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U.S. North Pacific Halibut

4th Surveillance Audit Report

F-SCS-0018

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January 07 2016

Contents

Glossary

ABC	Allowable Biological Catch
ABL	Auk Bay Laboratory
ADFG	Alaska Department of Fish and Game
AFSC	Alaska Fisheries Science Center
B	Biomass
BS	Bering Sea
BSAI	Bering Sea-Aleutian Islands
CAB	Certified Accreditation Body
CAS	Catch Accounting System
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EBFM	Ecosystem Based Fishery Management
EBS	Eastern Bering Sea
EM	Electronic Monitoring
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
ENP	Eastern North Pacific
ETP	Endangered, Threatened or Protected species
FAO	Food and Agriculture Organization of the United Nations
FEP	Fishery Ecosystem Plan
FCEY	Fishery Constant Exploitative Yield
FCM	Fisheries Certification Methodology
FMP	Fishery Management Plan
GOA	Gulf of Alaska
HAPC	Habitat Areas of Particular Concern
HEPR	Habitat and Ecological Research
IFQ	Individual Fishing Quota
ITQ	Individual Transferable Quota
IPHC	International Pacific Halibut Commission
IUCN	International Union for the Conservation of Nature
K	Growth Rate
Kg	kilogram
Lb.	Pound, equivalent to roughly 2.2 kg
LOA	Length Over-All
M	Million (lbs.)
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation
nm	nautical mile
NMFS	National Marine Fisheries Service

NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fishery Management Council
OFL	Over-Fishing Level
PBR	Potential Biological Removal
REFM	Resource Ecology and Fisheries Management
RPW	Relative Population Weight
SAFE	Stock Assessment and Fishery Evaluation
SCS	SCS Global Services
SE	Southeast
SSB	Spawning Stock Biomass
SWSH	Statewide Harvest Survey
t and mt	metric ton
TAC	Total Allowable Catch
TCEY	Total Constant Exploitative Yeild
US	United States
WWF	World Wildlife Fund

General Information

Fishery name	*US North Pacific Halibut Fishery*		
Unit(s) of assessment	*US North Pacific Halibut Fishery Demersal Longline (Hook and line), AK & WA*		
Date certified	August 4, 2011	**Date of certificate expiry**	August 3, 2016
Surveillance level and type	*Normal Surveillance/Level 6*		
Date of surveillance audit	*November 3-7, 2015*		
Justification	*This surveillance audit is taking place approximately 3 months after the anniversary date in order to accommodate the schedules of the assessment team and client.*		
Surveillance stage (tick one)	1st Surveillance		
	2nd Surveillance		
	3rd Surveillance		
	4th Surveillance	X	
	Other (expedited etc)		
Surveillance team	Lead assessor: Dr. Sian Morgan ***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.* Assessor(s): ***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 stock assessment 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. Recent consulting projects have included the design and implementation of a novel coastwide aerial survey used for assessment and management of west coast Pacific sardine, and various investigations for the Virginia Institute of Marine Science, Environmental Defense Fund, the Alliance of Communities for Sustainable Fisheries, the At Sea Processors Association, and other clients. 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.* ***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.*	
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Executive Summary

This report summarizes the findings from the fourth surveillance audit of the US north Pacific Halibut hook and line (bottom longline) fishery in AK and WA state waters, USA. The fishery was first certified to the MSC requirements in 2006 and re-certified as a source of sustainable seafood using the default assessment tree in 2011 (FAM 2.1, 2010).

The 2015 fourth annual surveillance audit focused on any changes since the 2011 re-certification and 2014 third annual surveillance audit, and monitoring continued compliance with the MSC Principles and Criteria. The fourth annual surveillance audit in 2015 was conducted alongside the 2nd re-assessment of the fishery as well as the 4th annual surveillance and 2nd re-assessment of the US North Pacific Sablefish fishery. 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).

Onsite surveillance audits were required in 2015 (based on CR V1.3 27.22), and were held on November 3rd-7th 2015 in Seattle WA, and Juneau, AK, USA. On the evening of November 3rd, the team held a face to face meeting with the client representative Robert Alverson, and other members of the client group (Fishing Vessel Owners' Association, FVOA). 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, as well as a meeting with International Pacific Halibut Commission (IPHC) staff. For a detailed on-site visit itinerary and meeting attendee list please see the "4th Annual Surveillance Audit Process" section.

In this year's fourth annual surveillance report, the assessment team evaluated progress against conditions and included new information in relevant sections of the report: this included summarizing this year's science advice provided by the International Pacific Halibut Commission (IPHC), and particularly updating information relevant to retained and bycatch species based on the most up to date catch accounting information data, as well as recent updates to the design and sampling frame used in the Observer Program.

The 2015 status of conditions is given in Table 2 below.

Table 1. 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*

Table 2. Summary of Assessment Conditions

Performance indicator (PI), Year Condition Issued	Year Condition Due to Close	Status after 3rd Surveillance (2014)	Status after 4th Surveillance (2015)	PI original score	PI revised score
1.2.3, 2014	**2017, TBD based on re-assessment**	**Open and on target**	**Open and on target**	**85 (2011), 75 (2014)**	**Not revised**
2.2.1, 2011	Year 3, 2014	Closed 2014	Closed 2014	70	>80
2.2.3, 2011	**2017, TBD based on re-assessment**	**Open and on target, timelines revised to synchronize with 1.2.3**	**Open and on target**	**70**	**Not revised**
2.3.1, 2011	Year 3, 2014	Closed 2014	Closed 2014	75	>80
2.3.2, 2011	Year 3, 2014	Closed 2014	Closed 2014	75	>80

Performance indicator (PI), Year Condition Issued	Year Condition Due to Close	Status after 3rd Surveillance (2014)	Status after 4th Surveillance (2015)	PI original score	PI revised score
2.3.3, 2011	**2017, TBD based on re-assessment**	**Open and on target, timelines revised to synchronize with 1.2.3**	**Open and on target**	**70**	**Not revised**

Background

This is the 4th Annual Surveillance Report 2015 prepared by SCS to meet the requirements of the MSC for annual audits of certified fisheries.

It is SCS's view that the north Pacific halibut longline fishery in AK and WA, USA continues to meet the standards of the MSC and complies with the 'Requirements for Continued Certification.' SCS recommends the continued use of the MSC certificate through to the end of the certificate cycle while the fishery continues to work towards updated timelines associated with better monitoring and information in the small vessel IFQ halibut fleet, which does not currently have sufficient or accurate observer coverage, nor the proper capacity to monitor impacts, if any, of these vessels in the shallower inshore waters where the smaller vessels tend to fish.

The sections below provide an update on the fishery since the 3rd annual surveillance audit in 2014 with a brief summary of the fishery for context.

Target Stock.

Pacific Halibut are a flat, demersal, groundfish in the family Pleuronectidae. They are among the largest teleost fishes in the world. From November to March, mature halibut concentrate annually on spawning grounds along the edge of the continental shelf at depths from 183 to 457 m (600 to 1,499 ft). 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 1). Individuals also make regular seasonal migrations from more shallow feeding grounds in summer to deeper spawning grounds in winter.

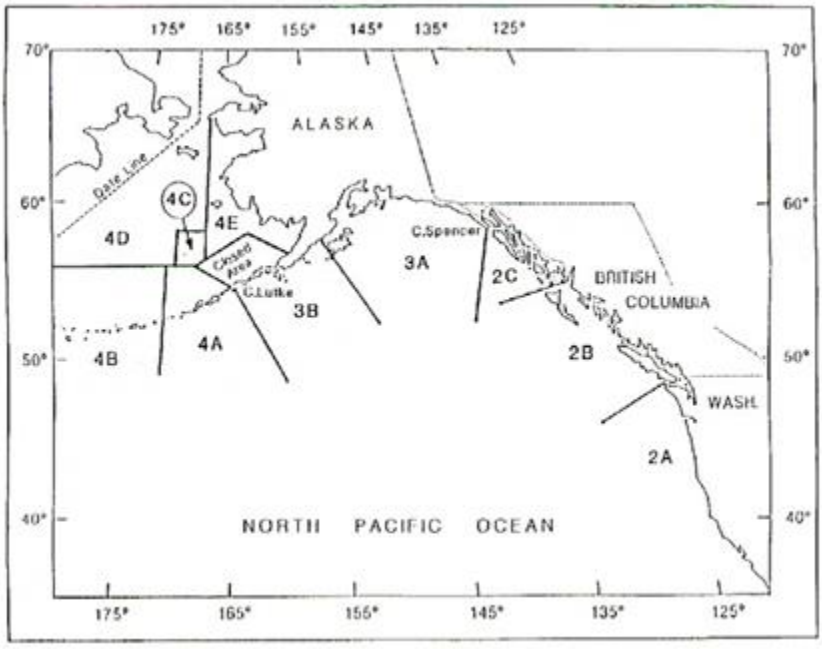

Figure 1: IPHC managed areas. All areas are considered in the unit of certification except area 2B, which is covered under a separate certificate. (Source IPHC)

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 (million pounds), corresponding to 42% of the unfished spawning biomass reference point (B0). The median values for SB30% and SB20% are 153 Mlb, 102 Mlb., respectively (Figure 2). 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).

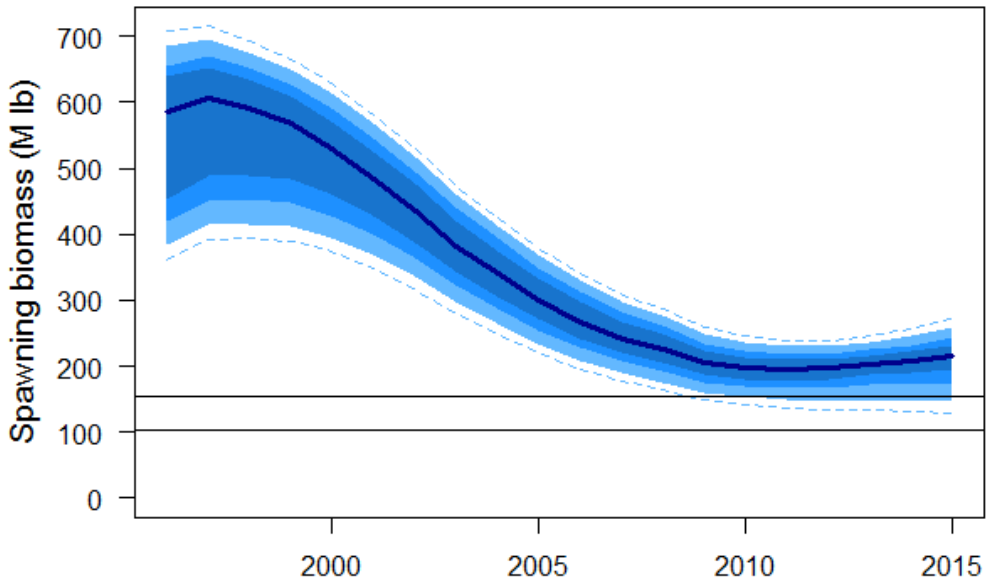

Figure 2. Time-series of recent spawning biomass estimates relative to harvest policy reference points. The horizontal lines correspond to B30% (153 M lbs) and B20% (102 M lbs), respectively. Source: Stewart and Martell (2015).

For fishery management in 2015, the IPHC staff again prepared a risk-benefit decision analysis (Table 3). 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 ($B_{20\%}$) is less than 1%.

Table 3. 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
	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
	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
	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
	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	$F_{43\%}$	31/100	1/100	56/100	36/100	8/100	<1/100	10/100	1/100	73/100	51/100	63/100	49/100	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 3). Observed age distributions continued to indicate a relatively stable stock, but with no evidence of strong recruitment in recent years (Figure 4).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 5) (Stewart and Martell 2015).

