations that are deemed to be within biological limits.

Management

Pacific cod are managed under two Fishery Management Plans: one for the Bering Sea/Aleutian Islands region and the other for the Gulf of Alaska region. The Fishery Management Plans control the fishery through permits and limited entry, catch quotas, gear restrictions, closed waters, seasons, bycatch limits and rates, and other measures. Total allowable catch (TAC), allowable biological catch (ABC), and overfishing level (OFL) is set for Pacific Cod in both the BSAI and GOA (Thompson 2014; A'mar and Palsson 2013). The NPFMC then allocates TAC to the various gear types, management sub-areas, and also the community development quota (CDQ). The Gulf of Alaska groundfish fisheries are among the few remaining limited access (not rationalized) fisheries in Alaska. Of these fisheries, Pacific cod is the predominant groundfish species targeted by the fixed gear sectors in the GOA. In 2009, the Council took action to add gear-specific (pot, hook-and-line, or jig) Pacific cod endorsements to GOA fixed gear licenses that met a minimum catch threshold during 2002-2008. The action also reduced the number of fixed gear licenses eligible to access the GOA Pacific cod fisheries, so that the number of participants in the directed GOA Pacific cod fisheries are permanently capped at the number of available licenses, and new entrants will have to purchase an existing license if they wish to fish in federal waters. The NPFMC is considering information to determine implication of assigning separate TAC for Pacific Cod in the BS and AI.

Information

Information on the stock status of Pacific Cod species is collected through both fishery dependent and fishery independent mechanisms, including the fishery independent surveys, catch accounting system, and observer program. More detail is provided in “Source of Information” section (Above).

Species: Skates (Alaska, Longnose, and Big Skate)

Biology

A diverse assemblage of skates are captured and discarded at sea. Skate life cycles are similar to sharks, with relatively low fecundity, slow growth to large body sizes, and dependence of population stability on high survival rates of a few well developed offspring (Moyle and Cech 1996). The primary skates caught in the halibut-directed longline fishery are Alaskan skates in the BSAI, and Big and Longnose skates in the GOA (Ormseth 2014; 2014b).

The general range of the big skate (*Raja binoculata*) extends from the Bering Sea to southern Baja California in depths ranging from 2 to 800 m. The longnose skate (*Raja rhina*) has a similar range, from the southeastern Bering Sea to Baja California in 9 to 1,069 m depths (Love *et al.* 2005). While these two species have wide depth ranges, they are generally found in shallow waters in the Gulf of Alaska. The AFSC Age and Growth Program has recently reported a maximum observed age of 25 years for the longnose skate in the GOA. In the same study, the maximum observed age for GOA big skates was 15 years (Table 13). GOA skates appeared to be generalists, consuming locally abundant invertebrates and fishes, including several commercially important taxa (e.g. pandalid shrimps, tanner crabs, gadids, flatfishes). As common benthic predators and competitors with other groundfishes, the studied skate assemblage may play an influential role in trophic dynamics and regulation of demersal marine communities in the Gulf of Alaska (Ebert *et al*. 2008).

The Alaska skate (*Bathyraja parmifera*) is distributed throughout the EBS shelf habitat area, most commonly at depths of 50 to 200 m (Stevenson 2004), and has accounted for between 91% and 97% of aggregate skate biomass estimates since species identification became reliable in 1999 (Ormseth 2014b). Age and size at 50% maturity were 9 years and 92 cm TL for males and 10 years and 93 cm TL for females (Table 13). Skates are predators in the BSAI FMP area. Some species are piscivorous while others specialize in benthic invertebrates; additionally, at least three species, deepsea skate, roughtail skate, and longnose skate, are benthophagic during the juvenile stage but become piscivorous as they grow larger (Ebert 2003, Robinson 2006). The Alaska skate, which eats primarily pollock (as do most other piscivorous animals in the EBS). The food web indicates that aside from sperm whales, most of the “predators” of EBS skates are fisheries, and that cod and halibut are both predators and prey of skates.

Table 13. Life history characteristics of Skate species commonly caught in the halibut directed fisheries, from Ormseth 2014.

Common Name	Max. obs. Length (TL cm)	Max obs. age	Are, length Mature (50%)	Feeding Mode	N embryos/egg case	Depth Range (m)
Alaska Skate	118 (M), 119 (F)	15(M), 17 (F)	9 yrs, 92 cm (M), 10 yrs, 93 cm (F)	predatory	1	17-392

Big Skate	244	15	4.8 yrs, 68 cm (F), 6.1 yrs, 87 cm (M)	predatory	1-7	16-402
Longnose Skate	180	25	12.3, 96 cm (F), 8.8 yrs, 72 cm (M)	Benthopelagic; predatory	1	9-1096

Status

A diverse assemblage of skates are captured and discarded at sea part of the longline and trawl fisheries. In the BSAI, "Other Skates" make up about 4.38% of the halibut fishery, and are primarily comprised of Alaska skates. In the GOA, longnose and big skates are recorded separately and make up roughly, 2.05% and 1.52% of the catch, respectively. GOA skates are assessed on a biennial basis to coincide with survey data from the biennial trawl survey and a full assessment was presented in 2014 (Ormseth, 2014). The 2013 survey biomass estimates for longnose skate increased substantially and is the highest estimate in the 1984 to 2013 time series. Big skate biomass, in contrast, is lower than in the 2012 estimate (Ormseth, 2012). There have been overages in big skate catch in the last several years. In early 2014, skate take was prohibited in all of the groundfish fisheries.

In the BSAI, the 2014 ABC and OFL for the "Other Skate" complex was 35, 383 t and 41, 849 t respectively. In the GOA, longnose skate ABC was 2,876 t and the OFL was 3,835 t. The big skate ABC was 3,762 t and the OFL was 5,016 t. These species are also captured in trawl and Pacific cod longline fishing, and total catches have averaged 570 t / year (Gulf of Alaska; Ormseth and Matta 2009) and 19,000 t/ year in the eastern Bering Sea / Aleutian Islands (Ormseth *et al*. 2009). Only in the Gulf of Alaska and Aleutian Islands does halibut fishing constitute a significant component of the total skate catch. For the 2013-2014 seasons, halibut fishing caught an estimated average of 1199.4 mt of skate in BSAI, 562.3 mt of GOA longnose, and 416.7 mt of GOA big skate. Since skates are assessed as a tier 5 species, NMFS cannot determine if they exist in an overfished condition, but based on catch estimates and harvest rules, they do conclude that overfishing is not occurring (Ormseth 2014; 2014b).

Management

The Bering Sea and Aleutian Islands (BSAI) skate complex is managed in aggregate, with a single set of harvest specifications applied to the entire complex. However, to generate the harvest recommendations the stock is divided into two units. Harvest recommendations for Alaska skate *Bathyraja parmifera*, the most abundant skate species in the BSAI, are made using the results of an age structured model and Tier 3. The remaining species ("other skates") are managed under Tier 5 due to a lack of data. The Tier 3 and Tier 5 recommendations are combined to generate recommendations for the complex as a whole (Ormseth 2014).

The Gulf of Alaska (GOA) skate complex is managed as three units. Big skate (*Beringraja binoculata*) and longnose skate (*Raja rhina*) have separate harvest specifications, with Gulf-wide overfishing levels (OFLs) and Acceptable Biological Catches (ABCs) specified for each GOA regulatory area (western, central, and eastern). All remaining skate species are managed as an "Other Skates" group, with Gulf-wide harvest specifications. All GOA skates are managed under Tier 5, where OFL and ABC are based on survey biomass estimates and natural mortality rate (Ormseth 2014b).

Information

Information on the stock status of shark species is collected through both fishery dependent and fishery independent mechanisms, including the fishery independent surveys, catch accounting system, and observer program. More detail is provided in "Source of Information" section (Above).

Species: Sharks (Pacific Sleeper and Spiny Dogfish)

Biology

Sleeper sharks (*Somniosus spp*.) can attain large sizes (>7 m total length), possess a slow-growth rate and are long-lived (Compagno 1984). The Pacific sleeper shark (*Somniosus pacificus*) inhabits cold waters and ranges off the Asian coast from the Sea of Japan north to the Chukchi Sea, then south along the North American coast through the Gulf of Alaska to Mexico (Hart, 1973; Compagno 1984; Orlov 1999). Pacific Sleeper sharks are versatile predators that feeds on a wide spectrum of prey, including teleosts, other sharks, cephalopods, crustaceans, marine mammals, fishery offal and carrion (Hart 1973; Compagno 1984; Orlov 1999). Tagging studies have revealed that Pacific sleeper sharks are much more mobile than previously thought, actively chasing prey and moving up in the water column (Hubert 2006).

Spiny dogfish (*Squalus acanthias*) occupy shelf and upper slope waters from the Bering Sea to the Baja Peninsula in the North Pacific. Historic estimates of spiny dogfish age-at-50%-maturity for the Eastern North Pacific range from 20 to 34 years. Growth rates for this species are among the slowest of all shark species, κ=0.03 for females and 0.06 for males (Tribuzio *et al.* 2010). Small juveniles and young-of-the-year tend to inhabit the water column near the surface or in areas not fished commercially and are therefore not available to commercial fisheries until they grow or migrate to fished areas (McFarlane and King 2003)

Spiny dogfish are the most well studied of the three main shark species in the Gulf of Alaska. Numerous studies have been published or are ongoing regarding this species. Spiny dogfish are longest lived and slowest growing of all shark species studied, living to 100 years or more and females do not reach maturity until they are 36 years old. Reproduction is also slow for this species, gestation takes nearly 2 years and females have about 9 pups on average. Diet studies shown that spiny dogfish do not target specific prey. Instead, they are opportunistic, feeding on whatever is available. Tagging studies are showing that spiny dogfish can undertake large scale migrations, moving from Canadian waters to Japan or Mexico, and they may inhabit areas previously unknown, such as pelagic waters far from shore. (Tribuzio *et al.* 2010)

Status

Shark bycatch in the halibut fishery is primarily comprised of spiny dogfish (*Squalus suckleyi*). There are currently no directed commercial fisheries for shark species in federal or state managed waters of the GOA and most incidentally caught sharks are not retained. Spiny dogfish is primarily captured in the flatfish trawl and cod longline fisheries (Tribuzio *et al.* 2012). For 2015, NMFS recommended the maximum allowable ABC of 5,989 t and an OFL of 7,986 t for the shark complex. For years 2013 and 2014 average shark catch in the halibut IFQ fisheries was 646.74 mt and total catches have been around 1,676.5 for BSAI and GOA combined, therefore there is no indication that overfishing is occurring although the 2014 stock assessment could not conclude if the stock is overfished, because of unreliable survey biomass estimates.

Management

Sharks are currently managed under the “other species” complex (Pacific sleeper, salmon, spiny dogfish and other unidentified sharks) in the BSAI FMP on a biennial basis. In the GOA, Spiny Dogfish are managed separately as a modified Tier 6 species (random effects model) biomass estimate while the “other species” complex (Pacific sleeper, salmon, and other unidentified sharks) is managed with a traditional Tier 6 (status quo 3-survey average) biomass estimate (Tribuzio *et al.* 2015).

Information

Information on the stock status of shark species is collected through both fishery dependent and fishery independent mechanisms, including the fishery independent surveys, catch accounting system, and observer program. More detail is provided in “Source of Information” section (Above).

There are three sources of information on sport harvest: (1) the ADF&G state-wide harvest survey (SWHS) provides estimates of catch (harvest plus released fish) and harvest (fish kept) of all shark species combined, in numbers of fish, (2) the mandatory charter logbook provides estimates of state-wide charter harvest of salmon sharks (numbers of fish) since 1998, and (3) dockside monitoring in the Southcentral Region obtains reported harvest and release and biological information for spiny dogfish, salmon shark, and Pacific sleeper shark.

Species: Grenadiers (Giant Grenadier, Pacific Grenadier)

Biology

Grenadiers (family *Macrouridae*) are deep-sea fishes related to hakes and cods that occur world-wide in all oceans. Also known as “rattails”, they are especially abundant in waters of the continental slope, but some species are found at abyssal depths. At least seven species of grenadier are known to occur in Alaskan waters, but only three are commonly found at depths shallow enough to be encountered in commercial fishing operations or in fish surveys: giant grenadier (*Albatrossia pectoralis*), Pacific grenadier (*Coryphaenoides acrolepis*), and popeye grenadier (*Coryphaenoides cinereus*) (Mecklenburg *et al.* 2002). Of these, giant grenadier has the shallowest depth distribution, overlapping primarily with the sablefish distribution, and the largest apparent biomass, and hence is by far the most frequently caught grenadier in Alaska (Rodgveller and Hulson 2014). Likely, most grenadier caught in this fishery is on trips targeting both sablefish and halibut (NOAA CAS 2015).

Giant grenadier range from Baja California, Mexico around the arc of the north Pacific Ocean to Japan, including the Bering Sea and the Sea of Okhotsk (Mecklenburg *et al.* 2002), and they are also found on seamounts in the Gulf of Alaska and on the Emperor Seamount chain in the North Pacific (Clausen 2008). In Alaska, they are especially abundant on the continental slope in waters >400 m depth.

Adults are often found in close association with the bottom, as evidenced by their large catches in bottom trawls and on longlines set on the bottom. In bottom trawl surveys conducted by NMFS in the Bering Sea and the Gulf of Alaska, this species is the most abundant fish, in terms of weight, in depths from 600 to 3,000 feet (200-1,000 meters). Giant grenadier extend much deeper than 3,000 feet (1,000 meters). Ageing studies have revealed that the species group is long-lived with the max age 58 and females not reaching 50% maturity until 23 years. Further, observed catch is mostly female. Giant grenadier have an important ecological role in their environment as an apex predator, with few apparent predators except the Pacific Sleeper Shark, Baird's Beaked Whale (Orlov and Moiseev 1999; Walker *et al.* 2002), and Sperm Whales which have been observed depradating on longline catches. In the Aleutian Islands, the diet comprised mostly squid and bathypelagic fish (myctophids), whereas in the Gulf of Alaska, squid and pasiphaeid shrimp predominated as prey. The habitat and ecological relationships of giant grenadier are relatively unknown and uncertain (Rodgveller and Hulson 2014).

Status

Due to a lack of necessary information, NMFS cannot establish a minimum stock size threshold from which to determine whether grenadier species complex (a Tier 5 stock) are overfished or approaching an overfished condition; however, on annual basis, NMFS can determine whether overfishing is occurring for tiers 4 and 5 stocks. The Alaska Fisheries Science Center estimates the grenadier species complex OFL in the annual Tier 5

stock assessment. For 2015, the maximum allowable ABC for the BSAI is 75,274 t and for the GOA is 30,691 t (Table 14). This ABC is a 12% increase for the BSAI and a 12% decrease for the GOA. The majority of this catch occurs in the sablefish longline fishery which comprised an average of 6,281.56 mt for fishing seasons 2013-2014. The halibut longline fishery accounted for an additional 643.33 mt of grenadier bycatch, although this was likely caught on trips that targeted both sablefish and halibut, because giant grenadier are rarely at the depth fished for halibut. The inclusion of giant grenadier bycatch is a result of the artifact that the catch accounting system designates halibut v. sablefish trips based on the total poundage of species landed, meaning even if a trip targeted sablefish but landed more halibut, the CAS would reflect a species composition more characteristic of a sablefish trip. Overfishing is not occurring in either the BSAI or GOA. Grenadiers catch is well below OFL and ABC and thus not subject to overfishing and there is no indication that grenadier are overfished or approaching an overfished condition (Rodgveller and Hulson 2014).

Table 14. Tier 5 computations for giant grenadier OFL and ABC are summarized as follows (AI = Aleutian Islands, EBS = Eastern Bering Sea, GOA = Gulf of Alaska; biomass, OFL, and ABC are in mt) for 2015 (Rodgveller and Hulson 2014).

BSAI and GOA grenadiers

Area	Biomass	Natural mortality *M*	OFL definition	OFL	ABC definition	ABC
EBS	553,557	0.078	biom x *M*	43,177	OFL x 0.75	32,383
AI	733,177	0.078	biom x *M*	57,188	OFL x 0.75	42,891
BSAI total	1,286,734			100,365		75,274
GOA	524,624	0.078	biom x *M*	40,921	OFL x 0.75	30,691
Grand total	1,811,358			141,286		105,965

These are unofficial ABC and OFL values since grenadier are an Ecosystem Component, which do not have ABCs or OFLs.

Management

Traditionally grenadiers have not been included in the BSAI and GOA Groundfish FMPs, despite the high level of bycatch in the longline fishery. The North Pacific Fishery Management Council recently adopted a Preliminary Preferred Alternative (PPA) to include grenadiers in the Ecosystem Component of the FMPs. Species or species groups can be included and considered in the Ecosystem Component if they are:

1. A non-targeted species or species group;
2. Not subject to overfishing, overfished, or approaching an overfished condition;
3. Not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and
4. Not generally retained (a small amount could be retained) for sale or commercial use.

Under the PPA, NMFS will establish record-keeping and reporting requirements for grenadiers, and grenadiers would be closed to “directed fishing.” Further, Maximum Retainable Amount of grenadiers as an incidental catch species would be established and limit grenadier retained catch to 8% (NPFMC 2014). These measures improve catch estimation, thereby helping to reduce scientific uncertainty, as well as preventing “unmanaged

target fishing" of grenadiers. This Council action provides management measures necessary to reduce the vulnerability of grenadiers to overfishing as an incidental catch species (NMFS 2013). FMPs may be reviewed by the Council to determine whether changing conditions have changed the applicability of the "ecosystem component" species classification criteria for a species. If viable markets for grenadiers can be developed then the "not generally retained for sale or personal use" and possibly the "a non-targeted species or species group" criteria may no longer be valid (NMFS 2013). If dramatically increased catch were to occur in the future then the "not subject to overfishing and/or overfished" criteria may no longer be valid. If such changes in criteria become a future concern the Council could initiate analysis of whether grenadiers meet the criteria for being reclassified as "in the fishery."

Information

Information on the stock status of grenadier species is collected through both fishery dependent and fishery independent mechanisms, including the fishery independent surveys, catch accounting system, and observer program. More detail is provided in Sources of Information (Above).

While little is presently known about the interactions of grenadiers with other groundfish species, the PPA (discussed above) may improve the level of scientific knowledge through, at a minimum, recording of their harvest and/or placing limits on their harvests. Thus, PPA does provide the precautionary management structure needed to sustainably manage the grenadier stock to potentially promote its sustainability and the sustainability of other groundfish species with which grenadier may have important ecological interactions.

The North Pacific Fishery Management Council has identified several research priorities (Rodgveller and Hulson 2014) for this species complex that include:

a. Because early life history information for giant grenadier is nil, studies are also needed to investigate where larvae and young juveniles reside.
b. Evaluation of the catchability of giant grenadier in the bottom trawl surveys, which would affect the accuracy of subsequent biomass estimates. Studies are needed on whether this fish is a completely benthic species or if individuals sometimes move off-bottom.
c. Validation of the AFSC Research Ecology and Fisheries Management (REFM) Division aging methodology for giant grenadier.
d. Further analysis and study of competition for hooks that may affect giant grenadier catch rates on the AFSC longline survey.
e. Continue a study to examine if the three different shapes of otoliths found in giant grenadier.
f. Represent separate species or subpopulations. This is an ongoing cooperative project between the Marine Ecology and Stock Assessment program at Auke Bay Laboratories (ABL), REFM Age and Growth Lab, and the ABL genetics lab.

Species: Seabirds (Black-footed albatross, Laysan albatross)

Biology

The main breeding colonies of the black-footed albatross (*Phoebastria nigripes*) are located in the Northwest Hawaiian Islands. They also breed on small, remote islands in Japan, and there have been reports of new black-footed albatross breeding colonies in Mexico. They utilize sandy, wind-swept beaches for their nesting sites. Outside the breeding season, the black-footed albatross is an open ocean species. They are most commonly

seen over shelf breaks and along boundaries between water masses. The average age of sexual maturity for black-footed albatross is 7. The black-footed albatross is a surface feeder. It forages by surface-seizing, contact dipping, and scavenging. Its primary prey species include squid, fish, and other invertebrates (Cousins and Cooper 2000)

Laysan Albatrosses (*Phoebastria immutabilis*) breed primarily in the Hawaiian Islands, but they inhabit Alaskan waters during the summer months to feed. In the U.S., Laysan Albatross nesting is limited to islands in the Hawaiian Archipelago. Colonies also exist on the Bonin Islands in Japan and on Guadalupe Island off the coast of Baja California. Between July and November, Laysan Albatrosses disperse widely throughout the North Pacific Ocean and adjoining seas. In Alaska, they are most commonly seen in the southern Bering Sea, Aleutian Islands, and the northwestern Gulf of Alaska. They are the most abundant of the three albatross species that visit Alaska. Laysan Albatrosses live from forty to sixty years and are capable of breeding annually. This species eats mostly fish, fish eggs, and squid often feeding at night when the prey rises to the surface. They also feed on fish waste disposed of by fishing vessels (Pittman *et al.* 2004)

Status

For both species, the current primary threat is incidental catch in pelagic longlining (Naughton *et al.* 2007), taking 5,000 black-footed and 2,000 Laysan albatrosses annually. Thus, the rate of albatross kills in the demersal longline fishery represents a much smaller threat than these types of fisheries (Table 15). Both species were heavily depleted in the late 1800's / early 1900s by feather hunting but have been rebounding in recent years (Arata *et al.* 2009).

For black-footed albatross, the observed nest counts in the Hawaiian breeding colonies indicate a stable population of 61,000 breeding pairs (Arata *et al.* 2009). Additionally, recent surveys of black-footed albatross nesting pairs at Midway came in at 28,610 for the atoll, a record high, up 18% from the 2010-2014 average (USFWS 2015b). The IUCN population status was recently changed from "endangered" to "near threatened" owing to the increases in population, but continued concern relating to sensitivity to fishing (BLI 2014). Overall, pelagic longline and gillnet have been the most important source of incidental mortality for black-footed albatrosses (Naughton *et al.* 2007). The Potential Biological Removal Level (PBR—the maximum number of mortalities, not including natural deaths, while maintaining an optimum sustainable population) is 11,980 (Arata *et al.* 2009). Matrix modeling results indicate that the black-footed albatross population, summed across all three colonies, is stable, or slightly increasing, with a population growth rate of 0.3 percent per year. The 2005 estimate of bycatch is 5,228 birds per year, but if this value is doubled, a safeguard for underestimating bycatch, it approaches the PBR of 11,980 birds per year, although the upper 95-percent confidence limit (17,486) exceeds the PBR (Arata *et al.* 2009). Other threats to black-footed albatross include sea level rise, invasive plant species on nesting island and atolls, and marine pollution. In 2013 and 2014, the halibut fishery took an estimated average of 71.79 birds/year representing a small portion of the overall incidental take.

For Laysan albatross, pre-hunting breeding population size was as high as 2 million pairs, but was reduced to 18,000 breeding pairs by the early1920's. 2015 surveys reveal that the number of breeding pairs far surpassed any previous documented year for nesting Laysan albatross on Midway Atoll with 666,044 pairs recorded. The current year count for Laysan albatross represents a 52% increase over the average number for the period from hatch years 2010 to 2014 (USFWS 2015b). The population appears to be increasing at a rate of 6.7%/year. IUCN has also recently changed the designation of Laysan albatross from "vulnerable" to "near threatened" (BLI 2013). Like the black-footed albatross, incidental kills in pelagic longlining are deemed the principal threat but

other threats include sea level rise, invasive plant species on nesting island and atolls, and marine pollution. Matrix models developed from stage specific demographic parameters and including bycatch mortality in fisheries suggest that current estimates of bycatch levels (2,500/year) can be sustained by the population without causing population decreases, and consequently Arata *et al.* (2009) conclude that longline fishing does not appear to be threatening the long-term viability of Laysan albatross. In 2013 and 2014, the halibut fishery took an estimated average of 16.34 birds/year representing a small portion of the overall take.

Table 15. Total and average seabird bycatch in Alaskan demersal Pacific halibut fishery, 2013-2015. Data in 2015 are through October 30, 2015. Numbers are bird count in individuals. Data provided by Shannon Fitzgerald at AFSC

		Species/Species Group							All
	FMP	BFAL	LAAL	NOFU	Shear	Unid/Other	Gull Sp	Total	Alaska
Sum across years	AI	19	17	0	0	10	7	53	570
	BS	10	16	0	0	9	6	41	
	GOA	114	24	80	0	0	258	476	
	All FMP's	143	57	80	0	19	271		
Avg. across years	AI	6.3	5.7	0.0	0	3.3	2.3	17.7	190.0
	BS	3.3	5.3	0.0	0	3.0	2.0	13.7	
	GOA	38.0	8.0	26.7	0	0.0	86.0	158.7	
	All FMP's	47.7	19.0	26.7	0	6.3	90.3		

Management

In Alaska and Washington (implemented Dec. 2015), longline vessels >55' fishing groundfish are required to use streamer lines that have been demonstrated to markedly reduce seabird mortality. The adoption of these measures has reduced seabird takes by one-third (Fitzgerald *et al.* 2008), and albatross takes by 85% (Fitzgerald *et al.* 2008). Several other voluntary methods for reducing seabird bycatch are also used by fishers including setting at night, using weights on gear to decrease sink time, offal discharge regulations, and under water setting tubes. Although reductions in seabird catch have been significant in the last several years, some seabirds are still caught in the halibut fishery.

Information

Information on the stock status of bird species is collected through both fishery dependent and fishery independent mechanisms, including the fishery independent surveys, catch accounting system, and observer program. More detail is provided in Overview of Non-target Catch (Above). Also, Laysan and Black-footed albatross population trends are monitored through nest surveys on breeding colonies, principally on three islands in the Hawaiian archipelago. These colonies account for 97% and 77% of the total breeding population for Laysan and Black-footed albatross, respectively.

Endangered, Threatened and Protected (ETP) Species

Species: Short-tailed Albatross

Biology

Short-tailed albatross (*Phoebastria albatrus*) are large (body length 33 to 37 inches; wingspan 84 to 90 inches) pelagic birds in the order *Procellariiformes* (tube-nosed marine birds; USFWS 2008). Short-tailed albatross are long-lived and first breed at age five or six years, with females laying one egg each year (USFWS 2008). Nesting areas are open and treeless, with little vegetation. Most of the birds breed at the Tsubamezaki colony on Torishima Island, which is an active volcano.

In the non-breeding season, short-tailed albatross primarily range along the continental shelf and slope regions of the North Pacific (Figure 8), possibly due to the presence of squid, which are an important prey species (Figure (Suryan *et al.* 2006, Walker *et al.* 2015, *in press*). A predominate amount of post-breeding time is spent off Alaska, and large groups have been observed over the Bering Sea canyons, which serve to funnel water and food onto the shelf edge (Piatt *et al.* 2006). Short-tailed albatross are also more active during the day than night (Suryan *et al.* 2007, as cited in USFWS 2008).

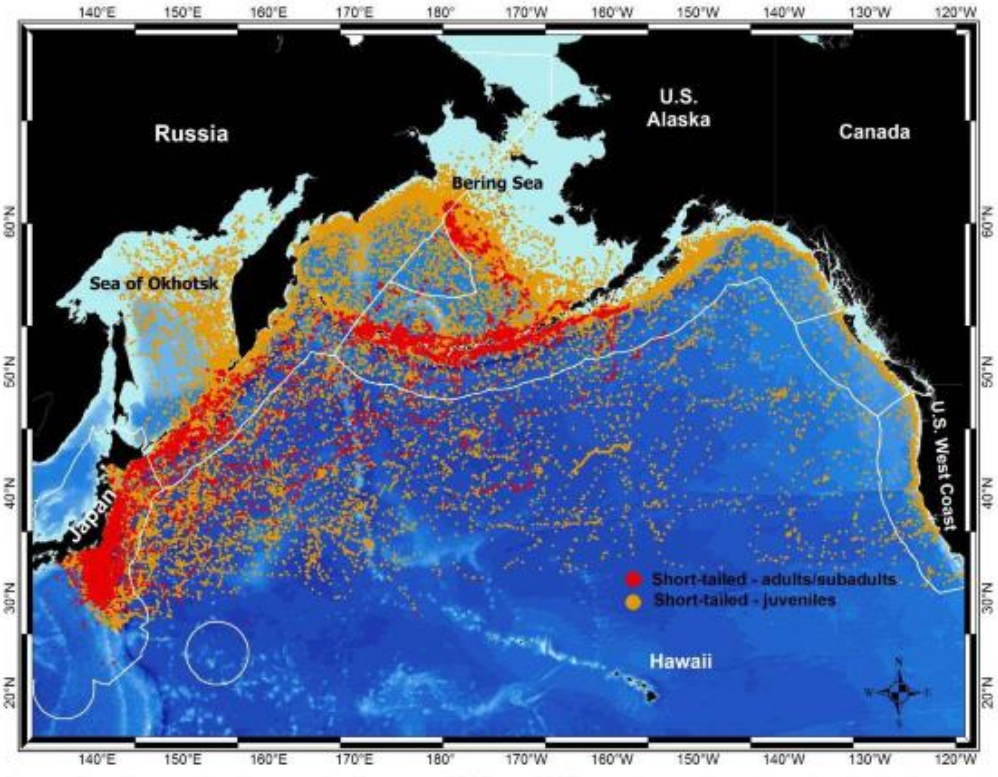


Figure 8. Short-tailed albatross locations tracked between 2002 and 2012, showing adult and juvenile distributions in the North Pacific. Where shown, white lines represent the exclusive economic zones of countries within the range of the short-tailed albatross (USFWS 2014).

Status

At the beginning of the twentieth century, the species declined to near extinction, primarily as a result of hunting at the breeding colonies in Japan. Although population estimates of short-tailed albatross before exploitation are not known, there are estimates of at least 300,000 breeding pairs on the island of Torishima, Japan alone (USFWS 2008). Historically, albatross were killed for their feathers and various body parts, and eggs

were collected for food (USFWS 2008). Starting in about 1885, the feather trade contributed to the decline and near extinction of the short-tailed albatross.

Originally numbering in the millions, the worldwide population of breeding age birds is estimated to be approximately 1,928 individuals and the worldwide total population is approximately 4,354 individuals (USFWS 2014; the population was estimated at 400 in 1988, 700 in 1994). The current population status was recently reviewed in detail by USFWS (2014), which stated "The 3-year running average population growth rate based on eggs laid at Torishima since 2000 ranges from 5.2 - 9.4 percent." There was a translocation effort at Mukojima in the Ogasawara (Bonin) Islands from 2008-2012 and early accounts seem promising. Additionally, a pair of short-tailed albatross at Midway Atoll in the Northwestern Hawaiian Islands has successfully bred during three seasons (USFWS 2014).

Management

The incidental take levels of short-tailed albatross (2 birds/2 years) have not been exceeded during the current or any previous Biological Opinions. However, in 2014, NMFS confirmed that two short-tailed albatross were taken by one vessel in the AK Pacific cod hook and line fishery. These represented the second take of short-tailed albatross in a two-year period and resulted in a re-initialization of the Biological Opinion for the groundfish fleet. The revised final Biological Opinion issued by the USFWS determined that activities by the North Pacific groundfish fleet are not likely to jeopardize the continued existence of the short-tailed albatross (USFWS 2015) however, this biological opinion did not address impacts from the halibut longline fishery, although due to the spatial distribution of fishing effort it is highly unlikely that the halibut fishery poses detrimental impacts to the recovery of the short-tailed albatross populations.

All longline vessels >55' are required to use seabird avoidance devices (Figure 9) that have been demonstrated to markedly reduce seabird mortality. The adoption of these measures has reduced seabird takes by one-third (Fitzgerald *et al*. 2008), and albatross takes by 85% (Fitzgerald *et al.* 2008). Several other methods for reducing seabird bycatch are also used by fishers including setting at night, using weights on gear to decrease sink time, offal discharge regulations, and under water setting tubes. Although reductions in seabird catch have been significant in the last several years, some seabirds are still caught in the halibut fishery.

If a short-tailed albatross is hooked and there is a fisheries observer on board the vessel, the observer will report the short-tailed albatross take to NMFS. The USFWS will be notified of the take within 48 business day hours. If there is not an observer on board the vessel, NMFS requests that the albatross specimen be retained and reported immediately to NMFS or USFWS (NMFS 2015). For unidentified albatross species categories, seabird biologists will contact and interview the observer within a day to determine if the unidentified seabird was a short-tailed albatross (Ed Melvin, *pers com*).

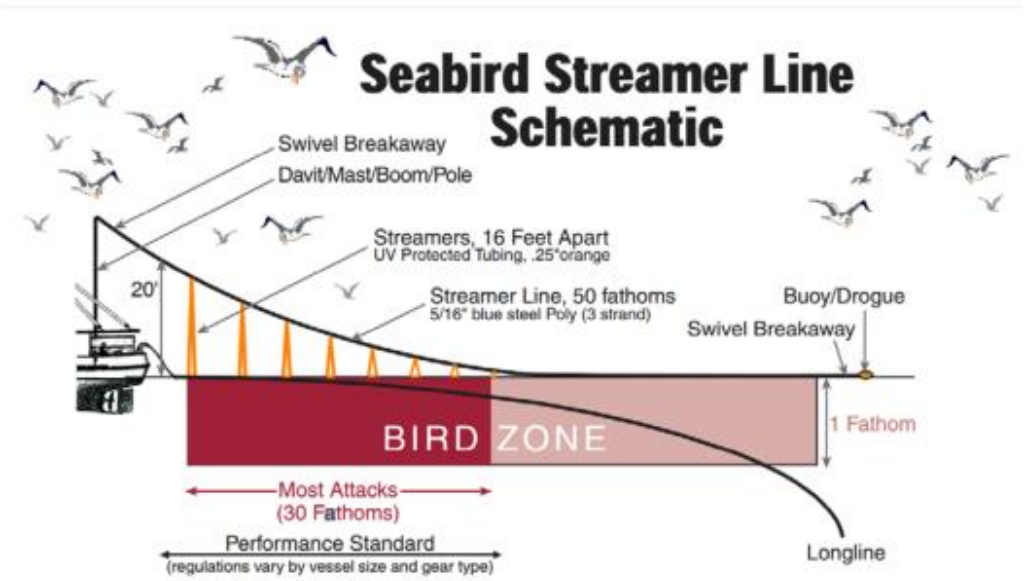


Figure 9. Streamer lines used to reduce seabird bycatch in hook-and-line fisheries (Melvin 2000).

Information

The Observer Program monitors fish, bycatch, and marine mammal and seabird interactions in Alaska's federally managed groundfish fisheries and parallel groundfish fisheries in State waters. The Observer Program also monitors catch of halibut allocated under the IFQ and CDQ Program. Information collected by observers, used in conjunction with reporting and weighing requirements, provides the foundation for in season management and for tracking species-specific catch and bycatch amounts. All observers entering the Observer Program receive training on seabird data collection responsibilities and how to identify dead seabirds, as well as specific information for the identification of species of interest including short-tailed albatross, red legged kittiwake, Steller's and spectacled eiders, and marbled and Kittlitz's murrelets (AFSC 2015). This training is provided during their initial 3-week certification course. Each subsequent year, observers receive a briefing before their first deployment that reviews seabird data collection and identifications (NMFS 2015f).

NMFS has estimated seabird bycatch using CAS in the BSAI and GOA groundfish fisheries since 2007 and in the halibut fisheries since 2013 (Fitzgerald *et al.* 2013). Seabird estimates are based on at-sea sampling by observers (AFSC 2015). In the CAS, observer data are used to create seabird bycatch rates (a ratio of the estimated bycatch to the estimated total catch in sampled hauls). The observer information from the at-sea samples is used to create bycatch rates that are applied to unobserved vessels. For trips that are unobserved, the bycatch rates are applied to industry supplied landings of retained catch. Expanding on the observer data that are available, the extrapolation from observed vessels to unobserved vessels is based on varying levels of aggregated data (post-stratification). Data are matched based on processing sector (e.g., CP or CV), week, target fishery, gear, and Federal reporting area (NMFS 2015).

Washington

Species: Yelloweye Rockfish

Biology

Yelloweye rockfish (*Sebastes ruberrimus*) are distributed in the northeastern Pacific Ocean from the western Gulf of Alaska to northern Baja California (Hart 1973, Love *et al*. 2002). Yelloweye are strongly associated with rocky bottom types, especially areas of high-relief such as caves and large boulders (Love et al. 2002). Mainly solitary, it is widely believed that yelloweye are very sedentary after settlement, with adults moving only short distances during their entire lifetime. They are long-lived (the oldest observed age is 147 years, from Washington in 2005), late-maturing and slow growing. Adult yelloweye are piscivorous predators eating most small pelagic and groundfish species as available.

Status

The coast-wide abundance of yelloweye rockfish is estimated to have dropped below the SB40% management target in 1988 and the overfished threshold in 1994. During 2002-2010, the total cumulative estimated yelloweye mortality (130 mt) represented only 69% of the summed ACLs and only 39% of the summed OFLs for that period. The total 2010 catch (11.4 mt) is just 3% of the peak annual catch that occurred in the early 1980s. These catch levels represent a 95% reduction from average catches observed in the 1980s and 1990s. Since 2002, the total 8-year cumulative catch (130 mt) has been only 69% of the sum of the ACLs for 2002-2010 and only 39% of the sum of the OFLs for that period. Yelloweye rockfish are caught coastwide in all sectors of the fishery. Yelloweye are particularly vulnerable to hook-and-line gears, including Halibut longlines, which are effective in the high relief habitats yelloweye reside. In aggregate, all sources of removals have been below both the OFL and ACL set for each year. The yelloweye population residing in the waters of Puget Sound is thought to be isolated from coastal waters and this stock was proposed for listing under the Endangered Species Act with the result that the stock was considered distinct and proposed to have threatened status. While halibut longline operations have historically been a large source of Yelloweye bycatch, the current management measures are effectively limiting the impact of these fisheries on the rebuilding plan.

Management

Before 2000, yelloweye rockfish were managed as part of the Sebastes Complex, which included all Sebastes species without individual assessments, OFLs and ACLs (Previously termed ABCs and OYs but referred to under the current terms from here forward). In 2000, the Sebastes Complex was divided into three depth-based groups (for areas north and south of 40° 10’ N. latitude), and yelloweye rockfish were managed as part of the minor shelf rockfish group until 2002. Since then, there has been species-specific management, and total catch has been below both the OFL and ACL for yelloweye each year. These catch levels represent a 95% reduction from average catches observed in the 1980s and 1990s (Taylor and Wetzel 2011). Managers have constrained catches by eliminating all retention of yelloweye rockfish in both commercial and recreational fisheries, instituting broad spatial closures (some specifically for moving fixed-gear fleets away from known areas of yelloweye abundance), and creating new gear restrictions intended to reduce trawling in rocky shelf habitats and the coincident catch of rockfish in shelf flatfish trawls. Critical habitat was designated for yelloweye rockfish, canary rockfish, and bocaccio in the Puget Sound/ Georgia Basin in November 2014. Depth management is the main tool used for controlling yelloweye rockfish fishing mortality in the Washington and Oregon recreational fisheries.

Information

Data for yelloweye rockfish are relatively sparse, especially regarding current trends. Historical catches are also uncertain, as yelloweye comprise a small percentage of overall rockfish removals and actual species-composition samples are infrequently available for historical analyses. In Alaska, sport harvest is estimated through the statewide harvest survey, creel sampling, and the charter logbook program. While there remain uncertainties with respect to recreational catches of yelloweye, it does not represent a substantial concern for the rebuilding plan (Taylor 2011). The following research topics were suggested in the 2009 assessment and are repeated here with minor modifications and additions. Progress on these points could improve the ability of this

assessment to reliably model the yelloweye rockfish population dynamics in the future and provide better monitoring of progress toward rebuilding:

1. Develop and implement a comprehensive visual survey.
2. Do a scientific review of current efforts to develop and improve stock size indices for yelloweye based on IPHC (including additional stations) and make recommendations on the best approaches to develop such indices.
3. Explore a recalculation of GLMM estimates in the IPHC survey that explores station effects which allows inclusion of stations that differ over time.
4. Investigate the development of a WA recreational yelloweye CPUE based on the recreational halibut fishery. Consider a full time series and one ending in 2002, since the yelloweye RCA in waters off northern WA was implemented in 2003.
5. Encourage the collection of samples to refine the estimate biological parameters, particularly maturity and fecundity.
6. Continue to evaluate the spatial aspects of the assessments, including growth, the number and placement of boundaries between areas, as well as the northern boundary with Canada.
7. Investigate alternative ways of re-weighting. This issue is relevant for all west coast stock assessments.
8. Investigate how best to account for the variability in dates in trawl surveys through a meta-analysis. This issue is relevant for all west coast stock assessments.
9. Conduct a historical catch reconstruction for WA to match those produced for OR and CA. This issue is relevant for all west coast stock assessments.
10. Access and processing of recreational data (catch and biological sampling) currently entails differing locations and formats for data from each of the three states and RecFIN. RecFIN is difficult to use and estimates from it don't match the total mortality estimates also provided by the state agencies. A single database that holds all raw recreational data in a consistent format would reduce assessment time spent on processing these data and potential introduction of errors or alternate interpretations due to processing.
11. The IPHC data organization should be revisited. Currently biological samples cannot be linked to the station from which they were collected. Age data for 2003-2005 is disconnected from length and sex information and other unknown issues may persist in these data. A thorough evaluation of what data are reliable and a final determination of what information is lost, or can potentially be recovered, is needed.
12. Instigate discard sampling of yelloweye bycatch in the directed Pacific halibut fishery.
13. Different trends in CPUE of yelloweye in the CA recreational fishery have been identified. CPUE by port from 1980 to 2000 should be analyzed using clustering methods to identify regions with a similar demographic trajectory. This could lead to improvements in management of the stock as well as possibly inform refinements of the spatial structure of future assessment models.

Emerging topics

Since 2014, sperm and orca whale depredation has increasingly been observed in the Bering Sea, Aleutian Islands, and Western Gulf of Alaska on halibut and sablefish longline sets (Peterson *et al.* 2015). While there is no indication that this depredation is having a negative effect on these marine mammal populations, and no

interactions have resulted in animal mortality, fishers and resource managers are taking steps to limit interactions with animals to reduce costs from lost fish. The IPHC includes estimates of halibut catch due to depredation and has modified its longline survey to reduce bias due to depredation. Fishers communicate with one another to avoid deploying or retrieving gear when whales are present. Additionally, research by industry and academic partners is investigating mitigation measures to further reduce interactions, including using real time satellite tags, acoustic decoy techniques, and video cameras to better understand how whales and orca depredate on fishing gear. Currently, this trend in depredation does not have any implications on scoring in the MSC system; however, future assessments should continue to consider depredation in light of its overall impact of removals from the fishery, potential for negative impacts on ETP species, indirect impacts on ETP species trophic dynamics, and changes in fishing behavior.

Habitat Impacts

Status

Halibut longlining is generally thought to have minimal impacts on the seafloor relative to other types of gear, but can impact corals by entangling and dislodging them (as evidenced by coral bycatch, Livingston 2003). The most important corals in Alaska waters are gorgonians, scleractinians and soft corals (*Gersemia* sp.). The distribution of corals has been assessed through NOAA trawl survey catch rates (Heifetz *et al.* 2002) and via smaller scale submersible surveys / observations (McConnaughey *et al.* 2009; Stone 2006). Identifying trends in these corals is difficult because they are encountered infrequently (Martin 2009), but nonetheless no discernible trend in gorgonians or scleractinians are apparent (Martin 2009). Areas of high coral density areas (coral gardens) have been identified, some in SE Alaska but most in the Aleutian Islands.

Longline gears can have an impact on certain sensitive habitat as evidenced by limited underwater observations (Livingston 2003). The actual capture of gorgonian and stony corals, as examples, has been verified by commercial fisheries observers and NMFS surveys (NOAA CAS 2015). Damage can be caused to corals, sponges, and some other sessile organisms by hooking, by crushing and plowing by pots and anchors, and from shearing by groundlines upon retrieval. From limited studies conducted in Alaska and global fisheries, a large proportion of longline gear is set on soft substrate where effects are considered negligible (Heifetz et al. 2009; Pham *et al.* 2014). The direct impacts from the Pacific halibut fleet have not been investigated, although research was recently conducted to assess these impacts.

Management

Alaska

There is a strategy in place for managing the impact of the fishery on coral habitats which consists of (1) closing coral garden sites to all bottom-contact fishing in the Aleutian Islands and (2) closing coral garden sites in SE Alaska to bottom-contact fishing gears; (3) monitoring trends in relative abundance via the NOAA-Fisheries trawl surveys. There is a transparent criterion for identifying and classifying habitats as “Habitat Areas of Particular Concern” (HAPC) on the basis of rarity, ecological importance, sensitivity and level of disturbance (NPFMC 2010b). Coarse grain habitat mapping is already available and on-going efforts are seeking to provide finer grained, depth and habitat-specific information by sharing platforms with AFSC survey and NOAA vessels (AFSC 2008).

Additionally, six Habitat Conservation Zones with especially high density coral and sponge habitat were closed to all bottom-contact fishing gear (longlines, pots, trawls) in 2005 (Figure 10). These “coral garden” areas total 110 nm2 and function as *de facto* marine reserves. To improve monitoring and enforcement of the Aleutian Island

closures, a vessel monitoring system is required for all fishing vessels in the Aleutian management area. In Southeast Alaska, three sites with large aggregations ("thickets") of long-lived *Primnoa* coral are also identified as HAPCs. These sites, in the vicinity of Cape Ommaney and Fairweather grounds, total 67 nm^2. The Gulf of Alaska Coral Habitat Protection Area designates five zones within these sites where submersible observations have been made, totalling 13.5 nm^2. All bottom-contact gear (longlines, trawls, pots, dinglebar gear, etc.) is prohibited in this area (Table 16).

