Agenda Item D.1
Situation Summary
September 2013

PACIFIC HALIBUT BYCATCH ESTIMATES

The Northwest Fisheries Science Center (NWFSC) West Coast Groundfish Observer Program (WCGOP) will brief the Council on the status of Pacific halibut bycatch estimates for the 2012 groundfish trawl and fixed gear fisheries (Agenda Item D.1.b, WCGOP Report). Additionally, WCGOP provided further analysis in response to a 2012 request by the Council's Scientific and Statistical Committee (SSC) (Agenda Item D.1.b, WCGOP Response to SSC). The SSC is expected to review and provide comments on the reports. Council action under this agenda item is to review and provide guidance on the Pacific halibut bycatch estimates which will be submitted by the National Marine Fisheries Service (NMFS) to the International Pacific Halibut Commission Area (IPHC) for use in establishing the 2014 Pacific halibut total allowable catch.

Additionally, the NWFSC provided two spatial data products requested by the Council. The first depicts Pacific halibut catch data collected by WCGOP and the At-Sea Hake Observer Program between 2002 and 2011 stratified by gear type (Agenda Item D.1.b, WCGOP Request). The second data product displays Pacific halibut catch by tow in the NWFSC bottom trawl survey from 2003-2008 (Agenda Item D.1.b, Trawl Survey Request).

Council Action:

1. **Utilizing input from the SSC, provide guidance, as necessary, to the completion of the bycatch estimates and its transmittal by NMFS to the IPHC.**
2. **Review data products provided by the NWFSC.**

Reference Materials:

1. Agenda Item D.1.b, WCGOP Report: Pacific Halibut Bycatch in U.S. West Coast Groundfish Fisheries (2002-2012).
2. Agenda Item D.1.b, WCGOP Response to SSC: Supplemental Material for SSC Review of the NWFSC Observer Program Annual Report on Pacific Halibut Bycatch in the U.S. West Coast Groundfish Fisheries: Response to 2012 SSC Comments and Suggestions.
3. Agenda Item D.1.b, WCGOP Request: Council Request for WCGOP Data.
4. Agenda Item D.1.b, Trawl Survey Request: Council Request for the NWFSC Bottom Trawl Survey Data.

Agenda Order:

a. Agenda Item Overview — Kelly Ames
b. National Marine Fisheries Service Recommendation — NW Fisheries Science Center
c. Reports and Comments of Advisory Bodies and Management Entities
d. Public Comment
e. **Council Action:** Review and Provide Guidance on the Pacific Halibut Bycatch Estimate for use by the International Pacific Halibut Commission in 2014 Fisheries

PFMC
08/09/13

Pacific halibut bycatch in U.S. west coast groundfish fisheries (2002-2012)

NOAA FISHERIES

Jason Jannot, Marlene Bellman, Melissa Mandrup & Jon McVeigh

NWFSC Fisheries Observation Science

Northwest Fisheries Science Center Seattle, WA

Take-home Messages

1. Largest discards in 2012
   - IFQ Bottom Trawl
   - Non-nearshore Fixed Gear

2. IFQ Discard below historical LE Trawl
   - 2012 IFQ ~10 mt greater than 2011

3. Non-IFQ estimate: 2012 ~ 2011 ~ 2010

Report Overview

Changes to 2012 Report

Minor changes

Most up-to-date PacFIN data

Pacific halibut bycatch

NOAA FISHERIES

Estimated for:

- **2002-2012**
- **All sectors observed by the NWFSC Groundfish Observer Programs**

Observed Sectors

IFQ Fisheries

- Shoreside non-Hake Groundfish
- LE CA Halibut
- Shoreside Hake
- At-sea Hake

Limited Entry Bottom Trawl 2002-2010

Non-Nearshore Fixed Gear

Nearshore Fixed Gear

Pink Shrimp Trawl

California Halibut Trawl

Sectors or Gears Not Included

- Non-Groundfish Gears
- Fisheries with incidental catch
- Research
- Shoreside WA tribal
- Recreational
- P. halibut directed fishery

IFQ Results

Clarification:

IFQ numbers = all areas, all gears

IBQ numbers = all gears north of 40°10´ N. lat.

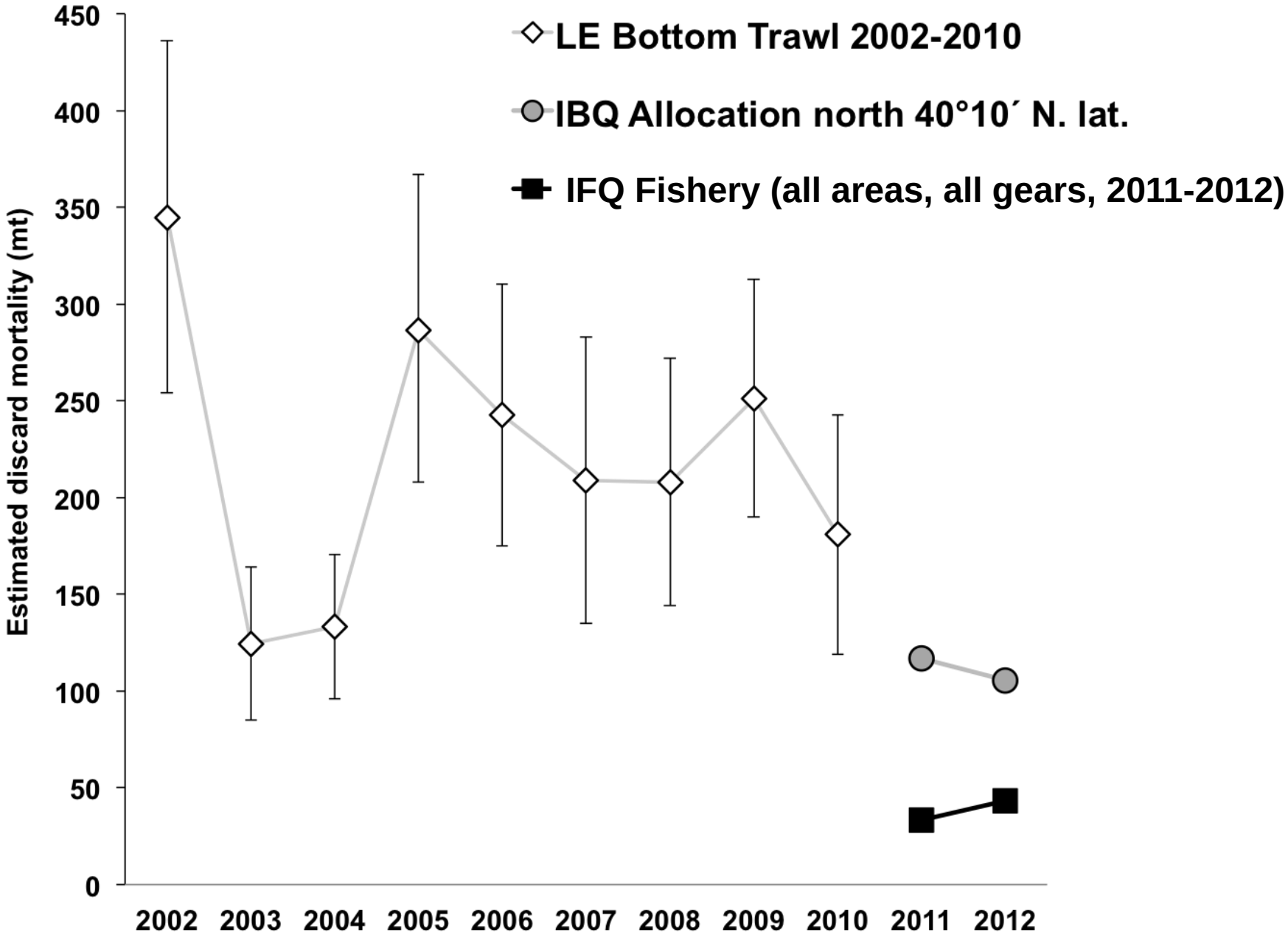
IFQ Sampling

Bottom Trawl

Year	no. sampled tows	no. unsampled tows	% sampled tows	no. partially sampled tows
2011	13078	45	99.7	107
2012	12824	43	99.7	153

Fixed Gear

Year	no. sampled sets	no. unsampled sets	% sampled sets
2011	2137	3	99.9
2012	2199	0	100


LE Bottom Trawl 2002-2010
IBQ Allocation north 40°10´ N. lat.
IFQ Fishery (all areas, all gears, 2011-2012)
Estimated discard mortality (mt)
450
400
350
300
250
200
150
100
50
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

Bars = 95% C.I.

IFQ In-season estimates

Year	Total IBQ mortality of P. halibut (mt)	
	Report	VAS
2011	33.08	32.14
2012	42.65	45.65

Why Historically Low?

Bottom trawl tow hours are below historical range

			Tow Hours	
Area	**Sector**	**Year**	**0 to 60 fathoms**	**> 60 fathoms**
North of Pt Chehalis				
	LE Trawl	2002-2010	967-3,539	5,862-13,766
	LE Trawl	2009	967	11,055
	LE Trawl	2010	*	8,616
	IFQ B.Trawl	2011	836	4,269
	IFQ B.Trawl	2012	704	5,142
South of Pt Chehalis				
	LE Trawl	2002-2010	2,737-9,568	39,198-70,012
	LE Trawl	2009	5,152	67,873
	LE Trawl	2010	2,737	56,982
	IFQ B.Trawl	2011	2,293	32,469
	IFQ B.Trawl	2012	1,943	29,910

Why 2012 > 2011?

	Difference (2012 – 2011)	
IFQ Gear	**P. halibut (mt, no mortality rate)**	**P. halibut (mt, mortality rate)**
Bottom Trawl	+ 10.7	+ 8.9
Hook & Line	+ 8.60	+ 1.3
Pot	- 1.40	- 0.4

Why 2012 > 2011?

	Difference (2012 – 2011)	
IFQ Gear	**P. halibut (mt, no mortality rate)**	**P. halibut (mt, mortality rate)**
Bottom trawl	+ 10.7	+ 8.9
Hook & Line	+ 8.60	+ 1.3
Pot	- 1.40	- 0.4
	Total Tow Hours	**Total Sets**
Bottom Trawl	- 2058.5	
Hook & Line		- 124
Pot		+ 186

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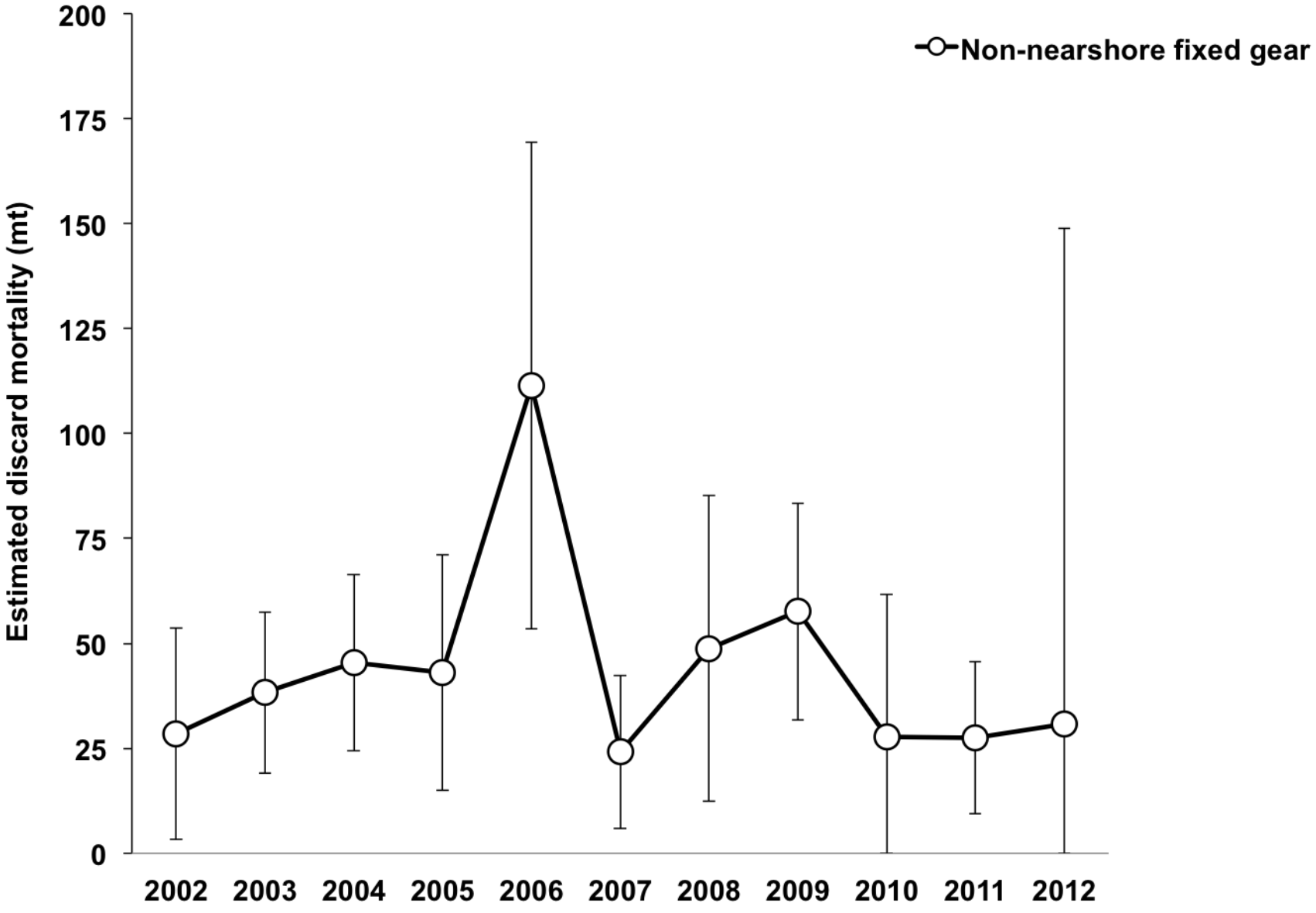
Non-IFQ, Non-Nearshore Fixed Gear