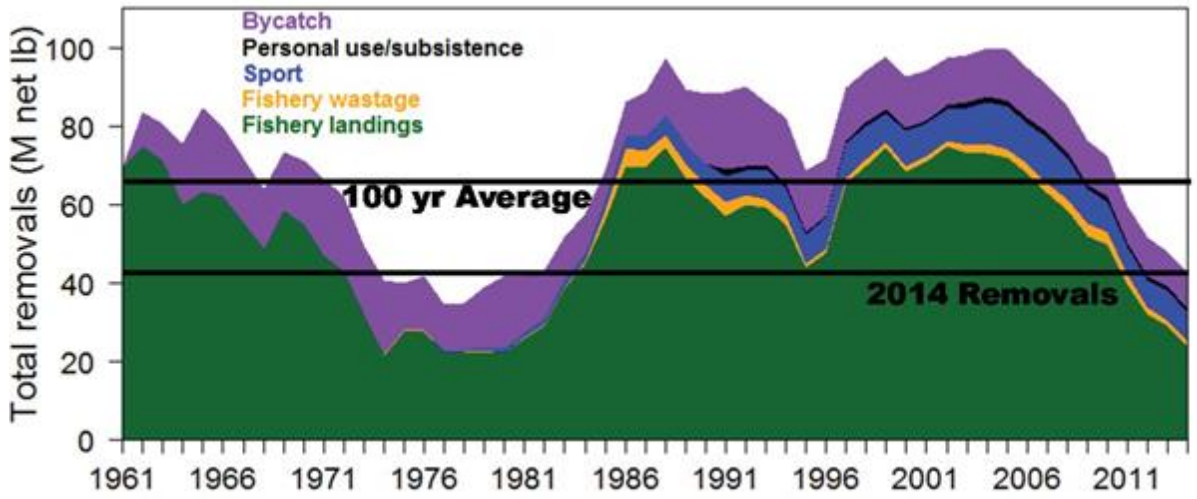

Figure 3. Total halibut removals by source since 1961. Source: (Stewart 2015). "Bycatch" indicated in purple pertains to halibut caught in the non-directed halibut fishery, whereas "wastage" is juvenile halibut caught in the directed halibut fishery.

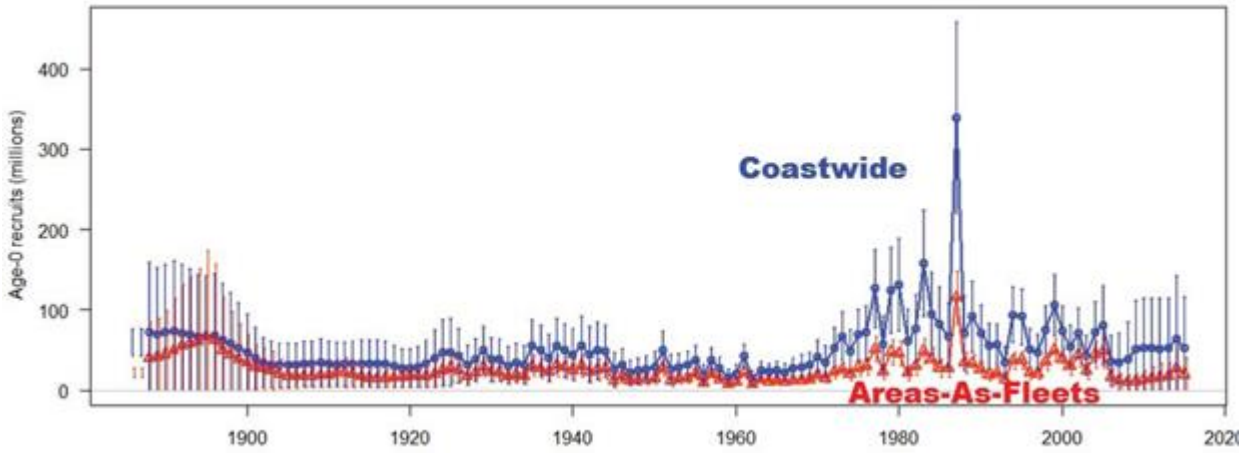

Figure 4 Trend in historical recruitment strengths (by birth year) for two long time series models. Note that estimates after 2008 are highly uncertain, as they are not yet informed by any direct observations. Source: (Stewart and Martell 2015).

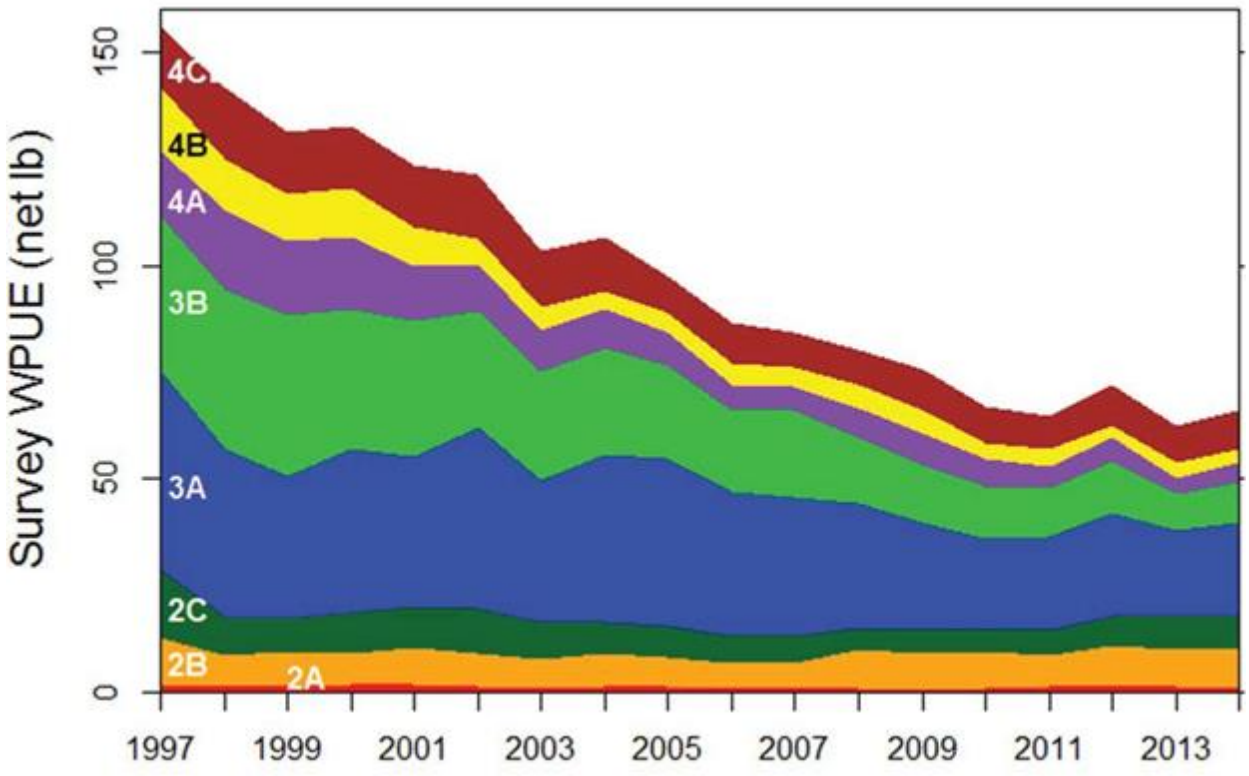

Figure 5 Weighted contributions of the regulatory areas to the coastwide survey total (over 32 inches) weight per unit of effort (WPUE). Source: (Stewart 2015).

Coastwide, 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 overall coastwide catch limit (Table 4), with remaining catch in British Columbia, Canada.

All anticipated removals of halibut are taken into account when recommending the annual TAC including: 1) commercial fisheries, 2) recreational fisheries, 3) discards in the directed fishery (referred to as "wastage"), 4) discards in non-directed fisheries (referred to as "bycatch", and 5) personal use (Table 4). 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 5).

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 6). A comparison of fishery removals and catch limits from 2009-2014 shows good management performance (Table 7 and Table 8). 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 8).

Table 4. 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 5. 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 6. 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 7. 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 8. 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 9. 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

Stock Assessment Update

An ensemble of models was again developed for 2014 stock assessment, similar to the approach taken in 2013. The final ensemble for 2014 included four individual models each of both short and long time-series models based on coastwide and Areas-As-Fisheries (AAF) data structures. The AAF models use fishery specific information to examine the stock on a finer spatial scale than the coastwide models. 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).

Research Update

The IPHC prepares a research plan annually, which includes research based on identified data needs, to supplement research already underway and to advance the IPHC mission. The 2015 Research Plan may be found at: http://www.iphc.int/library/raras/394-rara2014.html

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 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 (MSE), and 4) primary areas of research. Following reviews by the 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 longline survey.

Ecosystem Impacts

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.

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.

1. 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.

2. 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 information, dealer landing reports ("fish tickets"), and at-sea production reports are combined to provide an integrated source for fisheries monitoring and in-season decision making. Participants in the North Pacific Groundfish fisheries, including IFQ Halibut, are required to use one of two electronic reporting systems. The first (IFQ and CDQ on-line catch reporting) documents only landings of ITQ-species (halibut & sablefish) as a way to track each participants' annual catch. The second, e-Landings is a more comprehensive system that inputs all catches, including self-reported discards as well as all retained and sold landings for all 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. 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.

3. 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 Individual Fishing Quota (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 on the Observer Program Section below.

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.

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.

Updates on Non-target Species Impacts

Since the last surveillance report in 2014 (3rd Annual Surveillance) the CAB was presented with an additional year of observer data from the restructured observer program and updated information on bycatch of ETP species. This information was used to update the list of main retained and discarded bycatch in the halibut fishery. Non-target interactions make up 30% of the weight of the overall fishery (landings of target + non-target species) (Table 10).

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 restructure observer program. In past assessments, this species composition list was extrapolated from e-landings data alone and presented a much different picture of the 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. Species are categorized for scoring purposes as retained versus discarded based on whether they are greater than 50% retained or discarded (Table 10).

In particular, the main bycatch species were modified to include grenadiers, sharks, and albatross' as a vulnerable species groups, and removed sablefish (not vulnerable and <5% of fishery), sculpins (not vulnerable and <2% of fishery), and other rockfish species (potentially vulnerable, but <2% of fishery) (Table 10). The full updated species list and background on the updated species groups is provided below (Table 11). These additional species are not targeted by the fishery and recent assessments conclude that they are not being overfished. The inclusion of these species groups does not affect existing scores.

Overview of Non-target Catch

Table 10. Summary of Non-target Species as Categorized for Evaluation

Performance indicator	Species	Rationale
2.2 Discarded non-target	Pacific Cod	Main Discarded. Greater than 5% of catch by volume
2.2 Discarded non-target	Skates, Sharks, Grenadiers, Laysan Albatross, Black-Footed Albatross	Main discarded. < than 5% of catch but >2% of catch, vulnerable
2.3 ETP species	Short-tailed Albatross	ESA Listed "Endangered"

Table 11: 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. Source: NOAA Catch Accounting System, 2015.

Species	% of Halibut Fishery	% Retained	% Discarded	Average Catch (mt/year)	Average Retained (mt/year)	Average Discarded (mt/year)
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
GreenlandTurbot	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

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 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. The NPFMC is considering information to determine implication of assigning separate TAC for Pacific Cod in the BA 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 Ecosystem Impacts (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 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 (ENP) 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 (Tribuzio *et al*. 2010). 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.

Management

Sharks 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).

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 Sources of Information (Above).