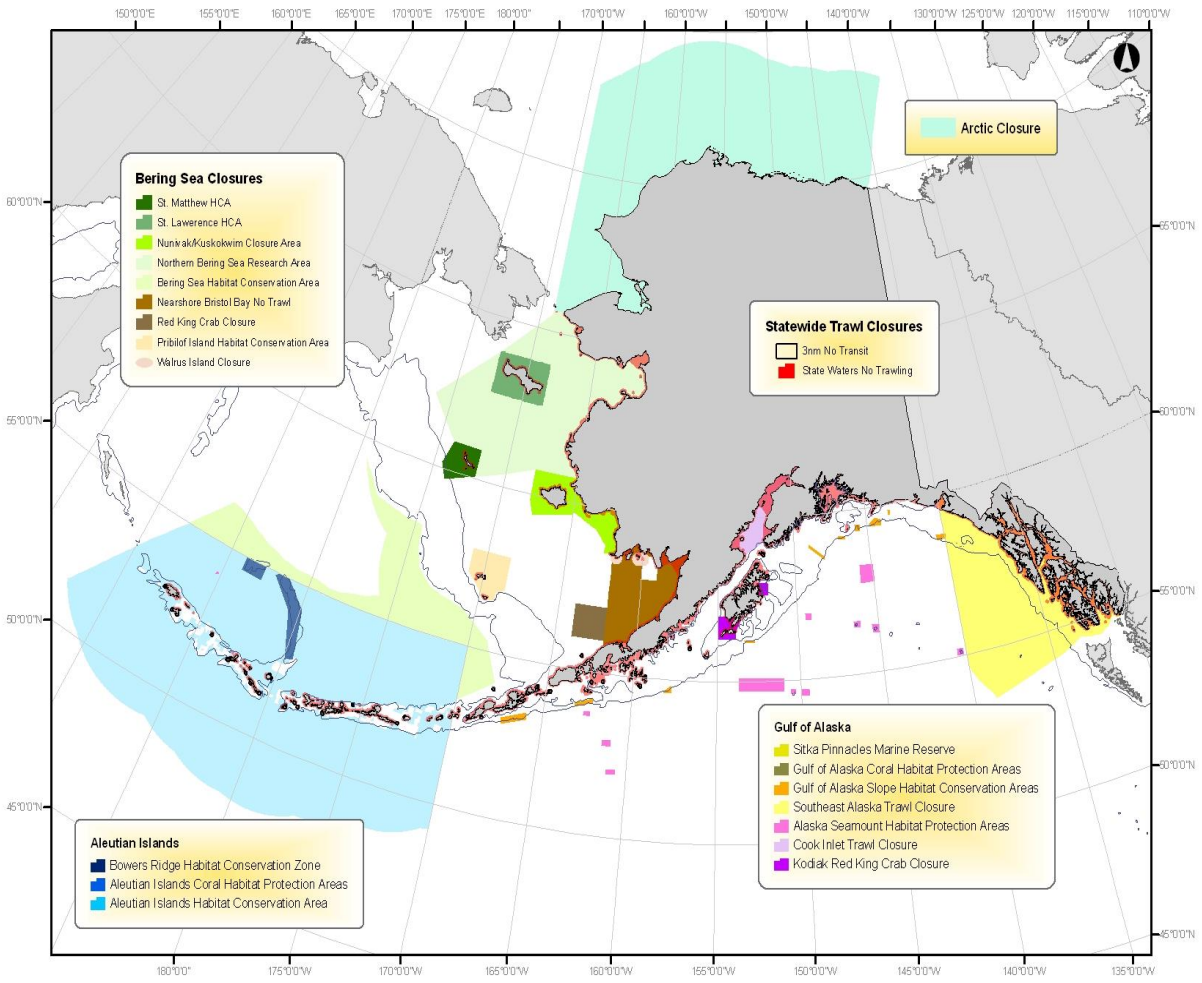


Figure 10. Map of existing habitat, species, and gear closures in Alaskan Waters. Source: NPFMC 2015. Available at: http://www.npfmc.org/habitat-protections/

Table 16. Habitat areas of particular concern descriptions and regulations Source: NMFS 2015. Available at: https://alaskafisheries.noaa.gov/sites/default/files/hapc_ak.pdf

HAPC	Individual HAPC's	Total Area Size	Fishery Management Application	Specific Regulation
Alaska Seamount Habitat Protection Areas	Dickens Seamount Denson Seamount Brown Seamount Welker Seamount Dall Seamount Quinn Seamount Giacomini Seamount Kodiak Seamount Odessey Seamount Patton Seamount Chirikof & Marchand Seamounts Sirius Seamount Derickson Seamount Unimak Seamount Bowers Seamount	5,300 nm^2	No federally permitted vessel may fish with bottom contact gear[i]. 50 CFR 679.22(a)(12)	Federal Register 50 CFR Part 679 Volume 71, No.124 Wednesday, June 28,2006 http://www.fakr.noaa.gov/frules/71fr36694.pdf
Bowers Ridge Habitat Conservation Zone	Bowers Ridge Ulm Plateau	5,330 nm^2	No federally permitted vessel may fish with mobile bottom contact gear [ii]. 50 CFR 679.22(a)(15)	Same as above
Gulf of Alaska Coral Habitat Protection Areas	Cape Ommaney 1 Fairweather FS1 Fairweather FS2 Fairweather FN1 Fairweather FN2	14 nm^2	No federally permitted vessel may fish with bottom contact gear [iii]. 50 CFR 679.22(b)(9)	Same as above
Gulf of Alaska Slope Habitat Conservation Areas	Yakutat Cape Suckling Kayak Island Middleton Island east Middleton Island west Cable Albatross Bank Shumagin Island Sanak Island Unalaska Island	1,892 nm^2	No federally permitted vessel may fish with nonpelagic trawl gear [iv]. 50 CFR 679.22(b)(10)	Same as above
Skate Nursery Areas	Bering 1 Bering 2 Bristol Pribilof Zhemchug Pervenets	81.7 nm^2	Monitoring Priority	Federal Register Vol. 80, No.6 Friday, January 09, 2015 http://alaskafisheries.noaa.gov/frules/80fr1378.pdf

[i] Bottom contact gear means nonpelagic trawl, dredge, dinglebar, pot, or hook-and-line gear http://alaskafisheries.noaa.gov/regs/679a2.pdf.
[ii] Mobile contact gear means nonpelagic trawl, dredge, or dinglebar gear http://alaskafisheries.noaa.gov/regs/679a2.pdf.
[iii] See footnote i.
[iv] Nonpelagic trawl means a trawl other than a pelagic trawl. http://alaskafisheries.noaa.gov/regs/679a2.pdf

All fishery management plans include a description and identification of essential fish habitat (EFH), adverse impacts, and actions to conserve and enhance habitat. Maps of essential fish habitat areas are used for understanding potential effects of proposed development and other activities. Each FMP contains the following EFH components: EFH identification and description for managed species, fishing and non-fishing activities that may adversely affect EFH, conservation and enhancement recommendations for EFH, and research and information needs. The EFH provisions in each FMP must be reviewed, and if appropriate, revised, every 5 years.

Washington

The Pacific Fishery Management Council (PFMC) has developed documents that describe and map EFH, and suggest management measures to reduce impacts from fishing and non-fishing activities, for coastal pelagic species, salmon, groundfish, and highly migratory species. The Council uses fishing gear restrictions, time and area closures, harvest limits, and other measures to lessen adverse impacts on EFH (PFMC 2005). When doing so, the Council considers whether the fishing activity is harming the habitat, the nature and extent of the damage, and whether management measures can be enforced. The Council also considers the long-term and short-term costs and benefits to the fishery, fishing communities, and the habitat.

To identify EFH for groundfish, NMFS developed a GIS-based assessment model that looked at the occurrence of groundfish in relation to depth, latitude, and substrate type. Ultimately the Council identified groundfish EFH as all waters from the high tide line (and parts of estuaries) to 3,500 meters (1,914 fathoms) in depth. HAPCs are a subset of EFH used to focus management and restoration efforts. The Council identified six HAPC types. The current HAPC types are: estuaries, canopy kelp, seagrass, rocky reefs, and “areas of interest” (a variety of submarine features, such as banks, seamounts, and canyons, along with Washington State waters.) (PFMC 2005)

In addition to identifying EFH and describing HAPCs, the Council also adopted mitigation measures directed at the adverse impacts of fishing on groundfish EFH. Principal among these are closed areas to protect sensitive habitats. There are three types of closed areas: bottom trawl closed areas, bottom contact closed areas, and a bottom trawl footprint closure. The 34 bottom trawl closed areas are closed to all types of bottom trawl fishing gear. The bottom trawl footprint closure closes areas in the EEZ between 1,280 meters (700 fathoms) and 3,500 meters (1,094 fathoms), which is the outer extent of groundfish EFH (PFMC 2005). The 17 bottom contact closed areas are closed to all types of bottom contact gear intended to make contact with bottom during fishing operations, which includes fixed gear, such as longline and pots.

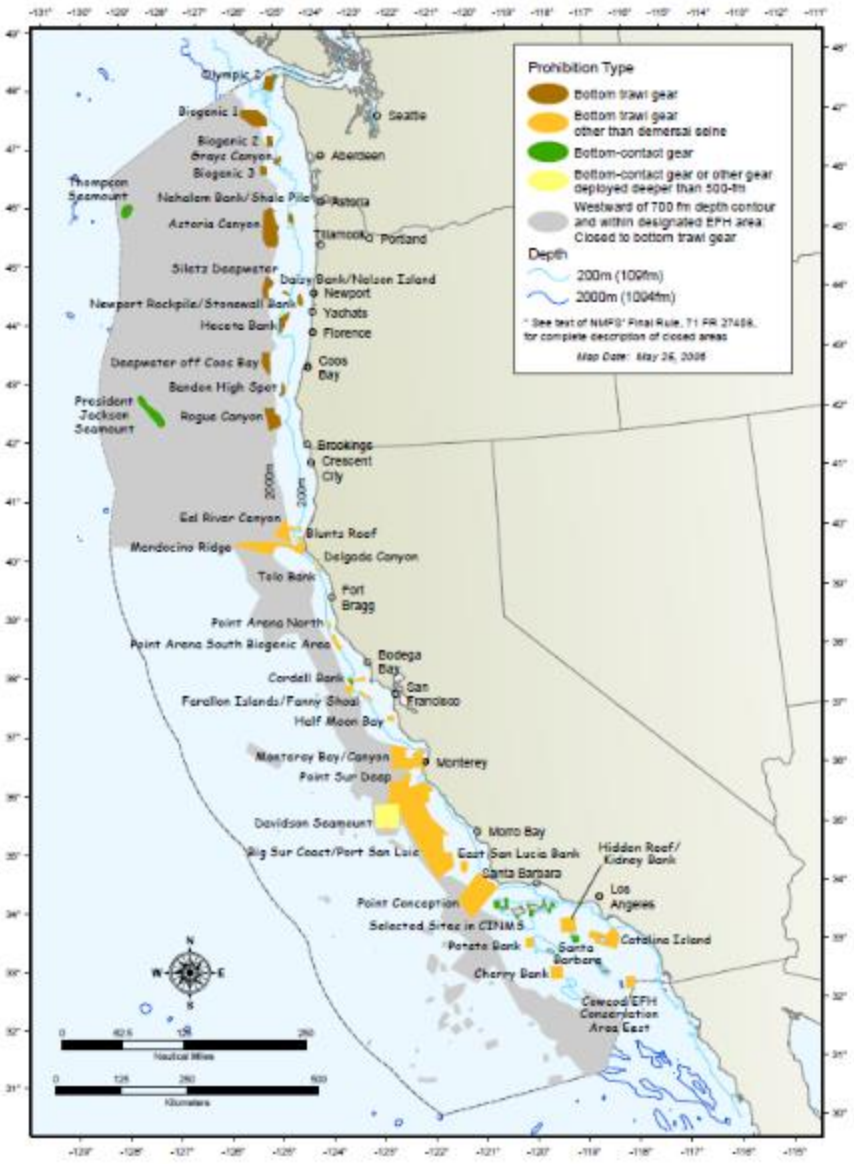


Figure 11: Map showing EFH areas designated by the Pacific Fishery Management Council. Map created by NOAA NMFW Northwest Regional Office and available at http://www.habitat.noaa.gov/protection/efh/newInv/EFHI/docs/pfmc_datasheet.pdf.

Information

NOAA's overarching Habitat and Ecological Processes Research program is responsible for research to support habitat-based and ecosystem approaches to fisheries management. Projects focus on integrated studies that improve understanding of habitat and ecological processes. Key research areas include the loss of sea ice, essential fish habitat, ocean acidification and "The Bering Sea Project"

In 2012 the NMFS Alaska Fisheries Science Center began an Alaska Coral and Sponge initiative. The work is sponsored by NOAA and consists of a three-year field research program in the AK region for deep sea coral and

sponges, in order to better understand the location, distribution, ecosystem role and status of deep sea coral and sponge habitat. The overall initiative includes eleven projects: developing a coral habitat map for the GOA and AI, and a geologically interpreted substrate map for AK; investigations of *Prinmoa* corals in the GOA; estimation of the effects of commercial fixed gear fishing on coral and sponge using underwater camera; and measurements of oxygen and pH and increased collections of coral and sponge specimens from the summer bottom trawl surveys. The initiative is intended to result in management products that can be of utility to the NPFMC, for example in the annual Ecosystem Assessment, the AI Fishery Ecosystem Plan, or the 2015 5-year Essential Fish Habitat Review (AKSCI 2013a; AKSCI 2013b; Martin 2009, NMFS 2012).

Ecosystem Impacts

Alaska

Status

The primary goal of the NPFMC's ecosystem assessment is to summarize and synthesize historical climate and fishing effects on the shelf and slope regions of the eastern Bering Sea, Aleutian Islands, Gulf of Alaska, and the Arctic, from an ecosystem perspective and to provide an assessment of the possible future effects of climate and fishing on ecosystem structure and function. Research has focused on quantifying food web linkages to increase understanding of how external forces such as fishing may cause unanticipated shifts in ecosystem composition.

The two food web interactions relevant to evaluating the halibut fisheries removal of halibut biomass on the ecosystem are the “top down” release of halibut prey species or the “bottom up” decline in productivity of halibut predators. Halibut are high trophic level predators, and their feeding habits are well described. Halibut undergo ontogenetic shifts in feeding, consuming numerous small-bodied prey (fish, crustaceans and other invertebrates) when small and consuming larger fish when they reach adulthood (Best and St. Pierre 1986). Primary fish prey include walleye pollock, sand lance and smaller flatfish species (Yang *et al.* 2001). Crabs may also be important components in halibut diets in some locations (Best and St. Pierre 1986). Accounts of halibut as prey are less frequent, but juveniles are occasionally consumed by larger –bodied halibut, and also Pacific cod (Best and St. Pierre 1986). Large sharks (e.g. sleeper sharks) may consume halibut and pinnipeds may also be predators on halibut.

There is some evidence that the fishery is highly unlikely to disrupt the key elements in the form of ecosystem models that have been developed for the Eastern Bering Sea, Aleutian Islands (Aydin *et al.* 2007) and the Gulf of Alaska (Gaichas and Francis 2008). The Ecosystem Consideration report provides an extensive accounting of the dynamics of key biophysical drivers and indicators of ecosystem and community structure (Zador 2014). Survey biomass of pelagic foragers has increased steadily since 2009 and 57 is currently above its 30-year mean. Fish apex predator survey biomass is currently near its 30-year mean, driven largely by the dynamics of Pacific cod and Arrowtooth flounder (Zador 2014). Moreover, indicators of community structure in the Eastern Bering Sea (e.g. species richness, community size-spectra) do not suggest that groundfish fisheries are having significant adverse effects but instead are more responsive to changes in spatial distribution of stocks and environmental conditions (Mueter and Lauth 2009; Boldt *et al.* 2008).

Since 2014, sperm and orca whale depredation has increasingly been observed in the Bering Sea, Aleutian Islands, and Western Gulf of Alaska on halibut and sablefish longline sets (Peterson *et al.* 2015). While there is no indication that this depredation is having a negative effect on these marine mammal populations, and no interactions have resulted in animal mortality, fishers and resource managers are taking steps to limit

interactions with animals to reduce costs from lost fish. The IPHC includes estimates of halibut catch due to depredation and has modified its longline survey to reduce bias due to depredation. Fishers communicate with one another to avoid deploying or retrieving gear when whales are present. Additionally, research by industry and academic partners is investigating mitigation measures to further reduce interactions, including using real time satellite tags, acoustic decoy techniques, and video cameras to better understand how whales and orca depredate on fishing gear. Currently, this trend in depredation does not have any implications on scoring in the MSC system; however, future assessments should continue to consider depredation in light of its overall impact of removals from the fishery, potential for negative impacts on ETP species, indirect impacts on ETP species trophic dynamics, and changes in fishing behavior.

Management

Ecosystem context and management is overseen by the NPFMC which is one of the national leaders in implementing ecosystem-based management. The council's FMPs specify a strategy to address, monitor and regulate ecosystem impacts of the fishery. Ecosystem-level constraints also factors into management decisions via a cap in total ecosystem removals for the Eastern Bering Sea and Gulf of Alaska based on considerations of the maximum surplus production of these ecosystems (Mueter 2009).

Each year since 1999, NPFMC has developed an Ecosystem Considerations report including information on indicators of ecosystem status and trends. In 2002, stock assessment scientists began using indicators contained in this report to systematically assess ecosystem factors such as climate, predators, prey, and habitat that might affect a particular stock. Information regarding a particular fishery's catch, bycatch and temporal/spatial distribution can be used to assess possible impacts of that fishery on the ecosystem. Indicators of concern are highlighted within each assessment and can be used by the Groundfish Plan Teams and the NPFMC to justify modification of allowable biological catch recommendations or time/space allocations of catch.

In February 2014, the Council reviewed a discussion paper on the development of a Bering Sea Fishery Ecosystem Plan (FEP), and decided to seek public input on what the objectives might be for a Bering Sea FEP, and how the plan could be structured to be of benefit to fishery management decision-making (NPFMC 2015). The Council heard from stakeholders and the Council's Scientific and Statistical Committee (SSC), Ecosystem Committee, and Advisory Panel between February and October 2014. The Council requested the Ecosystem Committee to continue development of the Bering Sea FEP, including developing a draft set of goals and objectives for Council consideration, and proposing an approach and format for an FEP. Given concerns about staff resources and dwindling budgets, the Council has not yet committed to tasking of the FEP, but rather has asked the Committee to investigate possible objectives and structure for a future Council discussion

a. Understand and plan for impacts of climate change
b. Understand tradeoffs among ecological, social, and economic factors of fishery harvest
c. Identify buffers needed to mitigate uncertainty
d. Create a cohesive plan for BS EBFM (rather than current piecemeal approach); define EBFM for the Council
e. Precautionary management, and shifting the burden of proof
f. Prioritize research, management based on ecosystem understanding, identify pathway of research to management
g. Identify areas of risk and opportunities to mitigate
h. Consider subsistence needs and traditional ecological knowledge
i. Define the Council's management process for broader public (for transparency and accountability – social contract); fishery audience, but also include importance of food security for broader audience

j. Balance the different values of Bering Sea user groups

At this same meeting the North Pacific Fisheries Management Council adopted an Ecosystem Policy that shall be given effect through all of the Council's work, including long-term planning initiatives, fishery management actions, and science planning to support ecosystem-based fishery management. The Council intends that fishery management explicitly take into account environmental variability and uncertainty, changes and trends in climate and oceanographic conditions, fluctuations in productivity for managed species and associated ecosystem components, such as habitats and non-managed species, and relationships between marine species. Implementation will be responsive to changes in the ecosystem, and our understanding of those dynamics, incorporate the best available science, including local and traditional knowledge, and engage scientists, managers, and the public.

Information

Information on ecosystem structure and effects of halibut fishing therein derives from data collected as part of Alaska Fisheries Science Center trawl and longline surveys, an extensive annual food habits collection program that dates to the 1980s, assessments for all main retained and discarded species, and monitoring of susceptible and vulnerable seabird populations. Moreover, ongoing research has been synthesizing this information via quantitative modeling (Aydin *et al.* 2007) and via comparative analyses (Gaichas *et al.* 2009, Link *et al.* 2009).

A central ecosystem tool relevant to holistic groundfish management in AK is the "Ecosystem Considerations" Appendix that accompanies the annual compilation of stock assessment documents called the Stock Assessment and Fishery Evaluation (SAFE) reports (Boldt and Zador 2009; Zador 2012). Here, biophysical and ecological indicators relevant to ecosystem monitoring are tracked and reported annually. This Ecosystem Considerations Appendix is a significant compendium of information giving indicators and time-series that are relevant to groundfish management. In 2002, stock assessment scientist began using indicators from the appendix to systematically assess ecosystem factors such as climate, predators, prey and habitat that might affect particular stocks. Data contributors have also been asked to provide a rationale explaining the importance of indices they contribute, and explanation of impacts of any observed trends on the ecosystem or ecosystem components and how the information can be used to inform groundfish management decisions. Many of the time series are available on the web with author permission at: http://access.afsc.noaa.gov/reem/ecoweb/index.cfm

Washington

Status

Each year the Pacific Fishery Management Council Ecosystem Work Group develops a "Status of the California Current Ecosystem Report" for the Council. The 2015 Annual Report reflects trends in physical, biological, and socio-economic indicators. In 2015, while oceanographic conditions show a warming trend, indicating lower primary productivity, forage fish base during spring surveys have shown a stable or positive trend. Additionally, approximately 1/3 of the managed species within the groundfish fishery management plan have been evaluated (either recently or historically) for the overfished threshold based on stock assessment results. Most of the recently assessed groundfish species are above the biomass limit reference point, and are thus not in a depleted "overfished" status, and no overfishing occurred on these stocks prior to their most recent assessments (NMFS 2015e). These indicators highlight that the ecosystem management strategy is being effectively implemented.

Management

In April 2013, the Pacific Fishery Management Council adopted an FEP, the Ecosystem Initiatives Appendix, and a schedule for implementation. The purpose of the FEP is to enhance the Council's species-specific management

programs with more ecosystem science, broader ecosystem considerations and management policies that coordinate Council management across its Fishery Management Plans and the California Current Ecosystem (PFMC 2013). The FEP outlines a reporting process wherein NOAA provides the Council with a yearly update on the state of the California Current Ecosystem (CCE), as derived from environmental, biological and socio-economic indicators. NOAA's California Current Integrated Ecosystem Assessment team is responsible for this report which the PFMC uses to guide decision-making and allocation.

Information

The California Current IEA uses a combination of conceptual and empirical models (i.e. Atlantis Ecosystem Model) to integrate information and assess indicators. Atlantis is a simulation modeling approach that integrates physical, chemical, ecological, and anthropogenic processes in a three-dimensional spatially explicit domain. The model represents key exploited species at the level of detail necessary to evaluate direct effects of fishing and also represents other anthropogenic and climate impacts on the ecosystem as a whole (Levin and Schwing 2011). Data comes from a variety of sources including CalCOFI oceanographic and biological surveys, NMFS triennial annual trawl surveys, PacFIN commercial fishing database, and other supporting sources (Levin and Schwing 2011).

3.5 Principle Three: Management System Background

Area of Operation and Relevant Jurisdictions

The UoA area of operation is within United States EEZ, off the coasts of: 1) the State of Alaska (IPHC Areas 2C, 3A, 3B, 4A, 4B, 4C, 4D, and 4E) and 2) the State of Washington (the northern portion of IPHC Area 2A)(Fig 1). Pacific halibut caught and landed in Canadian waters have been assessed as a separate Unit of Certification because of differences in governance.

The fishery management system evaluated in this report is a combination of: 1) the framework of the IPHC (a joint US-Canada international body), and 2) frameworks of two US Regional Fishery Management Councils; namely, the North Pacific Fishery Management Council (with jurisdiction in Alaska), and 2) the Pacific Fishery Management Council (with jurisdiction on the U.S. West Coast). The IPHC Commissioners recommend TACs for each country (US and Canada). The management authority for each country is then responsible for setting and managing the domestic TAC. Consultations with indigenous peoples are conducted through the NPFMC and PFMC frameworks, but there are not separate indigenous management jurisdictions.

As discussed under Principle 1, the Pacific halibut stock ranges from Alaska to California and is considered a single stock (straddling US and Canada) for the purposes of stock assessment. The stock assessment model is coastwide; however, spatially explicit data are used to apportion the TAC between IPHC fishing areas so that different amounts of quota allocation are recommended by fishing area. Pacific halibut are not considered a highly migratory species and are also not considered to be a discrete stock on the high seas.

Historical Governance

The Pacific halibut commercial fishery began in the late 1880s. As an industry led initiative, Canadian and US governments provided the first framework for international management in 1924 under a signed convention by creating the International Fisheries Commission (IFC) to manage the Pacific halibut resource. In 1953 the

Convention was modified and the IFC became the International Pacific Halibut Commission (IPHC). Today the IPHC performs assessments and research on the Pacific halibut stocks, recommends total allowable catches by fishing area, and determines regulatory measures related to conservation issues.

In 1977, both Canada and the US extended their coastal jurisdiction to 200 nautical miles. As a result, in 1979, the 1953 Halibut Convention was modified to prevent Canadian halibut vessels from fishing in US waters and US vessels from fishing in Canadian waters. The 1979 convention modification also empowered the individual governments to impose fishing regulations on their own halibut fleets.

Legal Framework

The North Pacific Halibut Act and the Magnuson-Stevens Act (MSA), in combination with other laws, currently form the legal framework governing management of the Pacific halibut fishery in the US. The North Pacific Halibut Act of 1982 implements the Convention for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea between Canada and the US. The Convention established the International Fisheries Commission, now known as the International Pacific Halibut Commission. The Halibut Act provides for the appointment of US Commissioners to the IPHC, specifies the responsibilities of that the US Secretary of Commerce has for carrying out the treaty, and provides for the regulation of the US portion of fishery by the North Pacific and Pacific Fishery Management Councils.

Related Legal Frameworks

The Marine Mammal Protection Act, the Endangered Species Act, the Migratory Bird Treaty Act, National Environmental Policy Act, Administrative Procedures Act, and other treaties, laws, and policies also are critical elements in the framework that governs the management system for the Pacific halibut fishery. The US laws are fully consistent with and supportive of several international laws and agreements related to fisheries management. The policies and practices based on these legal foundations constitute an appropriate and effective legal framework for delivering sustainable fisheries in accordance with MSC Principles 1 and 2.

Management Bodies in the UoA

As noted above, the United States and Canada participate in the International Pacific Halibut Commission (IPHC) and promulgate regulations governing the Pacific halibut fishery under the authority of the Northern Pacific Halibut Act of 1982 (Halibut Act). Regulations governing the allocation and catch of halibut in U.S. waters that are in agreement with the Halibut Act may be also be developed by the North Pacific Fishery Management Council (for Alaska), and the Pacific Fishery Management Council (for the US West Coast). A brief description of these management bodies follows.

International Pacific Halibut Commission (IPHC)

The IPHC consists of three government-appointed commissioners for each country who serve their terms without remuneration at the discretion of the President of the United States and the Canadian government respectively. In recent years, one commissioner from each country has been an employee of the federal fisheries agency, one a fisher, and one either a buyer or a processor. The chairmanship of the Commission alternates annually between countries (IPHC 2015).

The Commission is responsible for research on Pacific halibut and submits its recommended regulatory measures to the two governments for approval and fishers of both nations are required to observe the approved regulations. Although the IPHC technically recommends regulations, both governments usually – with only a few exceptions – approve and implement the recommended regulations. The IPHC recommends regulations for halibut fishing in 10 areas of the EEZs of Canada and the US. Some of the IPHC regulations apply generally to all halibut fishers; and other regulations apply specifically to commercial fishers, sport fishers, US Treaty Indian Tribes, Canadian Aboriginal groups, and those engaged in customary and traditional fishing (IPHC 2015)..

The Commission facilitates public participation in management via five advisory bodies and various State, Provincial, and Federal agencies. The Commission's advisory bodies include the Conference Board, the Processor Advisory Group, the Research Advisory Board, the recently convened Management Strategy Advisory Board, and the Scientific Review Board (IPHC 2015). Further information on the roles and responsibilities of each of these can be found in Appendix 2. Additionally, the IPHC self-reported progress on recommendations from an outside management review process in 2012 can be found in Appendix 4. A brief discussion of two key advisory bodies with relevance to MSC Principles (the MSAB and the SRB) follows.

Management Strategy Evaluation (MSE) and the Management Strategy Advisory Board (MSAB)

A relatively new initiative of the IPHC is the development of an operating Management Strategy Evaluation (MSE) model: a formal process for evaluating alternative management options against a range of assessment considerations and assumptions (e.g. observation and process uncertainty, alternative possible stock dynamics and structures). The intent of the MSE process is to use the knowledge of different advisory groups to build shared objectives for the fishery and accepted means of evaluating management options and performance (Figure 12).

The four key components required in developing an MSE are: (1) a clearly defined set of management objectives, (2) a set of performance measures related to the objectives, (3) a set of alternative management procedures, and (4) a means of evaluating the performance measures (Martell *et al.* 2014).

The Management Strategy Advisory Board (MSAB) is a cross-disciplinary group, with representatives from industry, science, fisheries management, and IPHC staff. In 2013, the Commission approved the formation of the MSAB to advise it on the development and evaluation of candidate objectives and strategies for managing the halibut resource.

The MSAB met in Seattle at the IPHC office on October 1st and 2nd, 2015. This was the first MSAB meeting in which an agenda committee, co-chairs, and a contracted facilitator were used to develop the agenda and run the meeting. The meeting focused on board and governance, and developing an outreach strategy for stakeholders.

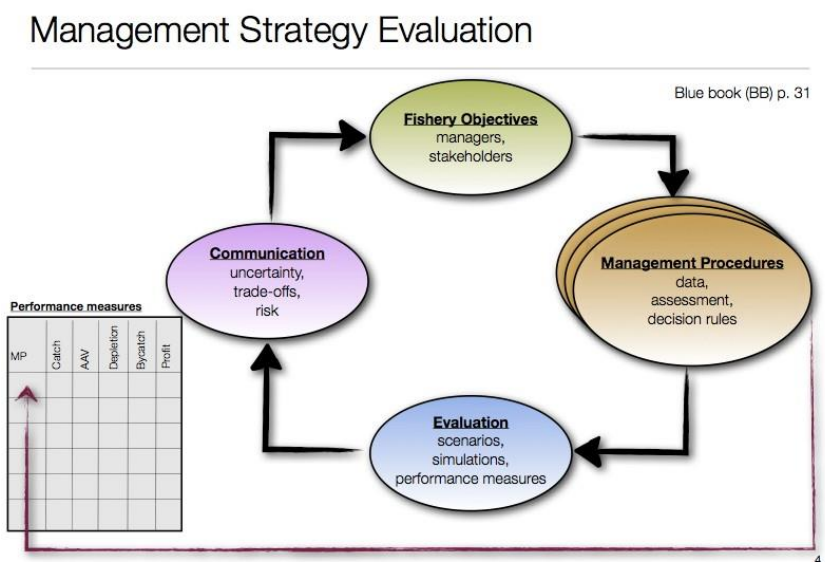


Figure 12. An illustration of the four major component processes used in Management Strategy Evaluation. First, fisheries objectives must be defined that ultimately define performance measures. A suite of alternative management procedures are developed and used to fill each row of the performance measures table. The evaluation of each management procedure is done over a range of scenarios that span the range of uncertainty in the current understanding of a fishery's dynamics. Lastly, communication with stakeholders is a key step in refining fisheries objectives and designing new management procedures that are robust to uncertainty. Source: IPHC.

Scientific Review Board

The Scientific Review Board (SRB) was formed in 2013 to provide ongoing scientific peer review of the stock assessment, harvest advice, and research. The SRB is currently comprised of three members, with a plan to expand to five in the future. The SRB operates in a three meeting process, with meetings taking place in late spring, October, and December. A recent report contains the results of two reviews conducted by the SRB during 2014: a review of the Commission stock assessment, management strategy evaluation, and long-term research plans held in June; and, a review of progress on stock assessment issues, held in October (Cox *et al.* 2015).

US Regional Fishery Management Councils

The US Congress passed the Fishery Conservation and Management Act in 1976, which became the Magnuson-Stevens Act at its reauthorization in 1996. The original Act created eight regional fishery management councils to manage fisheries in the US EEZ, and the reauthorization in 1996 added provisions to rebuild overfished fisheries, protect essential fish habitat, and reduce bycatch. The MSA was further strengthened with its re-authorization in 2007. The Act now requires fishery management plans to establish mechanisms for specifying annual catch limits at levels such that overfishing does not occur, calls for measures to ensure accountability within these limits, and requires that the limits do not exceed the scientific recommendations made by the Regional Management Councils' Scientific and Statistical (SSC) committees. Additionally, the MSA re-authorization in 2007 promoted the use of limited access privilege programs, such as the Pacific halibut IFQ program – an important feature of Pacific halibut management in Alaska (NOAA 2013).

The North Pacific Fishery Management Council and the Pacific Fishery Management Council both play an active role in the management of Pacific halibut. The Halibut Act allows these two Councils to develop regulations, including limited access regulations, that do not conflict with the regulations adopted by the Commission (16 U.S.C. §§ 773c, (c)). Regulations recommended by the Council must be approved by the Secretary of Commerce (Secretary) before being implemented through the National Marine Fisheries Service (NMFS). NMFS has responsibility for managing the fishery for halibut according to regulations approved by the Secretary.

Although neither Council has developed an explicit Pacific halibut fishery management plan, each Council has approved provisions that supplement IPHC regulations. Their principal actions to date have centered on allocating the IPHC's area-based catch limits to commercial, sport, tribal, and community user groups.

North Pacific Fishery Management Council (NPFMC) – (http://www.npfmc.org)

The NPFMC primarily manages groundfish in the Gulf of Alaska, Bering Sea, and Aleutian Islands, targeting cod, pollock, flatfish, mackerel, sablefish, and rockfish species harvested by trawl, longline, jig, and pot gear (NPFMC 2009).

The NPFMC has an open and participatory process, and conducts public meetings allowing all interested persons an opportunity to be heard in the development of FMPs and amendments, and other Council decisions (NPFMC 2012). The NPFMC is made up of 11 voting members from the states of Alaska, Washington, and Oregon; and one from NMFS. It also has members from other agencies, and many advisory bodies. The Council reviews and revises, as appropriate, the assessments and specifications with respect to the optimum yield from each fishery (16 U.S.C. 1852(h)). The NPFMC has developed a management policy and objectives to guide its development of management recommendations to the Secretary of Commerce (NPFMC 2009).

Alaska fisheries for salmon, crab, and scallops are managed jointly with the State of Alaska. The NPFMC also works very closely with the Alaska Department of Fish and Game (ADFG) and the Alaska Board of Fisheries (BOF) to coordinate management programs in federal and state waters (0-3 nm from shore). Many fishery resources are harvested in waters under both state and federal jurisdiction. As such, the NPFMC and state work together to address habitat concerns, catch limits, allocation issues, and other management details through coordination meetings and delegation of management oversight to one agency or the other.

The NPFMC also makes allocation decisions for halibut, in concert with the International Pacific Halibut Commission. NPFMC access programs for halibut including subsistence halibut, the IFQ and CDQ programs, as well as a catch sharing plan (CSP) for guided sport fisheries is discussed under 'Access Rights', below.

Pacific Fishery Management Council (PFMC) – (http://www.pcouncil.org)

For waters off the US West Coast (WA-OR-CA), the Pacific Council manages fisheries for about 119 species of salmon, groundfish, coastal pelagic species (sardines, anchovies, and mackerel), and highly migratory species (tunas, sharks, and swordfish) (http://www.pcouncil.org/). The Council is also active in international fishery management organizations that manage fish stocks that migrate through the Council's area of jurisdiction, including the International Pacific Halibut Commission, (Pacific halibut), the Western and Central Pacific Fisheries Commission (for albacore tuna and other highly migratory species), and the Inter-American Tropical Tuna Commission (for yellowfin tuna and other high migratory species) (http://www.pcouncil.org/).
The PFMC has developed a management policy and objectives to guide its development of management recommendations to the Secretary of Commerce. The Council process, emphasizes public participation and

involvement in fisheries management. Management measures developed by the Council are recommended to the Secretary of Commerce through the National Marine Fisheries Service (NMFS). Management measures are implemented by NMFS West Coast Regional offices and enforced by the NOAA Office of Law Enforcement, the 11th and 13th Coast Guard Districts, and local enforcement agencies. (http://www.pcouncil.org/).

The Pacific Fishery Management Council is made up of 14 voting representatives from Oregon, Washington, California, and Idaho; many advisory bodies; and 16 staff members located in Portland, Oregon. Some Council members represent state or tribal fish and wildlife agencies, and some are private citizens who are knowledgeable about recreational or commercial fishing or marine conservation. Apart from state and tribal representatives, Council members are chosen by the governors of the four states within the Council region, in conjunction with the Secretary of Commerce. (http://www.pcouncil.org/).

The PFMC also makes allocation decisions for halibut, in concert with the International Pacific Halibut Commission. The Council implements allocation decisions with a Halibut Catch-Sharing Plan; discussed under 'Access Rights', below.

Regional Management Council Dispute Resolution System

The management system resolves most disputes within its highly participatory, open, and transparent structure and processes. Section 302 of the MSA, and the APA, mandate the Regional Fishery Management Councils follow specific procedures for discussing and resolving disputes on fisheries policy. Dissatisfied parties affected by Council and NMFS decisions can appeal the decision to the Appeals Office in the NMFS Alaska Regional Office, which adjudicates appeals of initial administrative determinations made under the authority of 50 C.F.R. Part 679 and Part 680. The jurisdiction of the Appeals Office's includes the Individual Fishing Quota Program for Pacific halibut and sablefish, the Western Alaska Community Development Program, and other management programs.

These dispute resolution mechanisms have proven to be effective at dealing with most issues, avoiding legal disputes, and are appropriate for the context of the halibut fishery. In cases where the Council processes have not resolved disputes, the parties involved can and do, by law, resolve the disputes in the federal court system. There is ample evidence (c.f. NAPA 2002) that the management system attempts to comply with binding judicial decisions.

Access Rights to Pacific Halibut in the UoA

Groups that are granted specific access rights to the Pacific halibut fishery within the UoA include 1) subsistence halibut, IFQ, and CDQ holders, and guided sport fisheries in Alaska; and 2) tribal and non-tribal limited entry permit holders in Washington State.

State of Alaska

IFQ Program

The NPFMC developed and approved an individual fishing quota (IFQ) program – implemented in 1995 – for the commercial Pacific halibut fishery, to allocate portions of the IPHC's catch limits in the regulatory areas off Alaska (Pautzke and Oliver 1997; http://www.npfmc.org/ifqpaper/). Initial quota shares were assigned to vessel owners or leaseholders who had at least one landing in the years 1988, 1989, or 1990, with the amount of quota share allocated based on the highest 5-year historical catch records between 1984-1990. The share percentage is

multiplied by the annual quota assigned to the IFQ fishery to arrive at the permit-specific TAC on an annual basis. Quota shares are specific to vessel class (catcher boats versus freezer longliners) with catcher boats further divided into vessel length. Transfer and leases of quota share is governed under 50 CFR § 679.41: https://alaskafisheries.noaa.gov/sites/default/files/679d41.pdf. Further information regarding the ongoing operation of the IFQ program may be found on the NPFMC website at: https://alaskafisheries.noaa.gov/fisheries/ifq.

CDQ Program

For IPHC regulatory Area 4 (the Bering Sea and Aleutian Islands: See Figure 2), the NPFMC has approved a Catch Sharing Plan (CSP) that allocates a percentage of the Pacific halibut quota to six Community Development Quota groups. As authorized and governed by the MSA as amended in 2007, the CDQ Program receives annual allocations of quota for groundfish, halibut, crab, and prohibited species in the Bering Sea and Aleutian Islands Management Area to allow these communities to 'start and support regionally based, commercial seafood or other fisheries-related businesses' (Section 305(i)(1) of the MSA). A guide to the CDQ program may be found at: https://alaskafisheries.noaa.gov/fisheries/cdq. As the CDQ permits are a subset of the IFQ allocation, are eligible for commercial landings, and may be fished on the same trips as IFQ halibut, CDQ permitted landings are included in the UoA. According to the NMFS Fisheries Catch and Landings Reports (https://alaskafisheries.noaa.gov/fisheries-catch-landings) in 2015, CDQ landings accounted for around 4% of the total CDQ and IFQ landings.

For both the IFQ and CDQ permits, annual permits identify permissible harvest areas, which must be reported at landing. Annual permits cover an entire season, which generally runs from March to November. The E-landings catch accounting system described in the Sources of Information section above is used at landing to electronically deduct the volume of halibut landed from the permit holder's annual allocation. Vessels must notify the Office of Law Enforcement before making a landing, and product may only be landed at permitted locations (as a Registered Buyer according to 50 CFR § 679.4). For further description of traceability systems at landing, see the section on Traceability.

Non-UoA Access Rights

Implemented in 2003, the subsistence halibut fishery allows rural and Alaska native persons to 'practice the long-term customary and traditional harvest of Pacific halibut for food in a non-commercial manner'. A guide to the program may be found at: https://alaskafisheries.noaa.gov/sites/default/files/subsistence-halibut-overview.pdf

A Catch Sharing Plan (CSP) for the guided sport (charter) and commercial fisheries for Pacific halibut in waters of International Pacific Halibut Commission Regulatory Areas 2C (Southeast Alaska) and 3A (Central Gulf of Alaska) was implemented in January, 2014. The CSP replaced the Guideline Harvest Level (GHL) program that was previously in place to manage charter halibut fisheries, and established an annual process for allocating halibut between the charter and commercial fisheries in Area 2C and Area 3A. The allocations in the CSP were intended to: (1) reflect more recent harvest levels by the charter sector, and (2) allow the allocation percentage to fluctuate annually at different levels of halibut abundance. The program sets a limit on the total number of sport charter permits, which are transferable, to control the expansion of this fishery. Combined with daily bag limits, the limit on sport charter operations are the principal means for controlling sport charter catches.

In January 2014, Catch Accountability Through Compensated Halibut (CATCH) released a report that proposed a mechanism to integrate the charter halibut sector into the Catch Spare Program in place to manage commercial halibut fisheries in Areas 2C and 3A. The CATCH proposal would establish a Recreational Quota Entity authorized

by the Council to purchase Quota Share on behalf of the Area 2C and Area 3A charter halibut sector. The Quota Share, and resulting IFQ, would be used to supplement the charter sector allocation for Area 2C and Area 3A halibut.

In October 2014, the Council authorized the Recreational Quota Entity (RQE) Committee to contribute to the development of a Recreational Quota Entity program structure for analysis and review by the Council. The Council considered the RQE program under an initial review at the October, 2015 meeting in Anchorage, AK.

Current and historical information on permit holders for all of the Pacific halibut fisheries in Alaska may be found at: https://alaskafisheries.noaa.gov/permits-licenses

State of Washington

In Washington State, the Pacific halibut fishery is managed by the PFMC through a limited entry license system, and a catch sharing plan.

The Halibut Catch-Sharing Plan allocates the IPHC's catch limit for Area 2A (waters off Washington, Oregon, California) among all user groups (non-Treaty Indian commercial and sport users, and Treaty Indian commercial, ceremonial and subsistence users). Specifically, the Halibut Catch-Sharing Plan is a framework that dictates how the IPHC and NMFS will divide the total allowable catch (TAC) for Oregon, Washington, and California halibut fisheries (Area 2A). The total TAC is set each January by the IPHC, who also endorses the Catch Sharing Plan allocations set by the Council. Allocations between some recreational areas are subject to inseason and other changes. For a description of how the halibut harvest is shared, see the 2016 Pacific Halibut Catch Sharing Plan for Area 2A which was adopted by the Council and recommended for NMFS implementation. Each year the Council solicits proposed changes to the Catch Sharing Plan for its September meeting and takes comments on proposed changes between its September and November meetings. The Council then makes final recommendations for changes at its November meeting. Links to more information on the catch sharing plan may be found at: http://www.pcouncil.org/pacific-halibut/background-information/

Pacific halibut fishing is an important part of several tribal cultures, and many tribal members participate in commercial, ceremonial and subsistence fisheries. In 1995, the U.S. prohibited directed non-treaty commercial fishing north of Pt. Chehalis, Washington in order to allow the tribes to harvest their allocation of halibut. (http://www.pcouncil.org/).

IPHC regulations control catches in the Area 2 Pacific halibut non-Treaty Indian fisheries with a limited number of 10-hour fishing periods (e.g. seven in 2014) for the directed commercial halibut fishery (south of Point Chehalis, Washington), and limited fishing periods, combined with the daily bag limits, to control sport catches. *(Note: the anticipated Unit of Certification for this MSC assessment covers the State of Washington, but not the States of Oregon or California).* (http://www.pcouncil.org/).

Fishery Management Plans and Objectives

IPHC

The IPHC does not have a formal FMP for Pacific halibut; however, Article III of the Convention mandates the IPHC to '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'. While not an FMP per se (see 'FMP' at: http://www.iphc.int/research/glossary.html), the IPHC achieves this objective with its precautionary harvest policy (described in the P1 section of this report, above).

Major objectives of the IPHC include: 1) accommodation of the underlying biology of the fish, 2) accounting for all removals, 3) implementation of evolving assessment methodologies, 4) development and evaluation of harvest policy, and 5) the fostering of a consultative management process (Leaman 2007).

Research is a key function of the IPHC, directly supporting continuing objectives of the Commission, including: 1) improving the annual stock assessment and quota recommendations; 2) developing information on current management issues; and 3) adding to knowledge of the biology and life history of halibut (IPHC 2015b). IPHC research objectives are discussed further under "Research Plans", below.

As noted above, the IPHC is undertaking a major management strategy evaluation process, through its recently established Management Strategy Evaluation Board (MSAB). The role of the MSAB is to define clear, measurable fishery management objectives and to provide technical input on the development of an operating halibut fishery management model that will permit evaluation of various strategies to achieve the management objectives (Martell *et al.* 2014). This process is expected to yield well defined and measureable objectives in the coming years.

As noted above, 'accounting for all removals' has been a key objective at IPHC, and the theme of numerous IPHC reports and workshops, particularly with respect to proper accounting of halibut bycatch in non-directed fisheries. A brief discussion of recent progress on this issue follows.

Halibut Bycatch

The IPHC is concerned about the yield and spawning biomass losses to the halibut stock from mortality of halibut in non-directed fisheries; particularly by trawlers. Significant progress in reducing this bycatch mortality has been achieved in Areas 2A and 2B, using individual bycatch quotas for vessels in some fisheries: reductions have also occurred in Alaska. Estimation of halibut bycatch in the Alaska groundfish fishery has the potential to be improved through the restructured observer program.

At its 2015 Annual Meeting, the Commission received a presentation from its Halibut Bycatch Working Group (HBWG II), which outlined progress made during the past year on its four objectives: quantifying bycatch, documenting impacts to the fishery and resource, exploring options to mitigate impacts, and identifying options to reduce bycatch. The HBWG II report and comments are posted on the IPHC website at http://www.iphc.int/meetings/2015am/bb/10_1HalibutBycWorkGroup_rept_v17.pdf.