Non-Nearshore Fixed Gear

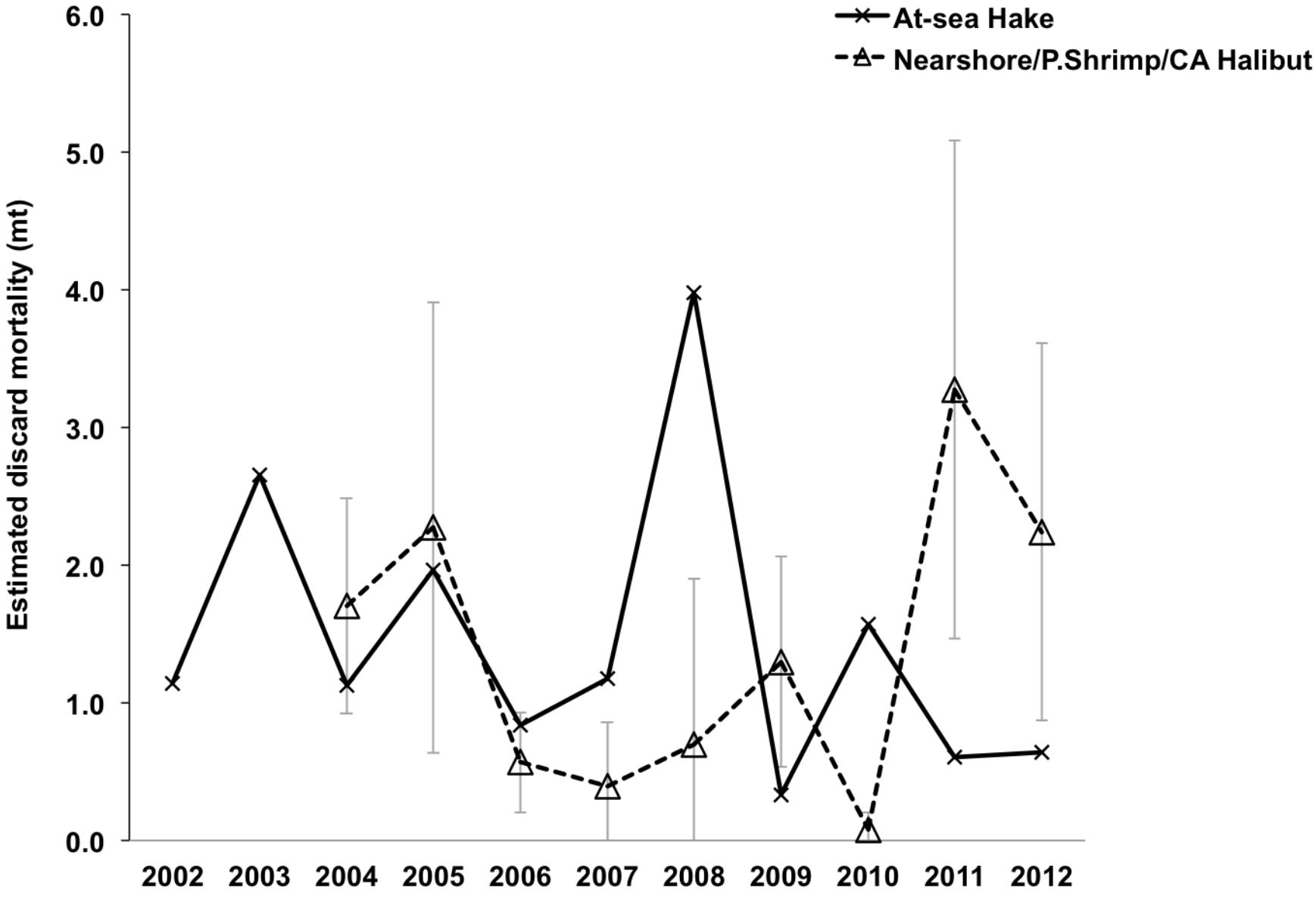


Bars = 95% C.I.

NOAA FISHERIES

Other Sectors
At-sea Hake, Nearshore Pink Shrimp, CA Halibut

Other Sectors



Bars = 95% C.I.

Take-home Messages

1. Largest discards in 2012
   - IFQ Bottom Trawl
   - Non-nearshore Fixed Gear

2. IFQ Discard below historical LE Trawl
   - 2012 IFQ ~10 mt greater than 2011

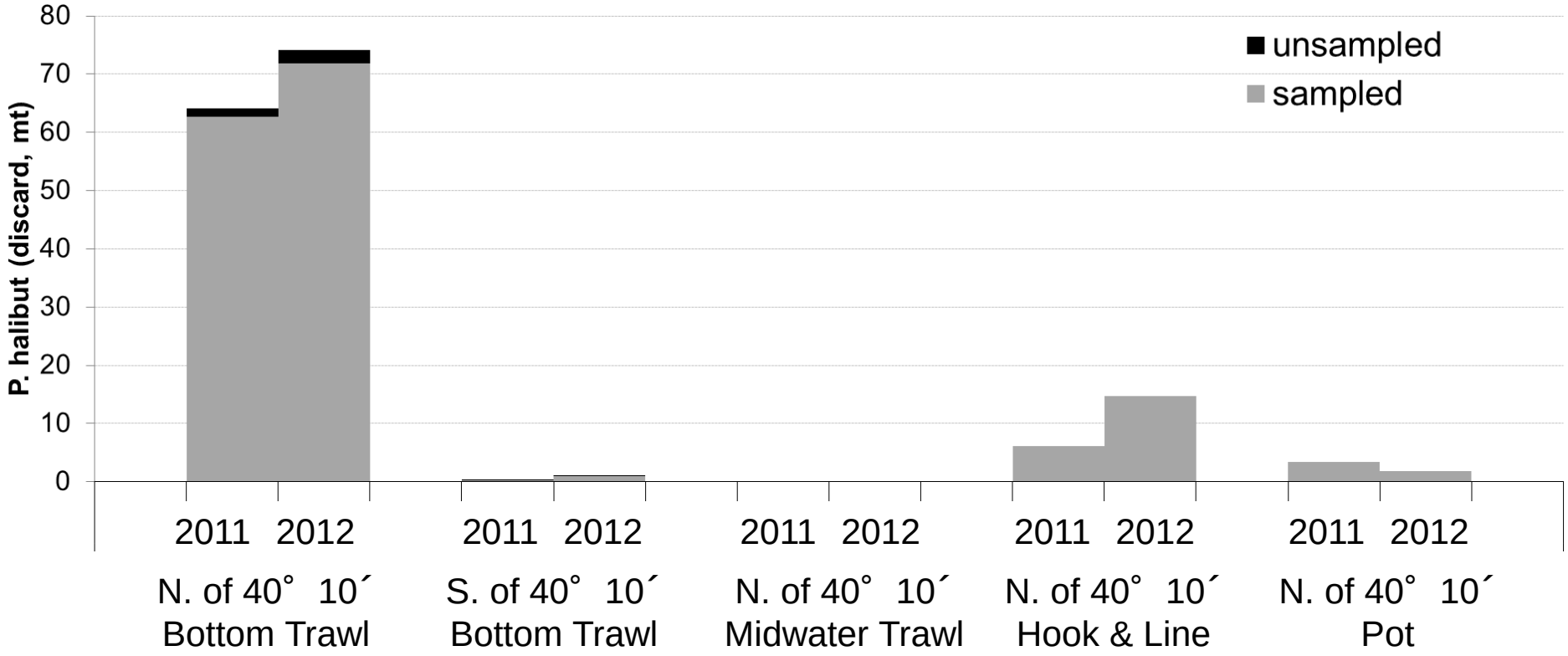
3. Non-IFQ estimate: 2012 ~ 2011 ~ 2010

NOAA FISHERIES

Thank you

Questions?

IFQ: Sampled vs. Unsampled



Comparison

Area / lbs per tow hour	Year	0 to 60 fathoms: Observed Discard ratio (kg/hr)	SE	Estimated Gross discard estimate (kg)	95% CI lower	95% CI upper		> 60 fathoms: Observed Discard ratio (kg/hr)	SE	Estimated Gross discard estimate (kg)	95% CI lower	95% CI upper
North of Pt Chehalis												
≤ 125 lbs												
LE Trawl	2002	6.85	0.99	6,261	4,483	8,040	**LE Trawl**	5.62	0.89	32,795	22,586	43,004
	2003	1.04	0.40	364	87	640		1.40	0.56	7,354	1,608	13,100
	2004	6.49	1.61	5,235	2,682	7,788		1.34	0.29	3,457	1,979	4,935
	2005	9.75	2.90	5,566	2,325	8,808		12.59	6.94	42,483	0	88,428
	2006	7.84	1.64	9,254	5,453	13,054		5.16	1.06	17,259	10,327	24,190
	2007	11.72	3.56	10,868	4,401	17,335		3.35	1.47	14,420	2,041	26,799
	2008	2.35	0.66	953	428	1,478		1.18	0.20	8,139	5,432	10,846
	2009	7.42	1.50	2,222	1,340	3,104		3.31	0.62	21,963	13,846	30,079
	2010	» 7.05	0.76	626	494	759		0.86	0.26	5,189	2,107	8,271
IFQ B.Trawl	2011	7.43	5.61	238	223	254	**IFQ B.Trawl**	1.91	2.05	3,571	3,551	3,592
IFQ B.Trawl	2012	9.61	11.51	829	779	878	**IFQ B.Trawl**	1.73	1.25	2,510	2,497	2,523
> 125 lbs												
LE Trawl	2002	10.88	1.05	21,973	17,808	26,138	**LE Trawl**	46.28	5.97	367,146	274,388	459,904
	2003	2.55	0.70	3,003	1,388	4,617		20.65	3.40	109,201	73,947	144,455
	2004	12.54	1.55	34,254	25,944	42,564		32.46	4.75	106,598	76,023	137,173
	2005	12.48	1.64	24,818	18,433	31,204		38.88	3.39	236,715	196,312	277,117
	2006	12.34	1.49	23,006	17,566	28,447		45.08	6.66	172,672	122,674	222,669
	2007	14.33	5.30	14,865	4,090	25,641		28.03	6.33	88,142	49,137	127,147
	2008	7.92	1.52	7,428	4,628	10,229		35.53	5.33	145,011	102,366	187,656
	2009	22.15	3.94	14,796	9,634	19,958		38.71	4.42	171,175	132,907	209,443
	2010	» 11.95	0.68	3,208	2,847	3,569		22.16	4.87	57,367	32,681	82,053
IFQ B.Trawl	2011	8.86	1.35	7,126	7,119	7,134	**IFQ B.Trawl**	7.54	0.64	18,076	18,072	18,079
IFQ B.Trawl	2012	6.38	1.44	3,944	3,938	3,950	**IFQ B.Trawl**	7.50	0.77	27,707	27,702	27,712

IFQ Unsampled Methods

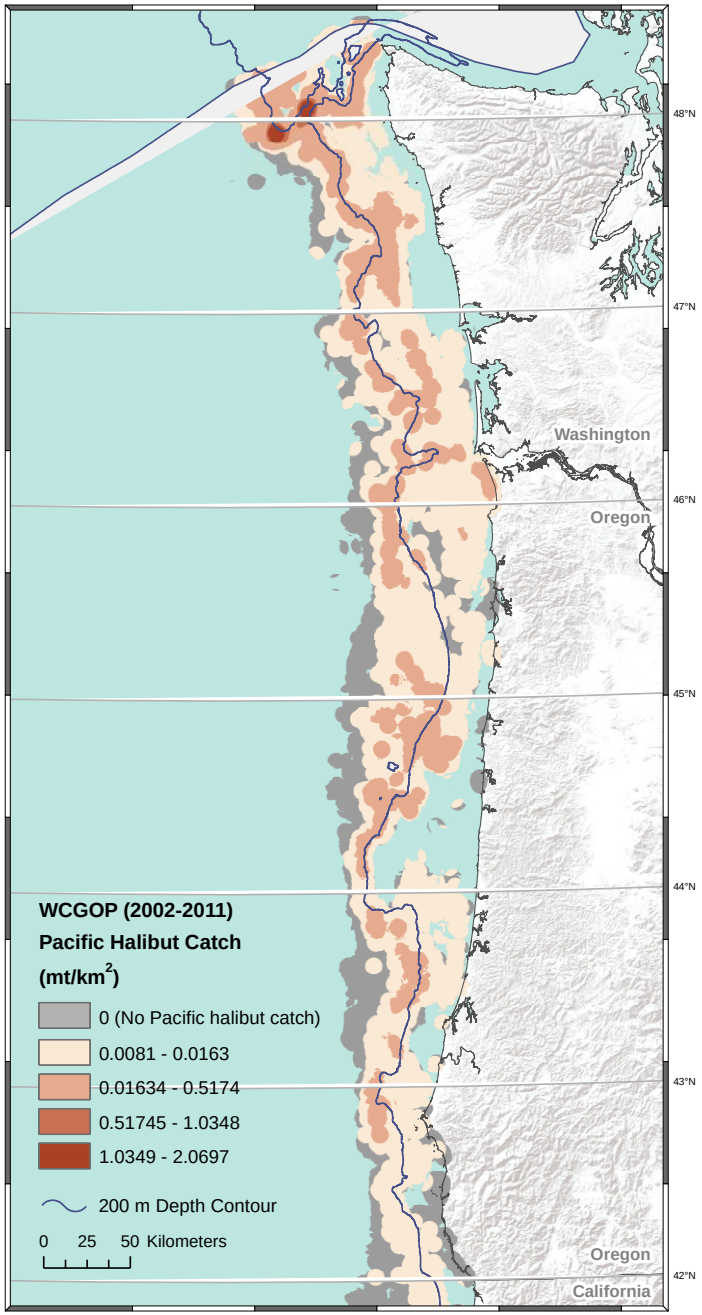
Entire Haul - Proportion of sampled P. halibut weight to sampled weight of ***all species***

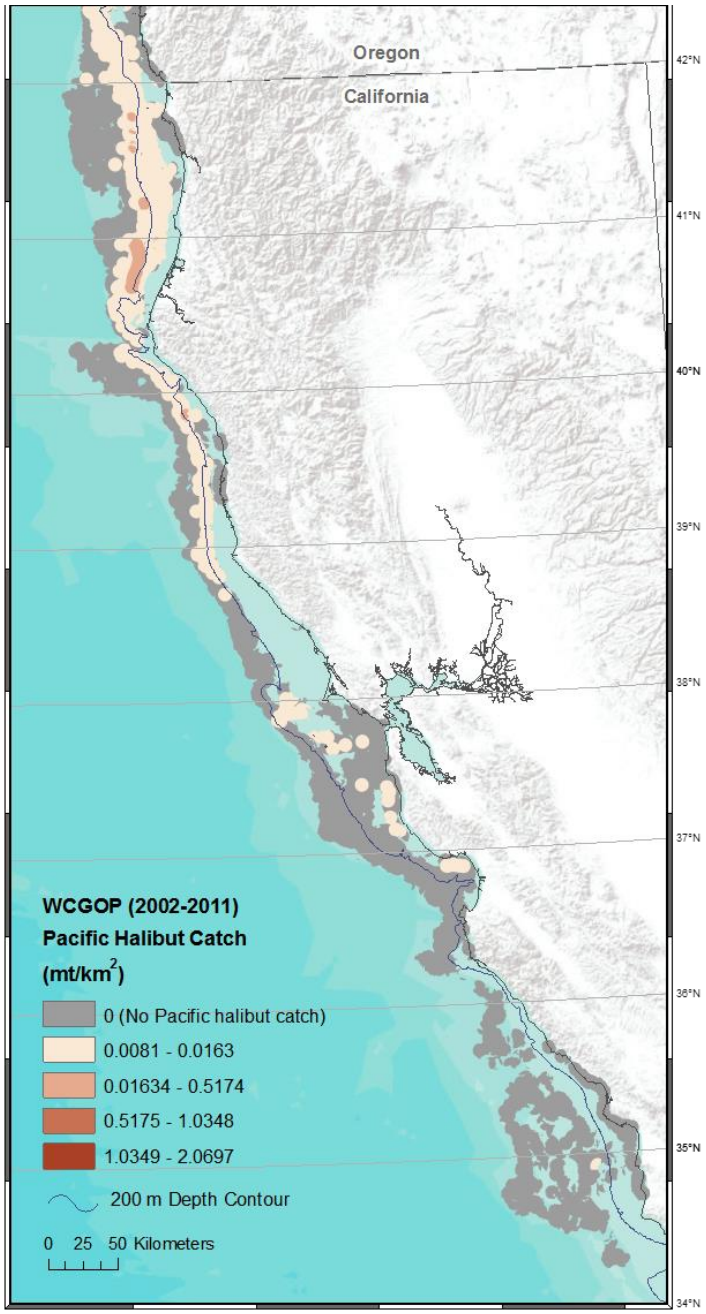
Partial Haul - Proportion of sampled P. halibut weight to sampled weight of ***category species*** (IFQFF, IFQM, NIFQ)

Viability Analysis

m_c	Rate
m_{exc}	0.20
m_{poor}	0.55
m_{dead}	0.90

m_c	Rate
m_{exc}	0.00
m_{poor}	1.00
m_{dead}	1.00





M. Bellman 8/16/2012

WEST COAST GROUNDFISH OBSERVER PROGRAM (WCGOP)
SUPPLEMENTAL DATA

The following document contains the summary data used to derive the Figures in Agenda Item D.1.b, WCGOP Request.