There are three sources of information on sport harvest: (1) the ADF&G statewide harvest survey (SWHS) provides estimates of catch (harvest plus released sharks) and harvest (sharks kept) of all shark species combined, in numbers of sharks, (2) the mandatory charter logbook provides estimates of statewide charter harvest of salmon sharks (numbers of fish) since 1998, and (3) dockside monitoring in

the South central 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 AS 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. Unlike other grenadiers species (e.g. hoki, blue grenadier), giant grenadiers have a watery flesh and soft texture. A NOAA fisheries sensory analysis panel cateogrized giant grenadier as 'unpalatable' and efforts to identify a market for the species have proven unsuccessful thus far (NOAA Fisheries).

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 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 12). 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.

Table 12. 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

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 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 would 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 Section (Above).

- Fishery independent surveys: NOAA- Fisheries conducts annual longline and trawl surveys in the Gulf of Alaska and in the Eastern Bering Sea / Aleutian Islands. The trawl survey in the BSAI has been problematic because since 1986 no trawl surveys have sampled deeper than 500 m. The AI trawl survey biomass estimates from the "shallow" depths, which are regularly sampled (1-500 m), and AI longline survey RPWs from "shallow" (200-500 m) and "deep" depths (501-1000 m). There is some evidence that trawl and longline survey abundance trends are similar. This may indicate that these surveys are sampling the same population and lend credence to the method used to extrapolate AI biomass from longline survey data.

- Observers: Grenadiers are primarily caught in the sablefish longline directed fisheries, although some catch occurs on vessels targeting both halibut and sablefish. 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 Individual Fishing Quota (IFQ) fisheries, and vessels between 40 feet and 60 feet length overall (LOA). This restructure increased the amount and reliability of data available to determine fishery impacts on non-target species, though data gaps with vessels < 40 feet still exist.

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:

1. Because early life history information for giant grenadier is nil, studies are also needed to investigate where larvae and young juveniles reside.
2. 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.
3. Validation of the AFSC Research Ecology and Fisheries Management (REFM) Division aging methodology for giant grenadier.
4. Further analysis and study of competition for hooks that may affect giant grenadier catch rates on the AFSC longline survey.
5. Continue a study to examine if the three different shapes of otoliths found in giant grenadier.
6. 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 Birds (Black-Footed and 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 (Pttman 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 13). 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 13: 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 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, possibly due to the presence of squid, which are an important prey species

(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).

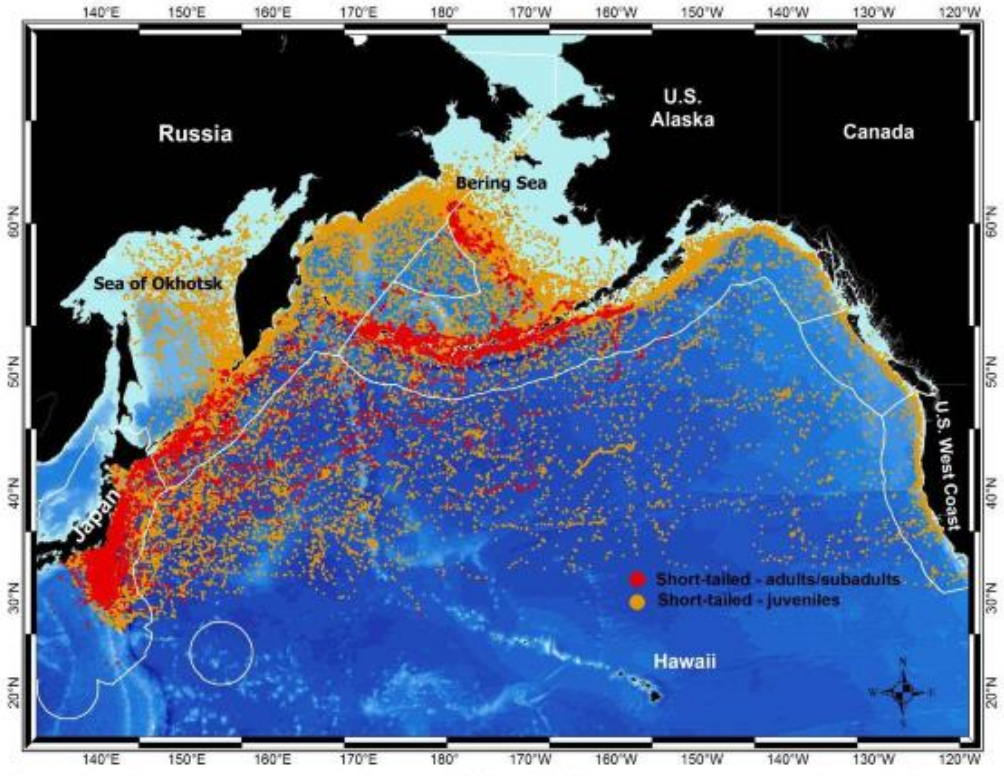

Figure 6. Short-tailed albatross locations tracked between 2002 and 2012, showing adult and juvenile distributions in the North Pacific. Where shown, white lines represent the exclusive economic zones of countries within the range of the short-tailed albatross (USFWS 2014).

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 that "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). The halibut fishery has less potential to take short-tailed albatross than the sablefish directed fishery because halibut boats don't tend to fish over the slope break where Short-tailed albatross are most common.

The incidental take levels of short-tailed albatross 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 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. In general, it is thought that the halibut fishery has a lower potential overlap with the spatial distribution of short-tailed albatross, which prefer the shelf break (**Error! Reference source not found.**).

Management

NMFS re-initiated consultation with USFWS because increases in the short-tailed albatross population in conjunction with increases in observer coverage and total effort (as estimated by total hooks deployed), increase the likelihood of observing short-tailed albatross interactions in the groundfish fisheries, especially where short-tailed albatross have historically been taken (NMFS 2015f). Given the increase in short-tailed albatross population, there is concern from NMFS, the Council, USFWS, and the industry that exceeding the take level from the biological opinion (USFWS 2003b) could result in an interruption to fishing prior to reinitiating consultation. 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). The Biological Opinion stipulated several Reasonable and Prudent Measures (RPM) that are necessary and appropriate for NMFS to minimize take of short-tailed albatross:

- RPM 1: The NMFS shall minimize the risk of short-tailed albatross interacting with the hook and-line fishery. Because short-tailed albatross are caught and killed by baited hooks in the hook-and-line fishery, minimization measures shall be employed to reduce the likelihood that they will attack the baited hooks.
- RPM2: The NMFS shall establish a multi-stakeholder, Alaska Groundfish and Short-tailed Albatross Working Group as an advisory body to the NMFS and the USFWS for the purposes of reducing fishery interactions with short-tailed albatross and seabirds. This group will work toward facilitating adaptive management to minimize and avoid take of short-tailed albatross and other seabirds.
- RPM3: The NMFS shall monitor the groundfish fisheries for interactions with short-tailed albatross and report all observed, reported and estimated takes, of short-tailed albatross to the Service, and report on the efficacy of avoidance and minimization measures.
- RPM4: The NMFS shall facilitate the salvage of short-tailed albatross carcasses taken by longline or trawl fishing vessels. Every effort should be made to retain short-tailed albatross carcasses for scientific and educational purposes.

All longline vessels >55' are required to use seabird avoidance devices (Figure 7) 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 short tailed albatross (Ed Melvin, pers com).

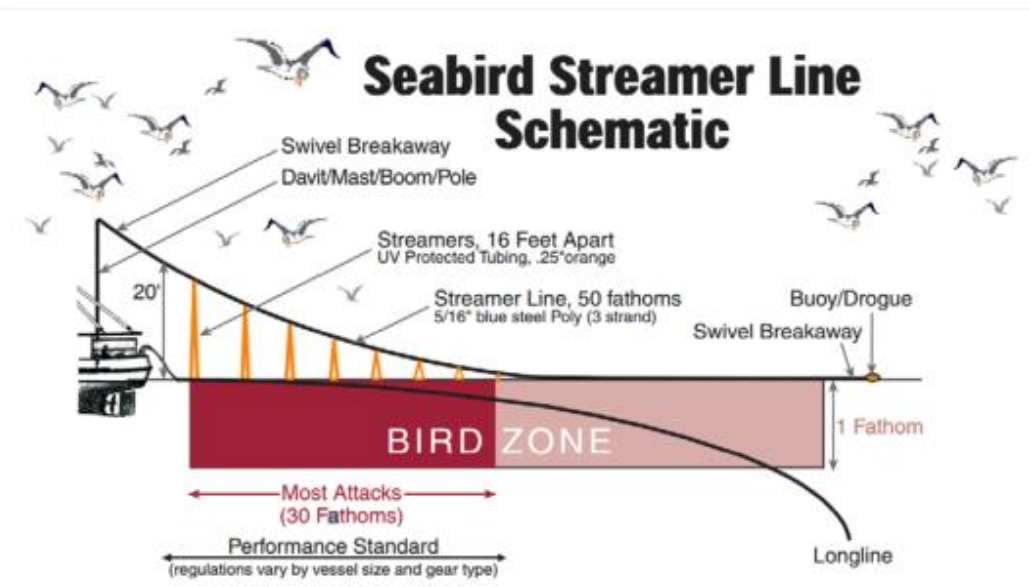

Figure 7. Streamer lines used to reduce seabird bycatch in hook-and-line fisheries (Melvin 2000).

In the short-tailed albatross incidental take statement (USFWS 2003b), USFWS anticipated up to four short-tailed albatross could be reported taken bi-annually (every 2 years, beginning September 16 of odd numbered years) as a result of the hook-and-line groundfish fishing activities in the BSAI and GOA areas regulated by NMFS. The Alaska groundfish fisheries have not exceeded the incidental take allowed by the incidental take statement. If the take was exceeded, NMFS would have to cease the activities (e.g. groundfish fishery) causing the take, until a consultation is reinitiated.

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 inseason 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).

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 (Heifitze *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).

Management

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) in 2005. 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, totalling 13.5 nm^2. All bottom-contact gear (longlines, trawls, pots, dinglebar gear, etc.) is prohibited in this area (Figure 8).