Also, the IPHC prepared a paper discussing bycatch control and abundance-based prohibited species catch limits for Pacific halibut in the Bering Sea/Aleutian Islands (available at: http://www.iphc.int/meetings/2015am/bb/10_3IPHCAbundancePSCv5.pdf), and the Alaska Seafood Cooperative, an industry association, prepared a 2015 Plan for the Reduction of Halibut Incidental Catch and

Mortality (available at: http://www.iphc.int/meetings/2015am/bb/AlaskaSeafoodCo2015Plan.pdf). A joint meeting of IPHC and NPFMC managers was held to discuss bycatch related issues on February 5th, 2015 in Seattle, Washington. The meeting agenda can be found at:

http://legistar2.granicus.com/npfmc/meetings/2015/2/921_A_North_Pacific_Council_15-02-05_Meeting_Agenda.pdf.

Regulatory Updates from the IPHC

Pacific halibut regulatory proposals for 2015, presented at the IPHC Annual Meeting, pertained chiefly to 1) fishing periods and catch sharing, and 2) sport charter management measures and fishery regulations for Areas 2C and 3A. These are summarized in Appendix 5, and a full discussion of IPHC regulation proposals for 2015 can be found at: http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2015.pdf

NPFMC

As noted above, the NPFMC does not have an explicit FMP for Pacific halibut; however, the groundfish FMPs for the Bering Sea/Aleutian Islands (NPFMC 2015a) and the Gulf of Alaska (NPFMC 2015b) do set supplemental measures for halibut as a prohibited species. Because significant interactions occur between the Pacific halibut fishery and the BSAI and GOA groundfish fisheries, numerous management measures in the FMPs were established for the expressed purpose of mitigating possible adverse effects of the groundfish fisheries on the halibut resource (NPFMC 2015a).

For groundfish, the BSAI and GOA FMPs contain 46 short- and long-term objectives grouped into nine categories: (1) Prevent Overfishing; (2) Promote Sustainable Fisheries and Communities; (3) Preserve Food Web; (4) Manage Incidental Catch and Reduce By-Catch and Waste; (5) Avoid Impacts to Seabirds and Marine Mammals; (6) Reduce and Avoid Impacts to Habitat; (7) Promote Equitable and Efficient Use of Fishery Resources; (8) Increase Alaska Native Consultation; and (9) Improve Data Quality, Monitoring and Enforcement. These objectives are well-defined and measurable, consistent with achieving the outcomes expressed in MSC Principles 1 and 2, and are explicit within the fishery management system. The annual SAFE reports produced annually in December, and other assessments, provide measures of the extent to which the specific objectives are being achieved.

Regulatory Updates from the NPFMC

In 2015, a regulation change was proposed by NPFMC to allow the use of sablefish pot gear in the GOA sablefish IFQ fishery (NMFS 2015d). Final action to allow sablefish pots in the GOA will rely on both the Council and IPHC allowing halibut IFQ retention in pot gear. A related proposal is to allow the retention of Pacific halibut in sablefish pots in in the BSAI (IPHC Area 4A).

Currently, the sablefish individual fishing quota (IFQ) fishery in the BSAI is prosecuted using hook-and-line gear and pot gear. However, halibut may be retained only with hook-and-line gear. Therefore, halibut caught in pot gear must be discarded. Participants have testified that discard of halibut caught in pot gear is being depredated by whales. The purpose of retaining incidentally caught halibut in pots fishing for sablefish is to better utilize the halibut resource provided the sablefish IFQ holders onboard the fishing vessel holds sufficient sablefish IFQ or CDQ and halibut IFQ (NPFMC 2015). Note: Pot fishing gear is not presently included in the UoA for this MSC assessment of US Pacific halibut.

PFMC

As noted above, the PFMC does not have an explicit FMP for Pacific halibut; however, the groundfish FMP for the West Coast (PFMC 2016) sets supplemental measures for halibut as a prohibited species.

The Council is committed to developing long-range plans for managing the Washington, Oregon, and California groundfish fisheries that will promote a stable planning environment for the seafood industry, including marine recreation interests, and will maintain the health of the resource and environment. For groundfish, the FMP lists 17 objectives under three long term goals. The goals of 1) Conservation, 2) Economics, and 3) Utilization were established in order of priority for managing the west coast groundfish fisheries, to be considered in conjunction with the national standards of the Magnuson-Stevens Act (PFMC 2016).

Regulatory Updates

For Area 2A, regulatory updates are posted on the WDFW (http://wdfw.wa.gov/fishing/creel/halibut/) and IPHC (http://www.iphc.int/commercial/11-area2a-commercial.html) websites.

Research Plans

IPHC

The IPHC prepares a Five Year Research Plan and an Annual Research Plan (ARP). These research plans derive directly from Commission objectives, with an accompanying process for input and periodic reviews by the Commission, interested stakeholders, the Research Advisory Board (RAB), and the Scientific Review Board (SRB) (IPHC 2015b).

Staff research is conducted within the four areas of study identified by the IPHC Five Year Research Plan. These areas, which connect to the IPHC mandate and support the assessment and management objectives of the Commission are: 1) Stock identification and assessment; 2) Harvest policy and management; 3) Biology, physiology, and migration; and 4) Ecosystem interactions and environmental influences.

The preliminary ARP is presented to the Commission at the Interim Meeting, where discussion of overall research priorities, individual studies, and associated budgets occurs. The staff then develops a final ARP and presents it at the Annual Meeting for Commission approval. The ARP is based on management and assessment needs as prioritized by the IPHC staff and Commission. It is the Commission's long-term goal to also obtain the views and advice of its SRB and RAB in the design and prioritization of research within the ARP (IPHC 2015b). The 2015 Research Plan may be found at:
http://www.iphc.int/publications/rara/2014/rara2014_02researchplan.pdf.

Two primary topics have recently been at the forefront of discussions about the halibut resource 1) the continuing decline in size at age, with the resulting effects and impacts on the harvest policy and stock status, and 2) The migratory behavior of the stock, specifically seasonal and ontogenetic migration.). Other current

IPHC research activities are discussed in the P1 section of this report, above; additional information may be found at: http://www.iphc.int/research.html.

NPFMC

The North Pacific Fishery Management Council identifies priorities for research, over the next 1 to 5 years, as those activities that are the most important for the conservation and management of fisheries in the Gulf of Alaska, Aleutian Islands, eastern Bering Sea, and the Arctic (http://www.npfmc.org/research-priorities). This listing of priorities has two purposes: 1) to meet the requirements of the revised Magnuson-Stevens Act for the Councils to identify 5 year research needs, and 2) to provide guidance on research priorities to the research community and funding agencies. Research priorities are organized into four categories: critical ongoing monitoring, urgent, important (near term), and strategic (future needs). These categories place less emphasis on the relative value of research topics and more emphasis on the correspondence of research to the Council's time horizon of management concerns.

The Council's research priorities are organized online through a publicly accessible database, research.psmfc.org, which can be queried for changes in research status and can also be downloaded completely for detailed information about all of the Council's research needs. Information about NPFMC research priorities is also available at: http://www.npfmc.org/research-priorities.

Specific to Pacific halibut, the current list of NPFMC research priorities identifies ten research items as "Urgent", four as "Important Near Term", and two as "Future Needs"; the status for eleven of these sixteen items is listed as "Underway" or "Partially Underway".

PFMC

The PFMC process for identifying research and data needs is reported in Council Operating Procedure 12. This procedure outlines the Council's process for documenting research and data needs and the schedule for completing and communicating these needs to organizations which may be able to support additional research. At least every five years, the Council staff present an updated version of the Research and Data Needs document(s) to the SSC for review. After the documents are approved, they are sent to NMFS, regional Sea Grant institutions, and other institutions and agencies. The most recent document is available at: http://www.pcouncil.org/wp-content/uploads/Res_Data_Needs_2013_FINAL.pdf.

Vessel Size Composition of the Commercial Fleet

In the 2014 US Pacific halibut fishery, vessels <41ft made up 37% of the commercial fleet by number (Table 16), and accounted for 19% of the commercial catch (Table 17). Vessels in the <40 ft size class are not presently covered by on-board fishery observers (NMFS 2014).

Table 17. Number of vessels landing Pacific halibut by vessel length class in the 2014 commercial fishery for area 2A (Washington, Oregon and California); Alaskan areas 2C, 3A, 3B, and 4; and Canadian area 2B. Source http://www.iphc.int/publications/annual/ar2014.pdf pg 78-79.

Halibut Commercial Vessel Counts - 2014								
Source: http://www.iphc.int/publications/annual/ar2014.pdf								
Vessel Length	**Area 2A**	**AK-2C**	**AK-3A**	**AK-3B**	**AK-4**	**US-Total**	**Canada**	**Grand Total**
Unknown	0	42	8	7	3	60	14	74
< 41 ft	15	227	153	42	102	539	45	584
41-55 ft	35	169	147	66	15	432	83	515
>55 ft	10	86	166	106	46	414	25	439
Total	60	524	474	221	166	1,445	167	1,612

Table 18. Landings (thousands of pounds, net weight) of Pacific halibut by vessel length class in the 2014 commercial fishery for area 2A (Washington, Oregon and California); Alaskan areas 2C, 3A, 3B, and 4; and Canadian area 2B. Sourcehttp://www.iphc.int/publications/annual/ar2014.pdf pg 78-79.

Halibut Commercial Landings (thousands of pounds, net weight) - 2014								
Source: http://www.iphc.int/publications/annual/ar2014.pdf								
Vessel Length	**Area 2A**	**AK-2C**	**AK-3A**	**AK-3B**	**AK-4**	**US-Total**	**Canada**	**Grand Total**
Unknown	0.0	92	59	64	49	264	404	668
< 41 ft	17.2	956	1356	307	758	3,394	885	4,279
41-55 ft	73.6	1,403	1,982	582	635	4,676	3,110	7,786
>55 ft	64.4	971	4,264	1,963	1,841	9,103	1,483	10,586
Total[1]	155.4	3,422	7,661	2,916	3,283	17,437	5,882	23,319
[1] The sum of the landings by vessel size class may disagree with the total due to rounding error.								

Observer Programs

NPFMC and PFMC Managers have recognized that data collection by onboard observers is currently the most reliable method available to gain fishery discard and biological information on fish, and data concerning seabird and marine mammal interactions with fisheries. Onboard observers also perform the task of collecting biological data such as species composition, weights, and tissue samples that are critically important for stock assessment scientists and researchers (NMFS 2014, Jannot et al 2011).

North Pacific Groundfish and Halibut Observer Program

The Observer Program provides the regulatory framework for NMFS-certified observers to obtain information necessary to conserve and manage the groundfish and halibut fisheries in the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands (BSAI) management areas. Data collected by well-trained, independent observers are a cornerstone of management of the Federal fisheries off Alaska. These data are needed by the North Pacific Fishery Management Council (Council) and NMFS to comply with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the Marine Mammal Protection Act, the Endangered Species Act, and other applicable Federal laws and treaties (NMFS 2014).

The NPFMC approved a re-structuring of the North Pacific observer program in October, 2010 that came into effect in January 2013, replacing the previous "interim" observer strategy that had lasted 23 years. The new regulations amend how observer coverage is funded and changes the coverage requirements for vessels and processors. Changes were made to increase the statistical reliability of data, to address cost equity issues for all participants, and to expand coverage to previously unobserved fisheries (NPFMC 2011).

The program placed all vessels and processors in the groundfish and Pacific halibut fisheries off Alaska into either " full coverage" or "partial coverage" categories. Vessels subject to full coverage include catcher-processors and motherships in the groundfish and Pacific halibut fisheries, catcher vessels fishing under a management system that uses prohibited species caps in conjunction with a catch share program, and shoreside and floating processors taking deliveries of AGA or CDQ pollock.

Analysis and evaluation of the partial coverage category of the observer program is managed through an Annual Deployment Plan (ADP) and associated review process. An interagency working group, the Observer Science Committee conducts an evaluation and makes recommendations to NMFS and NPFMC on deployment methods. An Observer Advisory Group (OAC), that includes members from the fishing Industry and others, provides independent recommendations to the Council. NMFS presents an Annual Performance Review (APR) report to the NPFMC during its June meeting with proposed changes to the deployment plan for the following year. The APR report details how well various aspects of the program are working, and leads to recommendations to be implemented in the subsequent year's amended ADP.

As the re-structured observer program evolved, NMFS identified sampling frame problems when using the vessel-selection method to assign observers to vessels. This issue was addressed by dropping the vessel-selection method, and using only the trip-selection method to assign observers to vessels in 2015. Two trip-selection pools were employed for 2015: 1) *Small vessel trip-selection***:** this pool is comprised of catcher vessels that are fishing hook-and-line or pot gear and are greater than or equal to 40ft, but less than 57.5ft LOA (the vessels in this pool were in the "vessel-selection" pool in the 2013 and 2014 ADPs), and 2) *Large vessel trip-selection***:** this pool comprises three classes of vessels: a) all catcher vessels fishing trawl gear, b) catcher vessels fishing hook-and-line or pot gear that are also greater than or equal to 57.5ft LOA, and c) catcher-processor vessels exempted from full coverage requirements (this pool was termed the "trip-selection" pool in the 2013 and 2014 ADPs). Anticipated selection probabilities in 2015 are 12% for the small vessel trip-selection pool and 24% for the large vessel trip-selection pool. This represents an identical selection rate in the former vessel-selection pool and a 50% increase in the large vessel trip-selection pool relative to the coverage rates in 2014 (NMFS 2014).

NMFS has placed vessels less than 40ft LOA and jig vessels in the "no-selection" pool since 2013 (NMFS 2015c). However, the Observer Program Annual Report (NMFS 2015a) and the Observer Program Supplemental Environmental Assessment (NMFS 2015b) have highlighted the data gaps caused by not having any observer information on vessels less than 40 ft LOA. NMFS proposed to continue placing vessels less than 40ft LOA in the no selection pool in 2016 and recommended that these vessels be considered for testing of electronic monitoring in the future (see EM discussion, below). Additionally, vessels not < 40 ft LOA that are selected by NMFS to participate in Electronic Monitoring (EM) Cooperative Research were eligible to be in the no selection pool while participating in such research (NMFS 2015c).

In both the 2013 and 2014 Annual Reports, NMFS found that biased observer data resulted from the policy of issuing conditional releases and temporary exemptions (e.g. for vessels with limited life raft capacity), and

recommended no exemptions for 2016 (NMFS 2015c). The NPFMC supported this in a Council Motion dated October 10, 2015 (Appendix II), given the option for these vessels to be in the electronic monitoring pool in 2016.

The Observer Declare and Deploy System (ODDS) is used to facilitate random selection of trips in the two trip selection pools. Two issues have been identified for improvement in the 2013 and 2014 Annual Reports. One issue involved potential bias due to cancelled trips, and another pertained to lack of a shared trip identifier between ODDS and the eLandings system. The eLandings system enables the Alaska fishing industry to report landings and production of commercial fish and shellfish to the three management agencies in Alaska (NMFS, Alaska Department of Fish and Game, and the International Pacific Halibut Commission) through a single online application. NMFS has proposed two alternatives as potential modifications to ODDS to address temporal bias, and has also proposed changes to the eLandings system in 2016, to provide better linkage between ODDS and eLandings and improve data analysis (NMFS 2015c).

The analysis and evaluation of the data collected by observers and ADP development is an on-going process. NMFS has released the Draft 2016 ADP for review by the OAC, Groundfish Plan Teams, SSC, and Council in Fall, 2015, and will finalize the 2015 ADP and release it to the public prior to the December 2015 Council meeting. In June 2016, NMFS will present the 2015 Annual Report that will form the basis for the 2016 ADP (NMFS 2014). NMFS continues to recommend trip-selection method for all vessels in 2016 (NMFS 2015c).

Coverage rates and structure for the restructured program since 2013 are given in Table 19.

Table 19 Alaska observer program targeted coverage rates in the small and large vessel selection pools, 2013-2015 (NMFS 2015c).

Stratum	Small vessel trip selection		Large vessel trip selection	
ADP Year	Rate (%)	Unit	Rate (%)	Unit
2013	11	vessel	11-15	trip
2014	12	vessel	16	trip
2015	12	trip	24	trip

In 2013-2014, it was also recognized that better definition of a “trip” was needed for sample selection when vessels make deliveries to tenders, rather than making landings directly on shore (Robert Alverson FVOA, *pers comm*). There is the need to distinguish between trips (leave port – return to port) and deliveries (offloads to tenders). There appears to be evidence that for vessels using tenders, “normal” (unobserved) trips are longer than observer trips, and there appears to be an incentive for observed boats to deliver to tenders to avoid starting a new trip and thus taking on an observer, effectively providing exemption from coverage. In September 2014, the FVOA remained concerned that NMFS and Council staff have determined that the data did not show a systematic difference in trip length between observed and unobserved vessels delivering to tenders (and associated shifts in processor delivery patterns), and presented their concerns to the council in a letter dated September 26th 2014. Following recommendations from the OAC and SSC, the Council made a motion on June 8, 2015 to “Identify the best approach to a trip identifier tied to landings data to provide a linkage between ODDS and eLandings and improve data analysis, including those trips delivered to a tender.”

NPFMC Recommendations associated with observer program improvements in 2015 can be found in Appendix 3.

Electronic Monitoring and Coverage for Small Vessels (<40 ft and 40-57.5ft LOA)

A number of efforts to examine the benefits and weaknesses of electronic monitoring systems have occurred over the last 10 years; the first in 2002 (Ames 2005), a second in 2004 (Ames *et al.* 2007) and most recently in 2010 (Cahalan *et al.* 2010). The 2010 study indicated that observer coverage and EM coverage exhibited statistically unbiased and acceptable comparability related to identification and numbers for almost all species, with the exception of those that could not be identified beyond the species grouping levels used in management. EM does not however, have the same capacity as human observers to collect biological specimens (e.g. otoliths, scales).

In 2014, NPFMC established an Electronic Monitoring (EM) Workgroup as a Council committee, to allow industry, agency, and EM service providers a forum to collaboratively design, test, and develop EM systems that are consistent with Council goals and objectives to integrate EM into the Observer Program. Multiple research tracks are being undertaken under the EM cooperative research plan in order to collect information that will help inform future Council alternatives for EM to enable catch estimation (NMFS 2015c).

For 2016, the EM workgroup has developed a Draft EM Pre-implementation Plan for small hook-and-line vessels. As part this process, NMFS sent an "opt-in" letter to the 40-57.5ft fixed gear vessel owners, requesting them to indicate if they are interested in participating in the 2016 EM pre-implementation program. As of August 2015, 56 vessel owners had responded to the letter (NMFS 2015c). Descriptive information about these vessels is available on the Council's website at: http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/EM%20Selection%20Pool%20Opt-In%20Characteristics.pdf .

Relevance of the Observer Program and EM to the Alaskan Halibut Fishery

In 2010, the IPHC noted that "Current information on bycatch (and at-sea discards) in the halibut fishery off Alaska is neither comprehensive nor representative and is derived primarily from unverified logbook reports, survey catches or other indirect sources" (IPHC.org). In the absence of comprehensive observer coverage, and recognizing that many small halibut boats may face logistic constraints carrying observers, the IPHC has explored alternative solutions including EM.

At the January 2013 IPHC meeting, the Conference Board, made up of halibut harvesters, asked either the IPHC or Canadian fisheries staff to present information to the NPFMC on electronic monitoring and how it's being used in Canada. The small boat fleet of halibut longliners wanted electronic monitoring for their vessels to be a larger component of the new observer program. The small boat fleet has also raised concerns that increasing observer coverage on smaller halibut and sablefish boats functionally decreases coverage for other sectors such as the Pollock and groundfish trawl fleets, where the latter have greater catches of prohibited species.

At present there is recognition by the NPFMC and the OAC of the disconnect between the intent to generate a better understanding of catch and discards via implementation of the overall observer program, and the reality of "releasing" small boats from coverage, while still facing obstacles to EM system implementation.

Washington Observer Program

The Northwest Fisheries Science Center groundfish observer program observes commercial catches of groundfish as either targets or bycatch, for fisheries managed by the Pacific Fishery Management Council on the West Coast. The program has two units: 1) the West Coast Groundfish Observers and 2) the At-Sea-Hake Observers. The program was established in May 2001 by NOAA Fisheries (NMFS) and requires that all vessels in US EEZ waters (3-200 miles offshore) must carry an observer if notified by NMFS to do so. NMFS jurisdiction has subsequently been expanded such that they may require that vessels fishing in state waters also carry observers (Jannot et al 2011). The NWFSC and PFMC are also currently evaluating the use of EM for the West Coast observer program. Information may be found at:

http://www.pcouncil.org/wp-content/uploads/C7b_SUP_NMFS_PPT_McVeigh_APR2014BB.pdf.

Regulation Compliance and Enforcement

Alaska

Enforcement authorities operate a comprehensive monitoring, control and surveillance (MCS) system over the fishery in Alaska. The MSA charges two federal agencies with the authority to implement provisions of the Act: The National Marine Fisheries Service and the US Coast Guard (USCG). The USCG enforces fisheries law and regulations at sea in conjunction with NOAA's Office of Law Enforcement and other federal, state, tribal, interstate and international organizations. The State of Alaska Department of Public Safety (Wildlife Troopers, Marine Enforcement Section) also enforces federal regulations under the MSA and other laws through a Joint Enforcement Agreement with NMFS.

For violations that are significant, or for repeat violators, the agent refers the case to the NOAA General Counsel's Office for Enforcement and Litigation for further action. Penalty schedules, which specify the civil penalties for violations of federal fisheries regulations, have been developed for each region's fisheries. The penalty schedule for groundfish and IFQ fisheries off the coast of Alaska contains sanctions for various violations of IFQ regulations.

As an example, the possession or sale of 300 to 1,500 pounds of IFQ halibut without an annual quota share carries a fine of $15,000 to $50,000, plus forfeiture or value of the illegal fish. For a person holding an IFQ, an overage during the final voyage of the year carries a civil penalty ranging from $1 - $6 per pound, plus forfeiture of the entire catch overage or its value.

The USCG monitors compliance in the Pacific halibut fishery by at-sea boardings across IFQ, derby, charter, subsistence, and recreational fisheries. The halibut fisheries violation rate over all sectors averaged 5% from 2010-2014 (Figure 13). A description of USGS resources and enforcement activities in Alaska and the Pacific Northwest is provided annually to IPHC (USCG 2015). Violation rates for commercial vessels boarded for inspection were 14.7% in 2013 and 8.1% in 2014 (Table 20). Across all IPHC management areas, the number of vessels boarded for inspection targeting Pacific halibut increased from 167 in 2013 to 420 in 2014 (Table 21). The most common violations observed are shown in Table 22.

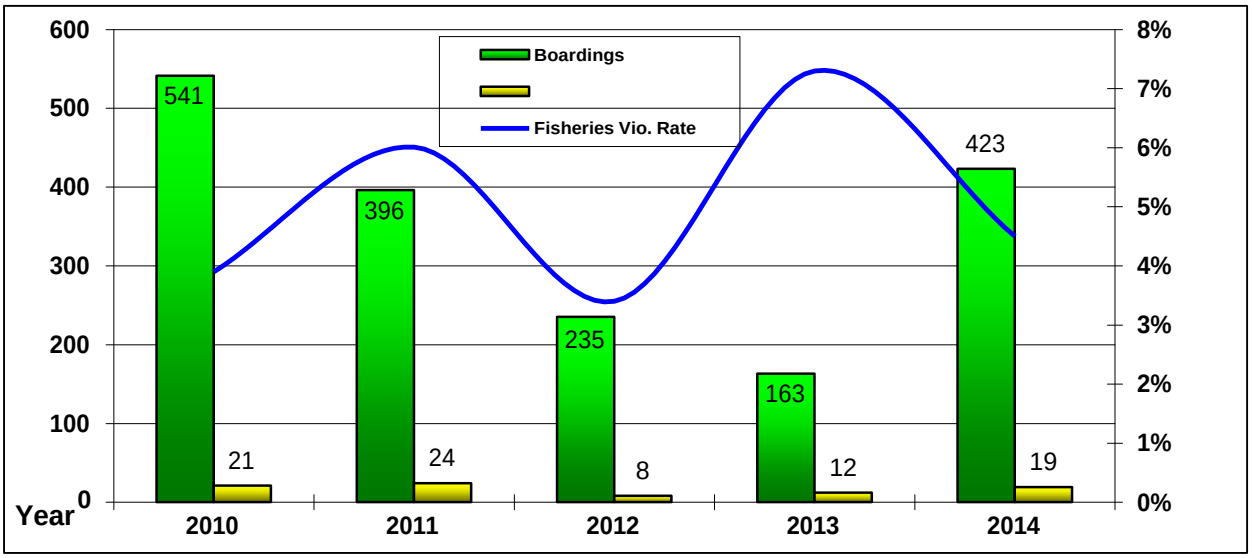


Figure 13. USCG Boardings and Fisheries Violations, 2010-2014. Source: USCG 2015. The unlabeled gold bar represents violations.

Table 20. USCG Boarding and Violation Summaries by Industry Sector, 2013 & 2014. Source: (USCG 2015). In this table, the "commercial" sector includes Alaskan IFQ, Area 2A Derby, and 3 vessels from other commercial fisheries.

2013 Boardings/Violations		2014 Boardings/Violations	
Total At-Sea Boardings	163	Total At-Sea Boardings	423
Commercial	68	Commercial	149
Charter	9	Charter	81
Recreational/Subsistence	86	Recreational/Subsistence	193
Fisheries Violations	12	Fisheries Violations	19
Commercial	10	Commercial	12
Charter	0	Charter	1
Recreational/Subsistence	2	Recreational/Subsistence	6
Fisheries Violation Rates	7.3%	Fisheries Violation Rates	4.5%
Commercial	14.7%	Commercial	8.1%
Charter	0.0%	Charter	1.2%
Recreational/Subsistence	2.3%	Recreational/Subsistence	3.1%

Table 21. Number of USCG boardings of vessels targeting halibut (all industry sectors) by INPFC area, 2013 & 2014. (USCG 2015).

IPHC Area	2013 Boardings	2014 Boardings
2A	12	41
2C	114	269
3A	5	74
3B	3	3
4A	11	8
4B	5	10
4C	10	10
4D	5	1
4E	2	4

Table 22. Description of IPHC Fisheries Violations observed by USCG in All Sectors, 2013 and 2014. (USCG 2015).

2013	2014
Lack of applicable permit.....3	Lack of applicable permit.....3
Fishing inside a closed area 1	Fishing inside a closed area 1
Failure to use careful release method.....1	Failure to use careful release method.....3
Mutilated catch.....1	Mutilated catch.....2
Subsistence fishing with too many hooks ... 1	Subsistence fishing with too many hooks…1
Failure to retain catch receipts.....1	Failure to complete offload……..1
Undersized catch 2	Discarding Pacific cod with IFQ fish onboard……1
Failure to mark buoys with ADFG or registration number 2	Discrepant permit classification……3
	Failure to maintain IFQ logbook……2
	Failure to complete charter logbook……1
	Failure to set seabird avoidance gear……. ... 1

Additionally, the USGS submits quarterly and annual year in review enforcement reports on IFQ fisheries (Pacific halibut and sablefish) to NPFMC. The year in review report for 2015 can be found at: http://npfmc.legistar.com/gateway.aspx?M=F&ID=8cf7b7cf-20af-492c-aa4d-3b45b6bd1871.pdf.

The NOAA Fisheries office of Law enforcement Alaska enforcement division also provides an annual report to the IPHC, that summarizes enforcement actions including compliance, inspections, and investigations in the Pacific halibut fishery (Table 23). Additionally, the State of Alaska Enforcement Division submits reports biannually to the NPFMC in June and December.

Table 23. NOAA Fisheries Alaska Enforcement Division, Pacific halibut related inspections, 2013-2014. Source: (NOAA 2014).

	2013			2014		
	Inspections	Violations Discovered During Inspection	Observed Compliance	Inspections	Violations Discovered During Inspection	Observed Compliance
Subsistence Halibut Fishing Vessel	19	12	37%	11	2	82%
Commercial Halibut Fishing Vessel	465	104	78%	493	34	93%
Charter Halibut Fishing Vessel	32	4	88%	45	8	82%
Sport Halibut Fishing Vessel	114	14	88%	131	6	95%
IFQ Buyer/Processor	10	5	50%	10	3	70%
Total	**640**	139	**78%**	**690**	53	**92%**

Washington

For the West Coast fisheries managed by PFMC, management measures are enforced by the NOAA Office of Law Enforcement, the 11th and 13th Coast Guard Districts, and local enforcement agencies.

4 Evaluation Procedure

4.1 Harmonised Fishery Assessment

The US North Pacific halibut demersal longline fishery partially, but not completely, overlaps with multiple MSC units of assessment. There are several certified fisheries in the geographic areas of Alaska and Washington, but only two were considered sufficient in overlap for harmonization consideration, which was undertaken in accordance with MSC FCR V2.0 Annex PB.

Canada Pacific halibut is considered for harmonization for Principle 1 (same species) and Principle 3 (IPHC management). North Pacific Sablefish is also considered for Principle 3 harmonization for its shared management under the NPFMC. Both of these fisheries have or are being assessed under MSC CRV1.3. In scoring, the assessment team considered the outcomes and rationales of the overlapping fisheries, and where a different scoring conclusion has been reached, has provided a rationale as presented in the tables and associated footnotes below.

Assessment coordination was undertaken with the North Pacific sablefish 2nd re-assessment, which is occurring simultaneous to this North Pacific halibut re-assessment, by the same assessment team and CAB, and for the same client group. Canada Pacific halibut was re-certified in July of 2015, so no assessment timeline coordination was applicable.

Table 24. Fisheries in the MSC System Considered for Harmonization.

Fishery	Status	Principles for Harmonization	Conformity Assessment Body
1 Canada Pacific halibut	Re-certified 2015	1,3	SCS
2 North Pacific sablefish	In 2nd re-assessment	3	SCS

Table 25. Scoring Summary for PIs under Harmonization Consideration. Scoring differences highlighted in orange and explained in footnotes below.

Component	PI	Performance Indicator (PI)	US Halibut	BC Halibut	Alaska Sablefish
Outcome	1.1.1	Stock status	90	90	90
	1.1.2	Reference points	90	90	100[1]
	1.1.3	Stock rebuilding	NA	NA	NA
Management	1.2.1	Harvest strategy	85	85	95[1]
	1.2.2	Harvest control rules & tools	90	80[1]	90
	1.2.3	Information & monitoring	65	90[2]	100[2]
	1.2.4	Assessment of stock status	95	95	100[3]
Governance and policy	3.1.1	Legal & customary framework	100	100	100
	3.1.2	Consultation, roles & responsibilities	100	100	100
	3.1.3	Long term objectives	100	90[3]	100
	3.1.4	Incentives for sustainable fishing	85	100[4]	100[4]
Fishery specific management system	3.2.1	Fishery specific objectives	100	100	100
	3.2.2	Decision making processes	100	100	100
	3.2.3	Compliance & enforcement	80	100[5]	95[5]
	3.2.4	Research plan	100	90[5]	100
	3.2.5	Management performance evaluation	90	100[5]	100[6]

Canada Pacific (BC) Halibut

[1] The Team scored SIc at 100, due to new evidence showing the tools in use (an improved IPHC assessment, and a new IPHC decision table analysis-replacing the old SUFD policy) are effective in achieving the exploitation levels required under the harvest control rules.

[2] In contrast to BC, the US North Pacific Observer Program has a data gap; boats <= 40 ft LOA are not observed. Thus the Team scored this at PI at 70 and raised a Condition.

[3] The Team finds that together, the IPHC and NPFMC show evidence of clear long-term objectives, consistent with MSC Principles and Criteria and the precautionary approach, and they are explicit within and required by management policy. This satisfies all of the conditions for SG 100.

[4] In contrast to BC, Washington has no IFQ program, so only partial scoring is possible for the SG100 level.

[5] Differences in the NPFMC and DFO fishery specific management systems resulted in different scoring for these 3 PIs.

Alaska Sablefish

[1] Reference points and harvest strategy are specific to sablefish in the NPFMC Tier system.

[2] Although the US halibut and Alaska sablefish fisheries share the same NPFMC observer program, the gap in coverage (noted for halibut) is judged by the Team to have a little impact on the sablefish fishery information system.

[3] The stock assessment is specific to sablefish.

[4] Sablefish scores higher because it has an IFQ program, but Washington does not.

[5] Lack of coverage on <40ft vessels is more problematic in halibut fishing than in sablefish because the sablefish fishery is more geographically concentrated.

[6]Pacific halibut is subject to both the IPHC and NPFMC management systems. IPHCs MSE process is not yet an effective mechanism to evaluate all parts of the management system.

4.2 Previous Assessments

This fishery is in its 2nd re-assessment. The first certificate cycle extended from 2006-2011. The fishery originally received five conditions in the 2011 full assessment (2.2.1, 2.2.3, 2.3.1, 2.3.2, 2.3.3), all due to be closed out by the third annual surveillance audit in 2014. All conditions pertained to Principle 2 requirements related to non-target species encountered in the fishery. Conditions originally set for 2014 fall under the outcome and

information status Performance Indicators (PI) for bycatch species and outcome, management, and information status PIs for Endangered Threatened and Protected (ETP) species.

After the second annual surveillance audit, based on a multi-party stakeholder submission and discussion with assessment team members for Principle 1 on both the US Pacific Halibut and BC Pacific Halibut assessment teams, 2013 changes in stock assessment and understanding of stock status were determined to have the potential to constitute "major changes." As a result, Principle 1 for US Halibut was re-scored outside the second annual surveillance (July 2013) via an onsite meeting scheduled that was coordinated with the 4th annual surveillance audit and re-assessment of BC Pacific Halibut (Sept 2013): both units share science advice and stock assessment provided by the IPHC. The rescoring was submitted to the client as a report in 2013, and an associated Action Plan was delivered to SCS from the Client (FVOA), in January 2014. As a result of the re-scoring of Principle 1, and additional condition was placed on the fisher under PI 1.2.3.

Later in 2014, at the third annual surveillance audit, the assessment team closed the open conditions on PIs 2.2.1, 2.3.1, and 2.3.2. The three remaining three open conditions (1.2.3, 2.2.3, 2.3.3) are all based information needed from the observer program, germane to both P1 and P2 requirements that depend on sufficient observer coverage to inform stock assessment, and to manage impacts the fishery on of non-target and ETP species. The team accepted a revised action plan targeting these three remaining open conditions and extended timelines into year 2 of the next certificate cycle (2017-2018). The updated Plan focused on ongoing NPFMC plans to expand EM coverage to address information deficiencies from smaller vessels. (See Appendix 4).

The second certificate cycle is in its 5th and final year, and a 4th Annual Surveillance was completed at the same time as the on-site. Coming into the 4th Annual Surveillance, the fishery had 3 open conditions (Table 26). The 2nd full re-assessment was announced on October 1, 2015. Copies of this and all assessment downloads are available here: https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/pacific/us-north-pacific-halibut/2nd-re-assessment-downloads-1

Table 26. Summary of Previous Assessment Conditions and Status as of 4th Annual Surveillance. Open conditions highlighted in light green.

Condition	PI(s)	Year closed	Justification
The US halibut fishery shall assure that there is information on Pacific halibut removals from the stock by the groundfish fleet, including sufficient and comprehensive estimates from vessels < 40 ft. LOA and on boats 40--57.5 ft LOA. Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule.	**1.2.3**	Open and on target, Year 2 in Next Certificate Cycle	New in 2013 based on re-scoring of Principle 1
The fishery shall provide scientifically defensible and comprehensive evidence to the CB that all the main bycatch species are highly likely to be within biologically based limits by the third surveillance audit.	2.2.1	Closed 2014	Re-evaluated in 2015, remained closed.
Information shall be collected and provided to the CB to support a partial strategy to manage main bycatch species and sufficient data shall continue to be collected to detect any increase in risk to main bycatch species throughout the certification period.	**2.2.3**	Open and on target, Year 2 in Next Certificate Cycle	timeline adjusted
The fishery shall provide evidence to the CB that the effects of the fishery are highly likely to be within limits of national and international requirements for the protection of ETP species. This evidence should be provided by the third surveillance audit.	2.3.1	Closed 2014	Re-evaluated in 2015, remained closed.
By the third surveillance audit the fishery shall show that the strategy to manage impacts on ETP species is working, with an objective basis for confidence.	2.3.2	Closed 2014	Re-evaluated in 2015, remained closed.
The fishery shall have sufficient data to allow fishery related mortality and the impact of fishing to be quantitatively estimated in a scientifically defensible manner for ETP species and provide these estimates to the CB.	**2.3.3**	Open and on target, Year 2 in Next Certificate Cycle	timeline adjusted

4.3 Assessment Methodologies

This assessment was conducted by SCS Global Services, an accredited MSC certification body. The fishery was assessed using the MSC Certification Requirements Version 1.3 Annex CB [default tree], (January 2013), and the latest MSC process requirements from GCR V2.1 (September 2015) and FCR V2.0 (April 2015). The reporting template used in this report is V2.0. The default assessment tree was used without adjustments. The fishery will continue to be subject to updated *process* requirements (FCR 2.0 and GCR 2.1 or more up to date versions thereof) at the time of any next surveillance, but the fishery will remain on Part C of V1.3 of the Certification Requirements for all *performance* requirements (PISGs) for the five-year duration of the certificate cycle, should the fishery be found capable of scoring at a level that confers certification.

Parts of Principle 2 of the new MSC fisheries standard (v2.0) are assessed for all MSC Units of Assessments

(UoAs) rather than just the impact of the UoA included in the current assessment process.

Although fisheries certified against CR v1.3 are not yet subject to the 'MSC-cumulative' approach, fisheries being assessed against FCR v2.0 are required to take the impacts of these existing MSC fisheries into account where applicable (e.g. where there are overlapping, main primary species). Guidance is provided on this topic under harmonisation in Annex GPB and Annex GSA.

4.4 Evaluation Processes and Techniques

4.4.1 Site Visits

The assessment team selected interviewees and the location of the on-site visit based on information needed to assess management operations of the unit of assessment. The client group and other relevant stakeholders helped identify and contact fisheries management, research, compliance, and habitat protection personnel and agency representatives. Before the site visit and meetings were conducted, an audit plan was provided to the client and relevant stakeholders. The on-site meetings took place in Seattle, Washington, and Juneau, Alaska between November 3rd- 7th. The assessment team visited agency offices including the National Marine Fisheries Center Regional Office (Juneau), Alaska Fisheries Science Center (Juneau), IPHC (Seattle), and also visited the client office and the University of Washington (Seattle) to meet with seabird experts. Several meetings also took place at hotels and restaurants in Seattle and Juneau. See Table 27 and

Table 28 for more detail.

Table 27. Audit Plan: Key Meetings and Locations

Meeting number	Date	Location	Topic
Seattle, Washington			
1	November 3, 2015	Silver Cloud Inn	Team opening meeting
2	November 3, 2015	Ivar's Salmon House	Client opening meeting
3	November 4, 2015	University of Washington	Observer Program
4	November 4, 2015	University of Washington	Seabird bycatch
5	November 4, 2015	IPHC	Halibut stock assessment and management
Juneau, Alaska			
6	November 5, 2015	NMFS- Alaska Regional Office	Opening meeting
7	November 5, 2015	NMFS- Alaska Regional Office	IFQ Permitting
8	November 5, 2015	NMFS- Alaska Regional Office	Seabird bycatch
9	November 5, 2015	NMFS- Alaska Regional Office	Management and Data
10	November 6, 2015	NMFS- Auke Bay Laboratories	Sablefish stock assessment
11	November 6, 2015	NMFS- Alaska Regional Office	Compliance and Enforcement
12	November 6, 2015	NMFS- Alaska Regional Office	Ecosystem Impacts
13	November 6, 2015	Westmark Baranof Hotel	Stakeholder Meeting

Table 28. 2015 Meeting Attendees by Organization in General Order of Meetings

Table 2: Meeting Attendees		
Name	**Role**	**Affiliation**
Sian Morgan	Assessment Team Lead	SCS Global Services
Tom Jagielo	Assessment Team: Principles 1&3	Tom Jagielo Consulting
Todd Hallenbeck	Assessment Team: Principle 2	Independent Consultant
Jennifer Humberstone	Assessment Team Coordinator	SCS Global Services
Robert Alverson	Client Representative, FVOA General Manager	FVOA
Paul Clampitt	FVOA Trustee	FVOA
Ben Clampitt	FV Augustine	FVOA
Per Odegaard	FVOA President	FVOA
Shannon Fitzgerald	Resource Ecology and Ecosystem Modeling	NMFS- AFSC
Edward Melvin	Marine Fisheries Senior Scientist	Washington Sea Grant
Bruce Leaman	Director	IPHC
Steve Martell	Quantitative Scientist	IPHC
Ray Webster	Quantitative Scientist	IPHC
Anna Henry	Survey Manager	IPHC
Claude Dykstra	Research Biologist	IPHC
Kirsten MacTavish	Commercial Data Manager	IPHC
Farron Wallace	Fisheries Monitoring and Analysis Division	NMFS-AFSC
Rachel Baker	Sustainable Fisheries Supervisory Fisheries Management Specialist	NMFS-ARO
Mary Furuness	Sustainable Fisheries Supervisory Resource Management Specialist	NMFS-ARO
Kim Rivera	National Seabird Coordinator	NMFS-ARO
Glenn Merrill	Manager of Sustainable Fisheries Division	NMFS-ARO
Tracy Buck	Supervisory Permit Specialist: Restricted Access Management	NMFS-ARO
Kristin Mabry	Protected Resources Division	NMFS-ARO
Dana Hanselman	Marine Ecology & Stock Assessment	NMFS- AFSC
Chris Lunsford	Marine Ecology & Stock Assessment	NMFS- AFSC
Cara Rodgeveller	Marine Ecology & Stock Assessment	NMFS- AFSC

Ron Antaya	Monitoring and Enforcement	NMFS
Brandee Gerke	Sustainable Fisheries: Supervisory Fisheries Management Specialist	NMFS-ARO

4.4.2 Consultations

In addition to the meetings and attendees list above (Section 4.4.1), consultations have included direct email outreach to potentially interested stakeholders including an initial announcement of the fishery assessment and follow-up information regarding and invitation to participate in the on-site meeting. The direct email stakeholder list includes over 40 individuals representing local and regional fishing associations, local and regionally eNGOs, national and international NGOs active in sustainable seafood, bird conservation eNGOs, management representatives, and the client representative.

A number of key organizations were contacted in advance of the fishery's formal entry into public full assessment by the team leader, by phone. Stakeholders were directly notified of the various stages of the MSC report, in accordance with the requirements of MSC FCRV2.0.

Prior to the onsite meeting, as well as following the onsite meeting, there were no written stakeholder comments received.

4.4.3 Evaluation Techniques

Documentation

One of the most significant, and difficult, aspects of the MSC certification process is ensuring that the assessment team gets a complete and thorough grounding in all aspects of the fishery under evaluation. In even the smallest fishery, this is a challenging task as the assessment team typically needs information that is fully supported by documentation in all areas of the fishery from the status of stocks, to ecosystem impacts, through management processes and procedures.

Under the MSC program, it is the responsibility of the applicant organizations or individuals to provide the information required proving the fishery or fisheries comply with the MSC standards. It is also the responsibility of the applicants to ensure that the assessment team has access to any and all scientists, managers, and fishers that the assessment team identifies as necessary to interview in its effort to properly understand the functions associated with the management of the fishery. Last, it is the responsibility of the assessment team to make contact with stakeholders that are known to be interested, or actively engaged in issues associated with fisheries in the same geographic location.

Most information required for the assessment was provided by the client or was available online. The team requested additional data and reports that were provided by IPHC, NOAA and NMFS-AFSC staff, as well as Dr. Ed Melvin of University of Washington.

Scoring Process

Scoring was spurred through initial research and the 4-day site visit and completed iteratively through phone calls, emails and skype teleconferences between January and April 2016. Following the onsite visit in November 2015, the team compiled a list of requested documents that were communicated to respective information providers and agency staff November-December 2015. A final scoring meeting was held by teleconference on

March 17th 2016 with all members of the team and the project coordinator. Assessment team members were required to provide records of harmonization considerations and rationales for any differences in scoring outcomes (See Section 4.1).

Scoring was completed by consensus through team meetings and exchanging rationales by email and draft score and report sharing.

Table 29. Scoring elements

Longline (hook and line) gear			
Component	**Scoring Elements**	**Main/Not main**	**Data-deficient or not**
1.1 Target Species	Pacific halibut	Main	N
2.1 Retained non-target	Bait	*Main retained: Unknown volume, designated "main" to obtain information.	Y
2.2 Bycatch Species	Pacific cod	Main. Greater than 5% of catch	N
2.2 Bycatch Species	Skates, Sharks, Grenadiers, Laysan Albatross, Black-Footed Albatross	Main. Less than 5% of catch, but vulnerable	N
2.3 ETP species	Short-tailed Albatross; Yelloweye Rockfish	ESA Listed "Endangered"; ESA Listed "Threatened"	N

* For an in-depth rationale and explanation of the treatment of bait as a 'main retained' species in the UoA, see: "Bait Considerations."

Scoring was completed in accordance the MSC FCRV2.0 7.10. Element scoring was conducted in accordance with the requirements under FCRV2.0 7.10 and associated Table 4. Conditions were set, as necessary, at the PI level and in accordance with FCR V2.0 7.11.

The following table summarizes how scores are calculated for Scoring Issues with multiple elements, as well as at the PI level:

Score	Combination of individual scoring elements at the scoring issue level or scoring issues at the PI Level
<60	Any scoring element/SI within a PI which fails to reach SG60 shall not be assigned a score. Teams shall record their rationale in narrative form for the PI rather than assigning actual scores of less than 60.
60	All elements/SIs meet SG60 and only SG60.
65	All elements/SIs meet SG60; a few achieve higher performance, at or exceeding SG80, but most do not meet SG80.
70	All elements/SIs meet SG60; some achieve higher performance, at or exceeding SG80, but some do not meet SG80 and require intervention action to make sure they get there.
75	All elements/SIs meet SG60; most achieve higher performance, at or exceeding SG80; only a few fail to achieve SG80 and require intervention action.
80	All elements/SIs meet SG80.
85	All elements/SIs meet SG80; a few achieve higher performance, but most do not meet SG100.
90	All elements/SIs meet SG80; some achieve higher performance at SG100, but some do not.
95	All elements/SIs meet SG80; most achieve higher performance at SG100, and only a few fail to achieve SG100.
100	All elements/SIs meet SG100.