Table 1. West Coast Groundfish Observer Program Observations - Bottom Trawl Gear (Figures 1a and 1b). The state summary is based on the state of the return port for the trip, assigned to each tow within a trip. It is **not** based on the geographic coordinates of the fishing tow.

YEAR	STATE	NUM_VESS_TOT	NUM_TOWS_TOT	NUM_VESS_wPHLB	NUM_TOWS_wPHLB
2002	WA	10	513	10	384
2003	WA	10	203	10	96
2004	WA	11	498	10	314
2005	WA	11	630	11	415
2006	WA	10	402	10	292
2007	WA	7	166	7	91
2008	WA	7	236	5	159
2009	WA	8	397	8	257
2010	WA	7	158	7	85
2011	WA	9	929	8	419
2002	OR	58	1539	47	589
2003	OR	58	1245	41	324
2004	OR	55	1881	49	493
2005	OR	59	1960	50	890
2006	OR	53	1776	45	734
2007	OR	58	1567	49	604
2008	OR	66	2081	59	663
2009	OR	67	3023	61	1025
2010	OR	55	1862	47	445
2011	OR	46	5866	44	1752
2002	CA	67	1042	18	57
2003	CA	65	1094	13	30
2004	CA	47	1416	12	95
2005	CA	47	1398	12	88
2006	CA	31	962	12	114
2007	CA	39	1051	17	123
2008	CA	39	1136	18	205
2009	CA	33	972	18	142
2010	CA	27	712	14	69
2011	CA	36	2613	14	106

Table 2. At-Sea Hake Observer Program Observations - Midwater Trawl (Figure 2). No state summary is possible since this fishery has at-sea processing.

YEAR	NUM_VESS_TOT	NUM_TOWS_TOT	NUM_VESS_wPHLBcatch	NUM_TOWS_wPHLBcatch
2002	9	1748	5	21
2003	10	1812	2	33
2004	10	2592	6	23
2005	12	2991	6	41
2006	15	2872	9	34
2007	15	2843	14	49
2008	13	3576	12	169
2009	11	1858	7	25
2010	12	2470	10	54
2011	14	2973	11	31

Table 3. West Coast Groundfish Observer Program Observations- Fixed Gear (HKL - Hook-and-line gear, POT - Pot gear) (Figures 3a, 3b, 4a, 4b). The state summary is based on the state of the return port for the trip, assigned to each set within a trip. It is **not** based on the geographic coordinates of the fishing set.

YEAR	STATE	NUM_VESS_TOT	NUM_SETS_TOT	NUM_VESS_HKL	NUM_SETS_HKL	NUM_VESS_HKLwPHLB	NUM_SETS_HKLwPHLB	NUM_VESS_POT	NUM_SETS_POT	NUM_VESS_POTwPHLB	NUM_SETS_POTwPHLB
2002	WA	9	209	9	209	9	151	NA	NA	NA	NA
2003	WA	10	258	9	224	9	177	1	34	1	1
2004	WA	7	175	7	175	7	112	NA	NA	NA	NA
2005	WA	11	491	10	396	10	286	1	95	1	6
2006	WA	11	374	11	374	11	279	NA	NA	NA	NA
2007	WA	17	438	13	414	12	305	4	24	1	2
2008	WA	18	376	18	367	15	268	2	9	NA	NA
2009	WA	10	234	10	231	9	157	2	3	NA	NA
2010	WA	16	503	15	470	12	206	3	33	1	2
2011	WA	20	963	17	637	14	262	8	326	3	28
2002	OR	14	248	11	122	9	49	3	126	2	17
2003	OR	8	336	4	85	4	57	4	251	2	3
2004	OR	34	390	33	274	7	81	2	116	1	73
2005	OR	58	729	53	335	12	105	5	394	4	47
2006	OR	61	595	60	416	9	53	4	179	3	115
2007	OR	53	475	50	329	14	58	5	146	3	46
2008	OR	65	703	57	361	16	85	8	342	5	138
2009	OR	60	323	57	288	13	41	4	35	NA	NA
2010	OR	74	769	69	512	16	138	7	257	4	71
2011	OR	84	1459	77	763	25	237	8	696	7	129
2002	CA	13	193	10	72	1	1	3	121	NA	NA
2003	CA	69	625	59	469	1	1	13	156	NA	NA
2004	CA	111	851	86	533	2	3	38	318	NA	NA
2005	CA	84	429	65	357	3	16	21	72	NA	NA
2006	CA	86	546	65	366	2	5	23	180	2	5
2007	CA	101	624	84	538	NA	NA	19	86	1	2
2008	CA	84	395	65	334	3	19	19	61	3	3
2009	CA	88	525	73	423	2	2	17	102	2	11
2010	CA	101	732	74	626	1	5	29	106	3	4
2011	CA	116	1656	85	832	2	4	34	824	1	2

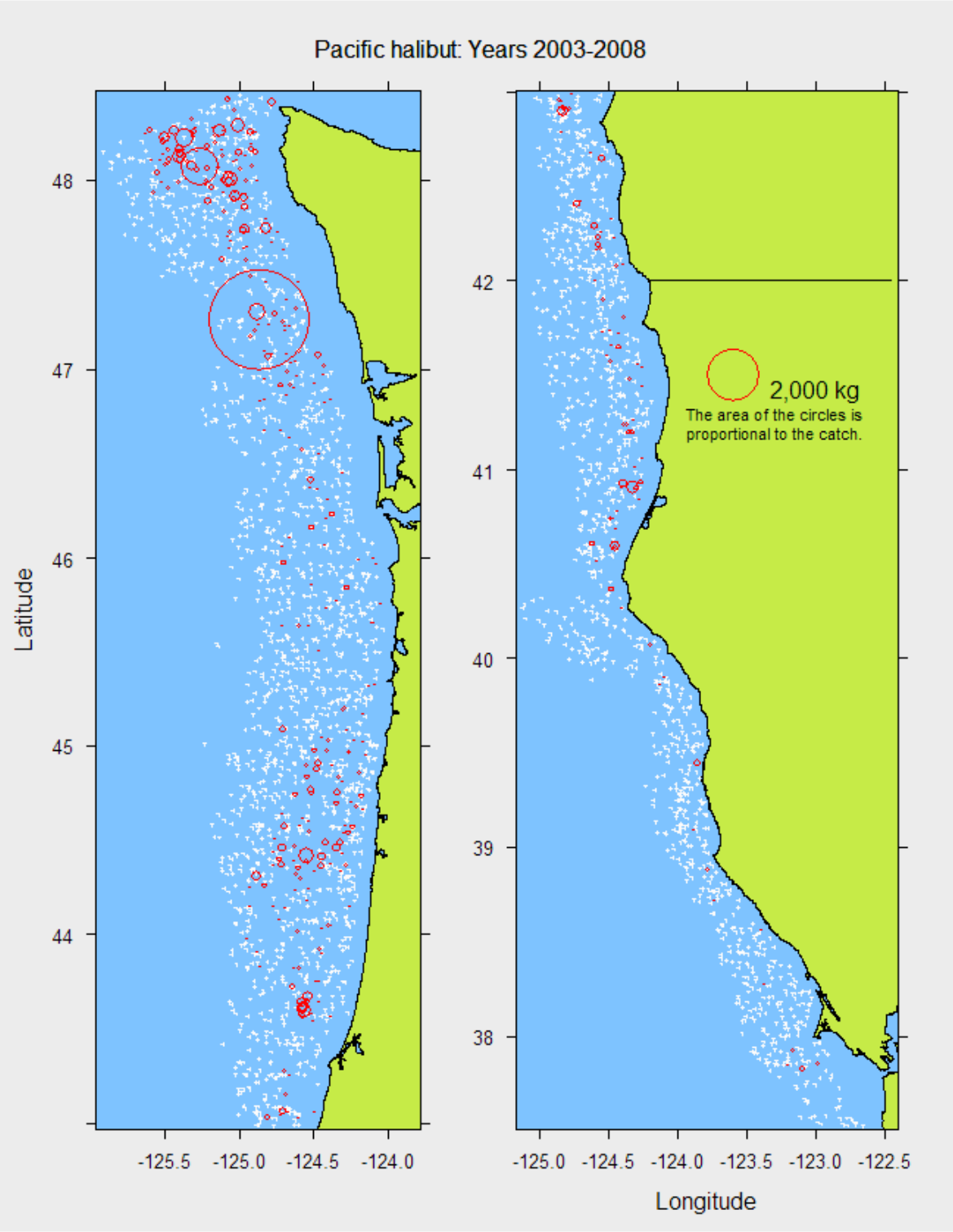


Figure 1. Pacific halibut catch by tow in the NWFSC bottomtrawl survey for years 2003-2008. The area (not the diameter) of the red circles is proportional to the catch. The white crosses are tows with no halibut catch.

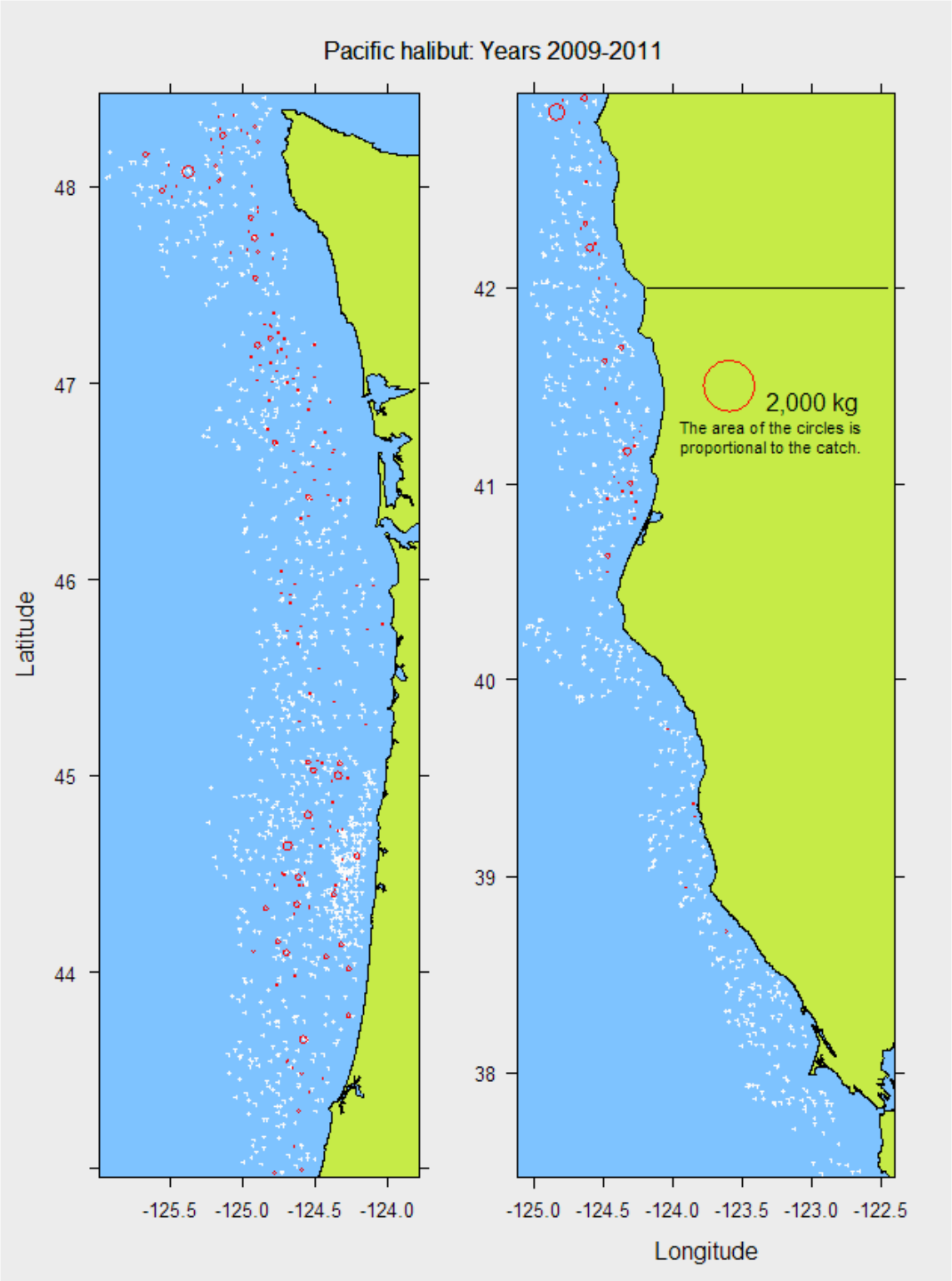


Figure 2. Pacific halibut catch by tow in the NWFSC bottomtrawl survey for years 2009-2011. The area (not the diameter) of the red circles is proportional to the catch. The white crosses are tows with no halibut catch.