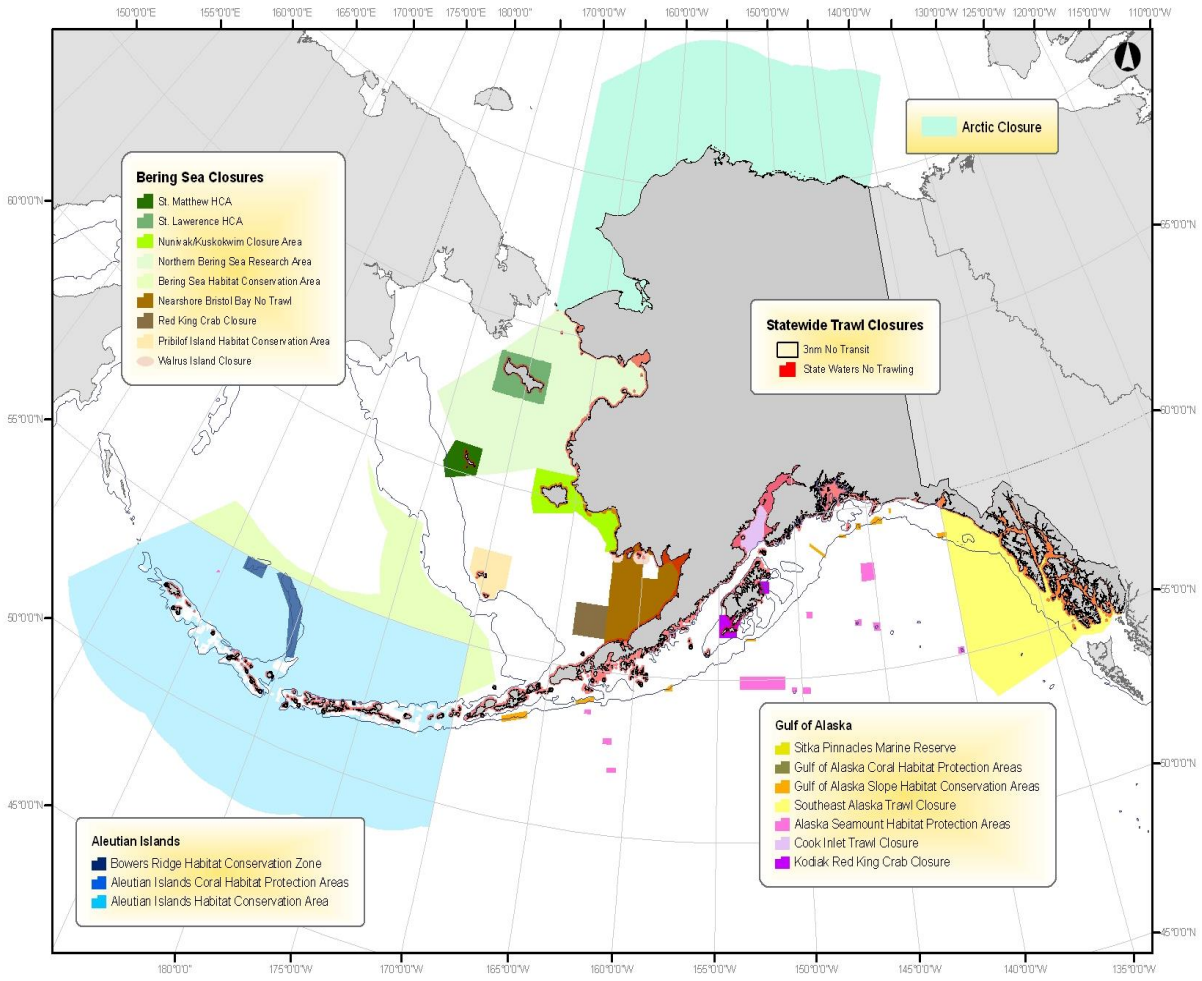

Figure 8: Map of existing habitat, species, and gear closures in Alaskan Waters. Source: NMFS.

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.

Information

NOAA's overarching Habitat and Ecological Processes Research (HEPR) 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.

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, so that whales do not have the opportunity to teach/learn depredation techniques or cue to the sound of line movement. 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 as depredation is not known to have negative effects on whales; 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.

Management

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 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). The stated ecosystem-based management goals of the NPFMC are:

1. Maintain biodiversity consistent with natural evolutionary and ecological processes, including dynamic change and variability
2. Maintain and restore habitats essential for fish and their prey
3. Maintain system sustainability and sustainable yields for human consumption and non-extractive uses
4. Maintain the concept that humans are components of the ecosystem. (Zador 2012)

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

1. Understand and plan for impacts of climate change
2. Understand tradeoffs among ecological, social, and economic factors of fishery harvest
3. Identify buffers needed to mitigate uncertainty
4. Create a cohesive plan for BS EBFM (rather than current piecemeal approach); define EBFM for the Council
5. Precautionary management, and shifting the burden of proof
6. Prioritize research, management based on ecosystem understanding, identify pathway of research to management
7. Identify areas of risk and opportunities to mitigate
8. Consider subsistence needs and traditional ecological knowledge
9. 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
10. 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 (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 strategy is being effectively implemented.

Management

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.

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).

Management Systems

No significant changes to the fishery-specific management system have occurred since the last re-assessment certification in 2011.

The International Pacific Halibut Commission (IPHC) performs assessments and research on the Pacific halibut stocks, and recommends total allowable catches (TACs) and regulatory measures for halibut fishing in 10 areas of the EEZs of Canada and the US. In the US, management

recommendations for Alaska and the West Coast (Washington/Oregon/California) are also put forward by the NPFMC, and PFMC, respectively. Regulations are subsequently implemented (usually without modification) by the National Marine Fisheries Service (NMFS) in the US, and the Department of Fisheries and Oceans (DFO) in Canada.

IPHC Update

The IPHC encourages 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 Management Strategy Advisory Board, and the Scientific Review Board. The roles and responsibilities of these bodies was reviewed in a previous Surveillance Audit report (Morgan and Jagielo 2015), and a full description of each can be found at http://www.iphc.int/about-iphc.html#advisors. Additionally, in 2014, the IPHC reported its progress on recommendations made during an outside management review process that occurred in 2012 (Appendix 1). Noteworthy developments since the last Surveillance Audit are summarized below.

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

An ongoing IPHC initiative 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.

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 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.

Halibut bycatch.

The IPHC has had an ongoing concern 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 NMFS North Pacific 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.

The IPHC prepared a paper discussing bycatch control and the concept of abundance-based prohibited species catch limits for Pacific halibut in the Bering Sea/Aleutian Islands (a copy is 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 (a copy is 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

In June 2015, the Council took final action to reduce halibut PSC mortality limits in the BSAI groundfish fisheries overall from 4,426 mt to 3,515 mt, a 21% reduction. The Council is also currently developing new approaches to further reduce halibut bycatch in the GOA (NPFMC 2015). More information can be found at http://www.npfmc.org/?s=halibut+bycatch.

Observer Program

The NMFS North Pacific fishery observer program has undergone significant changes since the re-assessment certification in 2011, as part of a re-structuring effort that began in January of 2013. The re-structuring effort is intended to 1) increase the statistical reliability of data, 2) address cost equity issues for all participants, and 3) expand coverage to previously unobserved fisheries (NPFMC 2011). Incremental changes following from the re-structuring of the program have been detailed in previous Surveillance Audit reports (Morgan and Jagielo 2013; Morgan and Jagielo 2014). NPFMC Recommendations associated with observer program improvements in 2015 can be found in Appendix 2.

A noteworthy change in the observer program since the last Surveillance Audit is a change in the way observers are assigned to vessels. Previously, two methods were used; a “vessel selection” method, and a “trip selection” method. As the re-structured observer program has evolved, NMFS identified sampling frame problems with the vessel-selection method. This issue was addressed by using only the trip-selection method in 2015 (NMFS 2014).

Two trip-selection pools were employed for 2015; a “small vessel trip-selection pool”, and a “large vessel trip-selection pool”. The small vessel pool is comprised of catcher vessels fishing hook-and-line or pot gear greater than or equal to 40 ft, but less than 57.5 ft in LOA (previously these vessels were in the “vessel-selection” pool). The large vessel pool is comprised of three classes of vessels: 1) all catcher

vessels fishing trawl gear, 2) catcher vessels fishing hook-and-line or pot gear that are also greater than or equal to 57.5 ft LOA, and 3) catcher-processor vessels exempted from full coverage requirements (this pool was previously termed the "trip-selection" pool). Targeted selection probabilities in 2015 are 12% for the small vessel pool and 24% for the large vessel pool. This represents no change in the selection rate for the small vessel pool and a 50% increase in the selection rate for the large vessel 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 for observer coverage since 2013 (NMFS 2015a). However, the Observer Program Annual Report (NMFS 2015b) and the Observer Program Supplement Environmental Assessment (NMFS 2015c) 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 vessels less than 40ft LOA be considered for testing of electronic monitoring in the future (NMFS 2015a).

In both the 2013 and 2014 observer program Annual Reports, NMFS reported that biased observer data resulted from the policy of issuing conditional releases and temporary exemptions (e.g. for small vessels with limited life raft capacity), and recommended no exemptions for 2016 (NMFS 2015a). The NPFMC supported this in a Council Motion dated October 10, 2015, given the option for these vessels to be in the electronic monitoring (EM) pool in 2016 (Appendix 2).

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). Evidence has suggested that for some vessels delivering to tenders, unobserved trips have been longer than observed trips. Apparently, some vessels not carrying observers may have made deliveries to tenders in lieu of making a landing on shore (to avoid officially starting a new "trip") and risking the chance of being selected to take an observer onboard. 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 26 September, 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." (Appendix 2).

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 2015a).

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 continues to recommend trip-selection method for all vessels in 2016 (NMFS 2015a).

Electronic Monitoring.

In 2014, the Council 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 2015a).

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 40-57.5 ft 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 2015a). 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 Pacific halibut longline fishery.

NMFS has placed vessels less than 40ft LOA and jig vessels in the "no-selection" pool for observer coverage since 2013 (NMFS 2015a). However, the Observer Program Annual Report (NMFS 2015b) and the Observer Program Supplement Environmental Assessment (NMFS 2015c) have highlighted the data gaps caused by not having observer information for 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 vessels less than 40ft LOA be considered for testing of electronic monitoring in the future (NMFS 2015a).

At present there is recognition by the NPFMC and the OSC 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.

Enforcement activities and compliance with regulations

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.

Enforcement authorities operate a comprehensive monitoring, control and surveillance (MCS) system in the US Pacific halibut fishery. The MSA charges two federal agencies with the authority to implement

provisions of the Act: the NMFS 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 (RAM 2009).

A description of USCG 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 14). Across all IPHC management areas, the number of vessels boarded for inspection targeting Pacific halibut increased from 167 in 2013 to 420 in 2014, following in part from a joint pulse operation with NOAA OLE in mid-September that increased law enforcement presence from the Bering Sea to Southeast Alaska (Table 15).The relatively greater number of boardings in Area 2C corresponds to coverage of the sizable recreational and charter fleets in that area. The most common violations observed are shown in Table 3.

Table 14. USCG Boarding and Violation Summaries by Industry Sector, 2013 & 2014. Source: (USCG 2015).Note: 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 15. 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 16. Description of IPHC Fisheries Violations observed by USCG in all sectors in 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……..…
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 USCG 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. The report summarizes enforcement actions including compliance, inspections, and investigations specific to the Pacific halibut fishery. Observed compliance increased from 78% in 2013 to 92% in 2014 (Table 17).

Table 17. 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%**

Additionally, the State of Alaska Enforcement Division submits reports biannually to the NPFMC in June and December.

Relevant regulations

Since the last Surveillance Audit, a regulation change has been 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).

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 3, and a full discussion of IPHC regulation proposals for 2015 can be found at:
http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2015.pdf

Personnel involved in science, management or industry.

The IPHCS Staff reported that Claude Dykstra has replaced Greg Williams, covering the function of Council Interactions. Additionally, Anna Henry has joined the science staff as Survey Manager. At the NMFS North Pacific Observer program, Chris Riling as taken the position of now retired Martin Loefflad.

Traceability

In Alaska, Pacific halibut from the UoC are readily segregated from non-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. This system has not changed significantly since the certification of the fishery. The certification extends only to the point of landing (where after chain of custody begins).

In Alaska, vessels must give notice before leaving for a trip and before landing at a registered landing site. At landing, the catch weight is debited electronically from the permit holder's IFQ permit amount for that year. This data feeds into the catch accounting system described in the **Error! Reference source not found.** section of this report. 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). Because the unit of assessment in the state of Alaska includes the entire IFQ fishery there is little risk of mixing with non UoA product at sea.

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. All landings are recorded and deducted from the quota holder's share. Dockside monitoring and enforcement ensure that all laws and regulations are adhered to.

The unit of assessment also includes product caught in Washington waters in area 2a under the respective IPHC license. Area 2a also includes Oregon and California state waters, and therefore there is theoretically an increased risk of mixing of UoA and non UoA product. This could occur if a boat fished in both non UoA and UoA (WA State) waters on a single trip, or if fish captured in Oregon or California were delivered to Washington ports, for example in Illwaco, Washington. This risk was discussed during the 2015 surveillance audit with the client group and agency representatives. While not quantified at this time, landings of this type are believed to be de negligible because a) the total volume fished outside of Washington state waters is minimal and b) the bulk of landings taken south of the Columbia River are landed in the ports of Newport and Astoria, Oregon (Bob Alverson, FVOA, Pers Comm).