Decision rules for final outcome

The decision rule for MSC certification is as follows:

- No PIs score below 60 (cannot receive certification)
- The aggregate score for each Principle, rounded to the nearest whole number, is 80 or above
- The aggregate score for each Principle is calculated using the MSC-provided scoring worksheet, which provides a weight per PI to be multiplied by the PI score received, where the sum of all weighted PI scores for a given Principle is provides the final Principle Score.
- Scoring worksheets can be downloaded from the MSC website here: https://www.msc.org/documents/scheme-documents/fisheries-certification-scheme-documents/fisheries-forms-and-templates

5 Traceability

5.1 Eligibility Date

The target eligibility date is set to be equivalent to the date of publishing the Public Comment Draft Report, as permitted under MSC FCRV2.0 7.6. The traceability and segregation systems that are required to ensure the separation of any certified product from non-certified product are believed to already be in place for the client fleet, as traceability systems are consistent with those in place through the last certificate cycle.

5.2 Traceability within the Fishery

Traceability in the unit of assessment is strong with low risk. This is primarily because the majority of product in the scope of the UoA is encompassed in the IFQ permitted fishery; the catch accounting system is able to

associate each landing with a permit that identifies the trip ID, quota holder, vessel category, and location of fishing; and compliance is considered high.

Based on the traceability systems in place and risks described below, the assessment team has determined that the scope of the certificate will extend to the point of landing, at which point eligible product may enter the chain of custody.

Traceability Risks and Systems in Place

In Alaska, vessels must give notice before leaving for a trip and before landing at a registered landing site. Pacific halibut from the UoA/UoC are readily segregated from non-UoA/UoC fish, because an IFQ/CDQ permit number is required to be associated with every delivery, and only IFQ/CDQ permit holders are allowed to make commercial landings. At landing, mixing is controlled in the following three main ways:

1. Fish Tickets: All ports where halibut are landed are required to have a registered code and scale to weigh the catch. This information is recorded on the landing slip which is required to be filled out by a registered weigh-master or registered dockside staff safeguarding against inaccurate or miss-reporting.

2. Catch Accounting: Quota shareholders are issued Landing Cards by NMFS-RAM, which must be presented at registered "transaction" locations when catch is off-loaded. The catch weight is then electronically debited from the holder's quota for that year. All landing card data is transmitted directly to NMFS-RAM databases. AK Fishermen must also alert the "transaction" station before leaving for a trip and notify OLE three hours prior to arrival at a registered landing site. Depending on whether a majority of halibut or sablefish is landed on a given trip, the total catch, including non-target species, are coded as "from a halibut trip" or "from a sablefish trip", depending on whether halibut or sablefish constituted >50% of the targeted catch. Therefore, at the point of landing product is traceable to a specific trip and IFQ permit (which also specifies vessel category and location of fishing).

3. Observers & Logbooks: All groundfish vessels have observer coverage and vessel captains complete voluntary and required logbooks.

This data feeds into the catch accounting system described in the Sources of Information section of this report. There is no likelihood of mixing on the water and a very low likelihood of mixing at the point of landing because of the three systems outlined above that ensure that landings are traceable back to a specific trip and permit (which also specifies vessel category and location of fishing). All landings are recorded and deducted from the quota holder's share.

Although the majority of the product of in the UoA is caught in the IFQ fishery in Alaska waters, the unit of assessment also includes product caught in Washington waters in area 2a under the relevant IPHC license. IPHC Area 2a also includes Oregon and California state waters, and therefore there is theoretically an area where there could be increased risk of mixing of UoA and non-UoA product under the same license. This could occur if a boat fished in both non UoA and UoA (WA State) waters on a single trip. This risk was discussed during the 2015 on-site audit with the client group and agency representatives. While not quantified at this time, landings

of this type are believed to be negligible due to the following factors: a) the species distribution with the highest volume of fish and therefore harvest come from Washington state waters; b) the location of the primary ports in each state and short duration of the fishing season make it unlikely for Washington state fishers to venture into Oregon waters during a fishing trip; and c) in accordance with point b, the bulk of landings taken south of the Columbia River are landed outside of Washington, in the ports of Newport and Astoria, Oregon (Bob Alverson, FVOA, *pers comm*).

Further, were the above to occur, it would be captured at landing via reporting areas used in fish tickets. In Washington, all fish brought into port are weighed and recorded on landing slips which record the vessel number, total catch weight, and location where caught (See Appendix 6) for catch reporting areas used in fish tickets). Dockside monitoring and enforcement ensure that all laws and regulations are adhered to.

There is no transshipment in the IFQ or IPHC Area 2a fishery, and tenders are not used (Bob Alverson, FVOA, pers comm).

Table 30. Summary of Traceability Factors within the Fishery:

Traceability Factor	Description of risk factor if present.
Potential for non-certified gear/s to be used within the fishery	Pot gear is permitted in the IFQ fishery, but at this time this gear is restricted to use in the sablefish fishery. Halibut are also caught as bycatch in the trawl fishery, but there are robust traceability systems at landing to differentiate between gear types. Observer coverage also helps to assure that only declared gear is used, but this is very low practical risk that an IFQ permitted vessel would employ a non-pot or longline gear type.
Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)	The UoA* encompasses the entire IFQ permitted area in the state waters of Alaska, and permit zoning is marked on fish tickets and can be verified with logbook entries. If vessels tried to fish outside of AK on the stock, they would be fishing illegally in Canadian waters and subject to legal prosecution. There is not evidence that this behavior occurs. There is a conceivable risk of fishing outside of the UoA for IPHC Area 2a permitted vessels fishing out of Washington. See above narrative description for more detail. *UoC product is determined based on landing (whether the processor is included in the certificate), so UoC considerations not applicable at sea.
Potential for vessels outside of the UoC or client group fishing the same stock	There is other fishing on the North Pacific halibut stock (e.g. recreational, Canada, Oregon & California IPHC Area 2a), but the IPHC management considers these removals, and inclusion in the UoA* can be verified via permit/fish ticket (which will identify fishers as IFQ permitted). *UoC product is determined based on landing (whether the processor is included in the certificate), so UoC considerations not applicable at sea.

Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction)	Chain of custody has been determined to begin at the point of landing. The assessment team has not evaluated risks beyond the point of landing, as traceability systems beyond the point of landing shall be audited by Chain of Custody auditors.
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	The only risk of mixing of certified and non-certified catch pertains to Washington State IPHC Area 2a permitted fishers harvesting in Oregon State waters. This risk is considered minimal. See above narrative description for more detail.
Risks of mixing between certified and non-certified catch during transhipment	There is no transshipment in this fishery.
Any other risks of substitution between fish from the UoC (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required	NA

5.3 Eligibility to Enter Further Chains of Custody

The assessment team has determined that sufficient traceability systems are in place to determine product from the unit of assessment to be eligible to enter further chains of custody at the point of landing as product eligible to be sold as MSC certified and/or carry the MSC ecolabel.

As in the 2011 1st re-assessment, this report does not cover processing beyond the point of landing. This report acknowledges that sufficient monitoring takes place to identify the fishery of origin for all landed fish via landing slips where the amount of catch and the fishing area are recorded for each line set during the fishing trip. This is sufficient to allow a chain-of-custody to be established from the point of landing forward for all products derived from the fishery. MSC chain-of-custody certifications were not undertaken in this project, and therefore, are undertaken on a separate and individual basis for those entities that may wish to identify and/or label products derived from the fishery. Only those fishers that belong to the certificate are eligible to enter the chain-of-custody where the products can then carry the blue MSC eco-label. Other eligible fishers may join the certificate at the discretion of the certificate holder. A complete list of all current certificate members may be found in the current fishery certificate, available at the MSC website: https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/pacific/us-north-pacific-halibut/reassessment-documents/20160316_F-SCS-0018_Revised_HAL123.pdf.

6 Evaluation Results

6.1 Principle Level Scores

Table 31. Final Principle Scores

Final Principle Scores	
Principle	**Score**
Principle 1 – Target Species	86.9
Principle 2 – Ecosystem	83.3
Principle 3 – Management System	95.1

6.2 Summary of PI Level Scores

Principle	Component	PI No.	Performance Indicator (PI)	Unit of Assessment
One	Outcome	1.1.1	Stock status	90
		1.1.2	Reference points	90
		1.1.3	Stock rebuilding	n/a
	Management	1.2.1	Harvest strategy	85
		1.2.2	Harvest control rules & tools	90
		1.2.3	Information & monitoring	65
		1.2.4	Assessment of stock status	95
Two	Retained species	2.1.1	Outcome	80
		2.1.2	Management	85
		2.1.3	Information	60
	Bycatch species	2.2.1	Outcome	85
		2.2.2	Management	95
		2.2.3	Information	75
	ETP species	2.3.1	Outcome	80
		2.3.2	Management	90
		2.3.3	Information	80
	Habitats	2.4.1	Outcome	80
		2.4.2	Management	90
		2.4.3	Information	80
	Ecosystem	2.5.1	Outcome	90
		2.5.2	Management	90
		2.5.3	Information	90
Three	Governance & policy	3.1.1	Legal & customary framework	100
		3.1.2	Consultation, roles & responsibility	100
		3.1.3	Long term objectives	100
		3.1.4	Incentives for sustainable fishing	85
	Fishery specific mgt.	3.2.1	Fishery specific objectives	100
		3.2.2	Decision making processes	100
		3.2.3	Compliance & enforcement	80
		3.2.4	Research plan	100
		3.2.5	Mgt. performance evaluation	90

6.4 Summary of Conditions

At the time of entering this 2nd re-assessment there were 3 open conditions (PIs 1.2.3, 2.2.3, 2.3.3). The 3 conditions were open and on target as of the 4th annual surveillance and likewise upon initiation of the 2nd re-assessment, due to close at the 2nd annual surveillance audit of the new certificate cycle. The conditions were set with a timeline extending beyond the previous certificate cycle to align with existing NPFMC timelines to implement increased observer and EM coverage the fishery that would address the open conditions. Because these were not considered behind target at the 4th surveillance, the assessment team does not consider their status as open to preclude recommendation for re-certification.

Two of these three conditions will remain open into the next certification cycle (see Table 32 below). The third open condition (on 2.3.3), was left open at the 4th annual surveillance, but after further consideration by the assessment team, has been re-scored to SG80, thereby closing the condition pertaining to information on ETP species. In addition to the 2 conditions from the previous certificate cycle, a new condition pertaining to PI 2.1.3 has been created.

Table 32. Summary of Conditions

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/NA)
1	By Surveillance year 3, The US halibut fishery shall assure that there is information on Pacific halibut removals from the stock by the groundfish fleet, including sufficient and comprehensive estimates from vessels < 40 ft. LOA and on boats 40--57.5 ft LOA. Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule.	**1.2.3**	**Y**
2	By surveillance year 3, the client will provide adequate information on the type, volume, and variability of bait used in the fishery to effectively assess the outcome status with respect to these species, to support a partial strategy if necessary, and determine if there is any increased risk level due to changes in the operation of the fishery.	**2.1.3**	**N**
3	By surveillance year 3, the client will provide adequate spatial fishing effort or catch composition information on the nature and the amount of bycatch from vessels <40 ft LOA to determine if there is a risk posed by this segment of the fishery that is different from the rest of the fleet and the effectiveness of the strategy to manage bycatch	**2.2.3**	**Y**

6.5 Determination, Formal Conclusion and Agreement

With the information available, the US North Pacific Halibut fishery meets the minimum requirements for being awarded certification which includes meeting the SG60 for all Performance Indicators and an average score of 80 or greater for all three Principle scores. The team discussed the merits and shortfalls of the fishery and by consensus recommended certification for the fishery. In accordance with MSC Certification Requirements, the report was made open to objection by interested parties for a period of 15 working days from publication of the Final Report with the positive certification determination, through August 18, 2016. No objections were

received. The SCS Certification Board reviewed the report, Performance Indicator rationales, peer reviews and stakeholder comments and agreed with the Assessment Team's recommendation to re-certify the fishery. The certificate will be awarded after the Public Certification Report is posted to the MSC website.

References

A'mar T, Palsson W. 2013. Assessment of the Pacific Cod Stock in the Gulf of Alaska. North Pacific Fishery Management Council. Anchorage, AK. pp. 159-266.

AFSC 2008. Alaska Fisheries Science Center. NOAA Essential Fish Habitat Research Implementation Plan for Alaska for FY 2007 – 2011 21 August 2006, Table 2 updated 3 July 2008. Available at: http://www.afsc.noaa.gov/HEPR/docs/UpdatedEFHResearchImplementationPlan.pdf

AKSCI 2013a. Alaska Coral and Sponge Initiative – Project Update. February 213. Pp. 3. Available at: http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/conservation_issues/AKCSI_FY12summary_213.pdf

AKCSI 2013b. Alaska Coral and Sponge Initiative: A 3-year research plan. Pp. 35 Available at: http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/conservation_issues/CoralSponge3yrFY13_213.pdf

Alaska Fisheries Science Center (AFSC). 2015. 2015 Observer Sampling Manual. Fisheries Monitoring and Analysis Division, North Pacific Groundfish Observer Program. AFSC, 7600 Sand Point Way N.E., Seattle, Washington, 98115. Document available at: http://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2015.pdf

Arata, J.A., Sievert, P.R., and Naughton, M.B. 2009. Status assessment of Laysan and black-footed albatrosses, North Pacific Ocean, 1923–2005: U.S. Geological Survey Scientific Investigations Report 2009-5131. 80p.

Aydin, K., S. Gaichas, I. Ortiz, D. Kinzey, and Friday, N., 2007. A comparison of the Bering Sea, Gulf of Alaska, and Aleutian Islands large marine ecosystems through food web modeling. NOAA NMFS Tech Memo. Pp. 309. Available at: http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-178.pdf

Bell, F.H. and G. St. Pierre. 1970. The Pacific Halibut. Technical Report No. 6. Seattle: International Pacific Halibut Commission.

BirdLife International 2013. Phoebastria immutabilis. The IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. Downloaded on 26 November 2014

BLI (BirdLife International). 2014. BirdLife International 2014. Phoebastria nigripes. The IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. Downloaded on 26 November 2014

Boldt, J, S. Bartkiw, P. Livingston, J. Hoff, and G. Walters 2008. Community size spectrum of the bottom trawl-caught community of the Eastern Bering Sea. Stock Assessment and Evaluation (SAFE) Report. Appendix A. Ecosystem Considerations. Available at: http://access.afsc.noaa.gov/reem/ecoweb/html/EcoContribution.cfm?ID=69

Brodziak, J., Ianelli, J., Lorenzen, K., and Methot, R.D. Jr. [eds.]. 2011. Estimating Natural Mortality in Stock Assessment Applications. NOAA Technical Memorandum NMFS-F/SPO-119

Casini, M. Lovgren, J. Hjelm, J., Cardinale M., Molinero, J-C, Kornilovs, G. 2008. Multi-level trophic cascades in a heavily exploited open marine ecosystem. Proceedings of the Royal Society B. 275:1644: 1793-1801

CDFW (California Department of Fish and Wildlife). 2005. Final Market Squid Fishery Management Plan. California Department of Fish and Wildlife. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=33570&inline=true

Clark, W. G. 2003. A model for the world: 80 years of model development and application at the International Pacifi c Halibut Commission. Natural Resource Modeling 16:491-503.

Clark, W.G, Hare, S.R. and Leaman, B.M. 2004. Sources of uncertainty in annual CEY estimates. IPHC RARA 2003. p. 163-170.

Clark, W. 2005. Effects of gear type, hook spacing, and hook size on commercial selectivity and catchability. IPHC RARA 2005. P. 93-104.

Clark, W.G., and Hare, S.R. 2006. Assessment and management of Pacific halibut: data, methods, and policy. IPHC Sci. Rep. No. 83.

Clausen, D. M. 2008. The giant grenadier in Alaska. In A. M. Orlov and T. Iwamoto (Editors), Grenadiers of the world oceans: biology, stock assessment, and fisheries, p. 413-450. Amer. Fish. Soc Sympos. 63. (Published by Amer. Fish. Soc., Bethesda, MD).

Clyde F.E. Roper Michael J. Sweeney Cornelia E. Nauen 1984. FAO Species catalogue VOL. 3. Cephalopods of the world An Annotated and Illustrated Catalogue of Species of Interest to Fisheries FAO Fisheries Synopsis No. 125, Volume 3

Cohen, D.M.; Inada.T.; Iwamoto, T.; Scialabba, N. FAO species catalogue. Vol. 10. Gadiform fishes of the world (Order Gadiformes). An annotated and illustrated catalogue of cods, hakes, grenadiers and other gadiform fishes known to date. FAO Fisheries Synopsis. No. 125, Vol. 10. Rome, FAO. 1990. 442 p.

Compagno LJV. 1984. FAO species catalog of the world, vol. 4 sharks of the world. An annotated and illustrated catalog of shark species known to date. Pt. 1. Hexanchiformes to Lamniformes. FAO Fish Synop 125. Rome.

Cousins K, Cooper J (Eds). 2000. The population biology of the black-footed albatross in relation to mortality by longline fishing. Western Pacific Regional Fishery Management Council. Workshop Report. Honolulu, HI. Available at: http://www.wpcouncil.org/library/docs/protectedspecies/1998%20Black%20footed%20albatross.workshop%20final%20report.pdf

Cox, S.P., Ianelli, J. and Mangel, M. 2015. Reports of the IPHC Scientific Review Board, 2014. IPHC Report of Assessment and Research Activities 2014: 267-276. Available at: http://www.iphc.int/publications/rara/2014/rara2014_16srb.pdf

Dodimead, A.J., Favorite, F., Hirano, T. 1963. Salmon of the North Pacific Ocean, Part II, Review of oceanography of the subarctic Pacific region. Bull. Int. N. Pac. Fish. Comm., 13, 195p.

Ebert, D.A. 2003. Sharks, rays, and chimeras of California. University of California Press, Berkeley, CA, 285 pp.

Ebert, D.A., J.J. Bizzarro, S.B. Brown, M.D. Boyle, and G.M. Cailliet. 2008. Diet and trophic ecology of skates in the Gulf of Alaska (Raja and Bathyraja spp.): ecological information for ecosystem–based management of demersal resources. North Pacific Research Board Final Report 621, 57 p.

Echave KB, Hulson PJ, Shotwell SK. 2015. Assessment of the Thornyhead stock complex in the Gulf of Alaska. AKFSC. Available at: http://www.afsc.noaa.gov/REFM/Docs/2015/GOAthorny.pdf

Essington, T.E., 2009. Trophic cascades in open ocean ecosystems. In: Terborgh, J.W., Estes, J.A. (Eds.), Trophic Cascades: Predators, Prey and the Changing Dynamics of Nature. Island Press. Pp. 488

Fitzgerald, S., Perez, S.M., Rivera, K. 2008. Summary of seabird bycatch in Alaska groundfish fisheries, 1993 through 2006. In Holdt and Zador, eds. Appendix C, Ecosystem Considerations for 2008, Stock Assessment and Fishery Evaluation Report. North Pacific Fishery Management Council.

Fitzgerald, S.M., J. Cahalan, J. Gasper, and J. Mondragon. 2013. Estimates of Seabird Bycatch in Alaskan Groundfish Fisheries Using the Alaska Region Catch Accounting System, 2007-2011. Poster presented at the Pacific Seabird Group 40th Annual Meeting, Portland, OR, Feb 2013. Document available at: http://access.afsc.noaa.gov/pubs/posters/pdfs/pFitzgerald03_seabird-bycatch.pdf

Gaichas, S. K, Francis R.C. 2008. Network models for ecosystem-based fishery analysis: a review of concepts and application to the Gulf of Alaska marine food web. Canadian Journal of Fisheries and Aquatic Science. 65:1965-1982.

Grant, W. S., Teel, D. J., Kobayashi, T., and Schmitt, C. 1984. Biochemical population genetics of Pacifi c halibut (*Hippoglossus stenolepis*) and comparison with Atlantic halibut (*H. hippoglossus*). Can. J. Fish. Aquat. Sci. 41:1083-1088.

Hanselman, D.H., Lunsford, C.R., Rodgveller, C.J. 2012a. Chapter 3. Assessment of the sablefish stock in Alaska. Stock Assessment and Fishery Evaluation (SAFE) Report. North Pacific Fishery Management Council, Anchorage AK, Pp. 545-654. Available at: http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf.

Hanselman DH, Heifetz J, Echave KB, Dressel SC. 2014. Move it or lose it: Movement and mortality of sablefish tagged in Alaska. Can. J. Fish. Aquat. Sci. 72:238-251. DOI: 10.1139/cjfas-2014-0251

Hare, S.R. 2012. Assessment of the Pacific halibut stock at the end of 2011. Int. Pac. Halibut Comm. Report of Assessment and Research Activities 2011: 101-201.

Hare, S.R., and Clark, W.G. 2005. Yield per recruit analysis for a sex specific halibut model. Int. Pac. Halibut Comm. Report of Assessment and Research Activities 2004:171-184.

Hare, S.R., and Clark, W.G. 2009. Assessment of the Pacific halibut stock at the end of 2008. IPHC RARA 2008. p. 137-202.

Hart JL. 1973. Pacific fishes of Canada. Fisheries Research Board of Canada. Ottawa.

Hauser, L., Spies, I., and Loher, T. 2006. Microsatellite screening in Pacifi c halibut (*Hippoglossus stenolepis*) and a preliminary examination of population structure based on observed DNA variation. Int. Pac. Halibut Comm. Sci. Rep. 81.

Heifetz, J. 2002. Coral in Alaska: distribution, abundance and species associations. Hydrobiologia. 471: pp 1928

Hickey, B., S. Geier, N. Kachel, and A. MacFayden. 2005. A bi-directional river plume: The Columbia in summer. Continental Shelf Research 25:1631-1656.

Hulbert, L.B., M.F. Sigler, and C.R. Lunsford (2006). Depth and movement behavior of the Pacific sleeper shark in the northeast Pacific Ocean. Journal of Fish Biology 69, 406-425.

Inter-American Development Bank (IADB). 2013. Argentina Sustainable Fishing and Aquaculture Program. Available at: http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=38895093

IPHC (International Pacific Halibut Commission). 1978. The Pacific Halibut: Biology, Fishery, and Management. International Pacific Halibut Commission. Seattle, WA. Available at: http://www.iphc.int/publications/techrep/tech0016.pdf

IPHC 2015. Annual Report 2014. International Pacific Halibut Commission. Seattle, WA. 96 pp. Available at: http://www.iphc.int/library/annual-reports.html.

IPHC 2015. Halibut Commission Announces 2015 Catch Limits and Seasons. News Release: January 30, 2015. Available at: http://www.iphc.int/news-releases/396-nr20150130.html

IPHC 2015b. 2015 Annual Research Plan. November 2015. IPHC Report of Assessment and Research Activities - 2014. Section 14c. 16 pp. Available at: http://www.iphc.int/publications/rara/2014/rara2014_02researchplan.pdf.

IPHC 2015c. Report of the Halibut Bycatch Working Group II. September 5, 2014. IPHC Report of Assessment and Research Activities - 2014. Section 14c. 74 pp. Available at: http://www.iphc.int/meetings/2015am/bb/10_1HalibutBycWorkGroup_rept_v17.pdf

Jannot, J.E., M. A. Bellman and J. Majewski. 2011. Pacific halibut bycatch in the U.S. west coast groundfish fishery from 2002 through 2010. West Coast Groundfish Observer Program. NWFSC, 2725 Montlake Blvd E., Seattle, WA 98112. Available at: http://www.pcouncil.org/wp-content/uploads/I2b_NMFS_SEPT2011BB.pdf

Johnson T. 2003. The Bering Sea and Aleutian Islands: region of wonders. Alaska Sea Grant College Program, University of Alaska Fairbanks, Fairbanks, Alaska, USA. Pp. 19-44.

Leaman, B. 2007. IPHC Stock Assessment Workshop, 2007. Fishery and Management Overview: Biology, Fishery, and Management. June 27, 2007. 34 pp. http://www.iphc.int/presentations/ws0701bml.pdf.

Levin, P.S., and F.B. Schwing (eds.) 2011. Technical background for an integrated ecosystem assessment of the California Current: Groundfish, salmon, green sturgeon, and ecosystem health. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-109, 330 p. Available at: http://www.nwfsc.noaa.gov/assets/25/1618_07122011_125959_CalCurrentIEATM109WebFinal.pdf

Livingston, P.A., Low, L.-L., Marasco, R.J., 1999. Eastern Bering Sea ecosystem trends. In: Sherman, K., Tang, Q. (Eds.). Large Marine Ecosystems of the Pacific Rim: Assessment, Sustainability, and Management. Blackwell Science, Malden, MA, p.140-162.

Livingston, P.A. 2003. Ecosystem considerations for 2004. In Stock Assessment and Fishery Evaluation Report for the groundfish resources of the EBS/AI and GOA. North Pacific Fishery Management Council, Anchorage. Available at: www.fakr.noaa.gov/npfmc/safes/2003/ecosystem2003.pdf.

Love, M.S., C.W. Mecklenberg, T.A. Mecklenberg, and L.K. Thorsteinson. 2005. Resource inventory of marine and estuarine fishes of the West Coast and Alaska: a checklist of north Pacific and Arctic Ocean species from Baja California to the Alaska-Yukon Border. U.S. Department of the Interior, U.S. Geological Survey, Biological Resources Division, Seattle, Washington, 98104, OCS Study MMS 2005-030 and USGS/NBII 2005-001.

Martin, M. 2009. HAPC Biota – Gulf of Alaska. In Boldt J.and Zador, S. Eds. Ecosystem Impacts for 2010. Appendix C, 2009 Stock Assessment and Fishery Evaluation (SAFE) report. North Pacific Fishery Management Council.

McConnaughey, R.A., Olson, J.V., and Sigler, M.F. 2009. Alaska Fisheries Science Center Essential Fish Habitat Data Inventory. AFSC Processed Rep. 2009-01, 40 p. Alaska Fisheries Science Center NOAA, National Marine Fisheries Service, 7600 Sand Point Way NE, Seattle WA 98115.

McFarlane GA and King JR. 2003. Migration patterns of spiny dogfish (Squalus acanthias) in the North Pacific Ocean. Fishery Bulletin, 101(2), pp. 358-367.

Mecklenburg, C.W., T.A. Mecklenburg and L.K. Thorsteinson. 2002. Fishes of Alaska. American Fisheries Society. Bethesda, MD.

Moyle, P.B., and J.J. Cech, Jr., 1996. Fishes, an introduction to ichthyology (Third edition). Prentice Hall: New Jersey, 590 pp.

Mueter, F. 2009. Total annual surplus production and overall exploitation rate of groundfish. In Boldt and Zador, Eds. Ecosystem Considerations for 2010. Stock Assessment and Fishery Evaluation (SAFE) report. North Pacific Fisheries Management Council. Available at: http://access.afsc.noaa.gov/reem/ecoweb/html/EcoContribution.cfm?ID=68

Mueter, F., Lauth, R. 2009. Average local species richness and diversity of the groundfish community. Community size spectrum of the bottom trawl-caught community of the Eastern Bering Sea. Stock Assessment and Evaluation (SAFE) Report. Appendix A. Ecosystem Considerations. Available at: http://access.afsc.noaa.gov/reem/ecoweb/EcoChaptMainFrame.cfm?ID=57

Munro, A. R., editor. 2015. Run forecasts and harvest projections for 2015 Alaska salmon fisheries and review of the 2014 season. Alaska Department of Fish and Game, Special Publication No. 15-04, Anchorage.

Naughton, M. B, M. D. Romano, T. S. Zimmerman. 2007. A Conservation Action Plan for Black-footed Albatross (*Phoebastria nigripes*) and Laysan Albatross (*P. immutabilis*). Ver. 1.0

NMFS. 2013. Amendment 100 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands, and Amendment 91 to the Fishery Management Plan for Groundfish of the Gulf of Alaska: Management of Grenadiers (Family Macrouridae). North Pacific Fishery Management Council. Anchorage, AK.

NMFS (National Marine Fisheries Service). 2014. Status Review of Southeast Alaska Herring (*Clupea pallasi*), Threats Evaluation and Extinction Risk Analysis. Report to National Marine Fisheries Service, Office of Protected Resources, pp. 183. Available at: http://www.nmfs.noaa.gov/pr/species/Status%20Reviews/se_ak_herring_sr_2014.pdf

NMFS. 2015. Programmatic Biological Assessment on the Effects of the Fishery Management Plans for the Gulf of Alaska and Bering Sea/Aleutian Islands Groundfish

NMFS (National Marine Fisheries Service). 2014. 2015 Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska. National Oceanic and Atmospheric Administration, 709 West 9th Street. Juneau, Alaska 99802.

NMFS (National Marine Fisheries Service). 2015a. North Pacific Groundfish and Halibut Observer Program 2014 Annual Report. National Oceanic and Atmospheric Administration, 709 West 9th Street. Juneau, Alaska 99802.

NMFS (National Marine Fisheries Service). 2015b. Draft Supplement to the Environmental Assessment for Restructuring the Program for Observer Procurement and Deployment in the North Pacific. NMFS, Alaska Regional Office, Juneau. May 2015.

NMFS (National Marine Fisheries Service). 2015c. Draft 2016Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska. National Oceanic and Atmospheric Administration, 709 West 9th Street. Juneau, Alaska 99802.

Fisheries and the State of Alaska Parallel Groundfish Fisheries on the Endangered Short-tailed Albatross (*Phoebastria albatrus*) and the Threatened Alaska breeding Population of the Steller's Eider (*Polysticta stelleri*). Sustainable Fisheries Division. Juneau, AK.

NMFS 2015e. California Current Integrated Ecosystem Assessment (CCIEA) State of the California Current Report. Pacific Fishery Management Council. Available at: http://www.pcouncil.org/wp-content/uploads/E1b_NMFS_Rpt2_MAR2015BB.pdf

NOAA 2013. Pacific Halibut – Sablefish IFQ report. March 2014.NMFS Alaska Region. Juneau, AK. 42 p. alaskafisheries.noaa.gov/ram/ifqreports.htm

NOAA 2014. NOAA Fisheries Office of Law Enforcement Alaska Enforcement Division Report to the International Pacific Halibut Commission. January 1, 2014 to November 15, 2014. http://www.iphc.int/meetings/2015am/bb/1306_2_NOAA_OfficeofEnforcement_Alaska.pdf

NPFMC. 2010b. North Pacific Fisheries Management Council. Initial Review Draft: Environmental Assessment / Regulatory Impact Review / Initial Regulatory Flexibility Analysis for proposed amendment 86 to the Fishery Management Plan of the Bering Sea / Aleutian Islands Management area and amendment 76 to the Fishery Management Plan of the Gulf of Alaska: Restructuring program for observer procurement and deployment in the North Pacific. June 2010. Pp. 380. Available at: http://alaskafisheries.noaa.gov/analyses/observer/amd86_amd76_earirirfa0311.pdf

NPFMC (North Pacific Fishery Management Council). 2011. Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis for Proposed Amendment 86 to the Fishery Management Plan for Groundfish of the Bering sea/Aleutian Islands Management Area and Amendment 76 to the Fishery Management Plan for Groundfish of the Gulf of Alaska: Restructuring the Program for Observer Procurement and Deployment in the North Pacific. March 2011. 239 pages plus appendices. Available online at http://alaskafisheries.noaa.gov/analyses/observer/amd86_amd76_earirirfa0311.pdf.

NPFMC (North Pacific Fishery Management Council). 2014. February 2014 Meeting, Grenadier Management Motion. Seattle, WA.

NPFMC. 2015. North Pacific Management Council. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. North Pacific Fishery Management Council, Anchorage, AK. pp.85-94.

NPFMC, 2015. Development of a Bering Sea Fishery Ecosystem Plan Preliminary Discussions for the Ecosystem Committee. NPFMC Meeting. Available at: http://www.npfmc.org/wp-content/PDFdocuments/membership/EcosystemCommittee/EcoPage/DRAFTBSFEPCommentSynthesis.pdf

NPFMC. 2009. Navigating the North Pacific Council Process. North Pacific Fishery Management Council, Anchorage AK.

NPFMC. 2012. Statement of organization, practices, and procedures of the North Pacific Fishery Management Council (Draft). North Pacific Fishery Management Council, Anchorage AK.

NPFMC. 2015. Fishery Management Plan for Groundfish of the Gulf of Alaska. August 2015. 150 pp. North Pacific Fishery Management Council, Anchorage AK.

NPFMC. 2015. Fishery Management Plan for Groundfish of the Bearing Sea and Aleutian islands Management Area. August 2015. 166 pp. North Pacific Fishery Management Council, Anchorage AK.

Orlov AM. 1999. Capture of especially large sleeper shark *Somniosus pacificus* (Squalidae)with some notes on its ecology in northwestern Pacific. J Ichthyol 39:548-553.

Orlov, A. M., and S. I. Moiseev. 1999. Some biological features of Pacific sleeper shark *Somniosus pacificus* (Bigelow and Schroeder 1944) (Squalidae), in the northwestern Pacific Ocean. Polish Academy of Sciences, National Scientific Committee on Oceanic Research, Institute of Oceanography, University of Gdansk. Oceanological Studies FVIII No. 1-2: 3-16.

Ormseth OA. 2014. Assessment of the skate complex in the Bering Sea and Aleutian Islands. North Pacific Management Council. Anchorage, AK. pp. 1693-1792. Available at: http://www.afsc.noaa.gov/REFM/Docs/2014/BSAIskate.pdf

Ormseth OA. 2014b. Assessment of the skate complex in the Gulf of Alaska. North Pacific Management Council. Anchorage, AK. pp. 855-920. Available at: http://www.afsc.noaa.gov/REFM/Docs/2014/GOAskate.pdf

Pacific Fishery Management Council (PFMC). 2014. Status of the Pacific Coast Coastal Pelagic Species Fishery and Recommended Acceptable Biological Catches. Stock Assessment and Fishery Evaluation for 2014. Available at: http://www.pcouncil.org/wp-content/uploads/2014_CPS_SAFE_Text_FINAL.pdf

Pacific Fishery Management Council (PFMC). 2005. Amendment 18 (Bycatch Mitigation Program) Amendment 19 (Essential Fish Habitat) to the Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery. Available at: http://www.pcouncil.org/wp-content/uploads/A18-19Final.pdf

Pacific Fishery Management Council (PFMC 2013). Pacific Fishery Ecosystem Plan. Pacific Fishery Management Council. Available at: http://www.pcouncil.org/wp-content/uploads/FEP_FINAL.pdf

Pacific Fishery Management Council (PFMC 2016). Pacific Coast Groundfish Fishery Management Plan. January 2016. 160 pp. Pacific Fishery Management Council.
Available at: http://www.pcouncil.org/wp-content/uploads/2016/01/GF_FMP_FINAL_Jan2016.pdf.

PFMC. 2014. Status of the Pacific Coast Groundfish Fishery: Stock Assessment and Fishery Evaluation. Pacific Fishery Management Council. Available Online: http://www.pcouncil.org/wp-content/uploads/2015/03/SAFE_Dec2014_v12.pdf

Peterson MJ, Mueter F, Criddle K, Haynie AC (2014) Killer Whale Depredation and Associated Costs to Alaskan Sablefish, Pacific Halibut and Greenland Turbot Longliners. PLoS ONE 9(2): e88906. doi:10.1371/journal.pone.0088906

Petersen MJ, Carothers C. 2013. Whale interactions with Alaskan sablefish and Pacific halibut fisheries: Surveying fishermen perception, changing fishing practices and mitigation. Marin Policy 42. pp 315-324. Available at: http://www.researchgate.net/publication/257163229_Whale_interactions_with_Alaskan_sablefish_and_Pacific_halibut_fisheries_Surveying_fishermen_perception_changing_fishing_practices_and_mitigation

Pham, C.K., Diogo, H., Menezes, G., Porteiro, F., Braga-Henriques, A., Vandeperre, F. and Morato, T., 2014. Deep-water longline fishing has reduced impact on Vulnerable Marine Ecosystems. Scientific reports, 4.

Pitman RL, Walker WA, Everett WY, Gallo-Reynoso JP. 2004. Population status, foods and foraging of Laysan Albatross *Phoebastria immutabilis* nesting on Guadalupe Island, Mexico. Marine Ornithology 32: 159-165.

Robinson, H.J. 2006. Dietary analysis of the longnose skate*, Raja rhina* (Jordan and Gilbert, 1880), in California waters. M.S. thesis, Moss Landing Marine Laboratories, CSU Monterey Bay.

Rodgveller K and Hulson P. 2014. Assessment of the Grenadier Stock Complex in the Gulf of Alaska, Eastern Bering Sea, and Aleutian Islands. North Pacific Fishery Management Council. Anchorage, AK. pp. 963-1000.

Sherman, K and Hempel, G (Editors). 2009. The UNEP Large Marine Ecosystem Report: A perspective on changing conditions in LME's of the world's regional seas. UNEP Regional Sea Report and Studies No. 183. United Nations Environmental Programme. Nairobi, Kenya. PP 205-226.

Shimada, A. M., and D. K. Kimura. 1994. Seasonal movements of Pacific cod (*Gadus macrocephalus*) in the eastern Bering Sea and adjacent waters based on tag-recapture data. U.S. Natl. Mar. Fish. Serv., Fish. Bull. 92:800-816.

Simenstad, C., L.F. Small, C.D. McIntire, D.A. Jay and C. Sherwood. 1990. Columbia River estuarine studies: an introduction to the estuary, a brief history, and prior studies. Progress in Oceanography 25:1-14

Skewgar, E. and S.F. Pearson (Eds.). 2011. State of the Washington Coast: Ecology, Management, and Research Priorities. Washington Department of Fish and Wildlife, Olympia, Washington.

Skud BE. 1978. Factors Affecting Longline Catch and Effort: Bait loss and competition. Scientific Report No. 64. IPHC. Pp. 25-43. Available at: http://www.iphc.int/publications/scirep/SciReport0064.pdf

Spies I, Wilderbuer TK, Nichol DG, Aydin K. 2014b. Assessment of the arrowtooth flounder stock in the Eastern Bering Sea and Aleutian Islands. AKFSC. Available at: http://www.afsc.noaa.gov/REFM/Docs/2014/BSAIatf.pdf

Spies I, Nichol D, Spencer PD. 2014. Assessment of the Other Rockfish stock complex in the Bering Sea/Aleutian Islands. Stock Assessment and Evaluation Report. North Pacific Fishery Management Council. Anchorage, AK. pp. 1571-1580. Available at: http://www.afsc.noaa.gov/REFM/Docs/2014/BSAIorock.pdf

Spies I, Spencer PD, Ianelli JN. 2015. Assessment of the shortraker rockfish stock in the Eastern Bering Sea and Aleutian Islands. NPFMC. Available at: http://www.afsc.noaa.gov/REFM/Docs/2015/BSAIshortraker.pdf

Stevenson, D. 2004. Identification of skates, sculpins, and smelts by observers in north Pacific groundfish fisheries (2002-2003), U.S. Department of Commerce Technical Memorandum NMFS-AFSC- 142. 67 p.

Stone RP. 2006. Coral habitat in the Aleutian Islands of Alaska: depth distribution, fine-scale species associations, and fisheries interactions. Coral Reefs. 25. pp.229-238.

Stone RP and Shotwell SK 2007. State of Deep Coral Ecosystems in the Alaska Region: Gulf of Alaska, Bering Sea and the Aleutian Islands. pp. 65-108. In: SE Lumsden, Hourigan TF, Bruckner AW and Dorr G (eds.) The State of Deep Coral Ecosystems of the United States. NOAA Technical Memorandum CRCP-3. Silver Spring MD. pp. 65-108.

Stewart, I.J. and B.M, Martell. 2014. Assessment of the Pacific halibut stock at the end of 2013. IPHC Report of Assessment and Research Activities 2013: 169-196. Available at: http://www.iphc.int/publications/rara/2013/rara2013_12_2013assessment.pdf

Stewart, I.J. and B.M, Martell. 2015. Assessment of the Pacific halibut stock at the end of 2014. IPHC Report of Assessment and Research Activities 2014: 161-180. Available at: http://www.iphc.int/publications/rara/2014/rara2014_11stockassessment.pdf

Stewart, I.J. 2015. Overview of data sources for the Pacific halibut stock assessment and related analyses. IPHC Report of Assessment and Research Activities 2014: 87-160. Available at: http://www.iphc.int/publications/rara/2014/rara2014_10sadatasources.pdf

Stewart, I.J. 2016. Regulatory area harvest policy calculations and catch tables. IPHC Report of Assessment and Research Activities 2015: 220-237. Available at: http://www.iphc.int/publications/rara/2015/RARA2015_14HarvestPolicy.pdf

Stone RP. 2006. Coral habitat in the Aleutian Islands of Alaska: depth distribution, fine-scale species associations, and fisheries interactions. Coral Reefs. 25. pp.229-238.

Suryan, R. M., K. S. Dietrich, E.F. Melvin, G.R. Balogh, F. Sato, K. Ozaki. 2007. Migratory routes of shorttailed albatrosses: Use of exclusive economic zones of North Pacific Rim countries and spatial overlap with commercial fisheries in Alaska. Biological Conservation 137: 450-460.

Taylor IG. 2011. Rebuilding analysis for yelloweye rockfish based on the 2011 update stock assessment. Pacific Fishery Managementt Council. Available at: http://www.pcouncil.org/wp-content/uploads/Yelloweye_2011_Rebuilding.pdf

Taylor IG, Wetzel C. 2011. Status of the U.S. yelloweye rockfish resource in 2011 (Update of 2009 assessment model), Pacific Fishery Managemetn Council. Available at: http://www.pcouncil.org/wp-content/uploads/Yelloweye_2011_Assessment_Update.pdf

Thompson GG. 2014. Assessment of the Pacific Cod Stock in the Eastern Bering Sea. North Pacific Fishery Management Council. Anchorage, AK. pp. 256-436. Available at: http://www.afsc.noaa.gov/REFM/Docs/2014/EBSpcod.pdf

Tribuzio CA, Echave K, Rodgveller C, Hulson PJ. 2015. Assessment of sharks in the Gulf of Alaska. In Stock assessment and fishery evaluation report for the groundfish resources of the Gulf of Alaska for 2010. North Pacific Fishery Management Council, 605 W 4th Ave, Suite 306, Anchorage, AK 99501. Available at: http://www.afsc.noaa.gov/refm/stocks/plan_team/GOAshark.pdf

Tribuzio CA, Kruse GH, Fujioka JT. 2010. Age and growth of spiny dogfish (Squalus acanthias) in the Gulf of Alaska: analysis of alternative growth models. Fishery Bulletin, 108(2), pp. 119-135.

USCG 2015. U. S. COAST GUARD ENFORCEMENT REPORT (IPHC Areas 2A, 2C, 3A, 3B, 4A, 4B, 4C, 4D and 4E). http://www.iphc.int/meetings/2015am/bb/1105_1_CGCombinedReport.pdf

USFWS. 2003. Programmatic Biological Opinion on the Effects of the Total Allowable Catch (TAC)-Setting Process for the Gulf of Alaska (GOA) and Bering Sea/Aleutian Islands (BSAI) Groundfish Fisheries to the Endangered Short-tailed Albatross (*Phoebastria albatrus*) and Threatened Steller's Eider (*Polysticta stelleri*). Anchorage Fish and Wildlife Field Office, 605 West 4th Avenue, Anchorage, AK 99501: 42 pp.

USFWS. 2008. Short-tailed Albatross Recovery Plan. Anchorage, AK: 105 pp. Document available at:http://www.fws.gov/alaska/fisheries/endangered/pdf/stal_recovery_plan.pdf

USFWS. 2014. 5-Year Review: Summary and Evaluation Short-tailed Albatross (*Phoebastria albatrus*) Anchorage, AK: 43 pp. Document available at: http://ecos.fws.gov/docs/five_year_review/doc4445.pdf

USFWS. 2015b. Record Numbers of Albatross Nest on Midway Atoll National Wildlife Refuge/Battle of Midway National Memorial. Available at: http://www.acap.aq/en/news/latest-news/2013-record-numbers-of-black-footed-and-laysan-albatrosses-breeding-in-the-midway-atoll-national-wildlife-refuge-this-year-thought-due-to-el-nino

Walker, W. A., J. G. Mead, and R. L. Brownell, Jr. 2002. Diets of Baird's beaked whales, *Berardius bairdii*, in the southern Sea of Okhotsk and off the Pacific coast of Honshu, Japan. Marine Mammal Science 18(4): 902-919.

Worm, B., Hilborn, R., Baum, J.K., Branch, T.A., Collie, J.S., Costello, C., Fogarty, M.J., Fulton, E.A., Hutchings, J.A., Jennings, S., Jensen, O.P., Lotze, H.K., Mace, P.M., McClanahan, T.R., Minto, C., Palumbi, S.R., Parma, A.M., Ricard, D., Rosenberg, A.A., Watson, R., Zeller, D., 2009. Rebuilding Global Fisheries. Science 325, 578585

Yang, M-S., and M. W. Nelson. 2000. Food habits of the commercially important groundfishes in the Gulf of Alaska in 1990, 1993, and 1996. NOAA Tech. Memo. NMFS-AFSC-112. 174p.