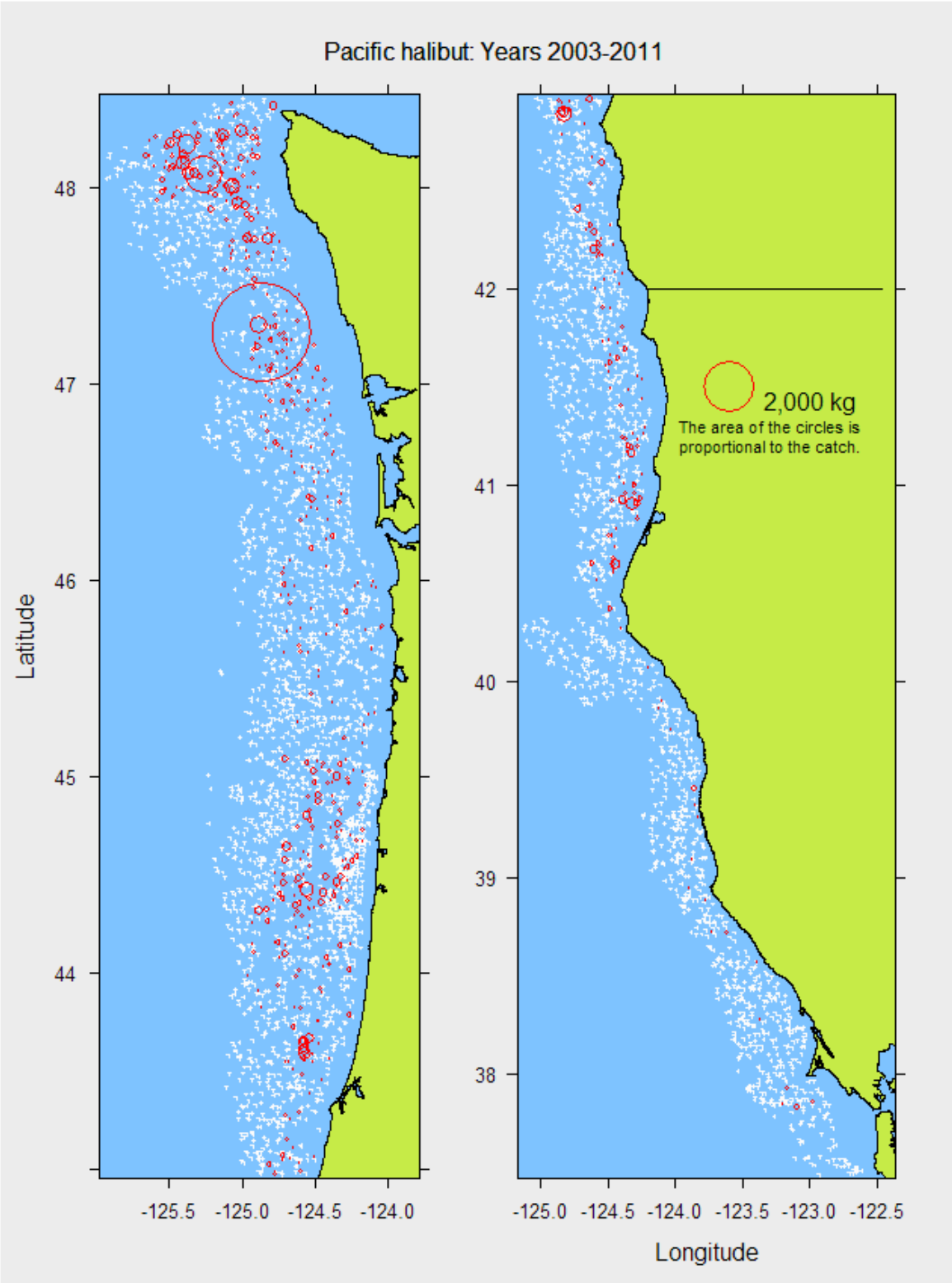


Figure 3. Pacific halibut catch by tow in the NWFSC bottomtrawl survey for years 2003-2011. The area (not the diameter) of the red circles is proportional to the catch. The white crosses are tows with no halibut catch.

Pacific Halibut Bycatch in U.S. West Coast Groundfish Fisheries (2002-2012)

Jason E. Jannot[1], Marlene A. Bellman[1], Melissa Mandrup[2], Neil B. Riley[1], Jon McVeigh[1]

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Publication Date: August 2013

This document should be cited as follows:

Jannot, J.E., M.A. Bellman, M. Mandrup, N.B. Riley and J. McVeigh. 2013. Pacific halibut bycatch in the U.S. west coast groundfish fisheries (2002-2012). NOAA Fisheries, NWFSC Observer Program, 2725 Montlake Blvd E., Seattle, WA 98112.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Pacific halibut mortality estimates are provided for 2002 through 2012 from all fishery sectors observed by the Northwest Fishery Science Center Groundfish Observer Program. These included:

- IFQ fisheries (2011-present)
- Limited entry (LE) bottom trawl (2002-2010)
- Non-nearshore fixed gear targeting groundfish (2002-present)
- Nearshore fixed gear (2003-present)
- Pink shrimp trawl (2004-present)
- California halibut trawl (2002-present)
- At-sea Pacific hake (2002-present)

Final estimates are shown in Table ES-1, which is synonymous with Table 22 in the report. In 2012, the IFQ non-hake bottom trawl sector constituted the largest source of discard mortality of Pacific halibut (P. halibut) among the sectors analyzed, followed by the non-nearshore fixed gear sector. Within the non-nearshore fixed gear sector, the majority of 2012 estimated discard mortality occurred in the limited entry (LE) sablefish endorsed component, which consists of federally permitted vessels fishing sablefish tier quota during the primary season from April through October. Specifically, discard rates for the non-nearshore fixed gear sector were highest on LE sablefish endorsed vessels fishing with longline gear in the area north of Point Chehalis, Washington. A smaller amount of Pacific halibut mortality also occurred on LE non-sablefish endorsed vessels fishing longline gear and open access (OA) vessels targeting non-nearshore groundfish species with hook-&-line gear.

The 2012 estimate of IFQ Pacific halibut discard mortality (both north and south of 40º 10’ N. lat.) was about 10 mt greater (43.29 mt = sum of 2012 IFQ, summing values from Table ES1 might result in small difference due to rounding) than the 2011 estimate (33.32 mt, Figure ES1). Results from prior years indicate that discard mortality of Pacific halibut increased from 2003 through 2006 and then dropped in 2007. Discard mortality increased gradually during the 2007-09 time period, but dropped again in 2010 (Figure ES-1). Pacific halibut discard in the nearshore fixed gear sector, pink shrimp trawl fishery, California halibut trawl fishery, and at-sea Pacific hake fishery represents a very small component of overall total Pacific halibut mortality.

The base data used in this 2013 report has been updated to include the most recent revisions (if any) for all years to both the observer and Pacific Fisheries Information Network (PacFIN) databases. The estimates for all sectors and years (except LE Trawl 2002-2010) have been recalculated based on this up-to-date base data. To provide more accurate P. halibut estimates, we made a new assumption regarding unsampled catch on IFQ fishing trips: if some portion of the catch was unsampled but Pacific halibut was sampled, we assume that all Pacific halibut were sampled and therefore we do not expand these hauls for unsampled Pacific halibut. This occurred on a small portion of the hauls (1.3% in 2011, 0.7% in 2012) and is consistent with observer training and discard reporting to the the Vessel Account System. In all other respects, this 2013 report uses the same methods as reported in 2012.

Table ES1. Pacific halibut discard mortality estimates (metric tons, 2002-2012) for all sectors observed by the NWFSC Groundfish Observer Program. Discard mortality rates were applied in the bottom trawl fisheries (LE and IFQ), IFQ hook-&-line, IFQ pot, and non-IFQ, non-nearshore fixed gear sectors, for which some information regarding survivorship was available. All weights are round weight units (i.e, whole fish). Rounding of weight might mask very small weights in some categories. Tables with unrounded values are provided on the NOAA/NWFSC/FOS website. (*) Confidential data.

																Totals	
																Mortality rate applied	No mortality rate
Year	LE bottom trawl	IFQ fishery (2011 - 2012)						Non-nearshore fixed gear			Nearshore fixed gear[1]	Pink shrimp[1]	CA halibut‡[1]	At-sea hake[1]	Total discard mortality	LE bottom trawl/IFQ + Non-nearshore fixed gear	Nearshore + Pink shrimp + CA halibut +At-sea hake
		Shoreside hake[1]	LE CA halibut[1]	Bottom trawl	Midwater trawl[1]	Hook-and-Line	Pot	LE endorsed	LE non-endorsed	OA							
2002	344.8							22.8	0.0	-	-	-	-	1.1	368.8	367.6	1.1
2003	124.4							30.2	0.0	-	0.0	-	0.0	2.7	157.3	154.7	2.7
2004	133.1							38.4	0.0	-	1.0	0.0	0.7	1.1	174.4	171.5	2.8
2005	286.5							33.8	0.0	-	2.2	0.1	0.0	2.0	324.5	320.3	4.2
2006	242.5							104.1	0.0	-	0.5	-	-	0.8	347.9	346.6	1.4
2007	208.8							20.3	0.3	3.6	0.1	0.2	0.1	1.2	234.5	232.9	1.6
2008	207.8							41.5	0.5	6.8	0.4	0.0	0.3	4.0	261.3	256.6	4.7
2009	251.1							51.6	0.0	5.9	1.3	0.0	0.0	0.3	310.3	308.7	1.6
2010	181.0							22.4	0.1	5.3	0.1	0.0	0.0	1.6	210.5	208.8	1.7
2011		0.03	0.0	31.4	*	1.0	0.9	21.9	3.4	2.2	3.1	0.2	0.0	0.6	64.8	60.9	3.9
2012		0.00	*	40.4	0.05	2.3	0.5	24.3	2.5	4.0	2.2	0.0	0.0	0.6	77.0	74.1	2.9
Total	1980.1	0.03	0.0	71.8	0.05	3.3	1.4	411.4	6.8	27.7	10.9	0.5	1.1	16.0	2531.2	2502.7	28.5

‡ Since 2011, CA Halibut only includes Open Access sector because the Limited Entry sector is covered under the IFQ Fishery.

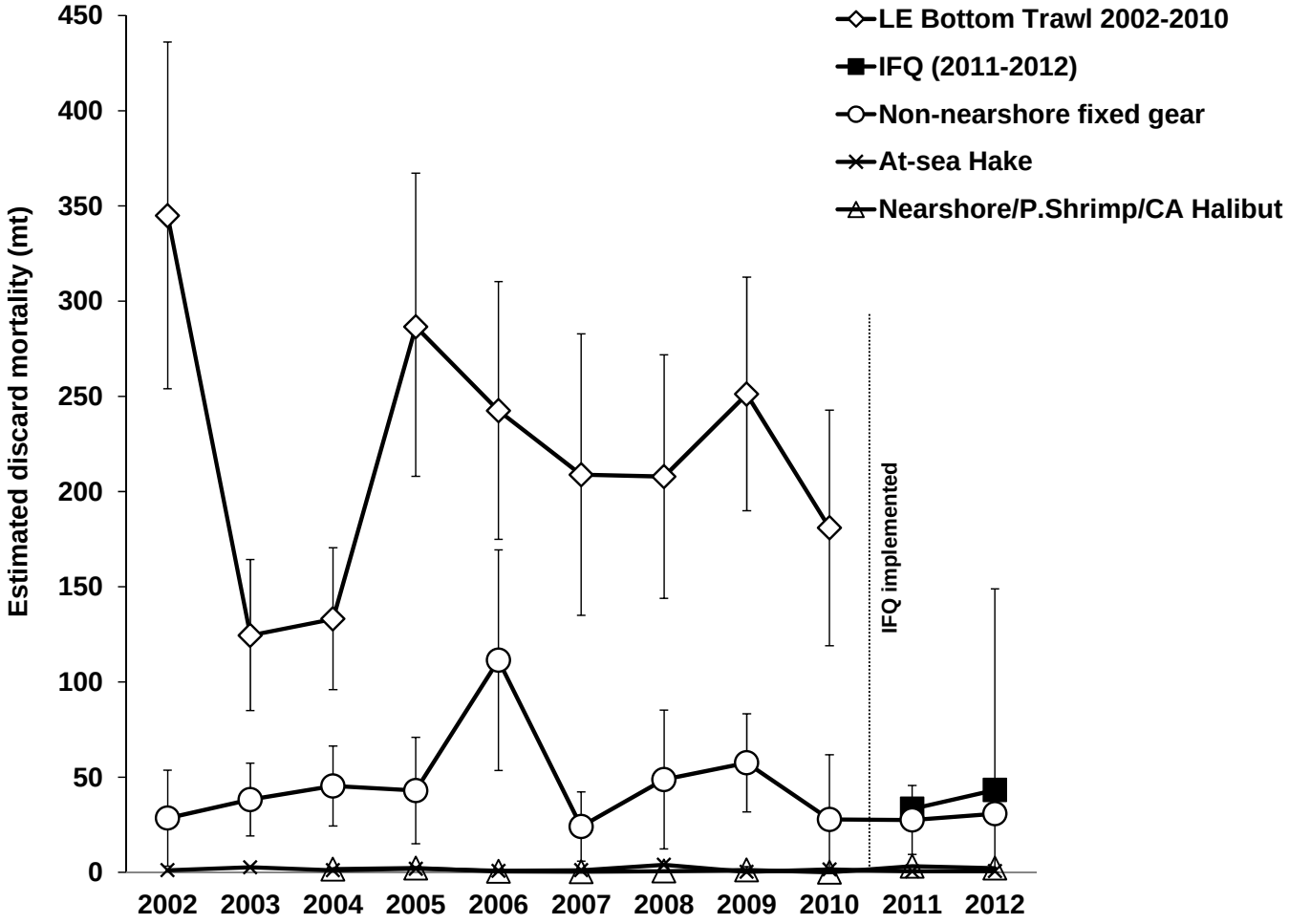
"-" Indicates years of incomplete or no observer coverage for which estimates are not available

[1]Mortality rate of 100% applied

Table ES2. A comparison of Pacific halibut IBQ total discard mortality (mortality rates applied; mt, north of 40°10′ N latitude) between the Vessel Account System (VAS) and the NWFSC Observer Program final estimation. The two systems use different approaches (see Methods) to estimate P. halibut mortality.

Year	Total IBQ mortality of P. halibut (mt)	
Source	VAS	Observer Program
2011	32.14	33.08
2012	45.65	42.65

Figure ES1. Total estimated P. halibut discard mortality (metric tons) for 2002-2012 from all sectors observed by the NWFSC Groundfish Observer Program. Estimates are not included for sectors and years where there were insufficient observer data.



INTRODUCTION

Pacific halibut (*Hippoglossus stenolepis*) is found in coastal waters throughout the North Pacific. Off the west coast of the United States, it inhabits continental shelf areas (< 150 fm) from Washington to central California (Clark and Hare 1998). Pacific halibut has long supported a directed commercial fishery in the US and Canada, but it is also caught as bycatch in other fisheries that target demersal species inhabiting similar depths and seafloor habitat types (Chastain 2012). The objective of this report is to provide estimates of Pacific halibut bycatch in the U.S. west coast groundfish fishery from 2002-2012.

West Coast Groundfish Fishery

The west coast groundfish fishery is a multi-species fishery that utilizes a variety of gear types. The fishery harvests species designated in the Pacific Coast Groundfish Fishery Management Plan (FMP; PFMC PFMC 2011) and is managed by the Pacific Fishery Management Council (PFMC). Over 90 species are listed in the groundfish FMP, including a variety of rockfish, flatfish, roundfish, skates, and sharks. These species are found in both federal (> 5.6 km) and state waters (0-5.6 km). Groundfish are both targeted and caught incidentally by trawl nets, hook-&-line gears, and fish pots.

Under the FMP, the groundfish fishery consists of four management components:

The Limited Entry (LE) component encompasses all commercial fishers who hold a federal limited entry permit. The total number of limited entry permits available is restricted. Vessels with an LE permit are allocated a larger portion of the total allowable catch for commercially desirable species than vessels without an LE permit.

The Open Access (OA) component encompasses commercial fishers who do not hold a federal LE permit. Some states require fishers to carry a state issued OA permit for certain OA sectors.

The Recreational component includes recreational anglers who target or incidentally catch groundfish species. Estimates of P. halibut catch in recreational fisheries are compiled by the IPHC and are not covered by this report.

The Tribal component includes native tribal commercial fishers in Washington State that have treaty rights to fish groundfish. Estimates of Pacific halibut bycatch from tribal fisheries are compiled by the IPHC and are not included in this report, with the exception of the observed tribal at-sea Pacific hake sector which are included as part of the "At-sea hake" values included in ES Table1 and Table 22.