Assessment Process

Scope and History of Assessments

At each annual surveillance, the Conformity Assessment Body is responsible for evaluating whether the fishery has acted sufficiently on the required conditions set forth in the original certification report, whether a random check on the performance of the fishery verifies continued compliance with the MSC standards. CABs also have responsibilities to document relevant changes in the fishery's management or the performance of the target or associated species (e.g. annual landings, changes in management, new research, use of the label etc.).

The annual surveillance audit process is comprised of five general parts:

1. The certification body provides questions around areas of inquiry to determine if the fishery is maintaining the level of management observed during the original certification. In addition, the surveillance team requires that the client provide evidence that the fishery management system has taken the necessary actions to meet all conditions placed on the fishery during the initial certification assessment or any previous surveillance audits.

2. The certification body informs stakeholders that they have the opportunity to contribute to the surveillance audit by participating in a face-to-face interview process or by submitting comments in writing. The certification body must inform stakeholders of the opportunity to provide comment at least 30 days before the onsite meeting.

3. The surveillance assessment team meets with the fishery client in an opening meeting to allow the client to present the information gathered and to answer questions asked by the surveillance team. The surveillance team can then ask questions about the information provided to ensure full understanding of how well the fishery management system is functioning and if the fishery management system is continuing to meet the MSC standards. Additional interviews are conducted with fishery management and science personnel as well as stakeholders.

4. The surveillance team determines if any Performance Indicators should be re-scored and presents preliminary findings to the client fishery at the end of the site visit in a closing meeting. The results outline the assessment team's understanding of the information presented and its initial conclusion regarding the fishery management system's continued compliance with MSC standards.

5. The surveillance team may receive further information related to conditions, finalizes updates and progress against conditions, submits a draft report to the fishery client and a subsequent final report to the MSC for posting on the MSC website. If there are continued compliance concerns, these are presented as non-conformances that require further action or performance may be scored as behind target for particular conditions in that year. If conditions remain behind target for two consecutive years (without adjustment of timelines, which requires a strong rationale), the certificate will move into suspension and withdrawal.

Sections 27.22.17 of the MSC Certification Requirements (V1.3, January 2013) oblige Conformity Assessment Bodies (the CAB *shall*): "undertake an "expedited audit" including as it determines necessary, review of documents and an onsite audit if the CAB becomes aware of (27.22.17.1) major changes in relation to the circumstances of the fishery… that are likely to have a material difference on the certification status. A performance indicators score falling below 60 or an outcome performance indicator score falling below 80, or a change that could bring about a Principle Level aggregate score to drop below 80 shall be considered material differences to certification status."

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 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. This work was led by Tom Jagielo (P1 US Pacific halibut unit), in collaboration with Joe DeAlteris (P1 BC Pacific halibut unit) at the BC Pacific halibut full reassessment meeting in Vancouver, BC, Canada September 18-20th 2013. 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. The scores from the P1 re-scoring, and the Client Action Plan associated with the new condition issued against performance indicator 1.2.3 as a result of re-scoring are now included in this surveillance alongside the conditions raised with the 2011 re-certification.

At the third annual surveillance audit three of the six total conditions (including the new condition on 1.2.3) were closed on schedule, and the timelines were adjusted on the remaining three conditions to extend into Year 2 of the next certificate cycle. An updated client action plan was created for this extended timeline, which may be found in Appendix 4.

4th Annual Surveillance Audit Process

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 14 2013, and the latest MSC process requirements from GCR V2.1 (September 2015) and FCR V2.0 (April 2015). The surveillance was executed alongside the 2nd re-assessment of the halibut fishery

and the 4th annual surveillance and 2nd re-assessment of the sablefish fishery. As such, all meetings targeted information needed for both surveillance and full re-assessment.

All previous surveillance audits in the certificate cycle were based in Seattle, with a similar set of meetings targeting input from IPHC and NMFS-AFSC representatives. This year's surveillance audit was bolstered by an additional trip to Juneau, Alaska, where the assessment team met with various representatives of the NMFS Alaska Regional Office and NMFS enforcement.

On-site Meetings

The assessment team selected visit sites and interviewees 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 (Table 19). 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 (Table 18). The assessment team visited agency offices including the National Marine Fisheries Center Regional Office, Alaska Fisheries Science Center, IPHC, and also visited the client office and the University of Washington. Several meetings also took place at hotels and restaurants in Seattle and Juneau.

Table 18 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	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 19. 2015 Meeting Attendees by Organization in General Order of Meetings

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	Alaska Enforcement Division	NMFS
Brandee Gerke	Sustainable Fisheries: Supervisory Fisheries Management Specialist	NMFS-ARO

In addition to the meetings and attendees list above (Section 4.4.1), consultations have included direct email outreach to potentially interested stakeholders. 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. This list contained over 40 individuals from approximately 35 organizations spanning the government, private, and non-profit sectors.

Results

As of the fourth annual surveillance there were three open conditions, all related to information status PIs (1.2.3, 2.2.3, 2.3.3). In the 2014 Annual Surveillance (3rd annual) the client provided a revised action plan (Appendix 4) and the assessment team revised the condition timelines to extend into 2017, or Year 2 of the certificate cycle.

All conditions placed on the fishery over this certificate cycle are reviewed in the below table. All three previously closed conditions remain closed, and it has been found that the open conditions are still on target. The timelines for the open conditions will be reviewed in the ongoing re-assessment.

Condition 1.2.3

Performance Indicator(s) & Score(s)	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
	1.2.3 b, c	**PISG 80** **b. Relevant information is collected to support the harvest strategy** **c. There is good information on all other fishery removal from the stock**	**70**
Condition	The US halibut fishery shall assure that there is good information on Pacific halibut removals from the stock (directed catch/bycatch/wastage) including estimates from vessels <40 ft. LOA, 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.		
Milestones **Client action plan**	See Appendix 4 for updated milestones and CAP		
Progress on Condition [2015]	*During the 2015 surveillance visit, observer program manager Farron Wallace provided an update to the timeline for EM to be implemented on vessels <40' (see 1.2.3b above). The current timeline continues to point to EM being at least partially implemented by 2017. However, in case of delays, the CAB is working with the client to identify alternative courses of action. The options that are being considered include: 1) Working with NMFS and/or the client group to get additional catch data from these <40 ft vessels, 2) Working with NMFS and/or the client group to get spatial fishing effort data to confirm that there is enough observed overlap of fishing effort by mid-sized vessels that these data can be used as proxies for the <40 ft vessels, such that there are no non-target, ETP or ecosystem impact information gaps.* *In an effort to determine if the <40' vessels truly represent different ecosystem impacts the CAB is recommending that the client conduct an analysis of the spatial overlap of observed vessels, such that observed vessels fishing in the same zones (closer inshore) as small vessels, may have their observer data used as proxies for species size/composition of non-target interactions by the <40 ft vessels.* *Preliminary data from NMFS indicate, that in 2014, the <40' vessels fished in 182 different STAT areas and all but 60 (33%) of the STAT areas had effort by the larger*		

	observed vessels. The total catch from those 60 STAT areas is 422 mt or 25% of the <40s total catch. This preliminary information indicates that there is overlap in effort that could be used to generate an indirect, but observer-based understanding of catch composition in these areas. There also remain gaps in the ability for mid or large sized observed vessels to act as accurate proxies for the fishing behaviour of small vessels that we will need further work by the client to close the condition on the agreed timelines. *For the purposes of the surveillance audit, the progress noted towards accounting for <40' vessel fishing impacts and potential avenues to compensate for deficiencies in observer coverage are sufficient to consider the condition 'Open and on target' this year.*
Status of condition	Open and on target. Due Year 2, next certificate cycle, based on CR 27.11.8.

Condition 2.2.1

	Insert relevant PI number(s)	**Insert relevant scoring issue/ scoring guidepost text**	**Score**
Performance Indicator(s) & Score(s)	**2.2.1**	**SG80 - Main bycatch species are highly likely to be within biologically based limits or if outside such limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.**	**80**
Condition	*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.*		
Milestones	*This would result in four (4) updated reports by the client of the progress of implementation of the amendments to the NPFMC observer program. Each report will contain the specific information outlined in the client action plan section, above. The first observer update would be presented to SCS January of 2012; second updated November 1, 2012; third updated August of 2013; and a fourth April of 2014. Progress reports will be available for each surveillance audit with a cumulative report summarizing the results of the observer program in October 2014. The surveillance audit in that year will take place in October to accommodate the publication date*		
Client action plan	*Eat on the Wild Side (FVOA and DSFU) as part of the action plan will provide a series of annual updates to SCS regarding the implementation process of the observer program amendments recommended by the NPFMC. The reports will include 1) the specific design features and the sampling protocols that the NMFS observer program intends to implement, 2) the methodology of choosing vessels for observation, 3) the rationale for length of time period observation per vessel, and 4) an analysis of costs of the program that are made available through the regulatory implementation process. We are anticipating an initial information document that will specify the different bycatch species including sharks, skates, and birds. As new information is made available regarding sharks, skates and birds, we will incorporate that information in our reports. We would propose that should the data indicate an additional bycatch beyond current assumptions for endangered species, such as albatross, or for a fin fish species that has*		

	been identified as being in critical condition, we would submit a suggested action to mitigate any adverse bycatch activities.
Prior Progress on Condition [2014 Surveillance]	*The issues to be resolved before fulfilling the requirement of the SG80 for other bycatch are that the species composition and therefore the stock status of skates in the "unidentified skate" category is not known. Issues also remain related to the fishery's effects on birds. In AK, vessels >55 ft LOA are required to use tori lines on longline gear to deter birds. Enforcement reports compliance of nearly 100% with tori line regulations. Similar mitigation methods are not currently used in the WA longline fishery by all boats, although FVOA vessels voluntarily use tori lines. Full implementation by NMFS of tori lines as deterrents on boats >55 ft LOA, as per AK, is required in the Pacific groundfish fleet by November 2014 under Section 9 of the Endangered Species Act, based on a Biological Opinion from the US Fish and Wildlife Service. In October 2012, NMFS published the 2013 Observer Program Annual Deployment Plan for AK which described how the plan was to be implemented (NMFS, 2012) in January 2013. At/following the 2013 second annual surveillance audit, the team received copies of the June 7 2013 Observer Program Council minutes, a copy of the minutes from the Observer Advisory Committee meeting June 3-4, Juneau, AK, a copy of the First and Preliminary 2013 Annual Performance Review (June 2013), NMFS responses to NPFMC recommendations for the 2014 Deployment Plan of the Observer Program, and a draft copy of the 2014 ADP. The team also met with Mr. Farron Wallace at the AK Fisheries Science Center in Seattle to learn more about the strengths and weaknesses that NMFS has encountered in the first phase of implementing changes to the Observer Program for AK in 2013. These updates are evidence that the fishery is making progress toward closing out this condition. At the 2013 closing meeting the Client was reminded of obligations associated with the Client Action plan which required four update reports to be delivered to SCS at 9 month intervals. It was agreed that FVOA would write a "third" update report for SCS, covering the agreed criteria from the Action Plan, following finalization of the 2014 ADP for the Observer Program (~ Oct 13). The "fourth" report will still be expected in April 2014, as previously agreed. In addition to agreed content outlined in the Client Action Plan, the "third" report (~Oct 13) will also outline when and how the Client intends to obtain bycatch information (2.2.3, 2.3.3) (including for boats < 40ft), how this will be used to develop precautionary management strategies (2.3.2) and options for mitigation that avoid risk of serious harm to bycatch and ETP species, by species or species group (2.2.1, 2.3.1)for AK and WA waters. These suggestions may be amended or fine-tuned in the "fourth" April 2014 report if spatial information or other relevant information makes it logical to take a suite of tailored approaches for different vessels/areas of the fleet. At the time of full assessment, it was anticipated that data from the increased sampling on halibut vessels >40 ft. LOA that began in 2013 would be used to identify skate species and enumerate and identify bird species taken by the fishery. Preliminary results in the 2013 annual performance review of the AK Observer Program indicate that there are still challenges obtaining sufficient and representative coverage of bycatch from boats 40ft-57.5ft which may be released from observer coverage due to spatial constraints, and are not yet equipped with electronic monitoring systems. There are not major plans to change release rules for the 2014 ADP. There remains no observer coverage on 42% of the fleet < 40ft LOA. By the third surveillance audit there will need to be clear evidence available to the assessment team that the Client has taken actions (this may require work with responsible management agencies) that assures that unidentified skate populations caught in the Pacific halibut longline fishery are highly likely to be within biologically based limits and that longline halibut vessels in AK and WA are not impacting bird species causing them to be outside biologically based limits (or if outside limits, there is a partial strategy that does not hinder recovery). On this basis the condition is rescored to 80 and is closed.*