Yang, M-S. K. Dodd, R. Hibpshman, and A. Whitehouse. 2006. Food habits of groundfishes in the Gulf of Alaska in 1999 and 2001. NOAA Tech. Memo. NMFS-AFSC-164. Pp. 199 Available at: http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-164.pdf

Zador S. 2014. Appendix C: Ecosystem Considerations for 2014. The Plan Teams for the Groundfish Fisheries of the Bering Sea, Aleutian Islands and Gulf of Alaska. North Pacific Fishery Management Council. Pp. 243. Available at: http://www.afsc.noaa.gov/REFM/Docs/2014/ecosystem.pdf

Appendix 1 Scoring and Rationales

Principle 1

Evaluation Table for PI 1.1.1

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	Female spawning stock biomass at the beginning of 2015 was estimated at 215.1 Mlbs, which corresponds to a depletion level of 41% of its unfished state (Stewart and Martell 2015). The limit reference point defining an overfished condition for Pacific halibut is the Minimum Stock Size Threshold (MSST), which is B20%. The probability of the stock being above B20% in 2015 was estimated to be greater than 99% (Stewart and Martell 2015). As per CR CB2.2.1, this corresponds to a "high degree of certainty" that the stock is above the point where recruitment would be impaired. A score of 100 is warranted.		
b	**Guidepost**		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		(Y/N) Y	(Y/N) N
	Justification	The target reference point for Pacific halibut is B30%. The probability of the stock being above B30% in 2015 was estimated to be 90% (Stewart and Martell 2015). Thus, the SG80 level is met. Scoring at the SG100 level would require the probability of being above B30% to be greater than or equal to 95%. Thus, the requirements of the SG100 level are not met.		
References		Stewart, I.J. and B.M, Martell. 2015. Assessment of the Pacific halibut stock at the end of 2014. IPHC Report of Assessment and Research Activities 2014: 161-180. Available at: http://www.iphc.int/publications/rara/2014/rara2014_11stockassessment.pdf		

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing			
Stock Status relative to Reference Points				
	Type of reference point	**Value of reference point**	**Current stock status relative to reference point**	
Target reference point	B30%	153 Mlb	B_{2015} = 215.1 Mlbs. B_{2015}/B30% = 1.41	
Limit reference point	B20%	102 Mlb	B_{2015} = 215.1 Mlbs. B_{2015}/B20% = 2.11	
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				

Evaluation Table for PI 1.1.2

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	(Y/N) Y	(Y/N) Y	
	Justification	The limit reference point (B20%), and the target reference point (B30%) have been demonstrated to be appropriate for the stock by simulation testing under the old area-based assessment framework (Clark and Hare 2006). The reference points can be, and are estimated during each assessment. Given that there is no underlying stock recruitment relationship defined for the coastwide Pacific halibut model, it is not possible to determine whether the target reference point is consistent with B_{MSY}; however, for many groundfish stocks the depletion level associated with B_{MSY} is generally in the range of 30% to 40% of the unfished stock (Clark 1993, 2002; Gabriel *et al.* 1998; Gabriel and Mace 1995; Morgan *et al*. 2009; Murawski *et al*. 2001; NMFS 1996). The team determined that the fishery meets all the scoring issues of SG 60 and SG 80; specifically, that the reference points are appropriate for the stock and can be estimated.		
b	**Guidepost**		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		(Y/N) Y	(Y/N) Y

PI 1.1.2		Limit and target reference points are appropriate for the stock		
	Justification	The limit reference point of B20% is appropriate for a demersal stock with many year classes (Clark 1993, 2002). The details of the calculation of relative spawning biomass have not changed from recent assessments. The unfished spawning stock biomass is calculated by multiplying the spawning biomass per recruit times the average coastwide recruitment from an unproductive regime. This calculation is conservative in that it uses estimates of recruitment from an unproductive regime (Clark and Hare 2006; Hare and Clark 2008). The team determined that the fishery meets the scoring issues of the SG 80 and SG 100, specifically that the limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.		
c	Guidepost		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		(Y/N) Y	(Y/N) N
	Justification	The limit reference point (B20%) is related to maintaining a relative minimum spawning stock biomass, and has been related to the limit biomass reference point of 0.5BMSY by Clark and Hare (2006). The target reference point was selected to be B30%, which is 1.5 times the limit reference point (Hare 2010). The unfished spawning stock biomass is calculated by multiplying the spawning biomass per recruit times the average coastwide recruitment from an unproductive regime. This calculation is conservative, in that it uses estimates of recruitment from an unproductive regime. The target reference point (B30%) is calculated as 30% of the unfished spawning stock biomass. Thus, the target reference point is considered to be conservative, and is consistent with Bmsy or a higher level. The team determined that the fishery clearly meets of the requirements of SG 80, but that more simulation work was required to quantify appreciable levels of risk before scoring at the SG 100 level could be justified.		
d	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	

PI 1.1.2		Limit and target reference points are appropriate for the stock		
	Met?		Not relevant	
	Justification			
References		Clark, W.G., 1993. The effect of recruitment variability on the choice of a target level of spawning biomass per recruit. In: Kruse, G, Marasco, R.J., Pautzke, C., Quinn, T.J. (Eds.), Proceedings of the International Symposium on Management Strategies for Exploited Fish Populations. Alaska Sea Grant College Program Report, 93-02, University of Alaska, pp. 233–246. Clark W.G. 2002. F35% revisited ten years later North Am. J. Fish. Manage., 22 (2002), pp. 251–257. Clark, William G. and Steven R. Hare. 2006. Assessment and management of Pacific halibut: data, methods, and policy. Scientific Report No. 83, International Pacific Halibut Commission, Seattle, WA. Gabriel, W.L. and P.M. Mace 1999. A Review of Biological Reference Points in the Context of the Precautionary Approach Proceedings, 5th NMFS NSAW. 1999. NOAA Tech. Memo. NMFS-F/SPO-40. Pp 34-45. Gabriel, W.L., M.P. Sissenwine, and W.J. Overholtz. 1989. Analysis of spawning stock biomass per recruit: an example for Georges Bank haddock. North Am. J. Fish. Manage., 9: 383–391. Hare, S. and W. Clark. 2008. 2007 IPHC harvest policy analysis: past, present, and future considerations. International Pacific Halibut Commission, Seattle, WA. Hare, S. 2010. Assessment of the Pacific halibut stock at the end of 2009, in IPHC, Annual Meeting Handout (Bluebook). International Pacific Halibut Commission Eighty-sixth Annual Meeting, Seattle, WA, 25-29 January 2010. Morgan, M.J., H. Murua, G. Kraus, Y. Lambert, G. Marteinsdottir, C.T. Marshall, L. O'Brien, and J. Tomkiewicz 2009. The evaluation of reference points and stock productivity in the context of alternative indices of stock reproductive potential. Can. J. Fish. Aquat. Sci., 66: 404–414 Murawski, S.A., P.J. Rago, and E.A. Trippel 2001. Impacts of demographic variation in spawning characteristics on reference points for fishery management ICES J. Mar. Sci., 58:002–1014		

PI 1.1.2	Limit and target reference points are appropriate for the stock	
	National Marine Fisheries Service (NMFS). 1996. Environmental Assessment/Regulatory Impact Review for Amendment 44 to the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Amendment 44 to the Fishery Management Plan for the Groundfish Fishery of the Gulf of Alaska to Redefine Acceptable Biological Catch and Overfishing, Appendix B. Alaska Fisheries Science Center, National Marine Fisheries Service, 7600 Sand Point Way NE., Seattle, WA 98115-0070.	
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 1.1.3

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	(Y/N)		(Y/N)
	Justification	Not Applicable. The halibut stock is not depleted.		
b	**Guidepost**	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	(Y/N)	(Y/N)	(Y/N)
	Justification	Not Applicable. The halibut stock is not depleted.		

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
c	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?	(Y/N)	(Y/N)	
	Justification	Not Applicable. The halibut stock is not depleted.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				NA
CONDITION NUMBER (if relevant):				

Evaluation Table for PI 1.2.1

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	The IPHC has an Explicit Harvest Policy (equivalent to a Harvest Strategy), that is published/updated every year in their Report of Assessment and Research Activities document, which is publicly available and presented to stakeholders in an annual meeting, normally held in January of each year. The IPHC uses a Constant Exploitation Yield (CEY) for its harvest policy; a procedure that applies a fixed harvest rate to the estimate of exploitable biomass to determine the TAC (Stewart 2016). First, a coastwide estimate of exploitable biomass from the stock assessment is apportioned to the individual management areas. Information to make this apportionment is obtained from an annual setline survey conducted by IPHC. Area-specific target harvest rates are then used to determine the area-specific catch limits. Finally, the area-specific catch limits are aggregated back to the coastwide level to establish the TAC for the entire stock. The CEY harvest policy is implemented with a Harvest Control Rule (HCR), using target and limit spawning biomass reference points. The HCR does not change the distribution of harvest among regulatory areas, but reduces the target harvest rates (for all areas) at low stock sizes (Stewart 2016). "*Specifically, if the coastwide stock is estimated to have fallen below 30% of the equilibrium stock size in the absence of fishing (B30%) the target harvest rates are decreased linearly such that there would be no fishing mortality below 20% relative spawning biomass (B20%). This policy was designed to provide a constant harvest rate that would avoid decreasing the stock below B30% with a relatively high frequency, and still provide a large fraction of the maximum sustainable yield available"* (Stewart 2016). As calculated by the IPHC, the value of B30% is intended to be precautionary; this is because it is defined relative to historically good size-at-age and recruitment in a relatively unproductive environmental regime (Clark and Hare 2006). The assessment team determined that all scoring issues for SG 60, SG 80 and SG 100 levels are met; specifically, that there is a harvest strategy that represents the guidelines that stipulate how managers go about setting general harvest levels or allowable fishing levels. This determines the yield from the fishery and defines both reference points and the HCR used to prevent overfishing. The IPHC Harvest Policy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points. Both the process and the outcome of the Harvest Policy are transparent and publicly available.		
b	**Guidepost**	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) N
	Justification	The harvest strategy appears to be robust; it has maintained the stock above the target reference point (B30%) since the 1980s, which has included a period of decreased removals as stock size has declined over the past decade (Stewart and Martell 2014; Figure 7). However, a decrease in size-at-age and changes in the stock assessment model for Pacific halibut have resulted in changes in estimated productivity and selectivity for both the directed fishery and the setline survey; previous estimates of optimal exploitation rates are outdated and need to be revised (Martell *et al.* 2014). IPHC has done an extensive amount of simulation testing to evaluate the current harvest strategy that is in place (Stewart and Martell 2015, Clarke and Hare 2006); however, the harvest strategy has not been fully tested with the coastwide assessment model and apportionment process, and given the recent changes in our understanding of the spatial population dynamics of the halibut stock, further evidence is needed to demonstrate that the harvest strategy is clearly able to maintain stocks at target levels. The requirements of SG 60 and SG 80 have been met for this Scoring Issue. The SG100 level could be met in the future following review of the optimal exploitation rates, and full testing of the harvest strategy with the coastwise assessment model.		
c	**Guidepost**	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	(Y/N) Y		
	Justification	The 2015 stock assessment describes a well-conceived and implemented monitoring plan, that collects data both at sea and dockside from all significant sources of mortality of halibut (Stewart and Martell 2015). The assessment team determined that SG 60 has been met.		
d	**Guidepost**			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			(Y/N) N

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	A major effort is now underway to evaluate the Pacific halibut harvest strategy, by conducting a Management Strategy Evaluation (MSE) (Martell *et al.* 2014) (See 3.2.1, below). While this effort clearly indicates that the harvest strategy is periodically reviewed, the results are not yet available and it is unclear at present how the harvest strategy will be modified or improved when the MSE is completed. Therefore, some but not all of the requirements are met at the SG100 level.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References		Clark, W.G., and Hare, S.R. 2006. Assessment and management of Pacific halibut: data, methods, and policy. IPHC Sci. Rep. No. 83. Stewart, I.J. and B.M, Martell. 2014. Assessment of the Pacific halibut stock at the end of 2013. IPHC Report of Assessment and Research Activities 2013: 169-196. Available at: http://www.iphc.int/publications/rara/2013/rara2013_12_2013assessment.pdf Stewart, I.J. and B.M, Martell. 2015. Assessment of the Pacific halibut stock at the end of 2014. IPHC Report of Assessment and Research Activities 2014: 161-180. Available at: http://www.iphc.int/publications/rara/2014/rara2014_11stockassessment.pdf Stewart, I.J. 2016. Regulatory area harvest policy calculations and catch tables. IPHC Report of Assessment and Research Activities 2015: 220-237. Available at: http://www.iphc.int/publications/rara/2015/RARA2015_14HarvestPolicy.pdf Martell, S., Leaman, B.M. and Stewart, I.J . 2014. Developments in the Management Strategy Evaluation Process, Fisheries Objectives, and Implications for Harvest Policy and Decision Making. IPHC Bluebook 2014:186-197. Available at: http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2014.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				

Evaluation Table for PI 1.2.2

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	(Y/N) Y	(Y/N) Y	
	Justification	The CEY harvest policy is implemented with a Harvest Control Rule (HCR), using target and limit spawning biomass reference points. The HCR does not change the distribution of harvest among regulatory areas, but reduces the target harvest rates (for all areas) at low stock sizes (Stewart 2016). "*Specifically, if the coastwide stock is estimated to have fallen below 30% of the equilibrium stock size in the absence of fishing (B30%; the target reference point) the target harvest rates are decreased linearly such that there would be no fishing mortality below 20% relative spawning biomass* (B20%; the limit reference point). *This policy was designed to provide a constant harvest rate that would avoid decreasing the stock below B30% with a relatively high frequency, and still provide a large fraction of the maximum sustainable yield available"* (Stewart 2016). As calculated by the IPHC, the value of B30% is intended to be precautionary; this is because it is defined relative to historically good size-at-age and recruitment in a relatively unproductive environmental regime (Clark and Hare 2006). The assessment team determined that the fishery meets the scoring issues for SG 60 and 80, specifically that a well-defined harvest control rule is in place that is consistent with the harvest strategy and is linked to reference points in the harvest strategy, by the requirement to ensure that the exploitation rate reduced as limit reference points are approached.		
b	**Guidepost**		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		(Y/N) Y	(Y/N) N

PI 1.2.2		There are well defined and effective harvest control rules in place		
	Justification	The harvest control rule used for managing Pacific halibut takes into account the main uncertainties in the annual IPHC stock assessment, including aspects of observation error, process error, and model error (Stewart and Martell 2015). The stock assessment addresses observation error by conducting an MCMC analysis of uncertainty in parameter estimates Process error is taken into consideration in the definition of the target HCR (B30%); as it is defined relative to historically good size-at-age and recruitment in a relatively unproductive environmental regime (Clark and Hare 2006). Model error is addressed by taking an ensemble approach; four separate model structures are incorporated into the final advice on stock status provided to management (see 1.2.4, below). There is clear evidence that annual catches have been adjusted up or down in an effective manner in the past based on changes in the spawning stock biomass (Stewart and Martell 2015). Thus, the HCR takes into account the main uncertainties, and the SG80 level is met. It is not clear at present that the harvest control rule takes into account "a wide range of uncertainties". Specifically, the coastwide model does not take into consideration the uncertainties associated with the movement/migration of halibut. Many questions regarding uncertainty of the Pacific halibut stock are of a spatial nature, and are being evaluated as part of the ongoing Management Strategy Evaluation (MSE) (Martell *et al.* 2014). Thus, a score of 100 is not justified at this time.		
c	Guidepost	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	The 2015 stock assessment provides clear evidence that the harvest control rule has been effective in controlling exploitation. For example, total mortality has decreased substantially since the early 2000s in response to declining stock biomass during that period (Figure 34 in Stewart 2015) and has remained above both the limit (B20%) and target (B30%) reference points over the past 15+ years (Figure 2).		
References		Clark, W.G., and Hare, S.R. 2006. Assessment and management of Pacific halibut: data, methods, and policy. IPHC Sci. Rep. No. 83. Stewart, I.J. and B.M, Martell. 2015. Assessment of the Pacific halibut stock at the end of 2014. IPHC Report of Assessment and Research Activities 2014: 161-180. Available at: http://www.iphc.int/publications/rara/2014/rara2014_11stockassessment.pdf		

PI 1.2.2	There are well defined and effective harvest control rules in place
	Stewart, I.J. 2016. Regulatory area harvest policy calculations and catch tables. IPHC Report of Assessment and Research Activities 2015: 220-237. Available at: http://www.iphc.int/publications/rara/2015/RARA2015_14HarvestPolicy.pdf Martell, S., Leaman, B.M. and Stewart, I.J . 2014. Developments in the Management Strategy Evaluation Process, Fisheries Objectives, and Implications for Harvest Policy and Decision Making. IPHC Bluebook 2014:186-197. Available at: http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2014.pdf Stewart, I.J. 2015. Overview of data sources for the Pacific halibut stock assessment and related analyses. IPHC Report of Assessment and Research Activities 2014: 87-160. Available at: http://www.iphc.int/publications/rara/2014/rara2014_10sadatasources.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 1.2.3

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	There is a large amount of information collected on Pacific halibut each year from commercial fisheries, recreational fisheries, and scientific surveys (Stewart 2015). Fleet composition is well defined and characteristics of vessel size classes are well documented (see Tables 16 and 17 of this document). An annual set line survey is used to collect information on size/age composition, relative abundance, and growth information. The spatial coverage of the setline survey is synoptic and has expanded into the Eastern Bering Sea (EBS) in 2015. In addition to the routine set line surveys and catch sampling programs, there have also been tagging studies to determine movements and migration of Pacific halibut. These tagging studies have shed light on stock structure and the results have led to the development of a coastwide assessment model. Environmental information in the form of the Pacific Decadal Oscillation (PDO) is also used in the assessment (Stewart 2015), and has been shown to explain halibut recruitment patterns, but is not necessarily relevant to the current harvest strategy. Based on this, the assessment team determined that the fishery meets the requirements of the SG 100 level; specifically, that there is a comprehensive range of information available for management purposes, including some that may not be related to the harvest strategy.		

PI 1.2.3		Relevant information is collected to support the harvest strategy		
b	Guidepost	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	(Y/N) Y	(Y/N) N	(Y/N) N

PI 1.2.3		Relevant information is collected to support the harvest strategy		
	Justification	Most information required by the harvest control rule is monitored on an annual basis and with a reasonable degree of certainty. There is a good understanding of the inherent uncertainties in the data (Stewart and Martel 2015). However, not all removals are well quantified. For example, reliable wastage data (i.e. bycatch of halibut not retained in the directed fishery) are not available for vessels <40 ft LOA, due to lack of observer coverage for these vessels (NMFS 2015). In 2014, vessels < 40 ft currently account for only 19% of the commercial landings, but they make up 37% of the fleet by number (Table 16). **This lack of observer information on the <40ft fleet is considered the primary source of information deficiency that precludes monitoring of fishery removals to be considered "regularly monitored at a level of accuracy and coverage consistent with the harvest control rule."** There are additional sources of uncertainty that contribute to overall uncertainty in fishery removals, but that on their own are not considered a significant enough deficiency to preclude alignment with the SG80 guidepost. 1) The net impact to the stock from halibut bycatch in the non-directed fishery is uncertain (IPHC 2015c), which along with the lack of coverage on the <40ft directed fleet has contributed to uncertainty in stock status (Stewart and Martell 2015). 2) Recreational halibut fishery removals are also a source of uncertainty. The Team reviewed the role of recreational removals in the targeted halibut fishery coastwide, and the uncertainty associated with these removals. Coastwide, recreational halibut removals are greatest in Alaska in areas 2C and 3A (Stewart 2015). Recreational removals in these areas are generally well estimated, and the greatest portion of total catch uncertainty is believed to be due to uncertainty in the rate of survival of discarded fish (ADFG 2015). The method for estimating total mortality, including the mortality of discarded fish, was reviewed by the NPFMCs SSC, and found to be robust (ADFG 2015). Additionally, the robustness of the harvest control rule has not been updated with the new coastwide model and apportionment scheme. Thus, the fishery clearly meets all scoring issues of SG 60, but could not satisfy the SG 80 or SG 100 levels.		
c	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		(Y/N) N	

PI 1.2.3		Relevant information is collected to support the harvest strategy
	Justification	There is good information on all the substantive removals from the stock due to the combination of 1) at-sea data collection for most of the fisheries that capture halibut, and 2) the intensive dockside monitoring program. A limitations of this information is the total removals by commercial vessels in Alaska that are < 40 ft. LOA; a portion of the fleet that does not have at-sea monitoring (NMFS 2015). Monitoring that demonstrates regular or systematic data collection, with sufficiently powerful sampling to estimate removals relative to limits, and that quantifies associated uncertainty would be acceptable to increase scoring. For wastage/bycatch, this information could be obtained via observers, by use of electronic monitoring systems/participation in EM pilot projects, or by other methods that have received outside methodological review. Thus, the fishery could not satisfy the SG 80 level for this Scoring Issue.
References		IPHC 2015c. Report of the Halibut Bycatch Working Group II. September 5, 2014. IPHC Report of Assessment and Research Activities - 2014. Section 14c. 74 pp. Available at: http://www.iphc.int/meetings/2015am/bb/10_1HalibutBycWorkGroup_rept_v17.pdf NMFS 2015. *Draft* 2016Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska. National Oceanic and Atmospheric Administration, 709 West 9th Street. Juneau, Alaska 99802. Stewart, I.J. 2015. Overview of data sources for the Pacific halibut stock assessment and related analyses. IPHC Report of Assessment and Research Activities 2014: 87-160. Available at: http://www.iphc.int/publications/rara/2014/rara2014_10sadatasources.pdf Stewart, I.J. and B.M, Martell. 2015. Assessment of the Pacific halibut stock at the end of 2014. IPHC Report of Assessment and Research Activities 2014: 161-180. Available at: http://www.iphc.int/publications/rara/2014/rara2014_11stockassessment.pdf
OVERALL PERFORMANCE INDICATOR SCORE:		**65**
CONDITION NUMBER (if relevant):		**1**

Evaluation Table for PI 1.2.4

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		(Y/N) Y	(Y/N) Y
	Justification	The annual assessments of Pacific halibut conducted by the IPHC are comprehensive in comparison to most groundfish stock assessments. In recent years, the assessment has incorporated four separate models, using an ensemble approach. The combination of models used in the 2014 assessment included a broad suite of structural and parameter uncertainty, including natural mortality rates (estimated in the long time-series models, fixed in the short time-series models), environmental effects on recruitment (estimated in the long time-series models), fishery and survey selectivity (by region in the AAF models) and other model parameters. These sources of uncertainty have historically been very important to the understanding of the stock, as well as the annual assessment results (Stewart and Martel 2015). Additional understanding of the interplay between the stock assessment, HCR, biology, and nature of the fishery for Pacific halibut is expected to come from an extensive MSE effort currently in progress (Martel et. al. 2014). The assessment team determined that the assessment is appropriate for the stock and for the harvest control rule, and takes into account the major features relevant to the biology of the species and the nature of the fishery, and therefore meets the scoring issues of SG 100.		
b	**Guidepost**	The assessment estimates stock status relative to reference points.		
	Met?	(Y/N) Y		
	Justification	The 2014 IPHC stock assessment explicitly estimates stock status relative to reference points (Stewart and Martell 2015). Therefore, the assessment team determined that the fishery meets the scoring issue of SG 60.		

PI 1.2.4		There is an adequate assessment of the stock status		
c	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	Major sources of uncertainty, including density dependent growth, recruitment, environmental variability, and selectivity are considered in the stock assessment. A decision table framework has been implemented in recent years, to evaluate uncertainty in stock status relative to reference points, and the consequence of alternative management actions in a probabilistic way (Stewart and Martell 2015), allowing uncertainty to be viewed explicitly in decision-making, and so that uncertainty relative to decisions that have been made by managers, is explicit to stakeholders.. The assessment team determined that the fishery meets the scoring issues for SG 80 and SG100.		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			(Y/N) N
	Justification	It is likely that parameter uncertainty is underestimated in the model. Stewart and Martell (2015) noted that pre-model processing (i.e. the estimation of certain parameters outside of the stock assessment model) and redundancy in some of the halibut data sets (essentially “double counting“ of the data) likely result in the underestimation of this source of uncertainty. Additional sources of uncertainty include choices made in structuring the assessment models used in the ensemble. These include explicit inclusion or exclusion of spatial processes, steps taken during data processing, and other sources that are not included in the results (Stewart and Martell 2015). Further, the current coastwide assessment model has not been simulation tested and alternative hypotheses and assessment approaches (e.g. spatially explicit modelling) have not been rigorously explored. Therefore, the Team determined that requirements at the SG 100 level were not met.		

PI 1.2.4		There is an adequate assessment of the stock status		
e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		(Y/N) Y	(Y/N) Y
	Justification	The 2014 Pacific halibut stock assessment has been internally and externally peer reviewed (Cox *et al.* 2015). The members of the Stock Assessment Review (SAR) committee are scientists from outside IPHC and they convene annually to review the new Pacific halibut stock assessment (Cox et al 2014). Therefore, all scoring issues of SG 80 and SG 100 have been met.		
References		Cox, S., Ianelli, J., and Mangel, M. IPHC Report of Assessment Research Activities 2014. p267-276. Martell, S., Leaman, B.M. and Stewart, I.J . 2014. Developments in the Management Strategy Evaluation Process, Fisheries Objectives, and Implications for Harvest Policy and Decision Making. IPHC Bluebook 2014:186-197. Available at: http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2014.pdf Stewart, I.J. and B.M, Martell. 2015. Assessment of the Pacific halibut stock at the end of 2014. IPHC Report of Assessment and Research Activities 2014: 161-180. Available at: http://www.iphc.int/publications/rara/2014/rara2014_11stockassessment.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

Principle 2

Evaluation Table for PI 2.1.1

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
	Met?	(Y/N) Bait: NA	(Y/N) Bait: NA	(Y/N) Bait: N, Minor: N
	Justification	**BAIT:** According to CR V1.3 CB3.5.5: "The team shall consider species used as bait in a fishery, if they are caught by the fishery under assessment or elsewhere under the Retained Species component in P2." In the UoA, bait type and volume are not recorded or quantified in a systematic way. During on-site meetings the assessment team was able to ascertain typical bait species used in the fishery as well as a ball-park volume estimate from fishery managers and industry members. However, this information was anecdotal and qualitative in nature, not verifiable, and not sufficient to determine whether bait in aggregate or on a species-specific level qualifies as 'main.' The assessment team has determined that the species will be classified as 'main' as a precautionary measure and to ensure that scoring on the "information PI 2.1.3" could reflect the deficiency in information on bait However, given the uncertainty surrounding bait type and volume, the team considers that there is not sufficient information to accurately score bait as a typical 'main' element under PI 2.1.1 pertaining to outcome status and 2.1.2 pertaining to management considerations. The team has therefore, where relevant, considered the bait element as 'NA' under PIs 2.1.1 and 2.1.2. In order to sum scoring elements and provide an overall PI score in accordance with CRV1.3 Scoring Requirements (27.10.7), the assessment team has considered NA equivalent to Y up to the SG80 level, similar to how 'minor' species are treated in under PIs 2.1.X and 2.2.X. Bait is scored traditionally as a 'main' species then under 2.1.3, where the baseline information deficiency is most appropriately assessed. This approach permits the assessment team to address the information deficiency regarding bait without nonsensically scoring bait for outcome and management considerations without appropriate information. Minor: For some other "minor" retained species (i.e. rockfish, Greenland turbot, Kamchatka flounder, arrowtooth flounder, Pacific cod) there is a high degree of certainty that species are also within biologically based limits. However, for tier 5 species, target reference points are not established. At present, the origin and stock status of bait species is unknown, therefore it is not possible to evaluate whether they have well defined target reference points (i.e. Market and Argentinian squid), biologically based limits or even indicators used to evaluate stock status. We cannot conclude that all retained species are highly likely to be within biologically based reference points and cannot score this PI at 100.		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
b	**Guidepost**			Target reference points are defined for retained species.
	Met?			BAIT: N, MINOR: N
	Justification	BAIT/MINOR: Target reference points have not been defined for all **retained** species (minor species included), and the origin of bait species is not known. Therefore, we cannot say that these are known to have well defined target reference points and we cannot award a score of 100.		
c	**Guidepost**	If main retained species are outside the limits, there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits, there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	(Y/N) BAIT: NA	(Y/N) BAIT: NA	
	Justification	It is currently unclear whether **bait** is a main component of this fishery, nor are there compelling reasons to believe that any of the bait species used by the fishery are outside of limits (most have robust life history traits). Bait unknowns are addressed most appropriately - until bait volume, stock origin and status are understood - under PI 2.1.3, as an information deficiency.		
d	**Guidepost**	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	(Y/N) BAIT: NA		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
	Justification	. BAIT: It is currently unclear whether bait is a main component of this fishery, nor are there compelling reasons to believe that any of the bait species used by the fishery are outside of limits (most have robust life history traits). Bait unknowns are addressed most appropriately - until bait volume, stock origin and status are understood - under PI 2.1.3, as an information deficiency.
References		Skud 1978; IADB 2013; Clyde et al. 1984; CDFW 2005; PFMC 2014; Munro 2015; NMFS 2014
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**NA**

Evaluation Table for PI 2.1.2

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	(Y/N) Bait: NA	(Y/N) Bait: NA	(Y/N) BAIT: N, MINOR: Y
	Justification	A strategy in the MSC system represents a cohesive and strategic arrangement that comprises one or more measures, an understanding of how they work to achieve an outcome that is appropriate to the scale, intensity and context of the fishery and contains mechanisms for the modification of fishing practices in the light of any unacceptable impacts. MINOR: In this system there is a strategy in place to manage **retained** species which consists of (1) extensive catch accounting system (2) observer program to estimate discarded catch (3) fishery independent surveys conducted by NOAA-Fisheries (4) statistical stock assessments for all of the main bycatch species (5) a tiered system of assessments that provides for more precautionary annual catch limits when assessments use less precise methods. The tiered, precautionary procedure for setting annual catch limits provides a high likelihood that stocks will be maintained at levels above their reference points and, and clear procedures exist for restricting catch limits if stock rebuilding is necessary. **BAIT**: See 2.1.1 for rationale for treatment of bait as a main retained species. Because the provenance of bait species used in the fishery have not been verified, we cannot be sure of the management systems (including necessary strategies) are in place for bait species. Bait unknowns are addressed most appropriately - until bait volume, stock origin and status are understood - under PI 2.1.3, as an information deficiency. However, by definition of bait as a 'retained species' in the MSC system, it cannot be said that the UoA has a strategy for managing all retained species due to this deficiency.		

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	(Y/N) Bait: NA	(Y/N) Bait: NA	(Y/N) MINOR:N, BAIT: N
	Justification	**BAIT/MINOR**: See 2.1.1 for rationale for treatment of bait as a main retained species and associated scoring methodology. Because the provenance of bait species used in the fishery have not been verified, we cannot be sure of the management systems (including necessary strategies) are in place for bait species. Bait unknowns are addressed most appropriately - until bait volume, stock origin and status are understood - under PI 2.1.3, as an information deficiency.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		(Y/N) Bait: NA	(Y/N) Bait/Minor: N
	Justification	There is some evidence in the form of annual or biannual stock assessments showing stocks are not overfished or subject to overfishing for a large number of **retained** species. However, lack of clear evidence that there is a strategy that is being implemented successfully for **bait** species prevents us from scoring at 100 for bait or minor species.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			(Y/N) Minor: Y, Bait: N

PI 2.1.2		**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**		
	Justification	MINOR: There is some evidence for **retained** species that the strategy is maintaining many retained species within biologically based limits and we score this at SG100. BAIT: There is not evidence that there is a strategy for all bait species, because these cannot be clearly identified. Therefore, this element does not achieve SG100.		
e	**Guidepost**	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	(Y/N/Not relevant) Y	(Y/N/Not relevant) Y	(Y/N/Not relevant) Y
	Justification	Based on observer coverage and reports from fishery managers, there is a high degree of certainty that shark finning is not occurring.		
References		Skud 1978; IADB 2013; Clyde et al. 1984; CDFW 2005; PFMC 2014; Munro 2015; NMFS 2014		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				**NA**

Evaluation Table for PI 2.1.3

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	(Y/N) Bait: Y	(Y/N) Bait: N	(Y/N) NA
	Justification	The North Pacific groundfish and Pacific halibut fisheries collect qualitative and quantitative sources of fishery dependent and fishery independent information on **retained** species. This information is used directly in stock assessments for main retained species, including annual fishery independent surveys, catch accounting system, and an observer program. For a full discussion of the fishery-specific information please see 'Sources of Information' section (above). There remain gaps with respect to quantitative, accurate and verifiable information for any retained species catch from boats <40ft LOA (applicable to minor retained species in this fishery). Therefore, we cannot score this element at SG100 and because no main retained species were identified, SG80 is not applicable for this element. **BAIT**: See background and 2.1.1 for rationale for treatment of bait as a 'main retained' species, and for scoring methodologies within 2.1.X. Since only qualitative information for bait species is currently known (see background on Bait Considerations), the team concluded that this element can only score at the 60 level overall.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	(Y/N/Not relevant) Bait: Y	(Y/N/Not relevant) Bait: N	(Y/N/Not relevant) NA

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
	Justification	MINOR: Information from the fishery independent surveys, catch accounting system, and observer programs is adequate to qualitatively assess outcome status of **retained** species with respect to biologically based limits. Despite gaps in observer coverage for boats <40ft LOA, dockside monitoring and elandings data provide information sufficient to estimate outcome status with respect to biologically based limits. However, because of observer coverage gaps, we cannot conclude that this information is sufficient to quantitatively estimate status with a high degree of certainty. Because no main retained species were identified, SG80 is not applicable for this element. BAIT: Since only qualitative information for **bait** species is currently known, the team concluded that this SI can only score at the 60 level overall.		
c	Guidepost	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	(Y/N) Bait: Y	(Y/N) Bait: N	(Y/N) NA
	Justification	MINOR Information from the fishery independent surveys, catch accounting system, observer programs, and dockside sampling programs is adequate to support partial strategies to manage main **retained** species (but no main retained species are present in this fishery). However, due to limitations in the currently restructured observer program, there remain information gaps associated with catch composition from fishing vessels <40ft LOA limiting the adequacy of the data to support a strategy with a high degree of certainty. This gap also impedes the fishery's ability to properly quantify non-target species relative to landings (main/minor spp.) Because no main retained species were identified, SG80 is not applicable for this element. BAIT: Information is not currently adequate to tentatively identify species used as **bait** and to assure that there are measures in these fisheries to manage these species. However, verifiable information available is not available to assure that information to support a partial strategy for bait species (if main) is available. Therefore, we can only score this element at SG60.		

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		(Y/N) BAIT: N	(Y/N) NA
	Justification	MINOR: Sufficient data from fishery independent surveys, catch accounting systems, and restructured observer program are collected to detect increase in risk for **retained** species. However, the lack of reliable information on the volume and type of bait used in the fishery prevent us from accurately assessing the outcome status with respect to these species. Additionally, the lack of coverage on fishing vessels <40 ft LOA prevents assessment of ongoing mortalities to all retained species. Because no main retained species were identified, SG80 is not applicable for this element. BAIT: Since only qualitative on the type and volume of **bait** used is available the team cannot conclude that sufficient data continue to be collected to detect any increase in risk level due to changes in fishing behavior and cannot score this at the SG80 level.		
References		Skud 1978; IADB 2013; Clyde et al. 1984; CDFW 2005; PFMC 2014; Munro 2015; NMFS 2014		
OVERALL PERFORMANCE INDICATOR SCORE:				**60**
CONDITION NUMBER (if relevant):				**2**

Evaluation Table for PI 2.2.1

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) Y: Cod; laysan albatross only

	Justification	Pacific Cod: For years 2013-2014, the average annual (total) catch of Pacific cod by the Pacific halibut fishery, estimated in the NOAA Catch Accounting System, was 1898.76 mt / yr. In 2013, the total TAC for both the GOA and BSAI was 320,600 mt and total catch (including incidental catch in other fisheries was 310,347 mt (A'mar and Palsson 2013). Based on evaluation of stock status relative to biologically based limits,both the Gulf of Alaska Pacific cod stock and the Bering Sea / Aleutian Island populations are not considered overfished and overfishing is not occurring (Thompson 2014). **The landings from halibut-directed longline operations therefore constitute a small fraction of the total catch on populations and there is a high degree of certainty that the species is within biologically based limits. Requirements of the SG100 level are met.** Skates: In the BSAI, the 2014 ABC and OFL for the "Other Skate" complex was 35, 383 t and 41,849 t respectively. In the GOA, longnose skate ABC was 2,876 t and the OFL was 3,835 t. The big skate ABC was 3,762 t and the OFL was 5,016 t. These species are also captured in trawl and Pacific cod longline fishing, and total catches have averaged 570 t / year in the Gulf of Alaska (Ormseth and Matta 2009) and 19,000 t/ year in the eastern Bering Sea / Aleutian Islands (Ormseth *et al*. 2009). Only in the Gulf of Alaska and Aleutian Islands does halibut fishing constitute a significant component of the total skate catch. Since skates are assessed as a tier 5 species, NMFS cannot determine if they exist in an overfished condition, but based on catch estimates and harvest rules, they do conclude that overfishing is not occurring (Ormseth 2014; 2014b). **Therefore, it is highly likely that skate species are within biologically based limits and this element is scored at SG80.** Sharks: Shark bycatch in the halibut fishery is primarily comprised of spiny dogfish (*Squalus suckleyi*). There are currently no directed commercial fisheries for shark species in federal or state managed waters of the GOA and most incidentally caught sharks are not retained. Spiny dogfish is primarily captured in the flatfish trawl and cod longline fisheries (Tribuzio *et al.* 2012). For 2015, NMFS recommended the maximum allowable ABC of 5,989 t and an OFL of 7,986 t for the shark complex. For years 2013 and 2014 average shark catch in the halibut IFQ fisheries was 646.74 mt and total catches have been around 1,676.5 for BSAI and GOA combined. Therefore, although the 2014 stock assessment could not conclude if the stock is overfished, there is no indication that overfishing is occurring. **It is highly likely that shark species are within biologically based limits and this element is scored at SG80.**

		Grenadiers: Due to a lack of necessary information, NMFS cannot establish a minimum stock size threshold from which to determine whether grenadier species complex (a Tier 5 stock) are overfished or approaching an overfished condition; however, on annual basis, NMFS can determine whether overfishing is occurring for tiers 4 and 5 stocks. The Alaska Fisheries Science Center estimates the grenadier species complex OFL in the annual Tier 5 stock assessment. For 2015, the maximum allowable ABC for the BSAI is 75,274 t and for the GOA is 30,691 t. This ABC is a 12% increase for the BSAI and a 12% decrease for the GOA. The majority of this catch occurs in the sablefish longline fishery which comprised an average of 6,281.56 mt for fishing seasons 2013-2014. The halibut longline fishery accounted for an additional 643.33 mt of grenadier bycatch, although this was likely caught on trips that targeted both sablefish and halibut, because Giant Grenadier are rarely at the depth fished for halibut. The inclusion of Giant Grenadier bycatch is a result of the artifact that the Catch Accounting System designates halibut v. sablefish trips based on the total poundage of species landed, meaning even if a trip targeted sablefish but landed more halibut, the CAS would reflect a species composition more characteristic of a sablefish trip. Overfishing is not occurring in either the BSAI or GOA. **Grenadiers catch is well below OFL and ABC and thus not subject to overfishing and there is no indication that grenadier are overfished or approaching an overfished condition, therefore it is highly likely that the grenadier species complex is within biologically based limits and this element is scored at SG80.** Black-footed albatross: For black-footed albatross, the observed nest counts in the Hawaiian breeding colonies indicate a stable population of 61,000 breeding pairs (Arata *et al.* 2009). Additionally, recent surveys of black-footed albatross nesting pairs at Midway came in at 28,610 for the atoll, a record high, up 18% from the 2010-2014 average (USFWS 2015b). The IUCN population status was recently changed from “endangered” to “near threatened” owing to the increases in population, but continued concern relating to sensitivity to fishing (BLI 2014). Overall, pelagic longline and gillnet have been the most important source of incidental mortality for black-footed albatrosses (Naughton *et al.* 2007). The Potential Biological Removal Level (PBR—the maximum number of mortalities, not including natural deaths, while maintaining an optimum sustainable population) is 11,980 (Arata *et al.* 2009). Matrix modeling results indicate that the black-footed albatross population, summed across all three colonies, is stable, or slightly increasing, with a population growth rate of 0.3 percent per year. The 2005 estimate of bycatch is 5,228 birds per year, but if this value is doubled, a safeguard for underestimating bycatch, it approaches the PBR of 11,980 birds per year, although the upper 95-percent confidence limit (17,486) exceeds the PBR (Arata *et al.* 2009).