These four components can be further subdivided into sectors based on gear type, target species, permits and other regulatory factors. This report includes data from the following sectors:

- IFQ fishery (formerly LE bottom trawl and At-sea hake, 2002-2010): This sector is subdivided into the following components due to differences in gear type and target strategy:

    - Bottom trawl: Bottom trawl nets are used to catch a variety of groundfish species. Catch is delivered to shore-based processors.
    - Midwater non-hake trawl: Midwater trawl nets are used to target mid-water non-hake species. Catch is delivered to shore-based processors.
    - Pot: Pot gear is used to target groundfish species, primarily sablefish. Catch is delivered to shore-based processors.
    - Hook-and-line: Longlines are primarily used to target groundfish species, mainly sablefish. Catch is delivered to shore-based processors.
    - LE California halibut trawl: Bottom trawl nets are used to target California halibut by fishers holding a state California halibut permit and a LE federal trawl groundfish permit. Catch is delivered to shore-based processors.
    - Shoreside hake trawl: Midwater trawl nets are used to catch Pacific hake. Catch is delivered to shore-based processors.
    - At-sea motherships and catcher-processors: Midwater trawl nets are used to catch Pacific hake. Catcher vessels deliver unsorted catch to a mothership. The catch is sorted and processed aboard the mothership. Catcher-processors catch and process at-sea. This component also includes the at-sea processing component of the tribal sector. The tribal sector must operate within defined boundaries in waters off Northwest Washington. The catch can be delivered to a contracted mothership by catcher vessels for processing or be caught and processed by a contracted catcher-processor.
- OA pink shrimp trawl: Trawl nets are used to target pink shrimp. Catch is delivered to shore-based processors.
- OA California halibut trawl: Trawl nets are used to target California halibut by fishers holding a state California halibut permit. Catch is delivered to shore-based processors.
- LE fixed gear (non-nearshore): This sector is subdivided into two components due to differences in permitting and management:
    - LE sablefish endorsed season: Longlines and pots are used to target sablefish. Catch is generally delivered to shore-based processors.
    - LE non-sablefish endorsed: Longlines and pots are used to target groundfish, primarily sablefish and thornyheads. Catch is delivered to shore-based processors or sold live.
- OA fixed gear (non-nearshore): Fixed gear, including longlines, pots, fishing poles, stick gear, etc. is used to target non-nearshore groundfish. Catch is delivered to shore-based processors.
- Nearshore fixed gear: A variety of fixed gear, including longlines, pots, fishing poles, stick gear, etc. are used to target nearshore rockfish and other nearshore species managed by state permits in Oregon and California. Catch is delivered to shore-based processors or sold live.

Northwest Fisheries Science Center (NWFSC) Groundfish Observer Program

The NWFSC Groundfish Observer Program observes commercial sectors that target or take groundfish as bycatch. The observer program has two units: the West Coast Groundfish Observer Program (WCGOP) and the At-Sea Hake Observer Program (A-SHOP).

The NWFSC Groundfish Observer Program was established in May 2001 by NOAA Fisheries

(NMFS) in accordance with the Pacific Coast Groundfish Fishery Management Plan (50 CFR Part 660) (50 FR 20609). This regulation requires all vessels that catch groundfish in the US EEZ from 3-200 miles offshore carry an observer when notified to do so by NMFS or its designated agent. Subsequent state rule-making has extended NMFS's ability to require vessels fishing in the 0-3 mile state territorial zone to carry observers.

The NWFSC Groundfish Observer Program's goal is to improve estimates of total catch and discard by observing groundfish fisheries along the U.S. west coast. The WCGOP and A-SHOP observe distinct sectors of the groundfish fishery. The WCGOP observes multiple sectors of the groundfish fishery, including: IFQ shore-side delivery of groundfish and Pacific hake, at-sea mothership catcher-vessels fishing for Pacific hake, LE and OA fixed gear, and state-permitted nearshore fixed gear sectors. The WCGOP also observes several fisheries that incidentally catch groundfish, including the California halibut trawl and pink shrimp trawl fisheries. The A-SHOP observes the IFQ fishery that delivers Pacific hake at-sea including: catcher-processor, mothership, and tribal vessels.

Pacific Halibut Management and Fishery Interaction

The International Pacific Halibut Commission (IPHC), a body founded through treaty agreement between the US and Canada, sets the Pacific halibut annual total allowable catch (TAC) for area 2A. The IPHC refers to U.S. waters off the states of Washington, Oregon and California collectively as Area 2A. The TAC is based on bycatch mortality, which takes into account potential survival after being discarded. Regulations for Area 2A are set by NOAA Fisheries Northwest Regional Office. Pacific halibut catch in Area 2A is divided between tribal and non-tribal fisheries, between commercial and recreational fisheries, and between recreational fisheries in different states (Washington, Oregon and California). The Pacific Fishery Management Council describes this P. halibut catch division each year in a catch-sharing plan. In 2012, the LE fixed gear sablefish endorsed sector was allowed to retain and land P. halibut north of Point Chehalis, WA. The IFQ shore-delivery Pacific hake fishery is a maximized-retention fishery. Under this fishery, small amounts of incidental take are allowed to be landed and subsequently donated to food banks. In all other West Coast commercial groundfish fishery sectors, P. halibut must be discarded at-sea. Here we only report estimates of P. halibut discarded at-sea. Any retained P. halibut, including from fisheries covered by this report, are estimated by the IPHC in their annual report (Chastain 2012).

In 2011, the limited entry (LE) bottom trawl sector of the U.S. west coast groundfish fishery began fishing under an Individual Fishing Quota (IFQ) management program. An IFQ is defined as a federal permit under a limited access system to harvest a quantity of fish, representing a portion of the total allowable catch of a fishery that can be received or held for exclusive use by a person (MSA 16 USC 1802(23)). The implementation of the IFQ management program in 2011 resulted in changes to the methods used for estimating fishing mortality, including the mandate that vessels must carry NMFS observers on all IFQ fishing trips. A list of changes can be found in Jannot, et al. 2012.

Under the IFQ program, Pacific halibut is managed at the permit level, through Individual Bycatch Quota (IBQ) pounds. An IBQ accounts for bycatch mortality, which can assume some

level of survivorship. This is the only species managed under IBQ for the west coast groundfish IFQ fishery. Each federal groundfish permit with a trawl endorsement is allocated IBQ pounds for P. halibut caught north of 40° 10′ N. latitude. Pacific halibut caught south of 40° 10′ N. latitude are not managed as an IFQ quota but are reported here under the IFQ fishery.

Data collection and reporting for this fishery is described in the "Pacific Halibut Data Collection in the shore-based IFQ Fishery" sections by gear type. The shore-based IFQ fishery includes all IFQ fishery components with the exception of at-sea motherships and catcher-processors. Motherships and catcher-processors have a bycatch quota for Pacific halibut, but it is not accounted for at the permit level.

With the exception of the IFQ fishery, P. halibut bycatch mortality is accounted for at the fishery sector level only. P. halibut is regularly caught as bycatch in the LE sablefish endorsed fixed gear, LE non-sablefish endorsed fixed gear, and OA fixed gear sectors.

METHODS

Data Sources

Data sources for this analysis include onboard observer data (from the WCGOP and A-SHOP), and landing receipt data (referred to as fish tickets, obtained from PacFIN). To date, observer data is used as the sole source for discard estimation in the IFQ sectors. A list of fisheries, coverage priorities and data collection methods employed by WCGOP in each observed fishery can be found in the IFQ and Non-IFQ WCGOP manuals (NWFSC 2013). A-SHOP program information and documentation on data collection methods can be found in the A-SHOP observer manual (NWFSC 2013).

The sampling protocol employed by the WCGOP is primarily focused on the discarded portion of catch. To ensure that the recorded weights for the retained portion of the observed catch are accurate, haul-level retained catch weights recorded by observers are adjusted based on trip-level fish ticket records. This process is described in further detail on the WCGOP Data Processing webpage and was conducted prior to the analyses presented in this report. All weights of P. halibut presented in this report are round weights, that is, whole, in-tact fish. IPHC converts these weights to dressed weights (i.e., head and organs removed).

For data processing purposes, species and species groups were defined based on management (NWFSC 2013). A complete listing of groundfish species is defined in the Pacific Coast Groundfish Fishery Management Plan (PFMC PFMC 2011).

Fish ticket landing receipts are completed by fish-buyers in each port for each delivery of fish by a vessel. Fish tickets are trip-aggregated sales receipts for market categories that may represent single or multiple species. Fish tickets are issued to fish-buyers by a state agency and must be returned to the agency for processing. Fish ticket and species-composition data are submitted by state agencies to the Pacific Fisheries Information Network (PacFIN) regional database. Annual fish ticket landings data were retrieved from the PacFIN database (July 2013) and subsequently

divided into various sectors of the groundfish fishery as indicated in Figure 1 and in further detail online (NWFSC 2013c).

Shore-based IFQ Fishery

The methods used to report in-season IBQ estimates are separate from those methods used to estimate final fleet-wide P. halibut mortality. In prior years, estimates from the two methods resulted in very similar fleet-wide estimates of P. halibut mortality (Table ES2).

Pacific Halibut Data Collection in the Shore-delivery IFQ Fishery

The WCGOP designed sampling methodologies that help ensure P. halibut mortality can be estimated, regardless of the limitations imposed by the vessel, catch composition, or catch quantity. Three pieces of information are necessary to estimate Pacific halibut mortality (also see Table 1):

1. A count of individual P. halibut in the haul or sample
2. Actual or visual length measurements (cm)
3. A viability obtained by physical assessment of individual P. halibut using IPHC designed dichotomous keys that relate the physical condition of the fish to a viability code (NWFSC 2013). A unique key is used for each gear type (trawl, longline, pot).

Observers could sample all or a subset of P. halibut caught in a haul/set. The proportion of P. halibut sampled is based on the number of P. halibut caught in the haul/set, the level of assistance provided by the crew, as well as other variables (e.g., physical space, time of day, weather). Sampling and assessment of P. halibut is dependent on crew assistance and cooperation. Regulations prohibit vessel crew from discarding any P. halibut without first notifying the observer. The vessel crew must comply with any and all requests by the observer to ensure proper P. halibut sampling, including but not limited to: modifying P. halibut sorting procedures, assisting the observer by delivering the P. halibut to the observer, and modifying operations to ensure P. halibut sampling is completed. Table 1 describes the P. halibut data obtained on IFQ-permitted vessels fishing different gear types.

On vessels fishing fixed gear (pot or hook-&-line), observers must sample at least 50% of the gear per set. Actual length measurements are obtained on bottom trawl, midwater trawl, and pot vessels, but only visual length estimates are made on vessels fishing hook-&-line gear. Visual estimates are done in 10 cm increments (55-64 cm, 65-74 cm, etc.).

The crew's cooperation is vital to the observer's sampling success when hook-&-line fishing. When an observer samples for P. halibut, the crew are not permitted to shake loose or discard any P. halibut before the observer can estimate the fish length, nor can they restrict the observer's view of the line as it comes out of the water. If requested by the observer, the crew is required to physically hand an individual fish to the observer or slow the gear retrieval.

Table 1. Data collected from Pacific halibut caught on IFQ vessels using different types of gear.

Gear	Count	Length Measurement	Viability
Bottom trawl	all in the haul	actual, all or subset	yes
Midwater trawl	all in the haul	actual, all or subset	yes
Pot	all in sampled portion	actual, all or subset	yes
Hook -and- line	all in sampled portion	visual, all or subset	no

Viability is assessed at the point of fish release when returned to sea. On vessels using "resuscitation boxes" or other techniques to increase the likelihood of survival, condition sampling is performed prior to the fish being returned to sea. Observations of several condition characteristics are used to assign each fish to one of three viability categories for trawl and pot gear: Excellent, Poor, or Dead (NWFSC 2013; Williams and Chen 2004). Observer field estimates of viability for Pacific halibut discarded in the IFQ fishery by vessels fishing bottom trawl or pot gear are used to compute the total estimated mortality of discarded Pacific halibut. IBQ weight (or simply IBQ) refers to the estimated mortality of discarded P. halibut, with the appropriate mortality rate applied based on viability (Tables 2 & 3 or 100%).

Viability categories are used to assign mortality rates to P. halibut. Mortality rates for vessels fishing bottom trawl gear are based on mortality data collected by Hoag (1975), who found some survivorship among fish in the dead condition category. Mortality rates for vessels fishing pot gear are based on conservative assumptions of likely survival from pot-induced injuries (Williams and Wilderbuer 1995). Because of the difficulties of collecting P. halibut viability on hook-and-line vessels, we used a discard mortality rate (DMR) of 16%, which represents an average of DMRs over all years for the Bering Sea/Aleutian region longline fishery (Williams 2008). Discard mortality was assumed to be 100% for midwater trawl bycatch estimates.

Table 2. Mortality rates used for each of the condition categories (m_c) for IFQ bottom trawl vessels (Clark et al. 1992).

m_c	Rate
m_{exc}	0.20
m_{poor}	0.55
m_{dead}	0.90

Table 3. Mortality rates used for each of the condition categories (m_c) for IFQ pot gear vessels (IPHC).

m_c	Rate
m_{exc}	0.00
m_{poor}	1.00
m_{dead}	1.00

Final Shore-based IFQ Fishery Bycatch Estimation

We stratified IFQ Pacific halibut bycatch data based on sector (shoreside non-hake groundfish, shoreside Pacific hake, at-sea Pacific hake, and LE California halibut) and gear (bottom trawl, midwater trawl, pot, hook-&-line). Within the shoreside non-hake groundfish sector, we further stratified using area and depth based on gear type. We maintained area and depth strata that were applied to bottom trawl, hook-&-line, and pot gear in previous reports (see Table 4 of this report for specific strata; Heery et al. 2010, Jannot et al. 2011, Jannot et al. 2012) because prior work had demonstrated that these variables were correlated with Pacific halibut bycatch (Heery et al. 2010). Observations from IFQ vessels fishing midwater trawl gear targeting Pacific hake or other midwater target species were not post-stratified. Similarly, observations of IFQ vessels targeting California halibut with bottom trawl gear were not post-stratified. In addition to the strata described above, we also provide bycatch estimates north and south of the North/South groundfish management line (40°10′ N. lat.) for each sector and gear type.

Despite the 100% observer coverage mandate in 2012, there were some rare occasions (e.g., observer illness) when tows or sets were either only partially sampled, or not sampled. In this report, we made the following assumption about IFQ data: if an observer sampled P. halibut on unsampled or partially sampled hauls, we assumed that all P. halibut were sampled on those hauls and therefore did not expand estimates on these hauls. This change from the 2012 report was made after staff reviewed these data. The intent of this assumption is to more accurately estimate P. halibut mortality without double counting. We used ratio estimators to apportion unsampled weight to specific species, including Pacific halibut, within each stratum. To obtain the estimated weight of Pacific halibut (W) when the entire haul or set was unsampled, the unsampled discard weight, summed across unsampled hauls within the stratum, was multiplied by the ratio of the weight of Pacific halibut discard (summed across fully sampled hauls within a stratum) divided by the total discard weight of all species in all fully sampled hauls within a stratum:

$$\widehat{W}_{p,s} = \sum_{p} x_{p,s} \times \frac{\sum_f w_{f,s}}{\sum_f x_{f,s}}$$

where, for each stratum:
s = stratum, which includes sector and year and could include, area, depth, gear
p = unsampled haul
f = fully sampled haul
x = weight of discarded catch
$\widehat{W}$ = estimated weight of unsampled P. halibut in the stratum

w = sampled weight of P. halibut

The unsampled weight of partially sampled hauls or sets was categorized into weight of non-IFQ species (NIFQ) or IFQ species. Unsampled IFQ species weight was further categorized into IFQ flatfish (IFQFF), IFQ rockfish (IFQRF), IFQ roundfish (IFQRD) and IFQ mixed species (IFQM). For the purposes of this report, we assume that unsampled P. halibut would only occur in NIFQ (south of 40°10′ north latitude only), IFQM, or IFQFF unsampled categories. Thus, those are the only categories for which P. halibut is estimated. IFQM included all 2012 IFQ managed species (see 76 FR 27508 for a listing of IFQ species). NIFQ included all species encountered that were not designated as an IFQ species in management. IFQFF included all IFQ flatfish species managed as a complex under the groundfish FMP. North of the 40°10′ north latitude groundfish management line, Pacific halibut would be included in unsampled IFQFF or IFQM categories. South of the groundfish management line, Pacific halibut would only be included in the unsampled NIFQ category.