Progress on Condition [2015 Surveillance]	*The main bycatch species in the Pacific halibut longline fishery are unidentified skates, sharks, Pacific cod, Grenadiers and seabirds such as the black-footed and Laysan albatross. Grenadiers, sharks, and seabirds were added and scored in 2015 based on a new year of observer data from the restructured observer program. Pacific cod populations are within biologically base limits and there is no evidence of overfishing (A'mar and Palsson 2014). Shark, skate, and grenadier populations are stable with no evidence of overfishing, recognizing that assessment methods remain data limited (Rodgveller and Hulson 2014;Tribuzio et al. 2015; Ormseth 2014a; Ormseth 2014b). Black footed and Laysan albatross populations are increasing and bycatch from halibut longlining is a small percentage of their overall catch (Arrata et al. 2009). Bycatch species that constitute "main" bycatch from directed halibut vessels are all well within their OFLs, or not at the levels at which there would be the potential to do serious or irreversible harm at the population level. On this basis, the condition retains a score of 80 and remains closed.*
Status of condition	*Closed 2014*

Condition 2.2.3

Performance Indicator(s) & Score(s)	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
	2.2.3	**SG80 - Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery. Information is sufficient to estimate outcome status with respect to biologically based limits. Information is adequate to support a partial strategy to manage main bycatch species. 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 effectiveness of the strategy).**	**70**
Condition	*Information shall be collected and provided to the CB by the third surveillance audit, 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.*		
Milestones	See Appendix 4 for 2015 Updated Client Action Plan and Milestones		
Client action plan			
Prior Progress on Condition [2014 Surveillance Report]	*The re-structured observer program has the capacity to provide qualitative information and some quantitative information on the amount of main bycatch species affected by the fishery. Information is currently adequate to support a partial strategy to manage main bycatch species. Further measures remain necessary to have a complete strategy to manage bycatch species as boats <40ft are exempt from observer coverage requirements and bycatch from this sector of the fleet, which is likely to differ in scale and composition from bycatch on larger offshore boats, remains unquantified. The fishery scores at the 80 level on scoring issues a and c. It is not yet clear that sufficient are being collected such that it is possible 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 effectiveness of the strategy). In particular, the resolution at which coverage on skates is reported in the BSAI remains insufficient, and does not allow examination of catches against reference points for main skate species such as big and longnose skate: in theory this information should be possible to obtain from the observer program, but species level reference points for the BSAI have not been generated. The majority of skates captured in Alaska are taken in the BSAI. In contrast, management measures in the GOA are sufficiently resolved to monitor risks to main skate species. Data resolution challenges the ability to score the halibut fishery's impacts separately from the overall fixed gear fleet. Therefore it is not possible to currently close this condition for scoring issues b and d.*		

Progress on Condition [2015 Surveillance Report]	*During the 2015 surveillance visit, observer program manager Farron Wallace provided update on the timeline for EM to be implemented on vessels <40' (see 1.2.3b above). The current timeline continues to point to EM being at least partially implemented by 2017. However, in case of delays, the CAB is working with the client to identify alternative courses of action. The options that are being considered include: 1) Working with NMFS and/or the client group to get additional catch data from these <40 ft vessels, 2) Working with NMFS and/or the client group to get spatial fishing effort data to confirm that there is enough observed overlap of fishing effort by mid-sized vessels that these data can be used as proxies for the <40 ft vessels, such that there are no non-target, ETP or ecosystem impact information gaps.* *In an effort to determine if the <40' vessels truly represent different ecosystem impacts the CAB is recommending that the client conduct an analysis of the spatial overlap of observed vessels, such that observed vessels fishing in the same zones (closer inshore) as small vessels, may have their observer data used as proxies for species size/composition of non-target interactions by the <40 ft vessels.* *Preliminary data from NMFS indicate, that in 2014, the <40' vessels fished in 182 different STAT areas and all but 60 (33%) of the STAT areas had effort by the larger observed vessels. The total catch from those 60 STAT areas is 422 mt or 25% of the <40s total catch. This preliminary information indicates that there is overlap in effort that could be used to generate an indirect, but observer-based understanding of catch composition in these areas. There also remain gaps in the ability for mid or large sized observed vessels to act as accurate proxies for the fishing behaviour of small vessels that we will need further work by the client to close the condition on the agreed timelines.* *For the purposes of the surveillance audit, the progress noted towards accounting for <40' vessel fishing impacts and potential avenues to compensate for deficiencies in observer coverage are sufficient to consider the condition 'Open and on target' this year.*
Status of condition	Open and on target. Due Year 2, next certificate cycle, based on CR 27.11.8.

Condition 2.3.1

Performance Indicator(s) & Score(s)	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
	2.3.1	**SG80 - 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. Direct effects are highly unlikely to create unacceptable impacts to ETP species. Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.**	**80**
Condition	*The fishery shall provide evidence to the CB that the effects of the fishery are highly likely within limits of national and international requirements for the protection of ETP species. This evidence should be provided by the third surveillance audit.*		
Milestones	*This would result in four (4) updated reports by the client of the progress of implementation of the amendments to the NPFMC observer program. Each report will contain the specific information outlined in the client action plan section, above. Progress reports will be available for each surveillance audit with a cumulative report summarizing the results of the observer program in October 2014. The surveillance audit in that year will take place in October to accommodate the publication date.*		
Client action plan	*Eat on the Wild Side (FVOA and DSFU) as part of the action plan will provide a series of annual updates to SCS regarding the implementation process of the observer amendments recommended by the NPFMC. The reports will include the specific design features and the sampling protocols that the NMFS observer program intends to implement; the methodology of choosing vessels for observation; rationale for length of observation per vessel and an analysis of costs of the program that are made available through regulatory implementation process. We are anticipating an initial information document that will specify the different bycatch species including sharks, skates, and birds. As new information is made available regarding sharks, skates and birds, we will incorporate that information in our reports. We would propose that should the data indicate an additional bycatch beyond current assumptions for endangered species, such as albatross, or for a fin fish species that has been identified as being in critical condition, we would submit a suggested action to mitigate any adverse bycatch activities.*		
Prior Progress on Condition [2014 Surveillance]	*No STAL albatross were encountered by halibut boats in 2012 - 2015, and on this basis, the condition is closed. The team notes that 5 STAL's were taken by the groundfish fleet in AK (not necessarily halibut vessels) in 2011 and 15 in 2010. If the halibut fleet captures STALs in the future, it is possible that this condition could be reopened, but existing evidence demonstrates that the halibut fleet in recent years has not caused any STAL mortality. For Yelloweye rockfish, the non-nearshore sector overall is estimated to have a 1.1 mt impact. The Annual Catch Limit (ACL) is 18mt coast wide, with most of the impacts generated from the recreational sector. Given that the directed halibut fishery in WA alone, would be a further subset of the 1.1mt taken, which also comprises commercial catches in OR and CA, there does not appear to be evidence that the directly halibut fishery has the potential to fish under current management measures at a level that corresponds to the 18mt ACL, which itself is set to allow recovery. Based on this, the condition is closed for Yelloweye rockfish in WA.*		
Progress on Condition [2015 Surveillance]	*No STAL were taken by the halibut fleet in 2015 and 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). 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. Given that this program was modelled off the successful program in AK, there is an objective basis for confidence that the strategy will work. This condition remains closed.
Status of condition	*Closed 2014*

Condition 2.3.2

Performance Indicator(s) & Score(s)	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
	2.3.2	**SG80 - There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality that is designed to be highly likely to achieve national and international requirements for the protection of ETP species. There is an objective basis for confidence that the strategy will work, based on some information directly about the fishery and/or the species involved. There is evidence that the strategy is being implemented successfully.**	**80**
Condition	*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.*		
Milestones	*This would result in four (4) updated reports by the client of the progress of implementation of the amendments to the NPFMC observer program. Each report will contain the specific information outlined in the client action plan section, above. Progress reports will be available for each surveillance audit with a cumulative report summarizing the results of the observer program in October 2014. The surveillance audit in that year will take place in October to accommodate the publication date.*		
Client action plan	*Eat on the Wild Side (FVOA and DSFU) as part of the action plan will provide a series of annual updates to SCS regarding the implementation process of the observer amendments recommended by the NPFMC. The reports will include the specific design features and the sampling protocols that the NMFS observer program intends to implement; the methodology of choosing vessels for observation; rationale for length of observation per vessel and an analysis of costs of the program that are made available through regulatory implementation process. We are anticipating an initial information document that will specify the different bycatch species including sharks, skates, and birds. As new information is made available regarding sharks, skates and birds, we will incorporate that information in our reports. We would propose that should the data indicate an additional bycatch beyond current assumptions for endangered species, such as albatross, or for a fin fish species that has been identified as being in critical condition, we would submit a suggested action to mitigate any adverse bycatch activities.*		
Prior Progress on Condition [2014 Surveillance]	*There is a strategy in place for managing the fishery's impact on STAL albatross species, including measures to minimize mortality: these measures include the use of streamer lines, quick sinking hooks/lines, setting at night and minimizing offal around boats. These methods have been shown to be highly likely to achieve effective reductions in bird bycatch and are consistent with best national and international practices for the protection of ETP birds. In AK there is evidence that the strategy is being implemented successfully.* *As of November 2014, there is a strategy in place for managing the fishery's impact on seabird bycatch for boats >55ft. These measures are consistent with those used in AK and are intended to minimize mortality: measures include the use of streamer lines, quick sinking hooks/lines, setting at night and minimizing offal around boats. These methods have been shown to be highly likely to achieve effective reductions in bird bycatch and are consistent with best national and international practices for the protection of ETP birds. In WA it is assumed that the strategy will be implemented successfully, but*		

	management measures are not mandatory on boats <55ft. The team is closing the condition, but if there is evidence of problematic STAL mortality (at levels with the potential to do serious or irreversible harm) on halibut vessels <55ft in WA that have not implemented seabird avoidance measures, the condition would be re-opened. Existing measures for Yelloweye rockfish indicate that the PFMC has put in place precautionary management strategies with formal HCRs and recovery timeline targets that should ensure that the halibut fishery (as well as the overall groundfish fleet) does not hinder recovery of Yelloweye. These recovery strategies are supported by measures prohibiting retention, area/time/depth closures, and Yelloweye conservation areas. The very minimal catch of yelloweye rockfish by the non-nearshore fleet indicates that there is a strategy in place designed to highly likely to achieve protection, there is an objective basis for confidence that measures will work and are being implemented that can be cross checked via catch accounting against reference points set to promote recovery.
Progress on Condition [2015 Surveillance]	*No STAL were taken by the halibut fleet in 2015 and 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. Additionally, the final rule to implement a seabird avoidance program in the Pacific groundfish fleet (WA, OR, AK) 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. Given that this program was modelled off the successful program in AK, there is an objective basis for confidence that the strategy will work. This condition remains closed.*
Status of condition	*Closed 2014*