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
		In 2013 and 2014, the halibut fishery took an estimated average of 71.79 birds/year representing a small portion of the overall incidental take. **It is highly likely that black-footed albatross are within biologically based limits and this element is scored at SG80.** Laysann Albatross For Laysan albatross, pre-hunting breeding population size was as high as 2 million pairs, but was reduced to 18,000 breeding pairs by the early1920's. 2015 surveys reveal that the number of breeding pairs far surpassed any previous documented year for nesting Laysan albatross on Midway Atoll with 666,044 pairs recorded. The current year count for Laysan albatross represents a 52% increase over the average number for the period from hatch years 2010 to 2014 (USFWS 2015b). The population appears to be increasing at a rate of 6.7%/year. IUCN has also recently changed the designation of Laysan albatross from "vulnerable" to "near threatened" (BLI 2013). Like the black-footed albatross, incidental kills in pelagic longlining are deemed the principal threat but other threats include sea level rise, invasive plant species on nesting island and atolls, and marine pollution. Matrix models developed from stage specific demographic parameters and including bycatch mortality in fisheries suggest that current estimates of bycatch levels (2,500/year) can be sustained by the population without causing population decreases, and consequently Arata *et al.* (2009) conclude that longline fishing does not appear to be threatening the long-term viability of Laysan albatross. In 2013 and 2014, the halibut fishery took an estimated average of 16.34 birds/year representing a small portion of the overall take. **There is a high degree of certainty that laysan albatross are within biologically based limits and this element is scored at SG100.** MINOR: However, for some bycatch species, particularly mobile invertebrate (i.e. snails, sea stars) there is no reliable information to determine is species are within biologically based limits. Therefore, not all requirements of SG100 are met.		
b	**Guidepost**	If main bycatch species are outside biologically based limits, there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits, there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	(Y/N) NA	(Y/N) NA	

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**		
	Justification	NA		
c	**Guidepost**	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	(Y/N) NA		
	Justification	NA		
References		A'mar and Palsson 2013; Thompson 2014; Ormseth and Matta 2009; Ormseth *et al*. 2009; Ormseth 2014; 2014b; Tribuzio *et al.* 2012; Arata *et al.* 2009; USFWS 2015b; BLI 2014; Naughton *et al.* 2007		

OVERALL PERFORMANCE INDICATOR SCORE: **(elements summarized in accordance with Table 4 (MSC FCRV2.0)**	**85**
CONDITION NUMBER (if relevant):	**NA**

Evaluation Table for PI 2.2.2

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) Y, cod only

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations
	Justification	In Alaska, there is a **strategy** in place to manage most bycatch fish species (main species, groundfish, seabirds) which consists of (1) extensive catch accounting system (2) observer program to estimate discarded catch (3) fishery independent surveys conducted by NOAA- Fisheries (4) statistical stock assessments for all of the main bycatch species (5) a tiered system of assessments that provides for more precautionary annual catch limits when assessments use less precise methods. The tiered, precautionary procedure for setting annual catch limits provides a high likelihood that stocks will be maintained at levels above their reference points and, and clear procedures exist for restricting catch limits if stock rebuilding is necessary. In Washington, there is a **strategy** to manage non-target species which consists of (1) a catch accounting system, (2) observer program to estimate catches of non-target species, (3) fishery independent surveys conducted by NOAA-Fisheries and IPHC, (4) statistical stock assessments for most non-target species, (5) a Seabird Avoidance Program, (6) Spatial management to restrict or prohibit fishing based on depth, species, and habitat (i.e. Groundfish Conservation Areas (GCAs)) The final rule to implement a seabird avoidance program in the Pacific groundfish fleet was implemented in Dec. 2015. This rule mandates the use of streamer lines by vessels >/= 55ft length overall (LOA) using bottom longline gear to harvest groundfish. Members of the client group, the FVOA already voluntarily use streamer lines on their vessels. Pacific cod There is a **strategy** for managing Pacific cod under two Fishery Management Plans: one for the Bering Sea/Aleutian Islands region and the other for the Gulf of Alaska region. The Fishery Management Plans control the fishery through permits and limited entry, catch quotas, gear restrictions, closed waters, seasons, bycatch limits and rates, and other measures. Total allowable catch (TAC), allowable biological catch (ABC), and overfishing level (OFL) is set for Pacific cod in both the BSAI and GOA (Thompson 2014; A'mar and Palsson 2013). The North Pacific Fishery Management Council then allocates TAC to the various gear types, management sub-areas, and also the community development quota (CDQ). The Gulf of Alaska groundfish fisheries are among the few remaining limited access (not rationalized) fisheries in Alaska. Of these fisheries, Pacific cod is the predominant groundfish species targeted by the fixed gear sectors in the GOA. In 2009, the Council took action to add gear-specific (pot, hook-and-line, or jig) Pacific cod endorsements to GOA fixed gear licenses that met a minimum catch threshold during 2002-2008. The action also reduced the number of fixed gear licenses eligible to access the GOA Pacific cod fisheries, so that the number of participants in the directed GOA Pacific cod fisheries are permanently capped at the number of available licenses, and new entrants will have to purchase an existing license if they wish to fish in federal waters. **Requirements of the SG100 level met for this element.**

		The NPFMC is considering information to determine implication of assigning separate TAC for Pacific Cod in the BA and AI. Pacific cod discards are accounted for in the stock assessments for both BSAI and GOA. Despite being a valuable fish, Pacific cod are often discarded because vessel owners may not have the Pacific cod endorsement or there is limited space aboard vessels for non-target catch. **The management approach described above in addition to gear and spatial restrictions represent an effective strategy for minimizing Pacific cod bycatch.** Sharks There is a **partial strategy** for managing sharks which are currently managed under the "other species" complex in the GOA and BSAI FMP (Pacific sleeper, salmon and other unidentified sharks) on a biennial basis: spiny dogfish is managed as a Tier 5 species while the overall "shark complex" is managed as Tier 6, with no reliable biomass estimates. Spiny dogfish ABC and OFL are calculated based on biomass estimates from the biennial trawl survey while the remaining shark species follow a traditional Tier 6 approach with the OFL = average historical catch (1997 – 2007) and the ABC = 0.75*OFL. The complex OFL is based on the sum of the Tier 5 and Tier 6 (average historical catch between the years 1997 - 2007) recommendations for the individual species (Tribuzio *et al*. 2010). **These represent partial strategies for managing the shark species complex and are expected to maintain shark species bycatch at levels which are highly likely to be within biologically based limits. Requirements of the SG80 level are met for this element.** Skates The Bering Sea and Aleutian Islands (BSAI) skate complex is managed in aggregate, via a **partial strategy**, with a single set of harvest specifications applied to the entire complex. However, to generate the harvest recommendations the stock is divided into two units. Harvest recommendations for Alaska skate *Bathyraja parmifera*, the most abundant skate species in the BSAI, are made using the results of an age structured model and Tier 3. The remaining species ("other skates") are managed under Tier 5 due to a lack of data. The Tier 3 and Tier 5 recommendations are combined to generate recommendations for the complex as a whole (Ormseth 2014). The Gulf of Alaska (GOA) skate complex is managed as three units. Big skate (*Beringraja binoculata*) and longnose skate (*Raja rhina*) have separate harvest specifications, with gulfwide overfishing levels (OFLs) and Acceptable Biological Catches (ABCs) specified for each GOA regulatory area (western, central, and eastern). 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 (Ormseth 2014b). **Taken together, these represent partial strategies for managing the skate species complex and are expected to maintain skate species bycatch at levels which are highly likely to be within biologically based limits and requirements of SG80 are met for this element.**

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
		Grenadiers There is a **partial strategy** for managing grenadiers, since they have not traditionally been included in the BSAI and GOA Groundfish FMPs, despite the high level of bycatch in the longline fishery. The North Pacific Fishery Management Council recently adopted a Preliminary Preferred Alternative to include Grenadiers "unofficial" stock assessments in the Ecosystem Component of the FMPs. Under the Preferred Preliminary Alternative (PPA), NMFS will establish record-keeping and reporting requirements for grenadiers, and grenadiers would be closed to "directed fishing." Further, Maximum Retainable Amount of grenadiers as an incidental catch species would be established and limit grenadier retained catch to 8% (NPFMC 2014). These measures help to better estimate catch, reduce scientific uncertainty, prevent "unmanaged target fishing" of grenadiers, and reduce the vulnerability of grenadiers to overfishing as an incidental catch species (NMFS 2013) and **represent a partial strategy for managing grenadier bycatch and are expected to maintain the grenadier species bycatch at levels which are highly likely to be within biologically based limits and requirements of SG80 are met for this element.** Laysann and back-footed albatross There is a **partial strategy** to manage seabird bycatch that involves all longline vessels >55' are required to use seabird avoidance devices that have been demonstrated to markedly reduce seabird mortality. The adoption of these measures has reduced seabird takes by one-third and albatross takes by 85% (Fitzgerald *et al.* 2008). Several other methods for reducing seabird bycatch are also used by fishers including setting at night, using weights on gear to decrease sink time, offal discharge regulations, and under water setting tubes. Although reductions in seabird catch have been significant in the last several years, some seabirds are still caught in the halibut fishery. **This partial strategy is expected to maintain seabird bycatch species at levels which are highly likely to be within biologically based limits and requirements of SG80 are met for this element.**		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) Y All

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
	Justification	There is high confidence that the partial strategies for cod, skates, sharks, grenadier and seabird species is working based on reported observer data, annual surveys, and catch accounting system indicating that the halibut fishery is having minimal impacts on bycatch species stock status. Furthermore, as described in the rational for 2.2.1, recent stock assessments have concluded that overfishing is not occurring. Therefore, requirements of the SG100 are met.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		(Y/N) Y All	(Y/N) Y All
	Justification	There is clear evidence for successful implementation of this management strategy manifest by the healthy stock status for main bycatch species. Furthermore, the ability to access reported landings and estimated total landings data as well as annual stock assessment reports for these species provides clear evidence that strategy is being successfully implemented and the halibut fishery is having minimal impacts on bycatch species. Therefore, requirements of SG100 are met.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			(Y/N) Y All
	Justification	Annual biomass surveys and stock assessments for main bycatch species provide some evidence that the management strategies are achieving objectives related to assuring that bycatch does not pose a risk of serious or irreversible harm to bycatch populations. (Note that this performance indicator does not assess efficient use of marine resources). Therefore, requirements of SG100 are met.		
References		Thompson 2014; A'mar and Palsson 2013; Tribuzio *et al*. 2010; Ormseth 2014; Ormseth 2014b; NPFMC 2014; NMFS 2013; Fitzgerald *et al.* 2008		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				**NA**

Evaluation Table for PI 2.2.3

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) N All
	Justification	The North Pacific groundfish and Pacific halibut fisheries collect qualitative and quantitative sources of fishery dependent and fishery independent information. This information is used directly in stock assessments for main bycatch species, including annual fishery independent surveys, catch accounting system, and an observer program. For a full discussion of the fishery-specific information please see 'Sources of Information' section (above). However, due to limitations on the coverage of boats <40ft LOA, there is a lack of verifiable information on the catch of bycatch species from this sector. **Therefore, we cannot conclude that the fishery meets the SG100.**		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	(Y/N/Not relevant) Y All	(Y/N/Not relevant) Y All	(Y/N/Not relevant) N All
	Justification	Information from the fishery independent surveys, catch accounting system, and observer programs is adequate to qualitatively assess outcome status of bycatch species with respect to biologically based limits. **We score this PI at SG80.**		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) N All

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
	Justification	Information from the fishery independent surveys, catch accounting system, and observer programs is sufficient to support Pacific cod, grenadier, shark, skate, and seabird management strategies. However, due to limitations in the currently restructured observer program, there remain information gaps associated with bycatch from fishing vessels <40ft LOA. Because of these information gaps, while information is available to support management **measures and a partial strategy**, it is not yet adequate to support a **strategy** for managing bycatch with a high degree of certainty. **Therefore, we cannot score this at SG100.**		
d	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		(Y/N) N All	(Y/N) N All
	Justification	Information from fishery independent surveys, catch accounting systems, and restructured observer program are collected on a regular and ongoing basis to assess changes in risk to outcome status, and monitoring is conducted to assess bycatch species mortalities. However, because of uncertainties about the disproportionate impacts of smaller boats on inshore species that are currently being detected due to limitations in the current observer program.		
References		NA		
OVERALL PERFORMANCE INDICATOR SCORE:				**75**
CONDITION NUMBER (if relevant):				**3**

Evaluation Table for PI 2.3.1

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) N All

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
	Justification	**Short-Tailed Albatross** - The incidental take levels of short-tailed albatross have not been exceeded during the current or any previous years of fishing since the short-tailed albatross was listed as an ESA species. However, in 2014, NMFS confirmed that two short-tailed albatrosses were taken by one vessel in the AK Pacific cod hook and line groundfish fishery. These represented the second take of short-tailed albatross in a two-year period and resulted in a reinitialization of the Biological Opinion. The revised final Biological Opinion issued by the USFWS determined that activities by the north pacific groundfish fleet are not likely to jeopardize the continued existence of the Short Tailed Albatross (USFWS 2015) and increased the incidental take from two birds every two years to six birds every two years. However, the original incidental take statement (2 birds/2 years) still applies to the halibut fishery. Given the lack of any observed bird mortalities from the halibut fishery in recent years, the lack of spatial overlap in the distribution of fishing effort and birds, and the increased population growth rate **impacts from the halibut fishery are highly likely to be within ESA limits, however due to the low observer coverage and incentive for under-reporting we cannot conclude that there is a high degree of certainty and cannot score at SG100.** **Yelloweye Rockfish -** The coast-wide abundance of yelloweye rockfish is estimated to have dropped below the SB40% management target in 1988 and the overfished threshold in 1994. During 2002-2010, the total cumulative estimated yelloweye mortality (130 mt) represented only 69% of the summed ACLs and only 39% of the summed OFLs for that period. The total 2010 catch (11.4 mt) is just 3% of the peak annual catch that occurred in the early 1980s. These catch levels represent a 95% reduction from average catches observed in the 1980s and 1990s. Since 2002, the total 8-year cumulative catch (130 mt) has been only 69% of the sum of the ACLs for 2002-2010 and only 39% of the sum of the OFLs for that period (Taylor and Wetzel 2011). Managers have constrained catches by eliminating all retention of yelloweye rockfish in both commercial and recreational fisheries, instituting broad spatial closures (some specifically for moving fixed-gear fleets away from known areas of yelloweye abundance), and creating new gear restrictions intended to reduce trawling in rocky shelf habitats and the coincident catch of rockfish in shelf flatfish trawls (Taylor 2011). **The current management measures are effectively limiting the impact of these fisheries on the rebuilding plan and it is highly likely that impacts from this fishery on Yelloweye are within ESA limits.**		
b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) N All
	Justification	**Short-tailed Albatross** - Since no short-tailed albatross have been taken on observed halibut trips, there is limited spatial overlap of fishing effort and bird distribution, and short-tailed albatross population growth rate continues to rise, there is a high degree of confidence that halibut longlining is highly unlikely to have significant detrimental effects on the short-tailed albatross population. Additionally, the BIOP also discussed direct impacts from plastic debris and toxic contamination from fishing and determined that they were likely not having a detrimental effect. **However, because of issues extrapolating short tailed albatross takes from observed trips and lack of observer coverage on boats <40 ft LOA, there is not a high degree of confidence that there are no significant detrimental direct impact, and we cannot score at SG100.** **Yelloweye Rockfish -** Since 2002, the total 8-year cumulative catch (130 mt) has been only 69% of the sum of the ACLs for 2002-2010 and only 39% of the sum of the OFLs for that period (Taylor and Wetzel 2011). **The current management measures are effectively limiting the impact of these fisheries on the rebuilding plan and it is highly unlikely to create unacceptable impacts to the rebuilding plan.** Since 2014, sperm and orca whale depredation has increasingly been observed in the Bering Sea, Aleutian Islands, and Western Gulf of Alaska on halibut and sablefish longline sets (Peterson et al. 2015). While there is no indication that this depredation is having a negative effect on these marine mammal populations, and no interactions have resulted in animal mortality, fishers and resource managers are taking steps to limit interactions with animals to reduce costs from lost fish. Currently, this trend in depredation does not have any implications on scoring in the MSC system; however, future assessments should continue to consider depredation in light of its overall direct impacts (i.e. entanglement).		
c	**Guidepost**		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		(Y/N) Y	(Y/N) N

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**
	Justification	**Short-tailed Albatross** - The revised biological opinion concluded that groundfish fisheries are not likely to have substantial indirect effects on the short-tailed albatross populations. It is reasonable to assume that while short-tailed albatross marginal additional nutrition from encounters with fishing vessels this determination assessed indirect effects, such as trophic impacts from fishery removals that would be assessed from the halibut fishery. This determination indicates that indirect effects have been considered and are thought to be unlikely to create unacceptable impacts. **Yelloweye Rockfish** – Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts. Since 2014, sperm and orca whale depredation has increasingly been observed in the Bering Sea, Aleutian Islands, and Western Gulf of Alaska on halibut and sablefish longline sets (Peterson *et al*. 2015). Currently, this trend in depredation does not have any implications on scoring in the MSC system; however, future assessments should continue to consider depredation in light of its overall impact of removals from the fishery, potential for negative impacts on ETP species, indirect impacts on ETP species trophic dynamics, and changes in fishing behavior.
References		USFWS 2015; USFWS 2003b; NMFS 2015f; Taylor and Wetzel 2011; Peterson *et al*. 2015
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**NA**

Evaluation Table for PI 2.3.2

PI 2.3.2		The fishery has in place precautionary management strategies designed to: • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) Y: STAL, N: YEL

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
	Justification	**Short-tailed Albatross -** Given current observer coverage, use of streamer lines, and mortality notification there is a **comprehensive strategy** which is designed to achieve above national and international requirements for the protection of ETP species. All longline vessels >55' are required to use seabird avoidance devices that have been demonstrated to markedly reduce seabird mortality. The adoption of these measures has reduced seabird takes by one-third (Fitzgerald *et al*. 2008), and albatross takes by 85% (Fitzgerald *et al*. 2008). Several other methods for reducing seabird bycatch are also used by fishers including setting at night, using weights on gear to decrease sink time, offal discharge regulations, and under water setting tubes. Although reductions in seabird catch have been significant in the last several years, some seabirds are still caught in the halibut fishery. If a short-tailed albatross is hooked and there is a fisheries observer on board the vessel, the observer will report the short-tailed albatross take to NMFS. The USFWS will be notified of the take within 48 business day hours. If there is not an observer on board the vessel, NMFS requests that the albatross specimen be retained and reported immediately to NMFS or USFWS (NMFS 2015f). For unidentified albatross species categories, seabird biologists will contact and interview the observer within a day to determine if the unidentified seabird was a sort tailed albatross (Ed Melvin, pers com). Additionally, the final rule to implement a seabird avoidance program in the Pacific groundfish fleet (WA, OR, CA) was implemented in Dec. 2015. This rule mandates the use of streamer lines by vessels >/= 55ft length overall (LOA) using bottom longline gear to harvest groundfish. Members of the client group, the FVOA already voluntarily use streamer lines on their vessels. **Yelloweye Rockfish** - Managers have constrained catches by eliminating all retention of yelloweye rockfish in both commercial and recreational fisheries, instituting broad spatial closures (some specifically for moving fixed-gear fleets away from known areas of yelloweye abundance), and creating new gear restrictions intended to reduce trawling in rocky shelf habitats and the coincident catch of rockfish in shelf flatfish trawls. Critical habitat was designated for yelloweye rockfish, canary rockfish, and bocaccio in the Puget Sound/ Georgia Basin in November 2014.

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
		Depth management is the main tool used for controlling yelloweye rockfish fishing mortality in the Washington and Oregon recreational fisheries (PFMC 2014). This combination of management measures represents a **strategy** for managing impacts on this ETP species, however because of uncertainties about additional sources of mortality from recreational fisheries prevents us from scoring this at 100.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) N All
	Justification	**Short-tailed Albatross** - The strategy is mainly based on information directly about the fishery, including observer data and the extrapolated takes from the catch accounting system, which provide an objective basis for confidence that the strategy will work to achieve objectives, based on information directly about the fishery. However, because short tailed albatross bycatch is estimated based only on observed mortalities, we cannot conclude that there with a high degree of confidence that the strategy will work to achieve its overall objectives of minimizing short-tailed albatross bycatch and score this element at SG80. **Yelloweye Rockfish** – There is an objective basis for confidence that the strategy will work based on fishery dependent and fishery independent information collected. This information includes: 1) Fishery independent data: including relative abundance indices, length and age data from the International Pacific Halibut Commission's (IPHC) longline survey 1999-2010, and the NWFSC and Triennial bottom trawl surveys 2003- 2010 (NWFSC survey) and 1980-2004 (Triennial survey); 2) Estimates of fecundity, maturity, length-weight relationships and ageing error from various sources; 3) Informative priors on natural mortality and stock recruit steepness derived from other fish and yelloweye stocks; 4) Commercial (targeted and bycatch) and recreational catch estimates from 1916-2010; 5) Commercial and recreational fishery biological data (age and length) from 1968-2010; 6) Fishery dependent catch-per-unit-effort series from recreational and charter observer programs from all three states.		

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		(Y/N) Y All	(Y/N) Y All
	Justification	**Short-tailed Albatross** - There is clear evidence, from observer data and the extrapolated takes from the catch accounting system, that the strategy is being successfully implemented, including a very high rate of adoption of bycatch reduction measures across the groundfish fleet. **Yelloweye Rockfish** – There is clear evidence from fishery independent and fishery dependent information that the strategy is working given progress made towards the rebuilding goals.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			(Y/N) Y All
	Justification	**Short-tailed Albatross** - There is evidence, including observer data and the extrapolated takes from the catch accounting system, which indicate that the strategy is achieving its overall objectives of minimizing short-tailed albatross bycatch. No short-tailed albatross have been reported taken in the halibut fishery. Furthermore, adoption of these measures has reduced albatross takes by 85% throughout the groundfish fleet (Fitzgerald *et al*. 2008). **Yelloweye Rockfish** – There is evidence from Pacific Observer program that catch of yelloweye rockfish is consistently below the levels set forth to maintain the rebuilding plan.		
References		USFWS 2015; Fitzgerald *et al*. 2008; NMFS 2015f; Ed Melvin, pers com; PFMC 2014		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				**NA**

Evaluation Table for PI 2.3.3

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species, including: • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) N All
	Justification	**Short-tailed Albatross** - Information on potential impacts of halibut fishing on short-tailed albatross consists of (1) quantitative knowledge on the effectiveness of seabird avoidance devices (2) monitoring of compliance with regulations that require the use of these devices; (3) observer coverage to monitor the fishery for short-tailed albatross kills; and (4) extensive monitoring of short-tailed albatross populations and quantitative modelling to assess rates of population change. This represents sufficient information to allow fishery related mortality and the impact of fishing to be quantitatively estimated, but because of gaps in observer coverage for boats <40ft LOA we cannot conclude this information provides a high degree of certainty, although expert information from ornithologists has asserted that STALs are seldom found in inshore waters (*Melvin pers. com)* **Yelloweye Rockfish** – Sufficient information is available to allow fishery related mortality and impact of fishing to be quantitatively estimated and includes: 1) Fishery independent data: including relative abundance indices, length and age data from the International Pacific Halibut Commission's (IPHC) longline survey 1999-2010, and the NWFSC and Triennial bottom trawl surveys 2003- 2010 (NWFSC survey) and 1980-2004 (Triennial survey); 2) Estimates of fecundity, maturity, length-weight relationships and ageing error from various sources; 3) Informative priors on natural mortality and stock recruit steepness derived from other fish and yelloweye stocks; 4) Commercial (targeted and bycatch) and recreational catch estimates from 1916-2010; 5) Commercial and recreational fishery biological data (age and length) from 1968-2010; 6) Fishery dependent catch-per-unit-effort series from recreational and charter observer programs from all three states. Although, because of gaps in the recreational fishery we cannot score this at SG100.		

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species, including: • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species.		
b	Guidepost	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	(Y/N/Not relevant) Y All	(Y/N/Not relevant) Y All	(Y/N/Not relevant) N All

	Justification	**Short-tailed Albatross** - The North Pacific Observer Program monitors fish, bycatch, and marine mammal and seabird interactions in Alaska's federally managed groundfish fisheries and parallel groundfish fisheries in State waters. The Observer Program also monitors catch of halibut allocated under the IFQ and CDQ Program. Information collected by observers, used in conjunction with reporting and weighing requirements, provides the foundation for in season management and for tracking species-specific catch and bycatch amounts. All observers entering the Observer Program receive training on seabird data collection responsibilities and how to identify dead seabirds, as well as specific information for the identification of species of interest including short-tailed albatross, red legged kittiwake, Steller's and spectacled eiders, and marbled and Kittlitz's murrelets (AFSC 2015). This training is provided during their initial 3-week certification course. Each subsequent year, observers receive a briefing before their first deployment that reviews seabird data collection and identifications (NMFS 2015f). NMFS has estimated seabird bycatch using CAS in the BSAI and GOA groundfish fisheries since 2007 and in the halibut fisheries since 2013 (Fitzgerald *et al*. 2013). Seabird estimates are based on at-sea sampling by observers (AFSC 2015). In the CAS, observer data are used to create seabird bycatch rates (a ratio of the estimated bycatch to the estimated total catch in sampled hauls). The observer information from the at-sea samples is used to create bycatch rates that are applied to unobserved vessels. For trips that are unobserved, the bycatch rates are applied to industry supplied landings of retained catch. Expanding on the observer data that are available, the extrapolation from observed vessels to unobserved vessels is based on varying levels of aggregated data (post-stratification). Data are matched based on processing sector (e.g., CP or CV), week, target fishery, gear, and Federal reporting area (NMFS 2015f). **Taken together, the observer program and CAS provide information sufficient to determine if the halibut fishery is a threat to short-tailed albatross population recovery but because of observer coverage gaps for boats <40ft, there is a lack of verifiable data on the magnitude of all impacts from the fishery.** **Yelloweye Rockfish –** Data for yelloweye rockfish are relatively sparse, especially regarding current trends. Historical catches are also uncertain, as yelloweye comprise a small percentage of overall rockfish removals and actual species-composition samples are infrequently available for historical analyses. In Alaska, sport harvest is estimated through the statewide harvest survey, creel sampling, and the charter logbook program. While there remain uncertainties with respect to recreational catches of yelloweye, it does not represent a substantial concern for the rebuilding plan (Taylor 2011).

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
		Therefore, we cannot conclude that there is accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species. However, the assessment team considers that information available is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	(Y/N) Y All	(Y/N) Y All	(Y/N) N All
	Justification	**Short-tailed Albatross** - Information on potential impacts of halibut fishing on short-tailed albatross consists of (1) quantitative knowledge on the effectiveness of seabird avoidance devices (2) monitoring of compliance with regulations that require the use of these devices; (3) observer coverage to monitor the fishery for short-tailed albatross kills; and (4) extensive monitoring of short-tailed albatross populations and quantitative modeling to assess rates of population change. This information is sufficient to measure trends and support a full strategy to manage impacts, but because of gaps in observer coverage for vessels <40ft LOA and limitations of extrapolating impacts from only observed vessels, and because STALs are inherently rare, information is not sufficient to support a comprehensive strategy to manage ETP mortality with a high degree of certainty. **Yelloweye Rockfish** – Because of the issues mentioned in Scoring Issue d, related to impacts from recreational fishing, we cannot conclude that information is sufficient to support a comprehensive strategy and cannot score this element at SG100. However, the uncertainties with respect to recreational catches of yelloweye are not considered to represent a substantial concern for the current rebuilding plan (Taylor 2011), and the information available is therefore considered sufficient to support a full management strategy.		
References		Fitzgerald *et al*. 2013; AFSC 2015; NMFS 2015f; *Melvin pers. Com; Taylor 2011*		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**NA**

Evaluation Table for PI 2.4.1

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	(Y/N/Partial) Y	(Y/N/Partial) Y	(Y/N/Partial) N

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	Justification	While some studies have examined the effect of longlining on seafloor habitats in other parts of the world (Pham *et al*. 2015) and conclude they are highly unlikely to reduce habitat structure, there remains a lack of comprehensive evidence on these impacts in Alaska (Meuter 2008) and Washington Halibut longlining is generally thought to have minimal impacts on the seafloor relative to other types of gear, but can impact corals by entangling and dislodging them (as evidenced by coral bycatch, Livingston 2003). The most important corals in Alaska waters are gorgonians, scleractinians and soft corals (*Gersemia* sp.). The distribution of corals has been assessed through NOAA trawl survey catch rates (Heifetz *et al*. 2002) and via smaller scale submersible surveys / observations (McConnaughey *et al*. 2009; Stone 2006). Identifying trends in these corals is difficult because they are encountered infrequently (Martin 2009), but nonetheless no discernible trend in gorgonians or scleractinians are apparent (Martin 2009). Areas of high coral density areas (coral gardens) have been identified, some in SE Alaska but most in the Aleutian Islands. Longline gears can have an impact on certain sensitive habitat as evidenced by limited underwater observations (Livingston 2003). The actual capture of gorgonian and stony corals, as examples, has been verified by commercial fisheries observers and NMFS surveys (NOAA CAS 2015). Damage can be caused to corals, sponges, and some other sessile organisms by hooking, by crushing and plowing by pots and anchors, and from shearing by groundlines upon retrieval. However, a large proportion of this gear is set on soft substrate where effects are considered negligible (Pham *et al.* 2014). Furthermore, the halibut fishery encountered an average of 3.41 mt of benthic structure forming organisms in 2013 and 2014 (sponges, corals, gorgonians and sea pens combined) representing a relatively low level of impact. Furthermore, habitat protections in Alaska and Washington (discussed in 2.4.2) have been set up to protect highly sensitive coral habitats. **Due to the lack of studies in Alaska and Washington related to the impact of longlining on habitat there is not sufficient evidence that longlining is highly unlikely to reduce habitat structure. However, because of studies conducted elsewhere, it is highly unlikely that halibut longlining operations will reduce habitat structure and function to a point of irreversible harm.**
References		Livingston 2003; Heifetz *et al*. 2002; McConnaughey *et al*. 2009; Stone 2006; Martin 2009; Pham *et al*. 2015; Mueter 2008
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**NA**

Evaluation Table for PI 2.4.2

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types
	Justification	**Alaska** There is a **strategy** in place for managing the impact of the fishery on coral habitats which consists of (1) closing coral garden sites to all bottom-contact fishing in the Aleutian Islands and (2) closing coral garden sites in SE Alaska to bottom-contact fishing gears; (3) monitoring trends in relative abundance via the NOAA-Fisheries trawl surveys. There is a transparent criterion for identifying and classifying habitats as "Habitat Areas of Particular Concern" on the basis of rarity, ecological importance, sensitivity and level of disturbance (NPFMC 2010b). Coarse grain habitat mapping is already available and on-going efforts are seeking to provide finer grained, depth and habitat-specific information by sharing platforms with AFSC survey and NOAA vessels (AFSC 2008). Additionally, six Habitat Conservation Zones with especially high density coral and sponge habitat were closed to all bottom-contact fishing gear (longlines, pots, trawls). These "coral garden" areas total 110 nm^2 and function as de facto marine reserves. To improve monitoring and enforcement of the Aleutian Island closures, a vessel monitoring system is required for all fishing vessels in the Aleutian management area. In Southeast Alaska, three sites with large aggregations ("thickets") of long-lived Primnoa coral are also identified as HAPCs. These sites, in the vicinity of Cape Ommaney and Fairweather grounds, total 67 nm^2. The Gulf of Alaska Coral Habitat Protection Area designates five zones within these sites where submersible observations have been made, totaling 13.5 nm^2. All bottom-contact gear (longlines, trawls, pots, dinglebar gear, etc.) is prohibited in this area. All fishery management plans include a description and identification of essential fish habitat, adverse impacts, and actions to conserve and enhance habitat. Maps of essential fish habitat areas are used for understanding potential effects of proposed development and other activities. Each FMP contains the following EFH components: EFH identification and description for managed species, fishing and non-fishing activities that may adversely affect EFH, conservation and enhancement recommendations for EFH, and research and information needs. The EFH provisions in each FMP must be reviewed, and if appropriate, revised, every 5 years. **Washington** The Pacific Fishery Management Council (PFMC) has developed a **strategy** which describes and maps EFH, and suggests management measures to reduce impacts from fishing and non-fishing activities, for coastal pelagic species, salmon, groundfish, and highly migratory species.

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
		The Council uses fishing gear restrictions, time and area closures, harvest limits, and other measures to lessen adverse impacts on EFH (PFMC 2005). When doing so, the Council considers whether the fishing activity is harming the habitat, the nature and extent of the damage, and whether management measures can be enforced. The Council also considers the long-term and short-term costs and benefits to the fishery, fishing communities, and the habitat. To identify EFH for groundfish, NMFS developed a GIS-based assessment model that looked at the occurrence of groundfish in relation to depth, latitude, and substrate type. Ultimately the Council identified groundfish EFH as all waters from the high tide line (and parts of estuaries) to 3,500 meters (1,914 fathoms) in depth. HAPCs are a subset of EFH used to focus management and restoration efforts. The Council identified six HAPC types. The current HAPC types are: estuaries, canopy kelp, seagrass, rocky reefs, and “areas of interest” (a variety of submarine features, such as banks, seamounts, and canyons, along with Washington State waters.) In addition to identifying EFH and describing HAPCs, the Council also adopted mitigation measures directed at the adverse impacts of fishing on groundfish EFH. Principal among these are closed areas to protect sensitive habitats. There are three types of closed areas: bottom trawl closed areas, bottom contact closed areas, and a bottom trawl footprint closure. The 34 bottom trawl closed areas are closed to all types of bottom trawl fishing gear. The bottom trawl footprint closure closes areas in the EEZ between 1,280 meters (700 fathoms) and 3,500 meters (1,094 fathoms), which is the outer extent of groundfish EFH (PFMC 2005). The 17 bottom contact closed areas are closed to all types of bottom contact gear intended to make contact with bottom during fishing operations, which includes fixed gear, such as longline and pots. **Taken together for Alaska and Washington, this represents a strategy in place for managing the impact of the halibut fishery on habitat types.**		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
	Justification	While there is some objective basis for confidence that the strategy for preventing structural habitat damage will work given relatively low levels of coral and sponge bycatch (NOAA CAS 2015) and implementation of closed areas, there remains a lack of testing in Alaska and Washington to support this strategy.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		(Y/N) Y	(Y/N) N
	Justification	There is some evidence from the observer program indicating a very few structure forming organisms are being captured by halibut longlining operations (NOAA CAS 2015). Additionally, limited submersible studies (Heifetz 2003), primarily aimed at identifying impacts from trawl fishing, found that fishing operations are not occurring in habitat conservation areas and that the strategy is being implemented successfully to prevent impacts to structure forming habitat. Conversations with AK enforcement officers indicated that there are occasionally enforcement actions related to illegal fishing in closed or restricted areas, although the extent of this problem was not clear. Because of this and a lack of directed studies on the effects of longlining in Alaska and Washington prevent us from scoring at 100.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			(Y/N) N
	Justification	There are habitat impact studies from the Alaska Coral and Sponge Initiative research project that recently concluded field work and should be able to provide evidence to whether the strategy is achieving objectives to minimize damage to habitats, but the results are not available.		
References		NPFMC 2010b; AFSC 2008; PFMC 2005; NOAA CAS 2015; Heifetz 2003		
OVERALL PERFORMANCE INDICATOR SCORE:				90
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 2.4.3

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	**Alaska -** The Alaska Fishery Science Center and the North Pacific Fishery Management council have developed criteria for identifying and classifying specific habitats as "habitat areas of particular concern" on the basis of rarity, ecological importance, sensitivity and level of disturbance (NPFMC 2010b). Coarse grain habitat mapping is already available and on-going efforts are seeking to provide finer grained, depth and habitat-specific information by sharing platforms with AFSC survey and NOAA vessels (AFSC 2008). There is an effort to compile and organize habitat data, and summarized information is presented in McConnaughey *et al*. 2009. These efforts provide information on the distribution of habitat types, particularly vulnerable habitat types. **Washington -** To identify EFH for groundfish, NMFS developed a GIS-based assessment model that looked at the occurrence of groundfish in relation to depth, latitude, and substrate type. Ultimately the Council identified groundfish EFH as all waters from the high tide line (and parts of estuaries) to 3,500 meters (1,914 fathoms) in depth. HAPCs are a subset of EFH used to focus management and restoration efforts. The Council identified six HAPC types. The current HAPC types are: estuaries, canopy kelp, seagrass, rocky reefs, and "areas of interest" (a variety of submarine features, such as banks, seamounts, and canyons, along with Washington State waters.)		

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	(Y/N) Y	(Y/N) Partial	(Y/N)
	Justification	**Alaska -** Sufficient information from the observer program, trawl surveys, and habitat mapping are available to allow the nature of the most impacts of the fishery on habitat types to be identified and provide reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear from boats in the observer program. However, because of limitations of observer coverage on boats <40ft LOA, there is no reliable information on spatial extent and timing of interactions from that sector which may disproportionately impact more shallow, inshore waters. **Washington -** There is sufficient data from the observer program indicating a very few structure forming organisms are being captured by halibut longlining operations (NOAA CAS 2015). However, lack of directed studies on the effects of longlining in Washington prevent us from scoring at 100.		
c	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		(Y/N) Y	(Y/N) N

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	Justification	**Alaska -** Sufficient information from the observer program, trawl surveys, and habitat mapping continue to be collected in such a way as to allow detection of increased risk to habitat from changes in fishing effort. Additionally, Martin (2009) describes trends in deep water corals and other biogenic habitat based on trawl survey bycatch and finds little evidence for persistent trends in corals in the Bering Sea, Aleutian Islands or Gulf of Alaska. Washington – Sufficient data from the observer program continue to be collected to allow detection of increased risk to habitat caused by changes in fishing effort.
References		NPFMC 2010b; AFSC 2008; McConnaughey *et al*. 2009; Martin 2009;
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**NA**

Evaluation Table for PI 2.5.1

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	(Y/N/Partial) Y	(Y/N/Partial) Y	(Y/N/Partial) Partial

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function
	Justification	**Alaska** The primary goal of the NPFMC's ecosystem assessment is to summarize and synthesize historical climate and fishing effects on the shelf and slope regions of the eastern Bering Sea, Aleutian Islands, Gulf of Alaska, and the Arctic, from an ecosystem perspective and to provide an assessment of the possible future effects of climate and fishing on ecosystem structure and function. Research has focused on quantifying food web linkages to increase understanding of how external forces such as fishing may cause unanticipated shifts in ecosystem composition. The two food web interactions relevant to evaluating the halibut fisheries removal of halibut biomass on the ecosystem are the "top down" release of halibut prey species or the "bottom up" decline in productivity of halibut predators. Halibut are high trophic level predators, and their feeding habits are well described. Halibut undergo ontongenetic shifts in feeding, consuming numerous small-bodied prey (fish, crustaceans and other invertebrates) when small and consuming larger fish when they reach adulthood (Best and St. Pierre 1986). Primary fish prey includes walleye pollock, sand lance and smaller flatfish species (Yang *et al*. 2001). Crabs may also be important components in halibut diets in some locations (Best and St. Pierre 1986). Accounts of halibut as prey are less frequent, but juveniles are occasionally consumed by larger –bodied halibut, and also Pacific cod (Best and St. Pierre 1986). Large sharks (e.g. sleeper sharks) may consume halibut and pinnipeds may also be predators on halibut. **There is evidence that the fishery is highly unlikely to disrupt the key elements in the form of ecosystem models that have been developed for the Eastern Bering Sea, Aleutian Islands (Aydin *et al*. 2007) and the Gulf of Alaska (Gaichas and Francis 2008).** The Ecosystem Consideration report provides an extensive accounting of the dynamics of key biophysical drivers and indicators of ecosystem and community structure (Zador 2014). Survey biomass of pelagic foragers has increased steadily since 2009 and is currently above its 30-year mean. Fish apex predator survey biomass is currently near its 30-year mean, driven largely by the dynamics of Pacific cod and Arrowtooth flounder (Zador 2014). Moreover, indicators of community structure in the Eastern Bering Sea (e.g. species richness, community size-spectra) do not suggest that groundfish fisheries are having significant adverse effects but instead are more responsive to changes in spatial distribution of stocks and environmental conditions (Mueter and Lauth 2009; Boldt *et al*. 2008).

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function
		Since 2014, sperm and orca whale depredation has increasingly been observed in the Bering Sea, Aleutian Islands, and Western Gulf of Alaska on halibut and sablefish longline sets (Peterson *et al*. 2015). While there is no indication that this depredation is having a negative effect on these marine mammal populations, and no interactions have resulted in animal mortality, fishers and resource managers are taking steps to limit interactions with animals to reduce costs from lost fish. The IPHC includes estimates of halibut catch due to depredation and has modified its longline survey to reduce bias due to depredation. Fishers communicate with one another to avoid deploying or retrieving gear when whales are present. Additionally, research by industry and academic partners is investigating mitigation measures to further reduce interactions, including using real time satellite tags, acoustic decoy techniques, and video cameras to better understand how whales and orca depredate on fishing gear. Currently, this trend in depredation does not have any implications on scoring in the MSC system; however, future assessments should continue to consider depredation in light of its overall impact of removals from the fishery, potential for negative impacts on ETP species, and changes in fishing behaviour. **Washington** Each year the Pacific Fishery Management Council (PFMC) Ecosystem Work Group develops a "Status of the California Current Ecosystem Report" for the Council. The 2015 Annual Report, reflects trends in physical, biological, and socio-economic indicators. In 2015, while oceanographic conditions show a warming trend, indicating lower primary productive, forage fish base during spring surveys have shown a stable or positive trend. Additionally, approximately 1/3 of the managed species within the groundfish fishery management plan (FMP) have been evaluated (either recently or historically) for the overfished threshold based on stock assessment results. Most of the recently assessed groundfish species are above the biomass limit reference point, and are thus not in a depleted "overfished" status, and no overfishing occurred on these stocks prior to their most recent assessments (NMFS 2015e). **These indicators highlight that the halibut fishery is highly unlikely to disrupt key elements of the ecosystem, although evidence is limited on other ecosystem impacts.**
References		NPFMC 2015; Yang and Nelson 2000, Yang *et al*. 2006; Hanselman *et al.* 2012; Hanselman *et al.* 2012; Aydin *et al*. 2007; Gaichas and Francis 2008; Zador 2014; Mueter and Lauth 2009; Boldt *et al*. 2008; Peterson *et al*. 2015
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		**NA**

Evaluation Table for PI 2.5.2

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) N

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function
	Justification	**Alaska** Ecosystem context and management is overseen by the North Pacific Fisheries Management Council. The North Pacific Fisheries Management Council is one of the national leaders in implementing ecosystem-based management. The council's Fishery Management Plans specify a strategy to address, monitor and regulate ecosystem impacts of the fishery. Ecosystem-level constraints also factor into management decisions via a cap in total ecosystem removals for the Eastern Bering Sea and Gulf of Alaska based on considerations of the maximum surplus production of these ecosystems (Mueter 2009). Each year since 1999, NPFMC has developed an Ecosystem Considerations report including information on indicators of ecosystem status and trends. In 2002, stock assessment scientists began using indicators contained in this report to systematically assess ecosystem factors such as climate, predators, prey, and habitat that might affect a particular stock. Information regarding a particular fishery's catch, bycatch and temporal/spatial distribution can be used to assess possible impacts of that fishery on the ecosystem. Indicators of concern are highlighted within each assessment and can be used by the Groundfish Plan Teams and the NPFMC to justify modification of allowable biological catch recommendations or time/space allocations of catch. Based on this information, **we conclude that there is a partial strategy in place** and that the impending development of ecosystem plans for the Bering Sea/Aleutian Islands represent an important step towards a comprehensive strategy. **Washington** In April 2013, the Pacific Fishery Management Council adopted the Fishery Ecosystem Plan (FEP), the Ecosystem Initiatives Appendix, and a schedule for implementation. The purpose of the FEP is to enhance the Council's species-specific management programs with more ecosystem science, broader ecosystem considerations and management policies that coordinate Council management across its Fishery Management Plans and the California Current Ecosystem (PFMC 2013). The FEP outlines a reporting process wherein NOAA provides the Council with a yearly update on the state of the California Current Ecosystem (CCE), as derived from environmental, biological and socio-economic indicators. NOAA's California Current Integrated Ecosystem Assessment (CCIEA) team is responsible for this report which the PFMC uses to guide decision-making and allocation. **This represents a partial strategy to manage ecosystem impacts.**

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) N

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
	Justification	Alaska **The partial strategy makes use of available physical, biological, and fishing effort information collected via trawl surveys, observer data, and ocean monitoring assets and is expected to restrain impacts of the fishery on the ecosystem, however, not all functional relationships are well understood.** The strategy includes indicators of ecosystem health such as sea surface temperature, biomass of forage fish species, and socioeconomic conditions. While these indicators represent important elements of the ecosystem, and the partial management strategy takes these indicators into account, they are not related through quantitative modeling efforts and functional relationships are not very well understood. The effort to develop ecosystem plans for the Bering Sea/Aleutian Islands could improve this knowledge, but we are unable to assess the impact on fishery management during this assessment. **Washington** The California Current IEA uses a combination of conceptual and empirical models (i.e. Atlantis Ecosystem Model) to integrate information and assess indicators. Atlantis is a simulation modeling approach that integrates physical, chemical, ecological, and anthropogenic processes in a three-dimensional spatially explicit domain. The model represents key exploited species at the level of detail necessary to evaluate direct effects of fishing and also represents other anthropogenic and climate impacts on the ecosystem as a whole (Levin and Schwing 2011). Data comes from a variety of sources including CalCOFI oceanographic and biological surveys, NMFS triennial annual trawl surveys, PacFIN commercial fishing database, and other supporting sources (Levin and Schwing 2011). **The partial strategy makes use of this modeling and is expected to restrain impacts of the fishery on the ecosystem, however, not all functional relationships are understood.**		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
	Justification	Alaska The Ecosystem Consideration report provides an extensive accounting of the dynamics of key biophysical drivers and indicators of ecosystem and community structure (Zador 2014). Survey biomass of pelagic foragers has increased steadily since 2009 and is currently above its 30-year mean. Fish apex predator survey biomass is currently near its 30-year mean, driven largely by the dynamics of Pacific cod and arrowtooth flounder (Zador 2014). Moreover, indicators of community structure in the Eastern Bering Sea (e.g. species richness, community size-spectra) do not suggest that groundfish fisheries are having significant adverse effects but instead are more responsive to changes in spatial distribution of stocks and environmental conditions (Mueter and Lauth 2009; Boldt *et al*. 2008). **Given these trends, the ecosystem management measures are considered likely to minimize ecosystem impacts from the fishery.** Washington Each year the Pacific Fishery Management Council (PFMC) Ecosystem Work Group develops a "Status of the California Current Ecosystem Report" for the Council. The 2015 Annual Report, reflects trends in physical, biological, and socio-economic indicators. In 2015, while oceanographic conditions show a warming trend, indicating lower primary productive, forage fish base during spring surveys have shown a stable or positive trend. Additionally, approximately 1/3 of the managed species within the groundfish fishery management plan (FMP) have been evaluated (either recently or historically) for the overfished threshold based on stock assessment results. Most of the recently assessed groundfish species are above the biomass limit reference point, and are thus not in a depleted "overfished" status, and no overfishing occurred on these stocks prior to their most recent assessments (NMFS 2015e). **These indicators highlight that the ecosystem management partial strategy is likely to minimize ecosystem impacts from the fishery.**		
d	**Guidepost**		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		(Y/N) Y	(Y/N) Y

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function
	Justification	Alaska The Ecosystem Consideration report provides an extensive accounting of the dynamics of key biophysical drivers and indicators of ecosystem and community structure (Zador 2014). Survey biomass of pelagic foragers has increased steadily since 2009 and is currently above its 30-year mean. Fish apex predator survey biomass is currently near its 30-year mean, driven largely by the dynamics of Pacific cod and Arrowtooth flounder (Zador 2014). Moreover, indicators of community structure in the Eastern Bering Sea (e.g. species richness, community size-spectra) do not suggest that groundfish fisheries are having significant adverse effects but instead are more responsive to changes in spatial distribution of stocks and environmental conditions (Mueter and Lauth 2009; Boldt *et al*. 2008). **These indicators provide evidence that the measures related to precautionary harvest rules, habitat protections, and other aspects of the ecosystem are being implemented successfully.** Washington Each year the Pacific Fishery Management Council (PFMC) Ecosystem Work Group develops a "Status of the California Current Ecosystem Report" for the Council. The 2015 Annual Report, reflects trends in physical, biological, and socio-economic indicators. In 2015, while oceanographic conditions show a warming trend, indicating lower primary productive, forage fish base during spring surveys have shown a stable or positive trend. Additionally, approximately 1/3 of the managed species within the groundfish fishery management plan (FMP) have been evaluated (either recently or historically) for the overfished threshold based on stock assessment results. Most of the recently assessed groundfish species are above the biomass limit reference point, and are thus not in a depleted "overfished" status, and no overfishing occurred on these stocks prior to their most recent assessments (NMFS 2015e). **These indicators provide evidence that the measures related to precautionary harvest rules, habitat protections, and other aspects of the ecosystem are being implemented successfully.**
References		Mueter 2009; Zador 2012; NPFMC 2015; Worm *et al*. 2009; Zador 2014; Mueter and Lauth 2009; Boldt *et al*. 2008; Levin and Schwing 2011
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		**NA**

Evaluation Table for PI 2.5.3

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	(Y/N) Y	(Y/N) Y	
	Justification	Alaska Information on ecosystem structure and effects of halibut fishing derives from data collected as part of trawl and longline surveys, an extensive annual food habits collection program, assessments for all main retained and discarded species, monitoring of susceptible and vulnerable seabird populations, and monitoring and conservation of sensitive habitats. Moreover, there ongoing research has been synthesizing this information via quantitative modelling (Aydin *et al*. 2008; Gaichas and Francis 2008) and via comparative analyses (Gaichas *et al*. 2009, Link *et al*. 2009). Ecosystem indicators are tracked annually and reported in the Ecosystem Considerations appendix of the Stock Assessment and Fishery Evaluation (SAFE) report (Boldt and Zador 2009). This information is adequate to broadly understand key aspects of the ecosystem. Washington The California Current IEA uses a combination of conceptual and empirical models (i.e. Atlantis Ecosystem Model) to integrate information and assess indicators. Atlantis is a simulation modelling approach that integrates physical, chemical, ecological, and anthropogenic processes in a three-dimensional spatially explicit domain. The model represents key exploited species at the level of detail necessary to evaluate direct effects of fishing and also represents other anthropogenic and climate impacts on the ecosystem as a whole (Levin and Schwing 2011). Data comes from a variety of sources including CalCOFI oceanographic and biological surveys, NMFS triennial annual trawl surveys, PacFIN commercial fishing database, and other supporting sources (Levin and Schwing 2011). This information is adequate to broadly understand key aspects of the ecosystem.		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	(Y/N/Not relevant) Y	(Y/N/Not relevant) Y	(Y/N/Not relevant) N
	Justification	Alaska and Washington The Ecosystem Considerations report provides detail about trends and dynamics of several key ecosystem indicators. However, there remain key knowledge gaps related to the relatively imprecise estimates of total impacts to non-target species and their ecological roles. Effects of the fishery on biogenic structures are not precisely determined, and any secondary effects that this may induce are also not well known. On the whole, there is a relatively high amount of information on the ecosystems in which this fishery operates and on the main impacts that the fishery might have but not all have been investigated.		
c	**Guidepost**		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		(Y/N) Y	(Y/N) Y
	Justification	Alaska and Washington Information on ecosystem structure and effects of halibut fishing derives from data collected as part of trawl and longline surveys, an extensive annual food habits collection program, assessments for all main retained and discarded species, monitoring of susceptible and vulnerable seabird populations, and monitoring and conservation of sensitive habitats. Taken together this provides reliable information on the impacts of the fishery and functional roles of the main components of the ecosystem.		
d	**Guidepost**		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Met?		(Y/N) Y	(Y/N) Y
	Justification	Alaska and Washington Information on ecosystem structure and effects of halibut fishing derives from data collected as part of trawl and longline surveys, an extensive annual food habits collection program, assessments for all main retained and discarded species, monitoring of susceptible and vulnerable seabird populations, and monitoring and conservation of sensitive habitats. This information is sufficient to allow consequences of fishery impacts to be inferred.		
e	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		(Y/N) Y	(Y/N) Y
	Justification	Alaska and Washington Information on ecosystem structure and effects of halibut fishing derives from data collected as part of trawl and longline surveys, an extensive annual food habits collection program, assessments for all main retained and discarded species, monitoring of susceptible and vulnerable seabird populations, and monitoring and conservation of sensitive habits. This information is considered by management teams when setting and allocating catch limits and is **sufficient to support the development of strategies to manage ecosystem impacts.**		
References		Aydin *et al*. 2008; Gaichas and Francis 2008; Gaichas *et al*. 2009, Link *et al*. 2009; Boldt and Zador 2009; Levin and Schwing 2011		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				**NA**

Principle 3

Evaluation Table for PI 3.1.1

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**
	Justification	The North Pacific Halibut Act[1] and the Magnuson-Stevens Act[2] (MSA), in combination with other laws, currently form the legal framework governing management of the Pacific halibut fishery in the US. The North Pacific Halibut Act of 1982 implements the Convention for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea between Canada and the US.[3] The Convention established the International Fisheries Commission, now known as the International Pacific Halibut Commission (IPHC). The Halibut Act provides for the appointment of US Commissioners[4] to the IPHC, specifies the responsibilities that the US Secretary of Commerce has for carrying out the treaty, and provides for the regulation of the US portion of fishery by the North Pacific and Pacific Fishery Management Councils. The Marine Mammal Protection Act (MMPA)[5], the Endangered Species Act (ESA)[6], the Migratory Bird Treaty Act, National Environmental Policy Act (NEPA)[7], Administrative Procedures Act (APA)[8], and other treaties, laws, and policies also are critical elements in the framework that governs the management system for the Alaskan halibut fishery[9]. The US laws are fully consistent with and supportive of several international laws and agreements related to fisheries management.[10] Two regional councils, the North Pacific Fishery Management Council (NPFMC) and the Pacific Fishery Management Council (PFMC), play an active role in the management of Pacific halibut. The Halibut Act allows the two Fishery Management Councils to develop regulations, including limited access regulations, that do not conflict with the regulations adopted by the Commission (16 U.S.C. §§ 773c, (c)). Although neither Council has developed a Pacific halibut fishery management plan, each Council has approved provisions that supplement IPHC regulations. Their principal actions to date have centered on allocating the IPHC's area-based catch limits to commercial, sport, tribal, and community user groups, and considering bycatch issues. The policies and practices based on these legal foundations constitute an appropriate and effective legal framework for delivering sustainable fisheries in accordance with MSC Principles 1 and 2. The requirements for scoring at the SG100 level are met.