To obtain the estimated weight of Pacific halibut ($\widehat{W}$) in partially sampled hauls or sets, the unsampled discard weight, summed across partially sampled hauls within the stratum, was multiplied by the ratio of the weight of Pacific halibut (summed across fully sampled hauls within a stratum) divided by the total discard weight of all species occurring within a category (NIFQ, IFQFF, IFQM) in all fully sampled hauls within a stratum. Estimated Pacific halibut weight was summed across unsampled categories

$$\widehat{W}_{p,s} = \sum_{y} \left(\sum_{p} x_{p,y,s} \times \frac{\sum_{f} w_{f,s}}{\sum_{f} x_{f,y,s}} \right)$$

where, for each stratum:
s = stratum, which includes year and sector, and could include, area, depth, gear
y = unsampled category (either NIFQ, IFQFF, or IFQM)
p = partially sampled haul
f = fully sampled haul
x = weight of discarded catch
$\widehat{W}$ = estimated weight of unsampled P. halibut in the stratum
w = sampled weight of P. halibut

Expanded weights of Pacific halibut obtained using the equations above for unsampled or partially sampled hauls were then added to the sampled weight of Pacific halibut within each stratum to obtain the total Pacific halibut weight per stratum.

Viability Analysis

We used observer field estimates of viability for Pacific halibut discarded in the IFQ fishery by vessels fishing bottom or pot gear to compute the total estimated mortality of discarded Pacific halibut by IFQ gear/sector and stratum.

To account for the impact of fish size on survivorship, we computed a weighted mortality rate for each condition category. Length measurements associated with each viability record were converted to weight based on the IPHC length-weight relationship:

$$W = 6.921\times10^{-6} \cdot L^{3.24}$$

where:
L = fork length (cm)
W = weight (lbs., whole fish)

A discard mortality rate for each condition category was then computed as the proportion of P. halibut sampled weight in a viability category multiplied by the viability category-specific mortality rate (see Tables 2 & 3 above):

$$DMR_{csj} = m_c \times P_{csj}$$

where:
s = stratum, which could include, area, depth, gear, and sector
c = viability condition (Excellent, Poor, Dead)
j = year
m_c = mortality rate
P = proportion of sampled P. halibut weight (w)
DMR = discard mortality rate

Discard mortality rates for each condition category c and stratum s were then multiplied by gross discard estimates to compute total estimated discard mortality for each of the two gear types:

$$\hat{F}_{sj} = \sum_{c} \left(B_{sj} \cdot DMR_{sj} \right)$$

where:
s = stratum, which could include, area, depth, gear, and sector
c = viability condition (Excellent, Poor, Dead)
j = year
F = total estimated discard mortality
B = gross estimated discard weight

Viability data are collected from only a subsample of the Pacific halibut that observers encounter. Based on previous evaluations by Wallace and Hastie (2009), we expect that survivorship of Pacific halibut in bottom trawl tows are most directly affected by the length of the tow and the amount of catch that fills the net. These variables are not part of the bycatch ratio stratification process (above), and their use in stratifying viability data would make it difficult to then apply discard mortality rates to initial gross estimates of bycatch. We found that tow duration was directly related to depth, one of the variables used to stratify discard ratios and initial gross discard estimates for bottom trawl gear. Because depth and tow duration appeared

to co-vary, we used depth and area to stratify IFQ viability data collected from bottom trawl gear. For IFQ viability data collected from pot gear, only area is used to stratify the data. For longline gear, we used a discard mortality rate of 16%, which represents an average of DMRs over all years for the Bering Sea/Aleutian region longline fishery (Williams 2008).

Final estimates of Pacific halibut bycatch and discard mortality are also presented in the context of the estimated mortality of legal-sized halibut. This was computed by applying the proportion of sampled P. halibut weight in each depth stratum that was from legal-sized fish (82 cm or larger) to initial estimates. Viabilities were then applied to gross legal-sized discard estimates in the same manner as described above.

Length Frequencies

The length frequency distribution for Pacific halibut in the 2012 IFQ fishery is provided in Table 10. Pacific halibut pose unique challenges for observer sampling. Observers typically measure the length of Pacific halibut and then convert the measurement to weight using the IPHC length-weight conversion table. Occasionally, observers actually weigh individual fish. Sometimes crew members presort the catch by removing Pacific halibut and immediately return them to sea. Vessel crews presort Pacific halibut to increase the likelihood of survival of the discarded fish. Presorting is most prevalent on vessels fishing with hook-&-line gear. Fishers have raised concerns regarding crew safety when landing large P. halibut. In addition, hook-&-line fishers are concerned that P. halibut individuals would be injured during landing because of their interaction with the vessel 'crucifier' (gear used to strip the bait and any catch off of the hook and gangion line). Therefore, shake-offs prior to the crucifier (a form of pre-sorting) is almost universal on IFQ hook-&-line vessels. Another case of pre-sorting can occur when halibut are too heavy and/or awkward to weigh in observer baskets. In all cases of pre-sorting, random samples are not available. Therefore, observers visually estimate the length of the halibut in ten-centimeter units (40cm, 50cm , 60cm, etc.), which are later converted to weight using the IPHC length-weight conversion table.

Table A1 (Appendix A) provides the actual observed length frequency distributions of discarded Pacific halibut for vessels fishing IFQ using bottom trawl or pot gear. These length frequencies have been weighted based on the ratio of total estimated P. halibut discard weight to the weight of P. halibut that was measured in each stratum (see Appendix A for further details). Because size-specific mortality rates have not been determined, we were not able to compute the length frequency distribution of discarded fish that died. However, we have summarized the proportion of length measurements in each condition category (Excellent, Poor, and Dead) in Table 2A (Appendix A) to inform size-specific modeling of mortality. The frequency of sampled fish within each condition category was weighted in the same manner as length frequency distributions and then summarized for each 2 cm length bin.

Non-nearshore Fixed Gear Fishery

The WCGOP samples each non-nearshore fixed gear sector through separate random selection processes, with the limited entry (LE) sablefish endorsed season permits receiving the highest level of coverage, then LE non-sablefish endorsed permits, and open access (OA) fixed gear the lowest. LE sablefish endorsed vessels that fish outside of the primary season or that have reached their tier quota in the primary season are not observed. Given this sampling structure

and anticipated differences in variance from one sector to the next, we chose to maintain sector as a stratification variable in our analysis. Testing of alternative stratification schemes (Heery et al. 2010) indicated that latitude and gear type were the most important variables with respect to Pacific halibut bycatch in the non-nearshore fixed gear groundfish fishery. Bycatch estimates were produced separately for each sector and gear combination. Two latitudinal strata were applied to the LE sablefish endorsed longline sector (north and south of Point Chehalis, Washington = 46° 53.30′ N. lat.) because previous modeling demonstrated that these strata significantly improved the fit of predicted bycatch amounts to the amounts observed (Heery et al. 2010). Point Chehalis, WA was used in previous estimates of Pacific halibut bycatch in the LE sablefish endorsed season longline sector because of its relevance to groundfish management and its apparent ability to split out higher bycatch rates off the northern coast of Washington (Heery and Bellman 2009). Evaluations of latitudinal strata for the other fixed gear sectors did not improve the fit of models to an extent that justified their use. Thus, we maintained the same stratification for the other groundfish fixed gear sectors that was used previously (Heery and Bellman 2009, Heery et al. 2010, Jannot et al. 2011, Jannot et al. 2012).

Discard Estimation

A deterministic approach was used to estimate Pacific halibut discard for all sectors of the non-nearshore groundfish fixed gear fishery. Discard ratios were computed from observer data as the discarded weight of Pacific halibut divided by the retained weight of either sablefish or all FMP groundfish (except Pacific hake), depending on the sector (Table 11; FMP groundfish species: NWFSC 2013). Ratio denominators were identified for each sector of the non-nearshore fixed gear fishery based on the targeting behavior of that sector (Table 12). Discard ratios were then multiplied by the total sector landed weight of either sablefish or FMP groundfish (except Pacific hake), corresponding to the denominator used to compute the observed discard ratio for each sector. This provided an expanded gross estimate of Pacific halibut discard for each sector. A discard mortality rate (discussed below) was then applied to compute estimated discard mortality.

Total landed weights for each sector are obtained from fish ticket landing receipts. Fish tickets for fixed gear that included recorded weights for sablefish were included in the non-nearshore fixed gear sector. Commercial fixed gear fish tickets with recorded nearshore species weight were not used in this portion of the fixed gear analysis, regardless of whether they included recorded weights for sablefish (Figure 1). In addition, fixed gear fish tickets without recorded sablefish or nearshore species were included in the non-nearshore fixed gear sectors only if groundfish landings were greater than non-groundfish landings based on a unique vessel and landing date.

Fish tickets from the non-nearshore fixed gear sector were partitioned into the three commercial fixed-gear sectors (LE sablefish endorsed season, LE non-sablefish endorsed, and OA fixed gear) through the following process. Commercial fixed-gear fish tickets were first divided out by whether the vessel had a federal groundfish permit (limited entry) or no federal groundfish permit (open access). OA fish tickets were placed in the OA fixed gear groundfish sector. Next, LE fish tickets were separated based on whether the vessel's federal groundfish permit(s) had a sablefish endorsement with tier quota for the primary season or if it was not endorsed (also referred to as 'zero' tier). Fish tickets for all LE sablefish vessels with tier endorsements that

were operating within this period and within their allotted tier quota were placed in the LE sablefish endorsed sector. If LE sablefish endorsed vessels fished outside of the primary season (November through March) or made trips within the season after they had reached their tier quota, the fish tickets were placed in the LE non-sablefish endorsed sector. In addition, fish tickets from non-endorsed LE vessels were also placed in the LE non-sablefish endorsed sector.

Further processing of fish tickets identified and removed the directed commercial Pacific halibut fishery landings from the non-nearshore fixed gear analysis. The directed Pacific halibut fishery occurs for only a few days each year, during 10-hour openings that are designated by the IPHC. LE and OA fixed gear vessels that typically target groundfish can participate in the directed fishery. For most fixed gear vessels, (other than LE sablefish endorsed vessels north of Point Chehalis) this is the only time during which they are allowed to land Pacific halibut. Fish tickets that included Pacific halibut landings on or within the 2 days after a directed fishery opening were considered to be part of the directed fishery and not part of the non-nearshore fixed gear fishery targeting federal FMP groundfish. These fish tickets were removed prior to our analysis. This approach may have resulted in the removal of some non-directed fishery landings north of Point Chehalis, but any bias introduced by this step is considered to be extremely small given the short time period across which fish tickets were removed. This filtering step was applied to the area north of Point Chehalis only.

WCGOP observer data were stratified according to sector and gear type (longline and pot/trap). As discussed earlier, one additional latitudinal stratum at Point Chehalis, Washington (46° 53.30' N lat.) was used for the LE sablefish endorsed longline sector. Some retention of Pacific halibut was allowed in the LE sablefish endorsed season in the area north of Point Chehalis. The Point Chehalis line was the only latitudinal stratification incorporated into our analysis and was only applied to the LE sablefish endorsed sector. Discard amounts provided for the other two fixed gear sectors represent coast-wide estimates.

The number of observed trips, sets, and vessels are summarized for each sector, gear type, and area (where applicable) (Table 11). The landed weight of sablefish and FMP groundfish (excluding Pacific hake) is used as a measure for expanding discard from observed trips to the entire fleet (Table 12 and13). Observed discard ratios were calculated by sector, gear type and area based on the following equation:

$$\hat{D}_s = \frac{\sum_t d_{st}}{\sum_t r_t} \times F_s$$

where:
s: stratum, including year, sector, gear type, and area
t: observed sets
d: observed discard (mt) of Pacific halibut
r: observed retained weight (mt) of sablefish or all FMP groundfish except Pacific hake
F: weight (mt) of retained sablefish or all FMP groundfish excluding Pacific hake recorded on fish tickets in strata *s*

$\hat{D}_s$: Discard estimate for stratum *s*

For all strata, except the LE non-sablefish endorsed longline and the OA sectors, discard ratios were calculated by dividing the stratum discard weight of Pacific halibut by the retained catch weight of sablefish. Retained groundfish was used as the ratio denominator for the LE non-sablefish endorsed longline and the OA sectors because these sectors target a wider range of groundfish species. A broader denominator was therefore necessary to effectively capture the level of fishing effort in these sectors. Please refer to earlier reports for further details of data pooling and discard ratios in prior years of observer coverage.

Where FMP groundfish (excluding Pacific hake) was used to compute discard ratios, any retained weights recorded by the observer not appearing on fish tickets were excluded from the denominator. This prevents double-counting associated with differences in the species codes used by observers and processors. For instance, while observers may record rockfish catch at the species level; various species of rockfish are often grouped, weighed, and recorded together on the fish ticket by the processor under a grouped species code such as NUSP - northern unspecified slope rockfish. In some cases, this difference in species coding prevents observer and fish ticket weights from being matched and adjusted properly. Species coding on fish tickets varies considerably between processors and over time, and it is not possible to make assumptions regarding which individual observer-recorded species likely coincide with species grouping codes on fish tickets. By using only the retained groundfish weight from fish tickets in discard ratio denominators, we prevent double-counting of retained weights. This is not a factor when using a single species in the denominator, such as sablefish, as any retained weights in observer and fish ticket data that share the same species code will match and adjust properly.

Table 13 demonstrates the expansion factors for each fishery sector and gear type. The discard rate multiplied by the expansion factor yielded an expanded gross P. halibut discard estimate for each stratum (Table 15). If landings were made by a fixed gear sector for which there were no or very few WCGOP observations, the most appropriate observed discard ratio was selected and applied to those landings based on similarities in the fishery management structure, fishing and discard behavior, and the gear fished. The LE sablefish endorsed vessels fishing outside of the primary season with pot gear often land a small amount of groundfish; however, this portion of the fleet is not observed by the WCGOP program. Given similarities in gear type and catch composition, OA fixed gear pot observations were selected as the most appropriate source of information for an observed discard rate (Table 12).