Condition 2.3.3

Performance Indicator(s) & Score(s)	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
	2.3.3	**SG80 - Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts. Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.**	**70**
Condition	*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 by the third surveillance audit.*		
Milestones	*This would result in four (4) updated reports by the client of the progress of implementation of the amendments to the NPFMC observer program. Each report will contain the specific information outlined in the client action plan section, above. Progress reports will be available for each surveillance audit with a cumulative report summarizing the results of the observer program in October 2014. The surveillance audit in that year will take place in October to accommodate the publication date.*		
Client action plan	*Eat on the Wild Side (FVOA and DSFU) as part of the action plan will provide a series of annual updates to SCS regarding the implementation process of the observer amendments recommended by the NPFMC. The reports will include the specific design features and the sampling protocols that the NMFS observer program intends to implement; the methodology of choosing vessels for observation; rationale for length of observation per vessel and an analysis of costs of the program that are made available through regulatory implementation process. We are anticipating an initial information document that will specify the different bycatch species including sharks, skates, and birds. As new information is made available regarding sharks, skates and birds, we will incorporate that information in our reports. We would propose that should the data indicate an additional bycatch beyond current assumptions for endangered species, such as albatross, or for a fin fish species that has been identified as being in critical condition, we would submit a suggested action to mitigate any adverse bycatch activities.*		
Prior Progress on Condition [2014 Surveillance]	*The re-structured observer program has the capacity to provide quantitative information on ETP species impacted by the fishery. Information is currently sufficient to determine whether the fishery may be a threat to protection and recovery of ETP STALs. The fishery scores at the 80 level on scoring issues a and b. Information is not currently sufficient from boats <40ft to support a full strategy to manage impacts on ETP species (scoring issue c) because boats <40ft are exempt from observer coverage requirements and their bycatch which may differ in scale and composition from bycatch on larger offshore boats, remains unquantified (also relevant to scoring issue a).*		
Progress on Condition [2015 Surveillance]	*During the 2015 surveillance visit, observer program manager Farron Wallace provided an update on the timeline for EM to be implemented on vessels <40' (see 1.2.3b above). The current timeline continues to point to EM being at least partially implemented by 2017. However, in case of delays, the CAB is working with the client to identify alternative courses of action. The options that are being considered include: 1) Working with NMFS and/or the client group to get additional catch data from these <40 ft vessels, 2) Working with NMFS and/or the client group to get spatial fishing effort data to confirm that there*		

	is enough observed overlap of fishing effort by mid-sized vessels that these data can be used as proxies for the <40 ft vessels, such that there are no non-target, ETP or ecosystem impact information gaps. *In an effort to determine if the <40' vessels truly represent different ecosystem impacts the CAB is recommending that the client conduct an analysis of the spatial overlap of observed vessels, such that observed vessels fishing in the same zones (closer inshore) as small vessels, may have their observer data used as proxies for species size/composition of non-target interactions by the <40 ft vessels.* *Preliminary data from NMFS indicate, that in 2014, the <40' vessels fished in 182 different STAT areas and all but 60 (33%) of the STAT areas had effort by the larger observed vessels. The total catch from those 60 STAT areas is 422 mt or 25% of the <40s total catch. This preliminary information indicates that there is overlap in effort that could be used to generate an indirect, but observer-based understanding of catch composition in these areas. There also remain gaps in the ability for mid or large sized observed vessels to act as accurate proxies for the fishing behaviour of small vessels that we will need further work by the client to close the condition on the agreed timelines.* *For the purposes of the surveillance audit, the progress noted towards accounting for <40' vessel fishing impacts and potential avenues to compensate for deficiencies in observer coverage are sufficient to consider the condition 'Open and on target' this year.*
Status of condition	Open and on target. Due Year 2, next certificate cycle, based on CR 27.11.8.

Conclusion

It is SCS's view that the US north Pacific halibut longline fishery continues to meet the standards of the MSC and complies with the 'Requirements for Continued Certification.' There were five conditions place on the fishery in its 2011 re-certification, and an additional condition was opened under Principle 1 after the principle was re-scored in 2013 due to major changes in stock assessment and understanding of stock status. Three conditions were closed in 2014, and three remain open with a target date of Year 2 of the next certificate cycle (2017). All previously closed conditions remained closed at this surveillance, and the three open conditions were found to be open and on target.

SCS recommends the continued use of the MSC certificate through to the end of the certificate cycle while the fishery continues to work towards updated timelines associated with better monitoring and information in the small vessel IFQ halibut fleet, which does not currently have sufficient or accurate observer coverage, nor the proper capacity to monitor impacts, if any, of these vessels in the shallower inshore waters where the smaller vessels tend to fish.

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Appendices

Appendix 1: 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 2. 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)

<u>SSC comments on variance</u>: 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 3. 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 4: 2015 Revised Client Action Plan

Condition	PISG 80	Core deficiency	What's Needed	Client Action Plan and milestones
1.2.3 b.	b. Relevant information is collected to support the harvest strategy	The fishery clearly meets all scoring issues of SG 60, but could not satisfy the SG 80 level because the fishery is not regularly monitored at a level of accuracy and coverage that assures complete information on removals is used for the HCR. This risks **the danger of under estimating total removals, particularly in Alaska on vessels < 40 ft. LOA and 40-57.5 ft LOA**. At the SG 100 level, there has not been an assessment of the robustness of the harvest control rule with the new coast wide model and apportionment scheme.	This is EM related – specific to halibut removals	The Client will be participating and reporting with the NPFMC's Electronic Monitoring work group. The NPFMC plans to amend their observer program in order to fund and integrate an EM program for vessels <40 and 40- 57.5 feet in length. This table outlines projected completion dates for fieldwork, design considerations, Council action for integrating an EM option in this observer program, and funding allocations to be determined. (See CAP Ref 1 below) **2015**: Client will report on 2015 fieldwork that focuses both on the operational testing of EM camera systems in the <40' and the 40-57.5' LOA, as well as further research on EM systems to evaluate whether they will successfully achieve the Council's goal to integrate EM used for catch estimation into the Observer program. The February 2015 NPFMC newsletter reports on the SSC and NPFMC endorsement of the EM Workgroup's Cooperative Research Plan for 2015. (See CAP Ref 2 below) **2016**: The Client will provide updates to the CAB as they occur during 2016 on EM field work applications for small vessels (<40'LOA; 40-57.5' LOA). During 2016, it is anticipated additional field work will continue with a NPFMC action to amend the observer program with actual EM deployment on certain sectors of the <57.5 foot halibut fleet (including the <40 foot fleet) in 2017. The Executive Director of the NPFMC has indicated he is willing to provide periodic updates for the Client. These will be forwarded to the CAB. **2017**: In June 2017 the Council will receive observer data from the previous year. Based on this, the Council will determine how they allocate the observer fee between observers and EM deployment.

				Then in October, they will take final action on this for effect in 2018. From 2017-2018 = regulatory process. Dec 2016 the NPFMC will take final action on the EM proposal, with some integration of EM. **2018**: **The integrated Observer/EM monitoring program becomes effective in 2018.**
1.2.3 c.	c. There is good information on all other fishery removal from the stock	There remain uncertainties associated with total removals by **recreational fisheries coastwide**, and by **commercial vessels in Alaska both < 40 ft. LOA that do not have at-sea monitoring and vessels 40-57.5 ft that have partial coverage with the potential for releases** that are decreasing initial targets for coverage. There remains no observer coverage on **52% of the fleet < 40ft LOA (by number), which operate in shallow, biodiverse, inshore waters where catch rates, size structure and life stages may be different** from areas fished further offshore by larger vessels.	This is EM and recreational fisheries related.	For all actions related to EM and the <40' and 40-57.5' LOA vessels, see milestones above: 2015: See 1.2.3 (b) 2016: See 1.2.3 (b) 2017: See 1.2.3 (b) For recreational fisheries coastwide, our plan in Alaska is for the client to provide to the certifier, IPHC methodology and ADFG collection processes for determining catches of halibut in the sport and charter sectors. This document will be provided by the client at the next surveillance audit. Additional written requests/letters/emails to relevant agencies may be made by the client to encourage improved methods, as appropriate.
2.2.3. b, d.	d. Sufficient data continue to be collected to detect any increase in risk to main bycatch spp (e.g. due to	Information is not currently sufficient from boats <40ft to **detect increases in risk to main bycatch species** (scoring issue d) because boats <40ft are exempt from observer coverage requirements and their bycatch which may differ in scale and composition from bycatch on larger offshore boats, remains unquantified. Species level reference points for skates in the BSAI have not been	EM related, needing actions culminating in something functional by 2017 are relevant	For all actions related to EM and the <40' LOA vessels, see milestones above: 2015: See 1.2.3 (b) 2016: See 1.2.3 (b) 2017: See 1.2.3 (b) The National Marine Fisheries Service provides reports in the fall of each year relative to the bycatch of sharks and skates, and other groundfish species. At the next annual surveillance audit the client will provide skate data from the observer program to the certifier at the highest resolution available for the BSAI and the GAO, and will provide the highest level of resolution of reference points for skates for both regions.

	changes in the outcome indicator scores or the operation o the fishery or the effectiveness of the strategy.).	generated. The majority of skates captured in Alaska are taken in the BSAI. At present, it is not therefore possible to compare different skate species catches against species-level reference points in the BSAI. (Management measures in the GOA are sufficiently resolved to evaluate catch against species level limits for main skate species not only in the GOA, but also in regional areas of the GOA, where catches above regional ABCs have been observed). .		
2.3.3 c	c. Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is not currently sufficient from boats <40ft to support a **full strategy to manage impacts on ETP species** (scoring issue c) because boats <40ft are exempt from observer coverage requirements and their bycatch which may differ in scale and composition from bycatch on larger offshore boats, remains unquantified (also relevant to scoring issue a).	EM related, needing actions culminating in something functional by 2017 are relevant.	For all actions related to EM and the <40' LOA vessels, see milestones above: 2015: See 1.2.3 (b) 2016: See 1.2.3 (b) 2017: See 1.2.3 (b) The observer program reports on birds and ETP species. For all years, the client will provide updates associated with all bird interactions and in particular, albatross species such as Black-footed, Laysan, and Short-tailed. The client will provide updates following the November Plan Team reports to the North Pacific Council and from the December NPFMC where additional bycatch information is usually provided for the year ending 2015, 2016, and 2017.