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
b	**Guidepost**	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.	The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	The fishery management council system is highly transparent and open to scrutiny and review, and adapts to new information in systematic ways. The management system resolves most disputes within its highly participatory, open, and transparent structure and processes. Section 302 of the MSA, and the APA, mandate the Regional Fishery Management Councils follow specific procedures for discussing and resolving disputes on fisheries policy. Dissatisfied parties affected by Council and NMFS decisions can appeal the decision to the Appeals Office in the NMFS Alaska Regional Office, which adjudicates appeals of initial administrative determinations made under the authority of 50 C.F.R. Part 679 and Part 680.[11]The jurisdiction of the Appeals Office's includes the Individual Fishing Quota (IFQ) Program for Pacific halibut and sablefish, the Western Alaska Community Development Program, and other management programs. These dispute resolution mechanisms have proven to be effective at dealing with most issues, avoiding legal disputes, and are appropriate for the context of the halibut fishery. In cases where the Council processes have not resolved disputes, the parties involved can and do, by law, resolve the disputes in the federal court system. [12]There is ample evidence (c.f. NAPA 2002) that the management system attempts to comply with binding judicial decisions. The requirements for scoring at the SG100 level are met.		

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
d	**Guidepost**	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	The fishery management system explicitly recognizes and accounts for the rights of people dependent on marine fishing in the form of the Western Alaska Community Development Quota Program and a subsistence halibut fishery in waters in and off Alaska. As authorized and governed by the MSA as amended in 2006, the CDQ Program receives annual allocations of quota for groundfish, halibut, crab, and prohibited species in the Bering Sea and Aleutian Islands Management Area to allow these communities to 'start and support regionally based, commercial seafood or other fisheries-related businesses' (Section 305(i)(1) of the MSA). [13] Implemented in 2003, the subsistence halibut fishery allows rural and Alaska native persons to 'practice the long-term customary and traditional harvest of Pacific halibut for food in a non-commercial manner'.[14] The requirements for scoring at the SG100 level are met.		
References		[1]6 U.S.C. §§ 773-773k. 2 Public Law 94-265 as contained in 16 U.S.C. 38). 3 The Convention (available at http://www.iphc.washington.edu/halcom/history/1923us.htm) was first signed in 1923, subsequently modified by the parties in 1930, 1937 and 1953, and added a protocol to the Convention in 1979. Much of the original wording and intent of the treaty remains in effect. The Convention mandates the IPHC to conduct research on and '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.' (http://www.iphc.washington.edu/halcom/about.htm). 4 The three US Commissioners consist of an official of NOAA, and two persons who are knowledgeable or experienced concerning the fishery, with one an Alaskan		

PI 3.1.1	**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**
	resident and one an Alaska nonresident. At least one of the three Commissioners has to be a voting member of the North Pacific Fishery Management Council. 5 The MMPA protects marine mammals by prohibiting take of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S. 6 The ESA conserves species that are in danger of extinction. 7 NEPA requires Federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their major proposed actions. 8 The APA insures that the public is kept informed of the organization, procedures, and rules of Federal agencies, provides for public participation, and prescribes uniform standards. 9 Including the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea, Coastal Zone Management Act, Fur Seal Act, and Fish and Wildlife Coordination Act. 10 These include the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, an integral part of the FAO Code of Conduct for Responsible Fisheries (implemented in the US through the High Seas Fishing Compliance Act (16 U.S.C. 5501 *et seq.*), the UN Straddling and Highly Migratory Fish Stocks Agreement, the Convention on Biological Diversity, and the Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean, the basic instrument for the North Pacific Anadromous Fish Commission, which serves as a forum for promoting the conservation of anadromous stocks and ecologically-related species, including marine mammals, sea birds, and non-anadromous fish, in the high seas area of the North Pacific Ocean (Cialino 2010). 11 A chief administrative judge, one administrative judge, an appeals specialist and an administrative assistant staff the Appeals Office. 12 NAPA (2002, 2005) provides an account and analysis of many of the legal disputes litigated in the federal court system. 13 For more information on the CDQ program see NRC (1999) and the websites by the NPFMC (http://www.fakr.noaa.gov/npfmc/current_issues/CDQ/CDQ.htm), the NMFS Alaska Regional Office (http://www.fakr.noaa.gov/cdq/default.htm), and the Western Alaska Community Development Association (http://www.wacda.org/). 14 Federal Register Vol 68, No 72, April 15, 2003; p. 18145. Also see http://www.fakr.noaa.gov/ram/subsistence/faq.htm and 50 CRF Part 300, 600 and 679, which contain regulations relating to subsistence halibut fishing in Alaska.

PI 3.1.1	**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**	
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 3.1.2

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties
	Justificatio Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach n	The United States and Canada participate in the International Pacific Halibut Commission (IPHC) and promulgate regulations governing the Pacific halibut fishery under the authority of the Northern Pacific Halibut Act of 1982 (Halibut Act). The IPHC is a management body of long standing with a well understood management process. Under Article III of the Halibut Convention, the Commissioners of the IPHC are authorized to submit fishery management regulations to the two governments for approval.[1] The Commissioners annually review the regulatory proposals made by the IPHC scientific staff and consider proposals from the industry, the Conference Board, and the Processors Advisory Group. The Conference Board (representing Canadian and American commercial, sport, subsistence, and first nations/native American harvesters) and the Processor Advisory Group (representing halibut processors) offer fishers' and processors' perspectives on the regulatory proposals presented at IPHC annual meetings. Union and vessel owner organizations from both nations select members of the Board. Regulations governing the allocation and catch of halibut in U.S. waters that are in agreement with the Halibut Act may be also be developed by the North Pacific Fishery Management Council (for Alaska), and the Pacific Fishery Management Council (for the US West Coast). The MSA (Section 302(g)) directs the Councils to 'establish, maintain, and appoint members to committees and advisory panels', and specifies the roles and responsibilities of the individuals involved in the management process (NPFMC 2009; 2012). The NPFMC and PFMC have clearly identified management policies and objectives to guide the development of management recommendations to the Secretary of Commerce. Management measures developed by the Councils are recommended to the Secretary of Commerce through the National Marine Fisheries Service (NMFS). Management measures are implemented by the NMFS Alaska Regional Office (Alaska) and by the NMFS West Coast Regional Office (West Coast). NMFS also maintains science centers for the support of fisheries management in the regions; the Alaska Fisheries Science Center (AFSC) for Alaska fisheries, and the Northwest Fisheries Science Center (NWFSC) and the Southwest Fisheries Science Center (SWFSC) for the West Coast. For each of these organizations, the functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction. Thus, the requirements for scoring at the SG100 level are met.

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**		
b	**Guidepost**	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	The IPHC, focused solely on Pacific halibut, has a structured consultation process that seeks and accepts information from stakeholders via Advisory Body meetings, workshops , and an Annual Meeting (IPHC.int). Also, the NPFMC and PFMC consult with a variety of interested and affected parties through their committees, advisory panels, plan teams, and workgroups (NPFMC 2009; 2012). In response to Executive Order 13175 (www.state.gov/documents/organization/136740.pdf), NMFS and the NPFMC have developed a formal framework for consultation and collaboration with Alaska Native representatives in the development of policies, legislation, regulations, and programs.[2] The FMPs for GOA and BSAI groundfish include the objective to increase Alaska Native consultation by collecting and incorporating local and traditional knowledge, and increase Alaska Native participation and consultation in fishery management. One of the eight appointed members of the PFMC is from an Indian tribe with federally recognized fishing rights from California, Oregon, Washington, or Idaho. By law, all Councils must conduct public hearings "to allow all interested persons an opportunity to be heard in the development of fishery management plans and amendments" (16 USC 38 Section 1852(h)). The consultation processes, which include regular meetings of the consultative groups and widely distributed documents, regularly seek and accept relevant information, including local knowledge. The system exhibits consideration of the information and explains how it is used (NPFMC 2009; 2012). The requirements for scoring at the SG100 level are met.		

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**		
c	**Guidepost**		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		(Y/N) Y	(Y/N) Y
	Justification	The fishery management system for Pacific halibut (including IPHC, NPFMC, and PFMC) has effective consultative processes that are open to all parties, provides clear guidance to organizations and individuals involved in the management process with their roles and responsibilities explicitly defined for key areas of responsibility and interaction (IPHC.int; www.pcouncil.org; NPFMC (2009, 2012). The IPHC holds Advisory Body meetings, workshops , and an Annual Meeting all open to the public (http://www.iphc.int/meetings-and-events.html); providing the opportunity and encouragement for all interested parties to be involved. The NPFMC and PFMC hold public Council meetings five times a year, and a detailed briefing book (containing the same information given to Council members for decision making) is made widely available to all participants, to facilitate effective engagement. The requirements for scoring at the SG100 level are met.		
References		1 The US Secretary of Commerce may accept or reject the Commission's recommended regulations. However, the Secretary has the legal obligation to carry out the terms of the Convention. 2 Specific information on this effort is available on the NMFS Alaska Regional Office website on Tribal Consultation in Alaska (http://alaskafisheries.noaa.gov/tc/). NPFMC. 2009. Navigating the North Pacific Council Process. North Pacific Fishery Management Council, Anchorage AK. NPFMC. 2012. Statement of organization, practices, and procedures of the North Pacific Fishery Management Council (Draft). North Pacific Fishery Management Council, Anchorage AK		

PI 3.1.2	**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.1.3

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	(Y/N/Partial) Y	(Y/N/Partial) Y	(Y/N/Partial) Y

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach
	Justification	The IPHC is mandated by Article III of the Convention to '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'. The IPHC achieves this objective with its precautionary harvest policy (described under PIs 1.1.2, 1.2.1, and 1.2.2 in this Evaluation Table, above). Specific objectives of the IPHC include: 1) accommodation of the underlying biology of the fish, 2) accounting for all removals, 3) implementation of evolving assessment methodologies, 4) development and evaluation of harvest policy, and 5) the fostering of a consultative management process (Leaman 2007). The IPHC is undertaking a major management strategy evaluation process, through its recently established Management Strategy Evaluation Board (MSAB). The role of the MSAB is to define clear, measurable fishery management objectives and to provide technical input on the development of an operating halibut fishery management model that will permit evaluation of various strategies to achieve the management objectives (Martell *et al.* 2014). This process is expected to yield additional long term objectives to guide decision making in the coming years. The NPFMC and PFMC are bound by the MSA, which specifies the long-term objectives (especially National Standards 1, 8, 9) and establishes a formal set of processes for setting short-term objectives and management measures to achieve the long-term objectives. The National Standards Guidelines (50 C.F.R. 600.310 et seq.) direct the authorities that develop and approve Fishery Management Plans to apply the precautionary approach when setting control rules in a fishery. The Guidelines describe how to address uncertainty such that there is a low risk that limits are exceeded, and mandate that 'Control rules should be designed so that management actions become more conservative as biomass estimates, or other proxies, for a stock or stock complex decline and as science and management uncertainty increases' (50 CFR 600.310, National Standard 1). The policies, regulations and implementing guidelines explicitly mandate the application of the precautionary approach as defined and described by the international scientific community (FAO 1996). The above evidence indicates that the fishery management system has clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, and they are explicit within and required by management policy. This satisfies all of the conditions for SG 100.
References		Hare, S. and W. Clark. 2007. 2007 IPHC harvest policy analysis: past, present, and future considerations. International Pacific Halibut Commission, Seattle, WA.

PI 3.1.3	**The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach**	
	Leaman, B. 2007. IPHC Stock Assessment Workshop, 2007. Fishery and Management Overview: Biology, Fishery, and Management. June 27, 2007. 34 pp. http://www.iphc.int/presentations/ws0701bml.pdf. Martell, S., Leaman, B.M. and Stewart, I.J . 2014. Developments in the Management Strategy Evaluation Process, Fisheries Objectives, and Implications for Harvest Policy and Decision Making. IPHC Bluebook 2014:186-197. Available at: http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2014.pdf	
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 3.1.4

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	(Y/N/Partial) Y	(Y/N/Partial) Y	(Y/N/Partial) Partial

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing
	Justification	The US fisheries management system provides economic and social incentives for sustainable fishing as part of fishery rationalization (for example, individual fishing quotas (IFQs), catch shares, and limited access) and cost-recovery programs. The NPFMC implemented an individual fishing quota (IFQ) program for the commercial halibut and sablefish longline fisheries off Alaska in 1995. The evidence indicates that the incentives under the IFQ program are consistent with achieving the outcomes expressed by MSC Principles 1 and 2. According to Knapp and Hull (1996), the IFQ program 'dramatically changed the Alaska halibut fishery.' Before 1995 thousands of fishing vessels required only two or three 24-hour openings to catch the entire halibut quota set by the IPHC. After the IFQ program was implemented, the season expanded to nine months (March until November), the average crew size on vessels decreased, the product changed from primarily frozen to primarily fresh, ex-vessel prices increased, and safety at-sea improved. Although the PFMC has a limited entry management system, the Pacific halibut commercial fishery in Washington does not share the same IFQ program in place in Alaska. Limited Entry programs are not considered to provide the same incentives for sustainable fishing that are typically associated with IFQ programs (NAP 1999). Although Alaska fisheries receive some subsidies (Sharp and Sumaila 2009) none appear to affect operations in the halibut fishery. The Team is not aware of any subsidies or other negative incentives that contribute to unsustainable fishing practices. The evidence indicates that the fishery management system satisfies all of the elements SG 80, but since the benefits of the Alaska IFQ program do not apply to Washington, only partial scoring is possible for the SG100 level.
References		Knapp, G, and Hull, D.. 1996. The first year of the Alaska IFQ program. A survey of halibut quota share holders. Inst. Of Social and Econ. Res. Univ. of Alaska, Anchorage, AK. September 1996. 135 p. National Academy Press. 1999. Sharing the Fish: Toward a National Policy on Individual Fishing Quotas. Committee to Review Individual Fishing Quotas. Ocean Studies Board. Commission on Geosciences, Environment, and Resources. National Research Council. 422 p. http://www.nap.edu/read/6335/chapter/1

PI 3.1.4	The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing	
	Sharp, R. and U. R. Sumaila. 2009. Quantification of U.S. Marine Fisheries Subsidies. North American Journal of Fisheries Management. 29:18-22.	
OVERALL PERFORMANCE INDICATOR SCORE:		**85**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 3.2.1

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
	Met?	(Y/N/Partial) Y	(Y/N/Partial) Y	(Y/N/Partial) Y

	Justification	Both the IPHC and NPFMC have explicit short and long-term objectives for the fishery with NPFMC having additional groundfish objectives that are consistent with achieving outcomes expressed by MSC Principle 2. IPHC objectives are primarily consistent with achieving the outcomes expressed by MSC Principle 1. The IPHC is mandated by Article III of the Convention to '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'. The IPHC achieves this objective in a specific way with its precautionary harvest policy (see 1.1.2, 1.2.1, and 1.2.2 above). Other specific objectives of the IPHC include: 1) accommodation of the underlying biology of the fish, 2) accounting for all removals, 3) implementation of evolving assessment methodologies, 4) development and evaluation of harvest policy, and 5) the fostering of a consultative management process (Leaman 2007). Research is a key function of the IPHC, directly supporting continuing objectives of the Commission, including: 1) improving the annual stock assessment and quota recommendations; 2) developing information on current management issues; and 3) adding to knowledge of the biology and life history of halibut (IPHC 2015b) Specific research objectives, which connect to the IPHC mandate and support the assessment and management objectives of the Commission fall under four areas: 1) Stock identification and assessment; 2) Harvest policy and management; 3) Biology, physiology, and migration; and 4) Ecosystem interactions and environmental influences. The IPHC is presently undertaking a major management strategy evaluation process, through its recently established Management Strategy Evaluation Board (MSAB). The role of the MSAB is to define clear, measurable fishery management objectives and to provide technical input on the development of an operating halibut fishery management model that will permit evaluation of various strategies to achieve the management objectives. The four key components required in developing an MSE are: 1) a clearly defined set of management objectives, 2) a set of performance measures related to the objectives, 3) a set of alternative management procedures, and 4) a means of evaluating the performance measures (Martell *et al.* 2014). This process is expected to yield additional well defined and measureable objectives in the coming years. As explained in 3.1.1, above, the 1982 Halibut Act provides for the regulation of the US portion of fishery by the North Pacific and Pacific Fishery Management Councils. The NPFMC has developed groundfish FMPs for the Bering Sea/Aleutian Islands (NPFMC 2015a) and the Gulf of Alaska (NPFMC 2015b). Numerous management measures in these two FMPs were established for the expressed purpose of mitigating possible adverse effects of the groundfish fisheries on the halibut resource (NPFMC 2015a); as such, these are specific objectives designed to achieve outcomes for the halibut fishery expressed by MSC Principle 1. Designed to manage groundfish, the FMPs also contain many objectives directly relevant to MSC Principle 2 for the halibut fishery. They contain 46 short- and long-term

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2
		objectives grouped into nine categories: 1) Prevent Overfishing; 2) Promote Sustainable Fisheries and Communities; 3) Preserve Food Web; 4) Manage Incidental Catch and Reduce By-Catch and Waste; 5) Avoid Impacts to Seabirds and Marine Mammals; 6) Reduce and Avoid Impacts to Habitat; 7) Promote Equitable and Efficient Use of Fishery Resources; (8) Increase Alaska Native Consultation; (9) Improve Data Quality, Monitoring and Enforcement. The NPFMC also has a well-developed set of research objectives, sixteen of which pertain directly to the Pacific halibut fishery, and relate directly to MSC Principles 1 and/or 2. These are available for review online at research.psmfc.org. The PFMC groundfish FMP for the West Coast also sets supplemental measures for halibut as a prohibited species (PFMC 2016). The Council is committed to developing long-range plans for managing the Washington, Oregon, and California groundfish fisheries that will promote a stable planning environment for the seafood industry, including marine recreation interests, and will maintain the health of the resource and environment. For groundfish, the FMP lists 17 objectives under three long term goals. The goals of 1) Conservation, 2) Economics, and 3) were established in order of priority for managing the west coast groundfish fisheries, to be considered in conjunction with the national standards of the Magnuson-Stevens Act (PFMC 2016). The evidence indicates that there are well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, and are explicit within the fishery's management system. Together, the IPHC and NPFMC demonstrate compliance with this PI at the SG100 level.
References		Martell, S., Leaman, B.M. and Stewart, I.J . 2014. Developments in the Management Strategy Evaluation Process, Fisheries Objectives, and Implications for Harvest Policy and Decision Making. IPHC Bluebook 2014:186-197. Available at: http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2014.pdf
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 3.2.2

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	(Y/N) Y	(Y/N) Y	
	Justification	Information provided in 3.1.2, 3.1.3, and 3.2.1 show that the IPHC and two US Management Councils (NPFMC and PFMC) have established effective decision making processes that result in measures and strategies to achieve the objectives of the fishery. The IPHC undertakes decision-making relating to total allocations based on results of the stock assessment conducted by IPHC staff and consulted on annually by several advisory bodies including the Conference Board, the Processor Advisory Group, the Research Advisory Board and the Management Strategy Advisory Board. IPHC also recently formed the: 1) Scientific Review Board -- to provide an independent scientific review of Commission science products and programs, and 2) a Management Strategy Evaluation Board -- to oversee the development of an operating halibut fishery management model that will permit evaluation of various strategies to achieve management objectives (IPHC 2015). The North Pacific Fishery Management Council and the Pacific Fishery Management Council both play an active role in the management of Pacific halibut. The Halibut Act allows these two Councils to develop regulations, including limited access regulations, that do not conflict with the regulations adopted by the Commission (16 U.S.C. §§ 773c, (c)). Regulations recommended by the Councils must be approved by the Secretary of Commerce (Secretary) before being implemented through the National Marine Fisheries Service (NMFS). NMFS has responsibility for managing the fishery for halibut according to regulations approved by the Secretary. The NPFMC and PFMC both have a well-defined, open and participatory decision-making process; conducting public meetings allowing all interested persons an opportunity to be heard in the development of FMPs and amendments, and other Council decisions (NPFMC 2012; pcouncil.org). The evidence shows the fishery meets the requirements at the SG60 and SG80 levels for this Scoring Issue.		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
b	Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y

	Justification	The IPHC and two US Management Councils (NPFMC and PFMC) have decision-making processes with proven records of responding to virtually all issues that are identified by research, monitoring, evaluation studies, and by consultations with stakeholders and other interested parties. The processes are transparent, operate in a timely manner, and take into account the wider implications of the decisions. The IPHC holds an annual meeting and encourages public participation in management via 1) five advisory bodies that meet throughout the year, and 2) various State, Provincial, and Federal agencies. The Commission's advisory bodies include the Conference Board, the Processor Advisory Group, the Research Advisory Board, the recently convened Management Strategy Advisory Board, and the Scientific Review Board. Information on the roles and responsibilities of each of these can be found in Appendix 2 of this report. Additionally, the IPHC self-reported progress on recommendations from an outside management review process in 2012 can be found in Appendix 4 of this report. Response to all management issues is provided in the form of supporting documents, minutes of meetings, and public testimony published on the IPHC website. Annual reports posted on the website include the "Bluebook" (a detailed recap of the Annual IPHC meeting) and the 'RARA" (a detailed IPHC Report of Assessment and Research Activities). The broad array of participants in this process ensures that account is taken of the wider implications of the decisions. The NPFMC and PFMC both have a well-defined, open and participatory decision-making process; conducting public meetings allowing all interested persons an opportunity to be heard in the development of FMPs and amendments, and other Council decisions (NPFMC 2012; pcouncil.org). The decision-making process at both Councils relies heavily on the Council's Scientific and Statistical Committees, Advisory Panels, Plan/Management Teams, Workgroups, and regular public hearings to identify issues of concern for fishery managers to address. All of these groups meet regularly and report the issues of concern to the Council for consideration in its decision-making deliberations. As mandated by the MSA, and APA, the processes must be open and transparent, with supporting documents, minutes of meetings, and testimony published on the Council's website. There are three key steps in the Councils decision-making process that produces the management plans and regulations to achieve the objectives: First, a Council develops a fishery management plan employing processes that proactively identify the issues and examine the implications that the proposed regulations may have beyond the fishery (other fisheries, the ecosystem, coastal communities, etc.). Second, the Secretary of Commerce evaluates the proposed plan, its wider implications, and whether it is consistent with all relevant laws. Third, NMFS, the states, and the US Coast Guard and their partners implement the provisions of the plan. The evidence shows that requirements are met at the SG100 level.

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
c	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		(Y/N) Y	
	Justification	The IPHC and two US Management Councils (NPFMC and PFMC) have decision-making processes that use the precautionary approach and are based on the best available information. Use of the precautionary approach at IPHC is evidenced by the IPHCs precautionary harvest policy, described under PIs 1.1.2, 1.2.1, and 1.2.2. Additionally, The IPHC is unique as a fishery management organization, in that it is well staffed by scientists focused solely on one fish: the Pacific halibut. This has fostered a long history (since the 1920s) of using the best available information for decision making. Adaptive management of fisheries and other natural resources is a well-established practice at all levels of government in the US. For marine resources, the President's Interagency Ocean Task Force produced several recommendations, since incorporated in Executive Order 13547, to apply ecosystem-based management and adaptive management to address ocean resource challenges (CEQ 2010). For marine fisheries specifically, the National Standards Guidelines for Standard 2 require that Fishery Management Councils amend FMPs 'as new information indicates the necessity for change in objectives or management measures' (Sec. 600.315(d)) and 'prepare and review annually a Stock Assessment and Fisheries Evaluation (SAFE) report for each fishery management plan' (Sec. 600.315(e)). SAFE reports contain information on the most recent condition of fish stocks, ecosystems, and the social and economic status of user groups. The Councils follow the National Standards Guidelines (50 C.F.R. 600.310 et seq.) when developing fishery management measures. The Guidelines for National Standard 1 instruct each Council and NMFS to apply the precautionary approach when setting control rules in a fishery. The Councils also are subject to National Standard 2 of the MSA, which mandates that 'conservation and management measures shall be based on the best available scientific information' (50 CFR 600.315). The Councils SSCs are charged with the task of reviewing the science behind management recommendations; determining if the information provided constitutes the 'best available scientific information'. Requirements are met at the SG80 level.		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
d	Guidepost	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	The IPHC and two US Management Councils (NPFMC and PFMC) have well-developed systems for the formal reporting of fishery performance and management actions, including how the management system responded to findings emerging from research, monitoring, evaluation, and review activity. At the IPHC, a formal reporting on all management issues is provided in the form of supporting documents, minutes of meetings, and public testimony published on the IPHC website. Annual reports posted on the website include the “Bluebook” (a detailed recap of the Annual IPHC meeting) and the ‘RARA” (a detailed IPHC Report of Assessment and Research Activities). Formal reporting of fishery performance and Council deliberations and actions occurs throughout the NPFMC and PFMC processes (NPFMC 2009; 2012; pcouncil.org). A detailed briefing book provides stakeholders with all of the information used by the Council members for decision-making. Draft documents (e.g., stock assessments, plan amendments, environmental assessments, and environmental impact statements) are readily available on Council and government websites. Final decisions, including comments from the public and specific responses from the decision-makers, are also posted for easy access. This provides comprehensive, formal reporting of the management system response to relevant findings and information. Requirements are met at the SG100 level.		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
e	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	Legal challenges to the US Pacific halibut fishery do not typically arise at the level of the IPHC, but rather occur at the Federal level in the US. The Office of General Counsel (GC), which represents NMFS, provides legal advice and counsel for the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce. NOAA GC has established a formal guideline for maintaining the agency administrative record (Schiffer 2012). This agency administrative record becomes an important aspect of justifying decisions and avoiding lawsuits. Further, NOAA and NMFS consult with plaintiffs and potential plaintiffs to settle disputes. The management system process includes proactive response from the decision-making agencies to legal actions brought against the management system, and strives to prepare decisions in substantive compliance with laws and regulations to minimize the likelihood of lawsuits, thereby meeting the requirements of the SG 100 level.		
References		CEQ 2010. IPHC 2015. Annual Report 2014. International Pacific Halibut Commission. Seattle, WA. 96 pp. Available at: http://www.iphc.int/library/annual-reports.html Leaman, B. 2007. IPHC Stock Assessment Workshop, 2007. Fishery and Management Overview: Biology, Fishery, and Management. June 27, 2007. 34 pp. http://www.iphc.int/presentations/ws0701bml.pdf. NPFMC. 2009. Navigating the North Pacific Council Process. North Pacific Fishery Management Council, Anchorage AK.		

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.
	NPFMC. 2012. Statement of organization, practices, and procedures of the North Pacific Fishery Management Council (Draft). North Pacific Fishery Management Council, Anchorage AK Schiffer, S. J. 2012. National Oceanic and Atmospheric Administration Guidelines for compiling an Agency Administrative Record. Memorandum from Lois J. Schiffer, General Counsel.
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.2.3

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) N

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
	Justification	Enforcement authorities operate a comprehensive monitoring, control and surveillance (MCS) system in the Pacific halibut and other Alaska fisheries. The MSA charges two federal agencies with the authority to implement provisions of the Act: the National Marine Fisheries Service (NMFS) and the US Coast Guard. The Coast Guard enforces fisheries law and regulations at sea in conjunction with NOAA's Office of Law Enforcement Alaska Enforcement Division and other federal, state, tribal, interstate and international organizations.[1] The State of Alaska Department of Public Safety (Wildlife Troopers, Marine Enforcement Section) also enforces federal regulations under the Magnuson-Stevens Fishery Conservation and Management Act and other laws[2] through a Joint Enforcement Agreement with NMFS. The Alaska Enforcement Division (AKD) of the NOAA Office of Law Enforcement (OLE), Alaska Wildlife Troopers (AWT) and the US Coast Guard (USCG) report the results of their MCS activities for the halibut and sablefish IFQ fisheries as a whole, since boarding and other inspections are 'intended to ensure compliance with all IFQ and IPHC regulations and do not focus on collecting species-specific data' (RAM 2009, p. 39). The AKD handles daytime and after hours surveillance of ports and shoreside monitoring of offloads. US Coast Guard activities are focused on at-sea and aerial surveillance. In FY2012, AKD personnel spent over 5,400 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 (NOAA 2014). Enforcement authorities have characterized the IFQ fishery as stable, with very low rates for significant violations. Typically, the AKD makes about 700 dockside boardings annually on sablefish and halibut IFQ vessels. Additionally, from 2008-2012, the US Coast Guard averaged 310 at sea boardings a year, with an average violation rate of 6.6%. (NOAA 2014). The MCS system has demonstrated an ability to enforce management measures, Strategies, and rules. However, the Assessment Team is concerned that 1) VMS is not a requirement on all vessels, and 2) a gap in Observer Program coverage exists for vessels <=40 ft LOA (see Sic, below). Requirements of the SG80 level (but not the SG100 level) are met for this Scoring Issue.		
b	**Guidepost**	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) N

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with
	Justification	Under the published policy for assessing civil penalties (GCEL 2010), there are three options available to an investigating agent for pursuing a violation of fisheries law and regulations. If a violation is not significant or is technical, the agent may issue a 'Fix-It Ticket' that allows the violator to correct the violation within a specified time period. For modestly significant violations, the agent may issue a 'Summary Settlement' notice, which allows the violator to pay a reduced penalty. Fix-It Ticket allowances and Summary settlement penalties follow the guidelines by developed and published by NOAA's Offices of Law Enforcement and of General Counsel.[3] For violations that are significant[4], or for repeat violators, the agent refers the case to the NOAA General Counsel's Office for Enforcement and Litigation (GCEL) for further action. Penalty schedules, which specify the civil penalties for violations of federal fisheries regulations, have been developed for each region's fisheries.[5] The penalty schedule, Groundfish & Individual Fishing Quota Fisheries off The Coast of Alaska, contains sanctions for various violations of sablefish IFQ regulations. As an example, the possession or sale of 100 to 1,500 pounds of IFQ sablefish without an annual quota share carries a fine of $15,000 to $50,000, plus forfeiture or value of the illegal fish. For a person holding an IFQ overage during the final voyage of the year, carries a civil penalty ranging from $1 - $6 per pound, plus forfeiture of the entire catch overage or its value. By law sanctions should be consistently applied; in other words, comparable sanctions should be issued for comparable violations. There is no evidence either way whether or not sanctions are consistently applied in the Alaska Region; however, no complaints of inconsistent or arbitrary treatment by enforcement authorities have come to our attention. Most observers of the fishery believe that the sanctions provide effective deterrence. Also, the evidence on non-compliance supports this claim (NOAA 2014). However, the Assessment Team is concerned that 1) VMS is not a requirement on all vessels, and 2) a gap in Observer Program coverage exists for vessels <=40 ft LOA (see Sic, below). Requirements of the SG80 level (but not the SG100 level) are met for this Scoring Issue.

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
c	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) N

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
	Justification	Regulations for the Pacific halibut fishery require that fishers maintain logbooks and regularly report their catches, landings, and other measures of fishing activity to NMFS. There is generally widespread compliance with the logbook requirement, with only a few violations of the requirement every year (NOAA 2015). Thus, it is clear that some evidence exists to demonstrate fishers comply with the fishery management system, and thus the requirements are met at the SG80 level. For this Scoring Issue, the SG 100 level requires a high degree of certainty that fishers are complying with the fishery management system. As noted at the time of re-certification in 2011, a shortcoming of the MCS program is the ability to monitor 1) where all Pacific halibut fishing takes place (e.g. with vessel monitoring systems (VMS) or 2) bycatch and discards of seabirds and particularly other rare, protected species (e.g. via the NPFMC Observer Program). The Vessel Monitoring System (VMS), required on many groundfish vessels (e.g. in the Alaska Pollock and cod fisheries) and in most commercial fisheries internationally, is not currently a requirement for the IFQ fishery; for example, in 2012 only 77 pacific halibut trips used the Vessel Monitoring System (VMS) checkout (NOAA 2014). Managers have recognized that data collection by onboard observers is currently the only reliable and verifiable method available to gain fishery discard and biological information on fish, and data concerning seabird and marine mammal interactions with fisheries (NMFS 2014). Evidence exists to show that the quality of the Observer program has improved since the re-certification in 2011, as a result of a re-structuring effort that began in January of 2013 (NMFS 2015). Targeted coverage rates by the observer Program in 2015 was 11% for small vessels, and 24% for large vessels; however, no coverage occurs on vessels <= 40 ft LOA (NMFS 2014). While the reliability of the Observer Program has clearly increased in recent years, the Team has not seen evidence to affirm a "high degree of confidence" that fishers are fully complying with the management system, at this time. Vessels are not required to carry VMS on board (to document fishing locations) and observer program coverage rates (to document bycatch) are not 100%. Furthermore, no observer coverage is occurring on vessels <= 40 ft LOA. Thus scoring is met at the SG 80 level, but not the SG100 level.		
d	**Guidepost**		There is no evidence of systematic non-compliance.	
	Met?		(Y/N) Y	

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with
	Justification	There have been no major changes to the way enforcement is carried out, and systematic non-compliance has not been an issue since the fishery was re-certified in 2011 (NOAA 2015). The requirement for scoring at the SG80 level is met for this Scoring Issue.
References		1 The Coast Guard and other enforcement authorities are also responsible for enforcing provisions of the MMPA, ESA, and international fisheries agreements. 2 Other laws include the Endangered Species Act of 1973; the Lacey Act Amendments of 1981; and the Northern Pacific Halibut Act of 1982. Source: http://www.gov.state.ak.us/omb/11_omb/budget/PublicSafety/enacted/2011proj35825.pdf. 3 The Fix-IT Ticket and Summary Settlement Schedules are available at http://www.gc.noaa.gov/enforce-office3.html and at http://www.gc.noaa.gov/docs.html. 4 The term 'significant' is related to the potential harm a violation may have on the resource (GCEL 2010). 5 Available at http://www.gc.noaa.gov/enforce-office3.html. NMFS 2014. 2015 Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska. National Oceanic and Atmospheric Administration, 709 West 9th Street. Juneau, Alaska 99802. NMFS. 2015. North Pacific Groundfish and Halibut Observer Program 2014 Annual Report. National Oceanic and Atmospheric Administration, 709 West 9th Street. Juneau, Alaska 99802. NOAA 2014. Pacific Halibut–Sablefish IFQ Report. Fishing Year 2012. March 2014. RAM. 2009. Pacific Halibut-Sablefish IFQ Report, Fishing Year 2008. NMFS Alaska Region, Restricted Access Management. Available at http://www.fakr.noaa.gov/ram/ifqreports.htm.
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 3.2.4

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y

	Justification	The IPHC and two US Management Councils (NPFMC and PFMC) each have research plans that address Pacific halibut information needs. The most comprehensive plan with regard to halibut is maintained by IPHC, addressing primarily the target stock, and thus is most relevant to MSC P1 considerations. The NPFMC research plan is quite comprehensive to all groundfish stocks under management, and thus with respect to Pacific halibut, pertains mainly to MSC P2 and P3 considerations. Article III of the Convention directs the IPHC to conduct and coordinate scientific studies relating to the halibut fishery. The IPHC prepares a Five Year Research Plan and an Annual Research Plan (ARP). These research plans derive directly from Commission objectives, with an accompanying process for input and periodic reviews by the Commission, interested stakeholders, the Research Advisory Board (RAB), and the Scientific Review Board (SRB) (IPHC 2015b). The preliminary ARP is presented to the Commission at the Interim Meeting, where discussion of overall research priorities, individual studies, and associated budgets occurs. The staff then develops a final ARP and presents it at the Annual Meeting for Commission approval. The ARP is based on management and assessment needs as prioritized by the IPHC staff and Commission. It is the Commission's long-term goal to also obtain the views and advice of its SRB and RAB in the design and prioritization of research within the ARP (IPHC 2015b). The 2015 Research Plan may be found at: http://www.iphc.int/library/raras/394-rara2014.html. The IPHC research plan provides the management system with a coherent and strategic approach to research on Pacific halibutResearch results, and changes in the research plan are updated and reported annually in the Commission's Report of Assessment and Research Activities (RARA) document, available online in a timely basis on the IPHCs website. Research activities fall into four chief areas: 1) stock identification, monitoring and assessment, 2) harvest policy and management, 3) biology, physiology, and migration, and 4) ecosystem interactions and environmental influences. High priority studies in 2015 included: 1) development of a methodology for accurate determination of the sex ratio of the commercial landings, 2) research on the harvest policy through the Management Strategy Evaluation (MSE) effort, 3) investigation into the declining trend in size at age, and 4) studies to describe halibut habitat in order to assess the effect of a changing climate on stock dynamics. The North Pacific Fishery Management Council identifies priorities for research, over the next 1 to 5 years, as those activities that are the most important for the conservation and management of fisheries in the Gulf of Alaska, Aleutian Islands, eastern Bering Sea, and the Arctic (http://www.npfmc.org/research-priorities). This listing of priorities has two purposes: 1) to meet the requirements of the revised Magnuson-Stevens Act for the Councils to identify 5 year research needs, and 2) to provide guidance on research priorities to the research community and funding agencies. Research priorities are organized into four categories: critical

		ongoing monitoring, urgent, important (near term), and strategic (future needs). These categories place less emphasis on the relative value of research topics and more emphasis on the correspondence of research to the Council's time horizon of management concerns. The NPFMC research priorities are organized online, and are available in a timely basis, through a publicly accessible database, research.psmfc.org, which can be queried for changes in research status and can also be downloaded completely for detailed information about all of the Council's research needs. Information about NPFMC research priorities is also available at: http://www.npfmc.org/research-priorities. Specific to Pacific halibut, the current list of NPFMC research priorities identifies ten research items as "Urgent", four as "Important Near Term", and two as "Future Needs"; the status for eleven of these sixteen items is listed as "Underway" or "Partially Underway". Of relevance to Pacific halibut off Washington State, the PFMC process for identifying research and data needs is reported in Council Operating Procedure 12. This procedure outlines the Council's process for documenting research and data needs and the schedule for completing and communicating these needs to organizations which may be able to support additional research. At least every five years, the Council staff presents an updated version of the Research and Data Needs document(s) to the SSC for review. After the documents are approved, they are sent to NMFS, regional Sea Grant institutions, and other institutions and agencies. The most recent document is available at: http://www.pcouncil.org/wp-content/uploads/Res_Data_Needs_2013_FINAL.pdf. The requirements are met at the SG100 level.		
b	**Guidepost**	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y
	Justification	Research plans and results of the research are disseminated to all interested parties in a timely fashion and made widely available; links to the IPHC, NPFMC, and PFMC research plans online are provided under Scoring Issue a, above. Additionally, the IPHC prepares a "Report of Assessment and Research Activities" giving detailed updates on research progress annually. The requirements are met at the SG100 level.		
References		IPHC 2015b. 2015 Annual Research Plan. November 2015. IPHC Report of Assessment and Research Activities - 2014. Section 14c. 16 pp. Available at: http://www.iphc.int/publications/rara/2014/rara2014_02researchplan.pdf.		

OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.2.5

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) N
	Justification	At IPHC, key parts of the management system were evaluated as part of an external review process held in 2012, and progress in meeting the recommendations that followed from that review is evaluated annually (see Appendix 4). Additionally, the IPHC has a Management Strategy Evaluation (MSE) process in place that holds promise as a mechanism to evaluate all parts of the management system under the Commission's purview (see 3.2.1, above). The NPFMC and PFMC each meet five times a year, and they both have mechanisms in place to evaluate all parts of the management system. For NPFMC, the annual management process is detailed in Council Operating Procedure 1H (NPFMC 2009; 2012). Under the annual cycle, management measures are put into place and adjusted through routine in-season evaluation and actions. Amendments to the NPFMC groundfish fishery management plans have averaged about two per year since the implementation of the council system, demonstrating the wide range of management topics evaluated by the NPFMC, effectively covering all parts of the management system. Additionally, the US Congress reviews the MSA every five years and amends it as necessary. The SG80 level is met for this Scoring Issue. The SG100 level could be met in the future, when evidence shows that the IPHCs MSE process is an effective mechanism to evaluate all parts of the management system.		
b	**Guidepost**	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	(Y/N) Y	(Y/N) Y	(Y/N) Y

PI 3.2.5		**There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives** **There is effective and timely review of the fishery-specific management system**
	Justification	The IPHC holds frequent advisory body meetings, and an annual meeting that effectively constitutes a review of the fishery-specific management system on a regular basis. A thorough external review was conducted in 2012, and progress on implementing the recommendations that followed from that review are evaluated annually. Performance review information, including the progress report, can be found on the Commission website at http://iphc.int/meetings-and-events/review.html. Additionally, the NPFMC management system undergoes internal review as part of the annual harvest specification process, involving the NPFMC Groundfish Plan Teams, Advisory Panel, SSC, public comment, and council member discussions. All NPFMC recommendations are externally reviewed by NMFS, NOAA, and the Department of Commerce, and NOAA OGC reviews proposed actions to assure compliance with the MSA. Further external review can occur through legal challenges, which have the effect of refining understanding of requirements under laws and regulations. The SG100 level is met for this Scoring Issue.
References		NPFMC. 2009. Navigating the North Pacific Council Process. North Pacific Fishery Management Council, Anchorage AK. NPFMC. 2012. Statement of organization, practices, and procedures of the North Pacific Fishery Management Council (Draft). North Pacific Fishery Management Council, Anchorage AK
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

Appendix 1.1 Conditions

Previous Conditions

At the time of entering this 2nd re-assessment there were 3 open conditions (PIs 1.2.3, 2.2.3, 2.3.3). The 3 conditions were open and on target as of the 4th annual surveillance and likewise upon initiation of the 2nd re-assessment, due to close at the 2nd annual surveillance audit of the new certificate cycle. The conditions were set with a timeline extending beyond the previous certificate cycle to align with existing NPFMC timelines to implement increased observer and EM coverage the fishery that would address the open conditions. Because these were not considered behind target at the 4th surveillance, the assessment team does not consider their status as open to preclude recommendation for re-certification.

Table 33. Summary of open conditions as of the 4th surveillance audit with updated status as of the 2nd re-assessment. Conditions still in place detailed in Tables A1.X below, with the addition of the new condition placed on the fishery pertaining to PI 2.1.3

Condition	PI(s)	Status as of 4th Surveillance	Status as of 2nd re-assessment
1) The US halibut fishery shall assure that there is information on Pacific halibut removals from the stock by the groundfish fleet, including sufficient and comprehensive estimates from vessels < 40 ft. LOA and on boats 40--57.5 ft LOA. Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule.	**1.2.3**	Open and on target, Year 2 in Next Certificate Cycle	**Condition still in place with timeline extended** to Year 3 of certificate cycle. (See Condition 1 below)
2) Information shall be collected and provided to the CB to support a partial strategy to manage main bycatch species and sufficient data shall continue to be collected to detect any increase in risk to main bycatch species throughout the certification period.	**2.2.3**	Open and on target, Year 2 in Next Certificate Cycle	**Condition still in place with timeline extended** to Year 3 of certificate cycle (See Condition 3 below)
3) The fishery shall have sufficient data to allow fishery related mortality and the impact of fishing to be quantitatively estimated in a scientifically defensible manner for ETP species and provide these estimates to the CB.	**2.3.3**	Open and on target, Year 2 in Next Certificate Cycle	**Condition closed** during scoring of re-assessment (see rationale for 2.3.3)

Conditions as of 2nd Re-assessment

Two of these three conditions will remain open into the next certification cycle (1.2.3 & 2.2.3). The third open condition (on 2.3.3), was left open at the 4th annual surveillance, but after further consideration by the assessment team, has been re-scored to SG80, thereby closing the condition pertaining to information on ETP species. In addition to the 2 conditions from the previous certificate cycle, a new condition pertaining to PI 2.1.3 has been created. Conditions applicable as of this 2nd re-assessment are described in the tables below.