Discard Mortality Rates

Once an initial gross estimate of P. halibut discard had been produced, this value was multiplied by a discard mortality rate (Table 15) to generate a final discard mortality estimate (Table 16 and Figure 3). Ideally, discard mortality would have been approximated based on viabilities in a manner similar to the approach used for IFQ bottom trawl and pot gear. WCGOP observers do record viability conditions as Pacific halibut are discarded from non-IFQ longline vessels. However, much of the time, Pacific halibut are removed from the line before being brought on-board. This is to ensure safety, as longline vessels are often small, and to have the least possible impact on Pacific halibut survivorship. Because these fish are not typically brought on-board,

the observer is not able to effectively assess viability or gain a random sample from Pacific halibut catch. Although viabilities from pot gear would be appropriate to use in estimating discard mortality, bycatch of Pacific halibut in pot gear is infrequent and the sample size was too small to utilize in this analysis.

Thus, Pacific halibut viabilities recorded from the non-nearshore fixed gear fishery were not used in our analysis. Discard mortality rates therefore had to be identified through other means. Review of the literature on Pacific halibut bycatch revealed little that could be applied to the entire discard estimate. Several studies have examined the survivorship of Pacific halibut in various conditions (Kaimmer and Trumble 1998, Trumble et al. 2000). However, without any information on the state of Pacific halibut that were being discarded, the findings from these examinations could not be put to use.

Instead, we relied on discard mortality rates computed for groundfish fisheries off Alaska (Williams 2008). An 18% discard mortality rate was applied to estimates for pot gear, coinciding with the DMR used for the sablefish pot CDQ fishery in Alaska. For longline gear, we used a discard mortality rate of 16%, which represents an average of DMRs over all years for the Bering Sea/Aleutian region longline fishery (Williams 2008).

For additional context, we present the length frequency distribution of Pacific halibut from visual length estimates and physically measured lengths in non-nearshore fixed gear sectors (Table 17) and the proportion of sampled Pacific halibut discard of legal (>82 cm) and sublegal ($\leq$ 82 cm) sizes in non-nearshore fixed gear sectors (Table 18). The majority of Pacific halibut lengths recorded in these fisheries have been collected through visual length estimation, rounded to the nearest 10 cm. In other words, specimens that are 76 cm and 82 cm are both visually estimated to be 80 cm. With this level of resolution, it was not possible to compute the exact proportion of sublegal versus legal Pacific halibut from visually estimated lengths. Visual estimates were instead summarized in the manner in which they are recorded; with sublegal and legal sized halibut falling within the 75-84 cm length bin. Observers have been instructed to make physical measurements of P. halibut lengths from randomly sampled fish on LE sablefish endorsed vessels, with the help of vessel crew.

Other Fisheries

Pacific halibut bycatch was also observed in the nearshore groundfish fixed gear sector (Table 19), the state pink shrimp trawl fisheries (Table 20), and the OA California halibut trawl fishery (Table 21) (LE California halibut is covered under the IFQ fishery). Bycatch estimates for these three fishery sectors were computed based on the following equation:

$$\hat{B} = \frac{\sum_t b_t}{\sum_t r_t} \times F$$

where:
b: observed discard (mt) of Pacific halibut on set/haul *t*

r: observed retained weight (mt) of target species on set/haul t
F: weight (mt) of retained target species
$\hat{B}$: Discard estimate of Pacific halibut (mt)

The nearshore fixed gear fishery targets a variety of groundfish species that inhabit areas shallower than 50 fathoms. All species included in the nearshore target group as listed in the WCGOP data processing appendix were included in the denominator when calculating bycatch ratios for the nearshore fixed gear sector . Pink shrimp and California halibut were considered the target species in their respective fisheries. Discard mortality rates were not applied to discard estimates for these other fishery sectors due to a lack of information regarding survivorship.

RESULTS

IFQ Fishery

All participating vessels carry an observer on all fishing trips under IFQ management (100% observed). For most strata, 98% or more of the observed IFQ tows or sets were sampled (Table 4). Non-IFQ species represented the largest portion of unsampled catch (Table 4), as only every third haul or set was required to be sampled for non-IFQ species under WCGOP sampling protocol (NWFSC 2013).

The total estimated weight of Pacific halibut from unsampled tows or sets in 2012 represents a small fraction (1.4 mt ~ 1.5%) of the total 2012 IFQ gross discard weight of P. halibut (Table 5). Unsampled P. halibut catch from both unsampled and partially sampled hauls represented 2.5% of the total gross discard weight (2.3 of 91.8 mt). Sixty percent of the total gross discard weight (1.4 mt) came from unsampled hauls, whereas another 38% (0.9 mt) came from IFQM catch (Table 5). The remainder was estimated from unsampled IFQFF or NIFQ catch (~0.06 mt).

Gross bycatch estimates and total discard mortality estimates were largest for vessels fishing bottom trawl gear, north of the 40°10´ N. latitude management line in depths greater than 60 fathoms (Tables 7, 8). This gear-area-depth stratum accounts for ~77% of 2012 Pacific halibut discard mortality in the fishery. The next largest fraction (~16%) of total discard mortality is found in the same gear-area combination in shallow waters (<60 fm). Together, bottom trawl gear fishing north of the 40°10´ N. latitude management line accounts for 93% of the 2012 Pacific halibut discard mortality in the IFQ fishery (Tables 7, 8).

In terms of viability, the majority of individuals were classified as either Excellent or Dead (Table 6). Individuals caught with bottom trawls were approximately evenly split between Excellent and Dead categories, north of Point Chehalis in all depths and south of Point Chehalis at depths greater than 60 fathoms (Table 6). South of Point Chehalis in the shallow depths, most individuals were either Excellent (north of 40°10´ N) or Dead (south of 40°10´ N).

Of the few individuals sampled from midwater trawl gear, individuals were Excellent when caught in the non-hake shoreside sector or Dead when caught in the shoreside hake sector (Table 6). Catch on midwater trawl vessels for non-hake groundfish is treated in a similar manner as

catch on bottom trawl vessels -- catch is normally dumped and sorted on deck. In contrast, midwater trawl vessels fishing for hake to be delivered shoreside dump the catch directly in the hold, with only rare presorting events, thus most P. halibut are Dead in this fishery. In addition, tow duration differs between the two types of midwater fishing: non-hake midwater tows observed in 2011-12 catch shares have generally been of shorter duration than those observed as shoreside hake. The majority of P. halibut caught with pot gear are categorized as Excellent viability (Table 6).

Estimated P. halibut discard mortality from all sectors and gears of the 2012 IFQ fishery was 29% greater than the 2011 IFQ estimated discard mortality. The most likely reason for the increase was probably less conservatism among fishers – fishers had more experience and knowledge about their IBQ usage relative to their fishing behavior or preferred fishing grounds and therefore could more closely match target catch and IBQ. Differences in effort among the IFQ bottom trawl fleet between 2011 and 2012 were relatively minor as the number of vessels, number of tows and number of hours spent towing was very similar in the two years (Figure 5).

Despite the increase from 2011, the 2012 IFQ estimated P. halibut discard mortality (all gears) remains 76% less than the estimated discard mortality from the 2010 LE bottom trawl fishery (Figure ES1) and 80% less than the 2002-2010 LE bottom trawl average. There are at least two possible explanations for this drop. First, IBQs for P. halibut might have increased fisher incentives to avoid P. halibut bycatch and thereby changed fisher behavior (i.e., fish different grounds or gear than in past). Second, testing of gear to exclude P.halibut from the catch became general practice in much of the 2012 trawl fleet, which enabled fishermen to increase fishing activity without additional risk to quota.

Estimated bycatch weight of P. halibut (0.6 mt) from the at-sea hake component of the 2012 IFQ fishery was similar to the 2011 value and low relative to the majority of prior years' reported (Table 22). At-sea hake sectors reported a range of P. halibut bycatch weight from 0.3 to 4 mt during the period from 2002 to 2012.

Non-Nearshore Fixed Gear Fishery

From 2011 to 2012, estimated discard mortality of Pacific halibut in the LE sablefish endorsed season longline sector decreased in the area north of Point Chehalis, WA but increased south of Point Chehalis (Table 15). During 2012, fleet-wide landings of sablefish and the observed discard ratio decreased relative to 2011 north of Point Chehalis (Table 13). South of Point Chehalis, 2012 also saw a drop in fleet-wide landings but an increase in the discard ratio relative to 2011 values (Table 13), indicating that fishing effort by the LE sablefish endorsed longline sector might have been lower in 2012 but encounter rates higher, relative to 2011 in this area. Decreased P. halibut discard mortality north of Point Chehalis and increased mortality south of Point Chehalis led to a 2012 coast-wide estimate very close to the 2011 coast-wide estimate for this sector (Table 15 & Figure 3). Gross estimated discard of P. halibut from LE sablefish endorsed season pot gear was on par with recent years (Table 15).

Discard of Pacific halibut among the non-sablefish endorsed fixed gear sectors (LE and OA) during 2012 deviated from previous years, a pattern first noticed in 2011. In 2012, estimated

discard mortality in the LE non-sablefish endorsed longline sector continued to be elevated relative to the annual estimates during the 2002-2010 time period (Table 15). The estimated discard mortality for OA fixed gear vessels fishing with hook-&-line gears in 2012 was within the historic range for this sector (3.9 mt; Table 15).

A large source of uncertainty in our estimates of Pacific halibut discard mortality on non-nearshore fixed gear vessels is the actual discard mortality rate applied to initial gross estimates. A small sample size of observed viability data are available from sablefish vessels fishing with pots, but not enough to be used in discard mortality estimation. Instead, we relied on findings from observed pot vessels in Alaska that assign specimens to the same condition codes used for trawl gear and then apply the discard mortality rates assumed by Williams (2008). This informed our decision to increase the discard mortality rate applied to pot estimates to 18% from 16%. As more viability information is collected by WCGOP observers from pot vessels, we intend to apply this directly to compute discard mortality in a manner consistent with the methods of Williams (2008).

Just as for trawl gear, discard mortality rates have been determined experimentally for Pacific halibut caught with longline gear (Kaimmer and Trumble 1998, Trumble et al. 2000). To apply these rates, Pacific halibut caught on longlines are assigned to one of four condition categories (minor, moderate, severe, and dead) based on the extent of their injuries at the time of release. Kaimmer and Trumble (1998) derived discard mortality rates for each of these categories using mark-recapture data. Their rates were later updated by Trumble et al. (2000) to account for hook sizes that are more consistent with gear used on the U.S. west coast for commercial purposes.

For reasons described earlier, Pacific halibut were infrequently brought on-board observed fixed gear vessels from 2002 to 2010, resulting in a small and potentially biased sample of viability data. Mortality rates specified by Trumble et al. (2000) cannot therefore be used in conjunction with these data to assess overall discard mortality. However, changes were implemented in the 2011 WCGOP data collection protocol that allowed observers on fixed gear vessels to collect a random sample of Pacific halibut from which to gather viability data. Sample sizes remain low but data collection continues. In the interim, discard mortality rates of 16% for longline gear and 18% for pot gear (Williams 2008) are thought to be the best option currently available.

Other Fisheries

Very small amounts of Pacific halibut bycatch were observed in other observed fisheries. Even without the application of discard mortality rates, bycatch estimates for the nearshore groundfish fixed gear sector, pink shrimp trawl fishery, and the OA sector of the California halibut trawl fishery made up a minor portion of the total mortality estimate for Pacific halibut. Discard estimates of P. halibut for these sectors provided in Tables 19, 20, and 21 are not intended to represent mortality values, as discard mortality rates for these sectors are not available.

SUMMARY & CONCLUSIONS

IFQ Fishery

- Estimated P. halibut discard mortality from the entire 2012 IFQ fishery represents a 30% increase from 2011, but is still 76% lower than the 2010 LE bottom trawl fishery estimate.
- The increase from 2011 to 2012 does not appear to be related to effort as measured by number of vessels, tows, or hours towed. Rather, the increase in effort appears to be primarily related to the increased discard in the bottom trawl vessels fishing north of 40°10′ N. latitude.
- P. halibut discard from the at-sea Pacific hake fishery in 2012 was nearly the same as in 2011.

Non-IFQ Fisheries

- The 2012 estimate of P. halibut mortality in the LE non-sablefish endorsed longline sector remains higher than historic (2002-2010) averages. The 2012 OA fixed gear longline sector exhibited an increase in estimated P. halibut mortality relative to the 2011estimate, but remains on the low end of the historic range.
- Estimated P. halibut mortality in all other non-IFQ observed sectors/fisheries are within the range observed in previous years.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the hard work and dedication of observers from the Northwest Fishery Science Center Fisheries Observation Science Program, Ryan Shama for answering our questions regarding WCGOP sampling strategies, and all the FOS program staff for their hard work and dedication. We also thank the Scientific and Statistical Committee of the PFMC and Gregg Williams (IPHC) for their contributions to this report.

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Table 4. Number of vessels, trips, and tows/sets observed and metric tons of discarded Pacific halibut sampled in the IFQ fishery by gear type fished. All participating vessels carry an observer on all fishing trips under IFQ management (100% observed). (*) Confidential data, (--) not applicable.

Bottom Trawl

Area / Depth (fm) / Year	No. of vessels	No. of trips	No. sampled tows	No. unsampled tows	Sampled tow hours	Unsampled tow hours	P. halibut discard (mt)	Unsampled categories from partially sampled hauls			Coverage rate	
								IFQFF	IFQM	Non-IFQ	% tows sampled	% tow hours sampled
North of Pt. Chehalis												
0-60												
2011	13	46	303	0	836	0	7.36	1	4	8	100%	100%
2012	13	65	316	5	704	7	4.77	0	0	1	98.4%	99.0%
> 60												
2011	22	146	1108	2	4269	12	21.65	1	5	48	100%	100%
2012	19	168	1338	3	5142	14	30.22	0	13	30	100%	100%
40° 10' to Pt. Chehalis												
0-60												
2011	20	137	1115	12	2129	24	10.48	9	2	33	98.9%	98.9%
2012	21	154	975	8	1943	19	7.72	1	3	14	99.2%	99.1%
> 60												
2011	56	754	5097	25	26486	133	22.02	5	13	133	100%	99.5%
2012	54	710	4540	24	23695	91	19.83	2	17	111	99.5%	100%
South of 40° 10' N Lat												
0-60												
2011	3	23	66	0	164	0	0.17	3	0	1	100%	100%
2012	*	*	*	*	*	*	*	*	*	*	*	*
> 60												
2011	15	241	1373	3	5983	12	0.16	3	0	34	100%	100%
2012	13	255	1645	3	6215	4	0.81	1	1	66	100%	100%
LE California Halibut												
South of 40° 10' N Lat												
2011	3	63	157	0	513	0	0.00	0	0	2	100%	100%
2012	*	*	*	*	*	*	*	*	*	*	*	*

Table 4. continued

Midwater Trawl

Area / Year	No. of vessels	No. of trips	No. sampled tows	No. unsampled tows	Sampled tow hours	Unsampled tow hours	P. halibut discard (mt)	Unsampled categories from partially sampled hauls: IFQFF	IFQM	Non-IFQ	Coverage rate: % tows sampled	% tow hours sampled
Non-hake Shoreside												
North of 40° 10' N Lat												
2011	*	*	*	*	*	*	*	*	*	*	*	*
2012	6	11	37	0	112	0	0.05	0	0	0	100%	100%
Shoreside Hake												
North of 40° 10' N Lat												
2011	26	913	1701	0	3940	0	0.03	0	0	2	100%	100%
2012	24	713	1562	0	5900	0	0.00	0	0	3	100%	100%

Hook-and-Line

Area / Year	No. of vessels	No. of trips	No. sampled sets	No. unsampled sets	Sampled tow hours	Unsampled tow hours	P. halibut discard (mt)	Unsampled categories from partially sampled sets: IFQFF	IFQM	Non-IFQ	Coverage rate: % sets sampled
North of 40° 10' N Lat											
2011	6	21	410	1	--	--	6.06	0	0	0	100%
2012	6	22	486	0	--	--	14.66	0	0	0	100%
South of 40° 10' N Lat											
2011	6	71	212	0	--	--	0.00	0	0	1	100%
2012	*	*	*	*	--	--	*	*	*	*	*

Pot

Area / Year	No. of vessels	No. of trips	No. sampled sets	No. unsampled sets	Sampled tow hours	Unsampled tow hours	P. halibut discard (mt)	Unsampled categories from partially sampled sets: IFQFF	IFQM	Non-IFQ	Coverage rate: % sets sampled
North of Pt. Chehalis											
2011	3	12	63	0	--	--	1.03	0	0	0	100%
2012	5	45	419	0	--	--	1.27	0	0	7	100%
40° 10' to Pt. Chehalis											
2011	8	75	714	2	--	--	2.30	0	0	1	100%
2012	9	60	468	0	--	--	0.62	0	0	0	100%
South of 40° 10' N Lat					--	--					
2011	11	148	738	0	--	--	0.00	0	0	2	100%
2012	13	167	814	0	--	--	0.00	0	0	1	100%

Table 5. Values used to calculate the expanded weight (mt) of Pacific halibut (PHLB) from each unsampled category in the U.S. west coast groundfish IFQ fishery by year. Unsampled catch weight could be assigned to one of four categories: IFQ flatfish species, IFQ mixed species, non-IFQ species, or all species (IFQ & non-IFQ). The sampled weight (mt), discard ratio, unsampled weight (mt) and estimated Pacific halibut gross discard (mt) are presented within each category, as a function of gear or sector, depth (bottom trawl only), management area, and area north or south of Point Chehalis, WA. The sum of expanded discard weight (mt) is the sum of the estimated gross P. halibut discard across categories. The sampled discarded PHLB weight (mt) is the sum of sampled PHLB from all observed hauls. The total discard (gross) is the sum of the PHLB in unsampled hauls plus the sampled PHLB. (*) Confidential data.