Cap Ref 1

Timelines

Diana Evans presented a timeline, developed with Martin Loefflad, of how the EM fieldwork and pre-implementation will integrate with the Council process for a regulatory amendment to implement the EM component, and the Observer Program Annual Deployment Plan cycles. The Workgroup discussed the major decision junctures for the Council (identified below). **Until the EM component is brought into the Council's Observer Program by regulatory amendment, all funding for the EM fieldwork and pre-implementation phases will need to come from independent sources, and cannot be supported by the observer fee.**

Integration of EM fieldwork with Council process and ADPs

Year	Fieldwork / Pre-implementation (Pre-Imp)	Council process, regulations	Observer Program/ Annual Deployment Plan (ADP)
2014	Fieldwork	EMWG developing purpose & need, alternatives, 2015 Cooperative Research Plan (CRP)	October – 2015 ADP places 10 vessels that are participating in EM research into the no selection pool
2015	Jan-Feb – stereo camera field research on pot vessel (RFP)		
	Feb – SSC reviews CRP	Feb – SSC reviews CRP	
	Mar-Apr – stereo camera field research on longline (RFP and NPRB) Mar-Sep – operational research	EMWG evaluates field data	
	(other fieldwork too)	October – present a refined 2016 Pre-Imp concept to Council	October – 2016 ADP proposes all EM Pre-Imp vessels in no selection pool
2016 (Pre-Imp 1)	Pre-implementation will likely focus on longline vessels <57.5', and be available to more vessels than in 2015. *(requires independent funding)*		
	Fieldwork as necessary/ possible for other elements (e.g., pot vessels, >57.5') *(requires independent funding)*	October – initial review for EM analysis. Focus on what type of EM program should go forward, and what regulatory changes are needed to allow it	October – 2017 ADP proposes all EM Pre-Imp vessels in no selection pool
		December – final action on EM analysis	
2017 (Pre-Imp 2)	Pre-Imp 2, potentially expanded to include other fixed gear vessels *(requires independent funding)*	Develop regs for integrating EM	June – 2016 Observer Annual Report provides preliminary analysis to support how to allocate observer fee between observer and EM deployment
			October – 2018 ADP allocates funding between observers and EM deployment
2018	**Integrated observer/EM monitoring program**		

Council decision junctures:

- **February 2015** – SSC review and Council approval of the utility of the 2015 Cooperative Research Plan

Recreational Quota Entity Workgroup

During Staff Tasking, Chairman Hull announced the formation of the Recreational Quota Entity (RQE) Workgroup. Council member Ed Dersham will be the chairman of the workgroup. The members of the workgroup are:
Ken Dole, Area 2C charter; Richard Yamada, Area 2C charter; Open, Area 2C longliner; Andy Mezirow, Area 3A Charter; Martin Spargo, Area 3A Charter; Bruce Gabrys, Area 3A longliner; Duncan Fields, Community Quota Entity
The Council continues to solicit nominations for the open Area 2C longliner seat. It is anticipated that an organizational meeting will be held around the time of the April Council meeting, the date and location will be announced later. Staff contact is Steve MacLean.

(continued from front page)

The Council also received reports from five BSAI groundfish industry sectors about voluntary efforts to comply with the Council's request to reduce halibut PSC mortality by 10% in the second half of 2014, compared to the 2009 to 2013 average. Representatives of the two Amendment 80 cooperatives, the AFA catcher processor and catcher vessel cooperatives, the freezer longline cooperative, and the CDQ groups all spoke to the Council about the extent to which they had achieved the target for 2014, and their intended bycatch reduction efforts for 2015.

In staff tasking, the Council initiated a discussion paper to evaluate possible approaches to link BSAI halibut PSC limits to model-based abundance estimates of halibut. During the joint IPHC meeting, the Council had reviewed an IPHC discussion paper on abundance-based limits, which concluded that while efforts to scale bycatch with direct metrics of halibut abundance were not promising, linking bycatch limits to metrics from the halibut model had potential. Staff will work with the IPHC to further develop such options.

Staff contact is Diana Evans.

Electronic Monitoring

The SSC and the Council endorsed the EM Workgroup's Cooperative Research Plan for 2015, and provided feedback. 2015 fieldwork will focus both on operational testing of EM camera systems in the under 58 ft longline fleet, as well as further research on EM systems to evaluate whether they will successfully achieve the Council's goal to integrate EM used for catch estimation into the Observer Program. The Council also received the final draft of the Alaska Regional Implementation Plan for Electronic Technologies. The plan addresses proposed costs for Alaska electronic monitoring and reporting programs, including a first estimate of funding needs for the planned 2016 EM pre-implementation.

The Council also received testimony on three grant applications to the National Fish and Wildlife Foundation, for projects that support electronic monitoring development in Alaska. The Council will be writing a letter of support for these proprosals. Council staff for this issue is Diana Evans.

Pcod CDQ Development

The Council took final action on a package that would allow small hook-and-line vessel operators, generally fishing for halibut CDQ, more of an opportunity to diversify their operations with Pacific cod CDQ fishing.

The Council chose as the preferred alternative of Alternative 4, with Option 1 and Sub-option 3.3. If approved, this amendment would exempt vessels less than or equal to 46 ft LOA using hook-and-line gear from an LLP license while fishing any CDQ groundfish and it would move these vessels from full observer coverage to partial observer coverage. Rather than being required to purchase an LLP license, interested participants would be placed on an online eligible vessel list by a CDQ manager, and vessels greater than 32 ft and less than or equal to 46 ft LOA would be required to carry a certificate of eligibility (obtained without charge) onboard to signal their exemption. Vessels directed fishing for Pacific cod CDQ would still be required to carry VMS.

The adoption of Sub-option 3.3 adds the flexibility for individual vessel operators to integrate a Pacific cod CDQ fishery before, during, and after their harvest of halibut CDQ. This Sub-option details a procedure that accounts for halibut and allows for directed Pacific cod CDQ fishing to occur even in the event that a participant does not have access to halibut quota (CDQ or IFQ). If halibut quota is not available to a small vessel hook-and-line participant fishing Pacific cod CDQ, they will be required to discard all halibut they catch alongside Pacific cod. At the time of landing, the absence of halibut will signal to the catch accounting system to calculate a small vessel PSC rate. This estimate will be charged to the "small vessel PSC limit" within a group's transferable PSQ. NMFS In-season management and CDQ managers will jointly monitor this account to ensure the prohibition against exceeding the PSQ is not violated. If a participant does have an available quota of halibut and they are retaining both halibut CDQ and Pacific cod CDQ no PSC rate will be estimated for that trip. In this type of dual fishing trip, once the vessel operator begins to retain halibut CDQ or IFQ, they are prohibited from discarding legally-sized halibut for the duration of the trip.

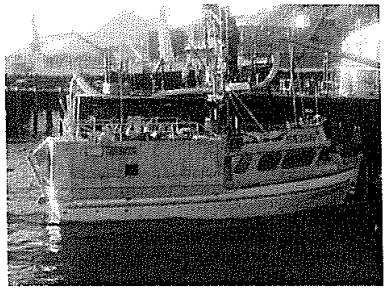
Staff contact is Sarah Marrinan.

Electronic Monitoring in the North Pacific--February 2015 Update

Prepared by: The Alaska Longline Fishermen's Association

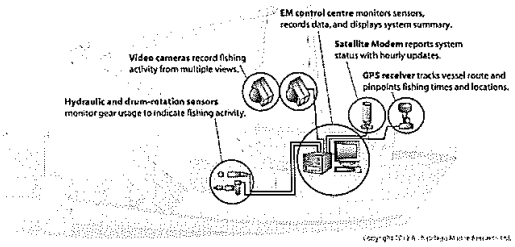
The Restructured North Pacific Observer Program extended coverage to approximately 1200 previously unobserved small boats in Alaska[1].

Many of these boats are too small to safely accommodate an observer without displacing crew, compromising safety, or forcing changes to long standing business relationships with quota share partners.



In 2013, the first year of the restructured Observer program, 2/3rds of small vessels selected to carry an observer requested waivers due to bunk space or life raft limitations.[2] These boats have living space roughly equivalent to the family station wagon; when forced to carry observers, vessel owners fished close to town and kept fishing trips short because crewmembers were sleeping on the floor. Changed fishing behavior generates non-representative or biased data, defeating the purpose of deploying observers.

Electronic monitoring (EM) provides a cost effective at-sea monitoring alternative that secures data important to fishery managers and is compatible with small boats.[3] EM systems are successfully and exclusively used to monitor British Columbia's halibut and sablefish fixed gear fisheries.[4] This same technology is ready to deploy in Alaska.



The Alaska Longline Fishermen's Association and other organizations representing small fixed gear boats in Alaska have conducted EM pilot programs and engaged in EM development since 2010.[5] Despite years of pilot program work, EM is not yet available in the United States as an alternative to observers.

[1] EA/RIR/IRFA for Proposed Amendment 86 to the BSAI FMP and Amendment 76 to the GOA FMP: Restructuring the Program for Observer Procurement and Deployment in the North Pacific, public review draft. NOAA and NPFMC, October 2010.

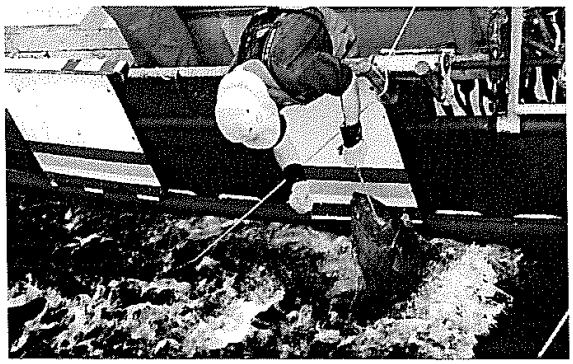
[2] Sept 13 letter from NMFS to NPFMC, P. 8 Table 2. NMFS anticipated placing human observers on 47 small fixed gear vessels between January and June 2013.(column B) 77 vessels were received notifications (Column E), yet only 27 were actually able to carry an observer (Column F) see http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/NMFS_InfoRequestsRpt_913.pdf

[3] Design and implementation of electronic monitoring in the British Columbia groundfish hook and line fishery: a retrospective view of the ingredients of success. Richard D. Stanley1*, Tameezan Karim2, John Koolman†, and Howard McElderry3; ICES Journal of Marine Science; doi:10.1093/icesjms/fsu212

[4] PACIFIC REGION INTEGRATED FISHERIES MANAGEMENT PLAN GROUNDFISH FEBRUARY 21, 2011 TO FEBRUARY 20, 2013. Appendix 2/ http://www.iphc.int/documents/commercial/bc/ifmp2011.pdf

[5] http://www.alfafish.org/observer-programelectronic-monitoring.html

In January 2014 a National EM workshop was convened in Seattle to "*discuss how to move forward with implementing electronic monitoring in federal fisheries from around the country.*" Workshop recommendations identified the importance of "*including all stakeholder in planning from beginning,*" and a warning about "*over reliance on new technology or technologies beyond what is needed to meet program objectives, i.e. "beware of the shiny bauble*" [6]



Nevertheless, NMFS continues to divert resources crucial to EM implementation to research and development of futuristic EM equipment and software that is not currently operational or compatible with small boats. Of the $1.3 million available in 2015 for EM integration in Alaska, more than 50% is obligated to research and development projects for future technologies, approximately 25% is allocated to operationalize a workable program, and the remainder is allocated to infrastructure.[7] In addition, the Alaska Fisheries Science Center intends to dedicate most of the $450, 00 recently awarded to the Center for EM pre-implementation to research and development of automated image analysis, despite the following finding from the Council's Science and Statistical Committee:

> *"...it is not clear how quickly a fully automated EM catch accounting system can come online. Simpler systems have been developed in the British Columbia fixed gear fisheries. These systems have been in use for over a decade now, and are providing detailed catch accounting through a combination of logbooks, dockside monitoring, and partial audits of the EM data to provide for compliance with logbook reporting on discard and retention."*[8] *(February, 2015)*

Small boats around the country need an observer alternative that is compatible with their size and operational constraints. EM can provide that alternative. NMFS resources should be focused on implementation, not R & D. New technology will be incorporated on an ongoing basis as that technology is tested, proven and judged to be compatible.

The perfect should not be the enemy of the good.

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[6] http://www.nmfs.noaa.gov/sfa/management/councils/ccc/2014/Feb/h_nat_electric_monitor_workshop_summary.pdf

[7] See EM workgroup Nov 19-20 Minutes. P 6 & 7. "$570,000 obligated to specific projects (elogbook and sensor integration, image processing and analysis, and an $83,000 NPRB grant to test stereo cameras)", "of the remaining portion of the discretionary funds in the EM budget ($765,000), approximately $125,000 is allocated to research and development fieldwork ($25,000 of camera/computer equipment, and contract costs for 2 personnel), plus 875 hours of video review..." **the budget for the operational testing fieldwork (10 vessels) is estimated at approximately $300,000, plus 400 hours of video review**".... "the remainder (approximately ~$340,000) amalgamates the cost of the programmer (which benefits everybody), the cost of video reviewers (for all fieldwork projects), and PSMFC supplies, services, and overhead for administering the grant."

[8] NPFMC February 2015 SSC minutes