Table A1.1: Condition 1

Performance Indicator	1.2.3 Relevant information is collected to support the harvest strategy
Score	70
Rationale	Please refer to scoring rationale for PI 1.2.3b,c beginning on page 194
Condition	By surveillance Year 3, the US halibut fishery shall assure that there is information on Pacific halibut removals from the stock by the groundfish fleet, including sufficient and comprehensive estimates from vessels < 40 ft. LOA. Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule.
Milestones	Surveillance year 1 – Further detail regarding existing data available and extrapolation methods used to account for removals by the <40ft fleet are provided to the assessment team for consideration, building off the information provided by NMFS in May of 2016 (See Appendix 1.1a). If the team considers the data and current methods sufficient, the condition will be closed. If not, the client will be tasked to identify an alternative pathway to meet the SG80 requirement. Surveillance year 2 – If condition not closed in Year 1 based on existing methods and data, client will provide evidence of a plan to identify data sources and/or methods that will provide the assessment team with more better information regarding the <40ft fleet removals. No change in score expected. Surveillance year 3 – If necessary, data is presented to the CAB. Depending on the quality and content of the data, this could result in SG80.
Client action plan	Year 1: The client will work with NMFS and IPHC to get a more complete understanding of the methodology used in determining impacts from the under 40 foot fleet, both of halibut and other species. Client will work with IPHC data managers to identify vessels in the 26-40ft. and 26-57.5 ft. category that can provide adequate data to evaluate halibut removals for <40ft vessels. Client will work with NMFS data mangers to provide a fishing or heat map with the goal of determining spatial overlap of small boat fishing locations compared to >40ft vessels with observer data, for representativeness. This will be completed in year one and present to the MSC reviewers. Year 2: If necessary, the client will work with IPHC and NMFS to build upon efforts undertaken in year 1, to ensure data are collected and evaluated from <40 ft vessels and compare to >40ft vessels for overlap coverage. Year 3: If necessary, the client will work with IPHC and NMFS to ensure data are analysed and ready for presentation. Evidence in the form of combined data from the work in years 1 and 2 will be provided to the CAB.

Consultation on condition	Fulfilment of the client action plan is dependent upon staff time and data resources from the IPHC and NMFS. See Appendix 1.1b for a letter of support from the IPHC. Appendix 1.1a demonstrates NMFS active participation in the ongoing dialogue regarding this open condition, and appendix 1.1c provides a letter of support for continued provision of information and clarification.

Table A1.2: Condition 2

Performance Indicator	2.1.3: Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species
Score	60
Rationale	Please refer to PI 2.1.3a,b,c rationale beginning on page 206
Condition	By surveillance year 3, the client will provide adequate information on the type, volume, and variability of bait used in the fishery to effectively assess the outcome status with respect to these species, to support a partial strategy if necessary, and determine if there is any increased risk level due to changes in the operation of the fishery.
Milestones	Surveillance year 1 – data collection methodology determined- no change in score Surveillance year 2 – data collection has begun- no change in score, Surveillance year 3 – data is presented to the CAB- The CAB will re-score based on this data to evaluate compliance with the condition and whether performance has achieved SG80 for PI 2.1.3
Client action plan	Year 1: Client will develop a questionnaire to determine type and volume of bait used in the halibut fishery and distribute to relevant association, etc. The questionnaire will include a prompt to help determine the degree of variability in use of bait from one year to the next. Year 2: Client will collect and collate information from questionnaire and present in final format to the CAB. To include accounting of bait species and volumes used in the fishery, as well as variability by year. Evidence will be provided in the form of a short report with supporting raw data. Year 3: Client will complete analysis of results from questionnaire and present in final format to the CAB. To include accounting of bait species and volumes used in the fishery, as well as variability by year. Evidence will be provided in the form of a short report with supporting raw data.
Consultation on condition	No external agency support or funding expected.

Table A1.3: Condition 3

Performance Indicator	2.2.3 Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch
Score	75
Rationale	Please refer to PI 2.2.3d rationale beginning on page 219
Condition	By surveillance year 3, the client will provide adequate spatial fishing effort or catch composition information on the nature and the amount of bycatch from vessels <40 ft LOA to determine if

	there is a risk posed by this segment of the fishery that is different from the rest of the fleet and the effectiveness of the strategy to manage bycatch.
Milestones	Surveillance year 1 – Further detail regarding existing data available and extrapolation methods used to account for removals by the <40ft fleet are provided to the assessment team for consideration, building off the information provided by NMFS in May of 2016 (See Appendix 1.1a). If the team considers the data and current methods sufficient, the condition will be closed. If not, the client will be tasked to identify an alternative pathway to meet the SG80 requirement. Surveillance year 2 – If condition not closed in Year 1 based on existing methods and data, client will provide evidence of a plan to identify data sources and/or methods that will provide the assessment team with more better information regarding the <40ft fleet removals. No change in score expected. Surveillance year 3 – If necessary, data is presented to the CAB. Depending on the quality and content of the data, this could result in SG80.
Client action plan	Year 1: The client will work with NMFS and IPHC to get a more complete understanding of the methodology used in determining impacts from the under 40 foot fleet, both of halibut and other species. Client will work with IPHC data managers to identify vessels in the 26-40ft. and 26-57.5 ft. category that can provide adequate data to evaluate halibut removals for <40ft vessels. Client will work with NMFS data mangers to provide a fishing or heat map with the goal of determining spatial overlap of small boat fishing locations compared to >40ft vessels with observer data, for representativeness. This will be completed in year one and present to the MSC reviewers. Year 2: If necessary, the client will work with IPHC and NMFS to build upon efforts undertaken in year 1, to ensure data are collected and evaluated from <40ft vessels and compare to >40ft vessels for overlap coverage. Year 3: If necessary, the client will work with IPHC and NMFS to ensure data are analyzed and ready for presentation. Evidence in the form of combined data from the work in years 1 and 2 will be provided to the CAB.
Consultation on condition	Fulfilment of the client action plan is dependent upon staff time and data resources from the IPHC and NMFS. See Appendix 1.1b for a letter of support from the IPHC. Appendix 1.1a demonstrates NMFS active participation in the ongoing dialogue regarding this open condition, and appendix 1.1c provides a letter of support for continued provision of information and clarification.

Appendix 1.1a: Letter from NMFS Regarding Current Discard Estimation Methods for the <40ft Fleet.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Alaska Fisheries Science Center
7600 Sand Point Way N.E. Bldg 4
Seattle, Washington 98115-6349
(206) 526-4000

May 23, 2016

Bob Alverson
Fishing Vessel Owner's Association
4005 - 20th Ave. West, Room 232
Seattle, WA 98199

Dear Mr. Alverson:

We received your request to provide information to the Marine Stewardship Council on how the National Marine Fisheries Service (NMFS) estimates discards in the <40 foot fleet of halibut vessels in the North Pacific. Catch and bycatch estimation in Alaska Federal fisheries is based on data from multiple sources including data collected onboard commercial fishing vessels (North Pacific Groundfish and Halibut Observer Program) and data provided by industry on landings reports (fish tickets). Estimates of the total weight of halibut retained by the halibut IFQ (directed) fishery are based entirely on reported landings.

Estimates of the at-sea discards of halibut in both the halibut IFQ fishery and other fisheries not targeting halibut are based on discard rates of halibut generated from observer data that are applied to groundfish landings. Estimates are made within each sampling strata (full coverage and two partial coverage deployment strata) before being combined across strata. Within each strata, data are always post-stratified by gear type and trip target (e.g., dominant retained species for trip). If data are available within a fishing trip and NMFS reporting area those data are used to estimate the discard rate for that trip which is then applied to the estimated groundfish (all species, retained and discarded) weight for that trip. However, if data are not available from the fishing trip, data are pooled within a NMFS reporting area and fishing sector for a three-week period centered on the fishing date. If data are not available in this pooled group, data are then pooled across fishing sectors. Ultimately, in the case that data are not available for within a NMFS area for a three week period over all fishing sectors, data are aggregated at the FMP level to generate estimates of at-sea discards.

These methods are documented in detail in Cahalan et al, 2014[1]; a gap analysis of the post-strata observer coverage can be found in the Supplement to the Environmental Assessment for Restructuring the Program for Observer Procurement and Deployment in the North Pacific[2]

[1] Cahalan, J.A., J. Mondragon, J. Gasper. 2014. Catch Sampling and Estimation in the Federal Groundfish Fisheries off Alaska: 2015 Edition. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-286, 41 p.

[2] Final Supplement to the Environmental Assessment for Restructuring the Program for Observer Procurement and Deployment in the North Pacific.
https://alaskafisheries.noaa.gov/sites/default/files/analyses/finalea_restructuring0915.pdf

For the portion of the fleet without a regulatory observer coverage requirement (zero coverage stratum, vessels under 40ft LOA or fishing with jig gear), data from vessels over 40ft fishing in the same post-strata are used in estimation. Specifically, data from the closest aggregation pool are used starting with data from the same NMFS reporting area for fishing activity in the same three week period.

Please let me know if you would like any other information.

Sincerely,

Douglas P. DeMaster, Ph.D.
Science and Research Director

Cc: Jim Balsiger
Glenn Merrill

Appendix 1.1b: Letter of Support from IPHC

COMMISSIONERS:
ROBERT ALVERSON
SEATTLE, WA
TED AGSU
CAMPBELL RIVER, B.C.
JAMES BALSIGER
JUNEAU, AK
DAVID BOYES
COURTENAY, B.C.
JEFFERY KAUFFMAN
WASILLA, AK
PAUL RYALL
VANCOUVER, B.C.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

ESTABLISHED BY A CONVENTION BETWEEN CANADA

AND THE UNITED STATES OF AMERICA

DIRECTOR
BRUCE M. LEAMAN

2320 W. COMMODORE WY, STE 300
SEATTLE, WA 98199-1287

TELEPHONE:
(206) 634-1838

FAX:
(206) 632-2983

20 June 2016

Ms. Jennifer Humberstone
SCS Global Services
2000 Powell Street, Suite 600
Emeryville, CA 94608

VIA EMAIL

Dear Ms. Humberstone

I am writing to confirm that the International Pacific Halibut Commission (IPHC) is committed to the provision of data on the distribution and quantity of fishing effort, for use in the estimation of bycatch and release mortalities during fishing by the <40 ft LOA directed halibut fleet. As a reminder however, it is necessary for confidentiality reasons to filter these data for IPHC statistical areas where there are at least three vessels landing in any particular time/area cell.

These IPHC data have been used in conjunction with National Marine Fisheries Service observer data from other directed halibut fishing by larger vessels in the same time/area cells, to estimate halibut release mortality and bycatch of non-target species, since the < 40 ft vessels currently have no requirement for observer coverage. We also note that there will be some observations from this small-boat component of the fleet available from electronic monitoring (EM). It is therefore possible to utilize the IPHC data and the EM data in the same manner as those data from human observers.

Sincerely,

Bruce M. Leaman, Ph.D.
Executive Director

cc: Robert Alverson, FVOA

1

Appendix 1.1c: Letter of Support from NMFS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Alaska Fisheries Science Center
7600 Sand Point Way N.E. Bldg 4
Seattle, Washington 98115-6349
(206) 526-4000

June 23, 2016

Ms. Jennifer Humberstone
SCS Global Services
2000 Powell Street, Suite 600
Emeryville, CA 94608

Dear Mr. Humberstone,

The National Marine Fisheries Service, Alaska Fisheries Science Center (AFSC) recently sent a letter to Bob Alverson, Fishing Vessel Owners Association (FVOA), describing current discard estimation methods in the <40 ft length overall (LOA) directed halibut fleet. We understand that the MSC certification is contingent upon continued development of comprehensive estimates of discards from vessels < 40 ft LOA. NMFS will continue to estimate discards in this fleet based on the description provided in the letter to Bob Alverson and will facilitate provision of such information to the MSC assessment team and to the FVOA as necessary. If further clarification of processes used to estimate discards is necessary, NMFS staff from AFSC and the Alaska Regional Office would be willing to meet with the MSC assessment team to discuss current estimation procedures.

Although vessels under 40 ft LOA are not currently subject to observer coverage, the North Pacific Fishery Management Council's Electronic Monitoring Workgroup is developing and testing EM technologies that could be used to collect data from the < 40 ft LOA fleet in the future. As described in the 2016 EM Pre-Implementation Plan, the <40 ft LOA fleet remains a goal for future EM data collection efforts. At the February 2016 meeting the Council passed a motion supporting the EM Workgroup efforts in 2017 to undertake a demographic study of the under 40' fleet, to evaluate effort both by the number of trips and vessel length, in order to identify priorities for phase in of coverage. This work would support the development of a plan for specific field research in the under 40 ft LOA fleet in 2018.

Please let me know if you would like any other information.

Sincerely,

Douglas DeMaster, Science and Research Director, Alaska Region
NOAA Fisheries

cc: Jim Balsiger
Glenn Merrill

Appendix 2: Advisory Bodies to the IPHC

1. Management Strategy Advisory Board

The Management Strategy Advisory Board (MSAB) was formed in 2013 to oversee the new Management Strategy Evaluation 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 Board has 24 members and held its first meeting in June 2013, with a second meeting scheduled for Oct 2013. Its structure, membership, purpose, and ongoing results are presented on the Commission website here: http://www.iphc.info/msab

2. Scientific Review Board

The Scientific Review Board was formed in 2013 and has not yet had its first meeting (scheduled for August 30th). The new initiative that will participate in evaluation of staff science and recommend new or alternative research. Its current members are Drs. Sean Cox (SFU), James Ianelli (NMFS), and Marc Mangel (UC Santa Cruz).

3. Conference Board

The IPHC Conference Board (CB) has been in existence since 1931 to obtain advice and recommendations from halibut harvesters on conservation measures and halibut management. The Board also reviews staff reports and recommendations and provides its advice concerning these items to the Commission at its Annual Meeting, or on other occasions as requested. The Board is self-regulating in terms of membership and in 2013 there were 64 voting members. It represents the harvesting sector, including commercial, recreational, Tribal/First Nations, and subsistence

users. It is currently reviewing a draft Rules of Procedure available in the link below, along with a brief description of the Board: http://www.iphc.info/conference-board

4. Processor Advisory Group

The Processors Advisory Group (PAG) was formed in 1995 and represents U.S. and Canadian halibut processors. The PAG provides industry advice on various potential conflicts between participants within a given fishery resource or area, conducts a review of staff recommendations and supporting information, similar to that of the Conference Board. It is currently reviewing a draft Rules of Procedure. PAG documents can be found at: http://www.iphc.info/pag

5. Research Advisory Board

The Research Advisory Board (RAB) was formed in 2000 to provide advice to the Commission staff on its research programs and proposed projects. The RAB meets annually with the IPHC Executive Director and staff and is composed of active members of the fishing community who are interested in contributing to the direction of IPHC research. A report of the proceedings and recommendations is presented to Commissioners and becomes part of the research discussion at the Interim and Annual Meetings.

Appendix 3: North Pacific Fisheries Management Council -- Observer Program Council Motions in 2015

C-4 Observer Annual Report Council motion June 8, 2015

The Council approves the following recommendations in the development of the draft 2016 Annual Deployment Plan and future annual reports, including consideration of SSC comments:

- Provide additional information on observer rates and percent coverage by gear type, in addition to numbers of trips and deployment. Report the percentage and metric tons of total catch observed (Table 4-2 and subsequent). Track these key metrics over time in each annual report. (OAC)

- Identify the best approach to a trip identifier tied to landings data to provide a linkage between ODDS and eLandings and improve data analysis, including those trips delivered to a tender. (OAC/SSC)

- Evaluate and suggest modifications to ODDS to reduce temporal bias associated with the policy of allowing trip cancelation and logging multiple trips prior to departure. (OAC and SSC)

- The Council appreciates the development of performance metrics and encourages NMFS to continue to develop tools to evaluate both the reliability of the data and deployment performance.

    - Include information on observer sampling such as percent of hauls observed vs total hauls/trip, and number of hauls with complete observer data vs partial data by vessel size and gear. (OAC)

    - Continue to develop ways to evaluate observer effects, including possible examination of potential associations of PSC with trip attributes on observed vessels. If associations are found, PSC rates in shoreside offloads from unobserved vessels could be compared for evidence of bias. (SSC)

    - Continue evaluation of and improvements in catch and bycatch estimation, including the necessary procedures for calculating the variances associated with point estimates. Consider SSC suggestions on a starting point for assessing variance. (OAC and SSC)

- Assess inefficiencies in the program and evaluate ways to achieve cost efficiencies in the partial coverage category within the existing 5-year contract. (OAC)

- Include information about the availability of fixed gear lead level 2 observers. (OAC)

- Incorporate some additional quantitative measures in the enforcement section of the report, especially in relation to trends by incident type. (OAC)

- The 2016 ADP should explore defining strata to deploy observers by gear (longline, pot, and trawl gear) and FMP area and, if necessary, consider operational sector (CV vs CP).

In addition, the Council supports continued outreach by enforcement personnel regarding observer issues, especially to vessels where captains are under increasing pressure to monitor PSC. (OAC)

SSC comments on variance: While we agree with the analysts that it is not the sole determinant of quality of the sampling program, there is a critical need to calculate the variances associated with the point estimates (e.g. target catch, by-catch) to aid with optimization of the observer deployment sampling design and to assess uncertainty in estimates of catch. For example, the observer effect detected in landed catch in the HAL and TRW gears could have been better assessed for significance if there had been variances of these landed catches. In this way the potential for bias detected by the observed versus unobserved trips could be weighed against measurement error in the estimates of landed catch for these two gears. Variances would also aid assessment authors in their understanding of the uncertainty associated with estimates of catch. Consider, as a first-step, the calculation of variance using standard multi-stage cluster sampling (Thompson 2012), wherein the stage-specific variance is calculated along with the mean.

Talking point on ADP: Given the comment that deploying into smaller boxes requires higher rates of selection, the OAC emphasized that it will be important to retain the ability in October to evaluate trade offs between the proposed strata and alternative designs, and the information provided should support an understanding of the size of the strata in terms of both trips and catch or discards and trade offs with deployment rates. If necessary to retain larger boxes for deployment, it seems that defining strata by gear type might be more important than FMP area, within the partial coverage category (e.g., all longline in BSAI and GOA in same strata with same deployment rate).

Council Motion, agenda item C5 October 9, 2015

Electronic Monitoring 2016 Pre-implementation Plan

The Council approves the draft 2016 Electronic Monitoring Pre-implementation Plan, and supports the EM Workgroup's suggestions for next priorities for EM implementation, which are for longliners under 40 ft, longliners over 57.5 ft, and vessels fishing with pot gear.

C-6 Observer Annual Deployment Plan Council motion October 10, 2015

The Council recommends the following for the draft 2016 Annual Deployment Plan:

- Use the trip-selection method to assign observers to vessels in partial coverage in 2016.
- Deploy observers in the trip-selection pool by gear in 2016, with optimal allocation. Support the following preliminary coverage rates resulting from this stratification:

Trawl (29%) Longline (14%) Pot (14%)

The no selection pool would include catcher vessels <40 ft LOA; vessels fishing with jig gear; and fixed gear vessels that participate in the 2016 electronic monitoring (EM) cooperative research.

- No temporary exemptions from observer coverage are allowed due to insufficient life raft capacity, given the option for these vessels to be in the electronic monitoring pool in 2016.
- Continue the policy (programming in ODDS) that prevents a 40 – 57.5' fixed gear vessel from being selected for a third consecutive observed trip.
- Maintain the ability for vessels to log up to three trips in advance in ODDS.
- Modify eLandings to enable the ODDS trip number to be entered voluntarily on groundfish landing reports to facilitate data analysis and provide a better link between ODDS and eLandings.
- Maintain the current Chinook salmon sampling protocols to identify stock of origin.
- Allow BSAI cod trawl catcher vessels to opt-in to full coverage and carry an observer at all times when fishing in the BSAI.
- Continue to conduct outreach in fall and winter 2015/2016, with efforts to meet in Kodiak earlier than the proposed April 2016.

The Council also supports the OAC's recommendations with regard to the status of analytical projects related to the observer program.

The Council requests that Observer Program staff evaluate different weighting schemes in the sampling design based on gear with optimal allocation, such that discards are weighted more heavily than retained catch, for the draft 2017 annual deployment plan.

Appendix 4: IPHC Self-reported annual progress against management performance review recommendations from 2012

2014 Update

The Commission reviewed the implementation of recommendations from the 2012 Performance Review. 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.

2013 Update

1. Adopt clear and comprehensive protocols/rules of procedure

IPHC is in the process of reviewing its internal Rules of Procedure (current as of 2011) and Financial Rules (current as of 2001). In addition, Rules of Procedure have been drafted for all advisory bodies (Conference Board, Processors' Advisory Group, Research Advisory Board, Management Strategy Advisory Board, and Scientific Review Board) and are being reviewed by those bodies, with a view to approval by the Commission at its 2014 Annual Meeting.

2. Improve commission transparency

IPHC has now designated all meetings as open unless specifically closed (which can be expected to concern personnel or financial discussions) and all meetings are now webcast and allow for two-way dialogue with webcast participants via comments submitted during those meetings. In addition, updates on scheduled meetings will be provided. Rules of Procedure and meeting minutes of all advisory bodies will be posted on the IPHC website in a timely manner. Commissioners will articulate the basis for all decisions.

3. Revisit stakeholder engagement structure

The Commission decided it would not integrate existing advisory bodies into a single advisory body at this time, rather it would retain the strengths of the existing structure. The Commission will seek the advice of its advisory bodies on how to improve efficiencies of the existing advisory process.

4. Develop strategic approach to research

The Commission has developed a Five-Year Research Plan to act as a guide to the Annual Research Plan prepared by staff. In addition, the Five-Year and the Annual Research plans will be independently reviewed by the Scientific Review Board.

5. Strengthen stock assessment model

The Commission staff implemented significant changes for the 2012 stock assessment that corrected the persistent but variable retrospective bias in the previous assessment. An external peer-review of the assessment was also conducted in 2012. A longer-term peer review process, involving an independent Scientific Review Board has also been established. Lastly a Management Strategy Evaluation, utilizing a stakeholder-based Management Strategy Advisory Board, has been initiated to guide the development of management objectives, harvest policy, control rules, and performance metrics for the halibut fishery.

6. Expand Commission composition

The Commission has decided not to expand the complement of national Commissioners at this time. All efforts will be made in both the U.S. and Canada to ensure timely appointments of Commissioners and effective transition planning for new Commissioners

7. Develop long-term strategic plan

The Commission is currently reviewing a long-term strategic plan drafted by the staff but it has a lower priority than the Five-Year Research Plan and the other initiatives arising from the Performance Review.

8. Strengthen delineation between scientific analysis and policy options

The Commission will follow accepted international and national best practices for delineating science and policy matters. As a component of this, staff is having a graduate intern develop a comparison of IPHC procedures with those of other Regional Fishery Management Organizations. In addition, the staff has re-formulated how management advice is provided to the Commission through the use of risk-based harvest advice tables, which acts to correctly portray uncertainty and vest policy-level choices with the Commission, rather than the staff.

9. Greater leadership at the Commissioner level

The Commission is exercising additional leadership through its direction to staff concerning changes to the stock assessment and review process. The Commission is also clarifying roles and responsibilities through its responses to Recommendations 1 and 2.

10. Elevate importance of Tribes and First Nations

While both contracting parties agree that there is a unique relationship between federal governments and Tribes/First Nations, the Commission expects that each Party will conduct its own domestic consultation process with the Tribes and First Nations and will consider the interests of the Tribes and First Nations when acting upon Commission matters. The Commission will not implement any additional changes to its structure.

11. Strengthen interim and annual meeting process

Major improvements to the transparency and feedback processes for the Interim and Annual meetings were implemented in 2012/2013. These included the elements under Recommendation 2 and the provision of all materials in advance of the meetings in a web-based format.

12. Improve communications

Two-way dialogue for all Commission meetings has been implemented to provide greater communication with stakeholders during decision making by the Commission. All staff presentations and background documents are readily available in advance of the meetings and summaries of meeting results are produced promptly. Additional outreach communication on the risk-based decision framework have also been undertaken

Appendix 5: 2015 Regulatory Updates from the IPHC

The following regulatory proposals for 2015 were presented at the IPHC Annual Meeting. A full discussion of IPHC regulation proposals for 2015 can be found at: http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2015.pdf

Fishing periods and catch sharing

- Staff proposes March 15 - November 7 for quota share fisheries
- Area 2A commercial and treaty Indian fisheries should fall within adopted season
- In 2A, a series of 10-h periods for the directed fishery starting June 24, at two-week intervals
- Endorse U.S. Management Councils' catch sharing plans for Areas 2A, 2C, 3A, and 4CDE
- Endorse DFO commercial:sport allocation plan for Area 2B

Areas 2C and 3A Charter Management Measures

- For Area 2C: One-fish daily limit of size ≤ 40 in. or ≥ 80 in., head-on. If catch limit sufficiently higher than Blue Line, sequentially increase lower limit upward to meet allocation

- For Area 3A: Two-fish daily limit with one fish ≤ 29 in.; and an annual limit of five fish. Each vessel restricted to one trip per calendar day. Chartering fishing prohibited on Thursdays from June 15 – August 31. If catch limit sufficiently higher than Blue Line, maximum size of second fish may be increased

Areas 2C and 3A Charter Fishing Regulations

- Change the guided sport fishing definition so that the guide does not need to be onboard a vessel. Guided sport fishing is with assistance from a compensated guide

Areas 2C and 3A Charter Fishing Regulations

- NMFS regulations will require that if a fish is filleted on board the vessel, the carcass must be retained on board until all the fillets are offloaded. IPHC regulations therefore do not need to retain this stipulation
- Clarify that charter vessel guide is responsible for angler actions, whether on the same vessel or not
- All retained halibut required to remain on the vessel on which they were caught until the end of the chartered fishing trip

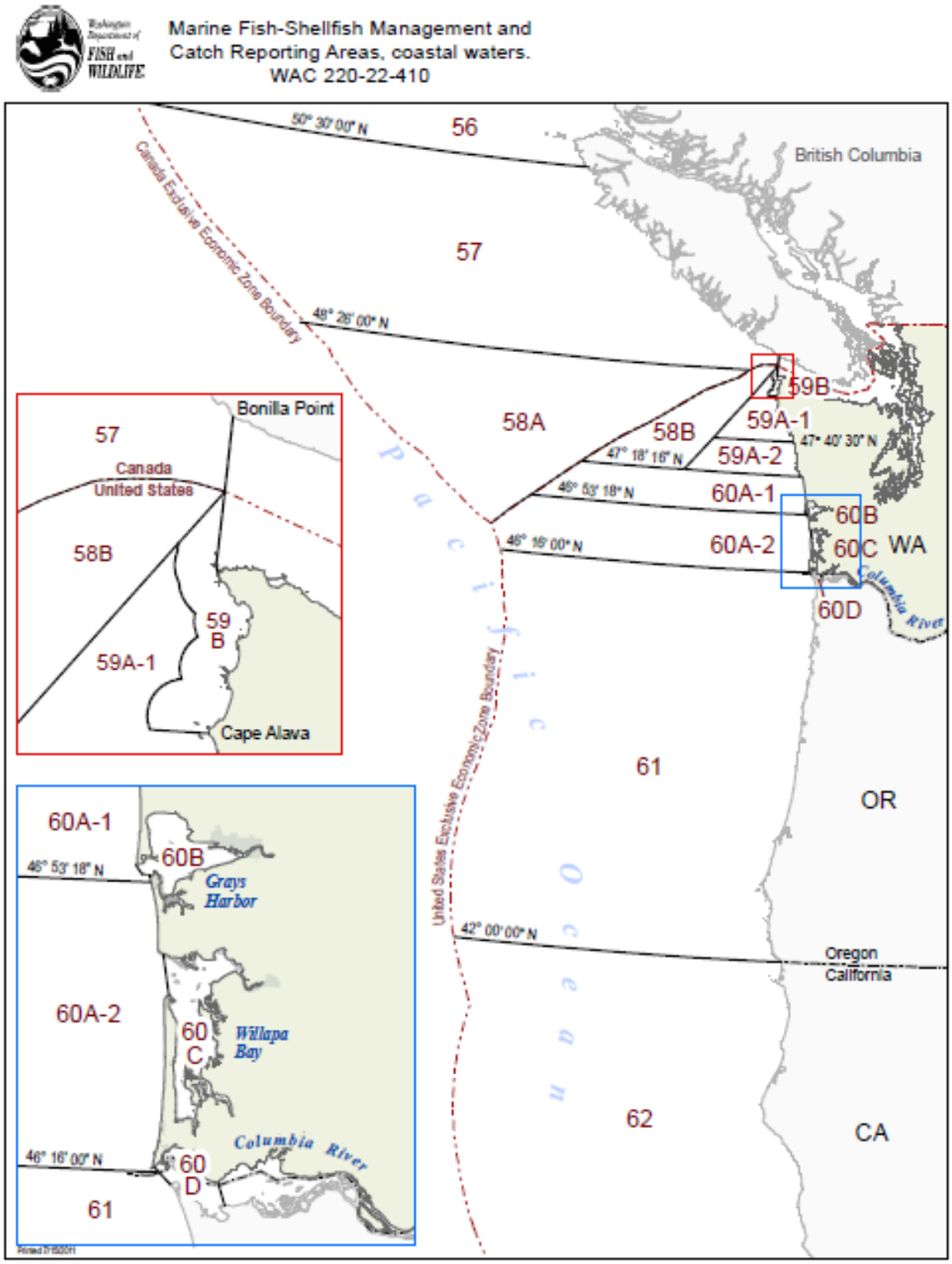
Authorized officer definition

- Add California Fish and Wildlife officers

Additional Regulation Issues

- Additional regulatory and catch limit comments/proposals from industry are contained or identified with web-links in the Blue Book (p. 225)

Appendix 6 Area 2a Catch Reporting Areas



Appendix 7 Peer Review Reports

Peer Review of the assessment was conducted by Dr. Susan Hanna and Dr. John D. Neilson. Peer Reviewers were selected through the Peer Review College as part of a pilot of the emerging Peer Review College program. Peer Reviewers were provided the assessment on May 16th, and responses were received by the assessment team on June 1, 2016. No scores were changed as a result of Peer Reviewer comments, but the commentary provided useful feedback to strengthen report clarity and strength in rationales.

Peer Reviewer #1:

Summary of Peer Reviewer Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes/No** **Yes**	**CAB Response**
Justification: Overall, the assessment team has reviewed the appropriate documentation and developed a sound evidence-based conclusion for each scoring element. However, the treatment of bait as a retained species does need further clarification, as indicated on the evaluation table. Re editing, the report is in much better shape than the sablefish document but does contain some font size inconsistencies. I have made a number of edits in "track changes" on the report draft.		The team thanks the peer reviewer for the careful review of the report, and notes formatting challenges that likely pertain to different versions of Word style compatibilities. PDF versions should not have such issues. Questions over treatment of bait are noted and responded to under relevant Principle 2 PI team responses. In general, the assessment team has provided additional references to MSC requirements to clarify the treatment of bait as (main) retained, and better aligned the structures within and between the US North Pacific Sablefish and Halibut reports for increased consistency and clarity. Tracked changes in the report are appreciated, and have been considered in revisions prior to the PCDR.

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCR 7.11.1 and sub-clauses]	**Yes/No** **Yes**	**CAB Response**
Justification: For condition 2, it would be helpful to include information on the degree of variability in bait type and source; i.e. how stable is the sourcing and the pattern of use?		Noted. Additional language was added to the condition to capture this information. See also team response in relevant PIs.

If included:

Do you think the client action plan is sufficient to close the conditions raised? [Reference FCR 7.11.2-7.11.3 and sub-clauses]	**Yes/No** **Yes**	**CAB Response**
Justification: The action plan as presented is sufficient to meet the conditions. I have no additional comments.		No response required.

Table 34 For reports using one of the default assessment trees:

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	Yes	Yes	NA	The explanation in a,b is complete and appropriately documented.	Review noted.
1.1.2	Yes	Yes	NA	Explanations provided under sections a,b,c,and d are complete and well-documented.	Review noted.
1.1.3	NA	NA	NA	Stock is not depleted	Review noted.
1.2.1	Yes	Yes	NA	The explanations provided under sections a,b,c,and d are complete and well-documented. Section e is NA. A reference cited in the table is missing form the list of references.	Review noted. Missing cite(s) added.
1.2.2	Yes	Yes	NA	Explanations provided under sections a, b. and c are complete. Three references cited in the scoring text are missing form the reference list.	Review noted. Missing cite(s) added.
1.2.3	Yes	Yes	Yes	Explanations provided in a,b,c are complete and appropriately documented. Reference list is incomplete.	Review noted. Missing cite(s) added.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.2.4	Yes	Yes	Yes	Explanations provided in a,b,c,d,e are complete and appropriately documented. Reference list is incomplete.	Review noted. Missing cite(s) added.
2.1.1	Yes	Yes	NA	Bait status is treated differently in the halibut and sablefish assessments. The treatment of it in this document as an unknown seems more appropriate than its treatment as a retained species for sablefish. The two approaches should be reconciled across documents, as it appears the species at issue and the information uncertainties are the same.	Bait is treated as a retained species in both assessments, per the MSC requirements (CRV1.3 CB3.5.5), We have included additional language related to the requirements and the team's rationale for classification in the background section dealing with bait. We have also gone through both assessments and reconciled both formatting and rationale of how bait is treated and scored within the scoring tables. No scores were changed.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.1.2	Yes	Yes	NA	Again, the treatment and scoring of bait issues needs to be reconciled with sablefish or the discussion clarified. Also explain its treatment as a retained species and reconcile across all scoring. Is it caught in the NP or imported?	Bait is both caught in the North Pacific and imported. Due to the information deficiency we don't have a good sense of how much is from each source. Conditions placed on this fishery regarding the information deficiency (PI2.1.3) should provide this level of detail. Bait is treated as a retained species in both assessments, per the MSC requirements. We have included additional language related to these requirements and the team's rationale for classification in the background section dealing with bait. We have also gone through both assessments and reconciled both formatting and rationale of how bait is treated and scored within the scoring tables. No scores were changed.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.1.3	Yes	Yes	Yes	More information about bait species is certainly needed. But a better explanation is needed of why, without knowing its origin, it is treated as a retained species. No references provided.	Bait is treated as a retained species in both assessments, per the MSC requirements (CRV1.3 CB3.5.5). We have included additional language related to these requirements and the team's rationale for classification in the background section dealing with bait. We have also gone through both assessments and reconciled both formatting and rationale of how bait is treated and scored within the scoring tables. No scores were changed.
2.2.1				Explanations in sections a,b,c are complete and documented	No response required
2.2.2	Yes	Yes	NA	Explanations in sections a,b,c,d are complete and documented	No response required
2.2.3	Yes	Yes	Yes	Explanations in sections a,b,c,d are complete.	No response required
2.3.1	Yes	Yes	NA	Explanations in sections a,b,c are complete and documented	No response required
2.3.2	Yes	Yes	NA	Explanations in sections a,b,c,d are complete and documented	No response required

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.3.3	Yes	Yes	NA	Explanations in sections a,b,c are complete and documented	No response required
2.4.1	Yes	Yes	NA	The explanation is complete and well documented	No response required
2.4.2	Yes	Yes	NA	Explanations in sections a,b,c,d are complete and documented	No response required
2.4.3	Yes	Yes	NA	Explanations in sections a,b,c are complete and appropriately documented	No response required
2.5.1	Yes	Yes	NA	The explanation is complete and well documented	No response required
2.5.2	Yes	Yes	NA	Explanations in sections a,b,c,d are complete and well documented	No response required
2.5.3	Yes	Yes	NA	Explanations in sections a,b,c,d,e are complete and well documented	No response required
3.1.1	Yes	Yes	NA	Explanations in sections a,b,c,d are complete and well documented	Review noted.
3.1.2	Yes	Yes	NA	Explanations in sections a,b,c are complete. References should include E.O. 13175	Review noted. Link to E.O 13175 added to text.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.1.3	Yes	Yes	NA	Explanation is complete. References section is incomplete	Review noted. Cite(s) added.
3.1.4	No	No	NA	More explanation is needed as to why the LE system in place for halibut in Washingto State is not a sufficient incentive for sustainable fishing. Just saying that it isn't the AK IFQ system isn't enough.	Explanation and new cites added to Justification.
3.2.1	Yes	Yes	NA	Explanation is complete and appropriately documented.	Review noted.
3.2.2	Yes	Yes	NA	Explanations in sections a,b,c,d,e are complete. References section is incomplete	Cite(s) added.
3.2.3	Yes	Yes	NA	Explanations in sections a,b,c,d are complete and well documented	Review noted.
3.2.4	Yes	Yes	NA	Explanations in sections a,b are complete. References section is incomplet	Cite(s) added.

Peer Reviewer #2:

Summary of Peer Reviewer Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes/No** **Yes**	**CAB Response**
Justification: *I considered that the team did a thorough and fair summarization of the abundant information available for this fishery. I have only a few suggestions for improving the report, but one of them is very important in my view (including improved information on the recreational fishery in a revised or additional Condition).*		The team thanks the peer reviewer for the careful review of the report. Specific concerns are addressed in the remainder of the Peer Review comments and associated responses.

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCR 7.11.1 and sub-clauses]	**Yes/No** **No**	**CAB Response**
Justification: *As noted above, there is a need to better account for the recreational fishery, and this will require an additional/modified Condition. Evidence for this need is apparent from retained bycatch, notably yelloweye rockfish, as noted in the Report: " ....Further, the relative contribution of recreational removals was very large, and there is high uncertainty in the exact magnitude of these removals."* *The report also notes that the recreational fishery contributes to uncertainty in the targeted halibut fishery:* *"...uncertainties associated with total removals by recreational fisheries coastwide".*		The assessment team has noted that there is uncertainty in the recreational yelloweye numbers, but that Tayor 2011 indicate that this uncertainty is not a significant concern for the rebuilding program and would not impact the ability to manage the resource effectively (or fall below the SG80). We have included additional language in the background section to address this concern. The Team reviewed the role of recreational removals in the targeted halibut fishery coastwide, and the uncertainty associated with these removals. Coastwide, recreational halibut removals are greatest in Alaska in areas 2C and 3A (Stewart 2015). Recreational removals in these areas are generally well estimated, and the greatest portion of total catch uncertainty is believed to be due to uncertainty in the rate of survival of discarded fish (ADFG 2015). The method for estimating total mortality, including the mortality of discarded fish, was reviewed by the NPFMCs SSC, and found to be robust (ADFG 2015). The team considers a condition pertaining to uncertainty in the recreational fishery unwarranted. The Team has modified the justification text for 1.2.3 (Scoring Issue c) to better justify why this uncertainty is not a barrier to the fishery meeting the SG80 level. References: ADFG 2015. ADFG Report to IPHC: Alaska recreational halibut fishery. Letter to Claude Dykstra (IPHC) from Scott Meyer et. al. (ADFG). November 5, 2015. 9 p. Stewart, I.J. 2015. Overview of data sources for the Pacific halibut stock assessment and related analyses. IPHC Report of Assessment and Research Activities 2014: 87-160. Available at: http://www.iphc.int/publications/rara/2014/rara2014_10sadatasources.pdf Taylor IG. 2011. Rebuilding analysis for yelloweye rockfish based on the 2011 update stock assessment. Pacific Fishery Managementt Council. Available at: http://www.pcouncil.org/wp-content/uploads/Yelloweye_2011_Rebuilding.pdf

If included:

Do you think the client action plan is sufficient to close the conditions raised? ***[Reference FCR 7.11.2-7.11.3 and sub-clauses]***	**Yes/No** **Yes**	**CAB Response**
Justification: *ʃThe action plan should allow closure of issues pertaining to the smaller vessels involved in the fishery and issues of bait. If an additional Condition is added following my suggestion above, then obviously the action plan would have to be augmented.*		Review noted. See response above for justification for not altering or adding to current conditions.

Table 35 For reports using one of the default assessment trees:

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	Yes	Yes	NA	A comprehensive assessment led by the IPHC is available. The certifier gave a score of 100 for Scoring Issue 1.1.1a. Although there is a disturbing downward trend in SSB that has only recently been arrested (Fig. 2), I agree with the evidence that as per CR CB2.2.1, this corresponds to a "high degree of certainty" that the stock is above the point where recruitment would be impaired. A score of 100 for this SI is therefore warranted. (but also see note in summary report concerning recent poor recruitment and growth). The overall score of 90 also appears appropriate.	Review noted. The reviewer correctly notes that poor recruitment and slower halibut growth have been a feature of the stock in recent times. The IPHC has been closely monitoring these trends (annual stock assessments are conducted), and it is conducting ongoing investigations as to the possible causes (Stewart and Martel 2015). The Team found sufficient evidence to support the conclusion that, although productivity has been in decline recently, the annual stock assessments have accounted for this and they have set the allowable catch accordingly (Stewart 2015, Stewart and Martel 2015). The reviewer also had a question about how the Canadian recreational removals are accounted for. All removals from the stock are accounted for in the modeling process, and this is detailed in Stewart (2015) and Stewart and Martel (2015).
1.1.2	Yes	Yes	NA		Review noted.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.3	NA	NA	NA	The halibut stock is not depleted relative the target.	Review noted.
1.2.1	Yes	No	NA	The certifier gave a score of 60 for Scoring Issue c. In my view, given that the stock is assessed annually (a rarity these days) and that the assessment is highly credible, there is abundant information available to determine if the harvest strategy is working. For that reason, I considered the scoring to be 100, consistent with " ***Evidence clearly shows*** *that the tools in use are effective in achieving the exploitation levels required under the HCRs*."	The reviwer objected to a score of 60 for Scoring Issue c;however, scoring Issue c is only scored at the SG 60 level for this PI. The overall score for the PI of 85 is consistent with the Teams evaluation that the IPHCs MSE program will need to mature before the SG100 level is met SI's b and d.
1.2.2	Yes	Yes	NA		Review noted.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.2.3	Yes	Yes	No	While the condition is meant to improve understanding of the catch made by <40' LOA vessels, I understood that there was a concern with the absence of knowledge in the recreational fishery. There is no mention of that issue in the condition. This seems surprising, especially considering that an ETP species of interest (yelloweye rockfish) are caught in the recreational halibut fishery. This condition requires expansion to include the recreational fishery.	Please see the CAB response to the second summary question (above). The Team has revised the rationale to more clearly explain why other sources of uncertainty (e.g. recreational fishery halibut mortality) is not of sufficient magnitude to merit a condition. Uncertainty regarding information for yelloweye rockfish is best addressed in 2.3.3 (ETP information)- the background on yelloweye and rationale in 2.3.3 has been revised for increased clarity as well. No scores were changes, and no conditions were added.
1.2.4	Yes	Yes	NA	For Scoring Issue e, it is not clear to me that external reviewers are used every year that a stock assessment is completed, perhaps the CAB could clarify. Otherwise, I agree with their findings.	Text in the justification section was modified to clarify that the external review process is conducted on an annual basis.
2.1.1	Yes	Yes	NA		No response required
2.1.2	Yes	Yes	NA		No response required
2.1.3	Yes	Yes	Yes		No response required

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.2.1	Yes	Yes	NA		No response required
2.2.2	Yes	Yes	NA		No response required
2.2.3	Yes	Yes	Yes		No response required
2.3.1	Yes	Yes	NA		No response required
2.3.2	Yes	Yes	NA		No response required
2.3.3	Yes	Yes	NA		No response required
2.4.1	Yes	Yes	NA		No response required
2.4.2	Yes	Yes	NA		No response required
2.4.3	Yes	Yes	NA		No response required
2.5.1	Yes	Yes	NA		No response required
2.5.2	Yes	Yes	NA		No response required
2.5.3	Yes	Yes	NA		No response required
3.1.1	Yes	Yes	NA		Review noted.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.1.2	Yes	Yes	NA		Review noted.
3.1.3	Yes	Yes	NA		Review noted.
3.1.4	Yes	Yes	NA		Review noted.
3.2.1	Yes	Yes	NA		Review noted.
3.2.2	Y	N	NA	The certifier awarded 100, but 2 of the 5 Scoring Issues were (appropriately) given <100. According to the FCR, *"Award 95 when performance against the scoring issues is almost at SG100 (most scoring issues are fully met, but a few are not fully met)…"*	Not all SI's provide an SG100 guidepost, but the fishery has been deemed in compliance with all SG100 scoring guideposts (and the SG60 and SG80 guideposts) within the PI. Therefore, the team considers that all SG100 scoring guideposts (available) are fully met.
3.2.3	N	Y	NA	I considered that the absence of information on the recreational fishery should have been mentioned in the narrative for the scoring, but I don't think it would have influenced the scoring.	The Team addressed the recreational fishery question in the second question of the summary section (above). The justification to PI 1.2.3 Scoring Issue c was modified accordingly. The greatest portion of total catch uncertainty in the recreational fishery is believed to be due to uncertainty in the rate of survival of discarded fish (ADFG 2015), which is not considered due to a deficiency in enforcement systems.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.2.4	Y	Y	NA		Review noted.
3.2.5	Y	Y	NA		Review noted.

Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary) can be added below and on additional pages

The North Pacific halibut fishery presents a model for good fishery management in my view, with features such as very high levels of observer coverage, frequent stock assessment, active research programs, and international cooperation that has led to generally consistent management strategies and tactics. The Peer Review Draft Report does a good job in describing this rich basis for management of the fishery, and I found it easy to evaluate the conclusions that the team made.

Apart from the concern about the recreational fishery raised earlier (which I feel warrants a new or modified Condition), I had a concern about the declining trend in weights at age in the fishery, and the recent pattern of low recruitment. It would be interesting to know how managers are accounting for these trends in future projections of catch and fishing mortality. The report is also silent on the Canadian recreational fishery, and how that source of mortality is dealt with.

Team Response:
The reviewer correctly notes that poor recruitment and slower halibut growth have been a feature of the stock in recent times. The IPHC has been closely monitoring these trends (annual stock assessments are conducted), and it is conducting ongoing investigations as to the possible causes (Stewart and Martel 2015). The Team found sufficient evidence to support the conclusion that, although productivity has been in decline recently, the annual stock assessments have accounted for this and they have set the allowable catch accordingly (Stewart 2015, Stewart and Martel 2015). The reviewer also had a question about how the Canadian recreational removals are accounted for. All removals from the stock are accounted for in the modeling process, and this is detailed in Stewart (2015) and Stewart and Martel (2015).

Appendix 8 Stakeholder submissions

There have been no stakeholder submissions received to date.

Appendix 9 Surveillance Frequency

The assessment team has determined that the default surveillance program is appropriate for the fishery. In the case that all conditions on the fishery are closed ahead of schedule, in which case the surveillance program will be amended in future surveillance reports (MSC FCR 7.23.10). The surveillance audits will be conducted as close to the anniversary date as feasible.

Table 4.1: Fishery Surveillance Program

Surveillance Level	Year 1	Year 2	Year 3	Year 4
Level 6	*On-site surveillance audit*	*On-site surveillance audit*	*On-site surveillance audit*	*On-site surveillance audit & re-certification site visit*

Appendix 10 Objections Process

The objection period was held from July 26, 2016 to August 18, 2016. No objections were received.