Bottom Trawl

Area / Depth (fm) / Year	IFQ Flatfish				Mixed IFQ Species				Non-IFQ Species				All Species (IFQ & Non-IFQ)				Sum of Exp. Discard Weight	Sampled Discarded PHLB	Total Discard
	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard			
North of Pt. Chehalis																			
0-60																			
2011	57.91	0.13	0.14	0.02	77.70	0.10	3.86	0.37	59.76	0.00	2.27	0.00	137.46	0.05	0.00	0.00	0.39	7.44	7.82
2012	50.47	0.09	0.00	0.00	55.83	0.09	0.00	0.00	46.28	0.00	0.09	0.00	102.11	0.05	0.56	0.03	0.03	4.77	4.80
> 60																			
2011	114.66	0.20	0.45	0.09	142.74	0.16	0.84	0.13	222.18	0.00	3.19	0.00	364.92	0.06	0.10	0.01	0.23	22.47	22.70
2012	91.37	0.43	0.00	0.00	129.32	0.31	1.48	0.45	281.81	0.00	4.70	0.00	411.36	0.10	12.10	1.16	1.61	39.48	41.10
40° 10' to Pt. Chehalis																			
0-60																			
2011	95.13	0.11	0.61	0.07	116.15	0.09	2.40	0.22	179.69	0.00	5.03	0.00	295.85	0.04	3.77	0.14	0.42	10.66	11.09
2012	70.72	0.11	0.28	0.03	84.05	0.09	0.85	0.08	144.43	0.00	1.07	0.00	228.48	0.03	1.95	0.07	0.17	7.72	7.89
> 60																			
2011	179.40	0.12	0.78	0.10	338.71	0.07	3.77	0.25	733.54	0.00	12.08	0.00	1072.25	0.02	6.38	0.13	0.47	22.06	22.53
2012	175.83	0.11	0.06	0.01	360.01	0.06	6.42	0.35	626.75	0.00	8.29	0.00	986.76	0.02	6.63	0.13	0.49	19.85	20.34
South of 40° 10' N Lat																			
0-60																			
2011	4.60	0.00	0.04	0.00	5.04	0.00	0.00	0.00	11.59	0.01	0.01	0.00	16.63	0.01	0.00	0.00	0.00	0.17	0.17
2012	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
> 60																			
2011	154.90	0.00	0.10	0.00	270.17	0.00	0.00	0.00	216.59	0.00	2.86	0.00	486.76	0.00	1.36	0.00	0.00	0.16	0.16
2012	75.94	0.00	0.01	0.00	255.67	0.00	0.03	0.00	214.71	0.00	7.08	0.03	470.38	0.00	1.93	0.00	0.03	0.81	0.84
LE California Halibut																			
South of 40° 10' N Lat																			
2011	0.73	0.00	0.00	0.00	0.74	0.00	0.00	0.00	74.19	0.00	0.01	0.00	74.93	0.00	0.00	0.00	0.00	0.00	0.00
2012	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 5. continued

Midwater Trawl

Area / Year	IFQ Flatfish				Mixed IFQ Species				Non-IFQ Species				All Species (IFQ & Non-IFQ)				Sum of Exp. Discard Weight	Sampled Discarded PHLB	Total Discard
	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard			
Non-hake Shoreside																			
North of 40° 10' N Lat																			
2011	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2012	0.05	0.97	0.00	0.00	0.29	0.18	0.00	0.00	0.53	0.00	0.00	0.00	0.82	0.06	0.00	0.00	0.00	0.05	0.05
Shoreside Hake																			
North of 40° 10' N Lat																			
2011	0.03	0.99	0.00	0.00	521.49	0.00	0.00	0.00	3.39	0.00	1.37	0.00	524.88	0.00	0.00	0.00	0.00	0.03	0.03
2012	0.00	0.00	0.00	0.00	128.31	0.00	0.00	0.00	8.19	0.00	0.36	0.00	136.50	0.00	0.00	0.00	0.00	0.00	0.00

Hook-and-Line

Area / Year	IFQ Flatfish				Mixed IFQ Species				Non-IFQ Species				All Species (IFQ & Non-IFQ)				Sum of Exp. Discard Weight	Sampled Discarded PHLB	Total Discard
	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard			
North of 40° 10' N Lat																			
2011	7.18	0.84	0.00	0.00	22.02	0.28	0.00	0.00	56.65	0.00	0.00	0.00	78.67	0.08	0.00	0.00	0.00	6.06	6.06
2012	19.30	0.76	0.00	0.00	36.79	0.40	0.00	0.00	96.49	0.00	0.00	0.00	133.28	0.11	0.00	0.00	0.00	14.66	14.66
South of 40° 10' N Lat																			
2011	0.18	0.00	0.00	0.00	3.70	0.00	0.00	0.00	20.82	0.00	0.00	0.00	24.52	0.00	0.00	0.00	0.00	0.00	0.00
2012	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Pot

Area / Year	IFQ Flatfish				Mixed IFQ Species				Non-IFQ Species				All Species (IFQ & Non-IFQ)				Sum of Exp. Discard Weight	Sampled Discarded PHLB	Total Discard
	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard			
North of Pt. Chehalis																			
2011	1.05	0.98	0.00	0.00	1.53	0.68	0.00	0.00	0.25	0.00	0.00	0.00	1.78	0.58	0.00	0.00	0.00	1.03	1.03
2012	2.46	0.52	0.00	0.00	9.11	0.14	0.00	0.00	2.26	0.00	0.01	0.00	11.37	0.11	0.00	0.00	0.00	1.27	1.27
40° 10' to Pt. Chehalis																			
2011	2.45	0.94	0.00	0.00	7.95	0.29	0.00	0.00	3.38	0.00	0.00	0.00	11.32	0.20	0.01	0.00	0.00	2.30	2.31
2012	1.22	0.51	0.00	0.00	3.86	0.16	0.00	0.00	6.03	0.00	0.00	0.00	9.88	0.06	0.00	0.00	0.00	0.62	0.62
South of 40° 10' N Lat																			
2011	0.30	0.00	0.00	0.00	6.48	0.00	0.00	0.00	6.88	0.00	0.00	0.00	13.36	0.00	0.00	0.00	0.00	0.00	0.00
2012	0.52	0.00	0.00	0.00	4.22	0.00	0.00	0.00	4.67	0.00	0.00	0.00	8.89	0.00	0.00	0.00	0.00	0.00	0.00

Table 6. Pacific halibut viabilities in the IFQ fishery by gear, depth, area, and year. The condition of sampled Pacific halibut was identified as Excellent (Exc), Poor, or Dead, consistent with IPHC protocol (NWFSC Observer Manual, 2013). The number of fish in each category was weighted based on the length-weight relationship (see Methods). Hook-and-line caught P. halibut viabilities are not currently used for estimating mortality. (*) Confidential data, (--) not applicable.

Bottom Trawl

Area / Depth (fm) / Year	Number of fish				Weighted percentages in each category		
	Exc	Poor	Dead	Total	Exc	Poor	Dead
North of Pt. Chehalis							
0-60							
2011	517	137	308	962	57%	14%	28%
2012	314	156	299	769	46%	20%	34%
> 60							
2011	1063	439	927	2429	47%	18%	35%
2012	1299	709	1368	3376	40%	21%	39%
40° 10' to Pt. Chehalis							
0-60							
2011	1076	169	199	1444	80%	10%	10%
2012	789	175	228	1192	68%	14%	18%
> 60							
2011	967	554	1188	2709	38%	20%	42%
2012	855	447	1200	2502	36%	17%	47%
South of 40° 10' N Lat							
0-60							
2011	0	0	10	10	0%	0%	100%
2012	*	*	*	*	*	*	*
> 60							
2011	7	1	6	14	48%	6%	46%
2012	35	7	36	78	49%	9%	42%
LE California Halibut							
South of 40° 10' N Lat							
2011	0	0	0	0	--	--	--
2012	*	*	*	*	*	*	*

Midwater Trawl

Area / Year	Number of fish				Weighted percentages in each category		
	Exc	Poor	Dead	Total	Exc	Poor	Dead
Non-hake Shoreside							
North of 40° 10' N Lat							
2011	*	*	*	*	*	*	*
2012	6	0	2	8	79%	0%	21%
Shoreside Hake							
North of 40° 10' N Lat							
2011	0	1	2	3	0%	46%	54%
2012	0	0	0	0	0%	0%	0%

Table 6. continued

Hook-and-Line							
Area	Number of fish				Weighted percentages in each category		
Year	Exc	Poor	Dead	Total	Exc	Poor	Dead
North of 40° 10' N Lat							
2011	--	--	--	902	--	--	--
2012	--	--	--	1271	--	--	--
South of 40° 10' N Lat							
2011	--	--	--	0	--	--	--
2012	*	*	*	*	*	*	*

Pot							
Area	Number of fish				Weighted percentages in each category		
Year	Exc	Poor	Dead	Total	Exc	Poor	Dead
North of Pt. Chehalis							
2011	53	3	19	75	84%	2%	14%
2012	103	21	24	148	66%	17%	17%
40° 10' to Pt. Chehalis							
2011	149	10	65	224	69%	5%	26%
2012	58	4	3	65	87%	8%	5%
South of 40° 10' N Lat							
2011	0	0	0	0	--	--	--
2012	0	0	0	0	--	--	--

Table 7. Estimated gross discard (mt) and discard mortality (mt) of Pacific halibut in IFQ fishery by gear type, depth, area, and year. Estimates were allocated to the three condition categories based on information presented in Table 6. DMR = Discard Mortality Rate. (*) Confidential data, (--) not applicable.

Bottom Trawl

Area / Depth (fm)	Estimate Gross Discard (mt)				Estimated Discard Mortality (mt)				DMR
Year	Exc	Poor	Dead	Total	m(Exc)	m(Poor)	m(Dead)	m(Total)	
North of Pt. Chehalis									
0-60									
2011	4.48	1.11	2.23	7.82	0.90	0.61	2.00	3.51	45%
2012	2.20	0.97	1.62	4.80	0.44	0.54	1.46	2.44	51%
> 60									
2011	10.61	4.14	7.95	22.70	2.12	2.28	7.15	11.55	51%
2012	16.58	8.56	15.96	41.10	3.32	4.71	14.36	22.39	54%
40° 10' to Pt. Chehalis									
0-60									
2011	8.90	1.06	1.13	11.09	1.78	0.58	1.02	3.38	30%
2012	5.34	1.10	1.45	7.89	1.07	0.60	1.31	2.98	38%
> 60									
2011	8.46	4.56	9.52	22.53	1.69	2.51	8.56	12.76	57%
2012	7.33	3.54	9.47	20.34	1.47	1.95	8.52	11.94	59%
South of 40° 10' N Lat									
0-60									
2011	0.00	0.00	0.17	0.17	0.00	0.00	0.15	0.15	90%
2012	*	*	*	*	*	*	*	*	*
> 60									
2011	0.08	0.01	0.08	0.16	0.02	0.01	0.07	0.09	54%
2012	0.41	0.08	0.35	0.84	0.08	0.04	0.32	0.44	52%
LE California Halibut									
South of 40° 10' N Lat									
2011	--	--	--	0.00	--	--	--	0.00	0%
2012	*	*	*	*	*	*	*	*	*

Midwater Trawl

Area	Estimate Gross Discard (mt)				Estimated Discard Mortality (mt)				DMR
Year	Exc	Poor	Dead	Total	m(Exc)	m(Poor)	m(Dead)	m(Total)	
Non-Hake Shoreside									
North of 40° 10' N Lat									
2011	*	*	*	*	*	*	*	*	*
2012	0.04	0.00	0.01	0.05	--	--	--	0.05	100%
Shoreside Hake									
North of 40° 10' N Lat									
2011	0.00	0.01	0.01	0.03	--	--	--	0.03	100%
2012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%

Table 7. continued

Hook-and-Line									
Area	**Estimate Gross Discard (mt)**				**Estimated Discard Mortality (mt)**				**DMR**
Year	Exc	Poor	Dead	Total	m(Exc)	m(Poor)	m(Dead)	m(Total)	
North of Pt. Chehalis									
2011	--	--	--	6.06	--	--	--	0.97	16%
2012	--	--	--	14.66	--	--	--	2.34	16%
40° 10' to Pt. Chehalis									
2011	--	--	--	0.00	--	--	--	0.00	0%
2012	*	*	*	*	*	*	*	*	*

Pot									
Area	**Estimate Gross Discard (mt)**				**Estimated Discard Mortality (mt)**				**DMR**
Year	Exc	Poor	Dead	Total	m(Exc)	m(Poor)	m(Dead)	m(Total)	
North of Pt. Chehalis									
2011	0.86	0.02	0.15	1.03	0.00	0.02	0.15	0.17	16%
2012	0.84	0.21	0.21	1.27	0.00	0.21	0.21	0.43	34%
40° 10' to Pt. Chehalis									
2011	1.59	0.11	0.61	2.31	0.00	0.11	0.61	0.71	31%
2012	0.54	0.05	0.03	0.62	0.00	0.05	0.03	0.08	13%
South of 40° 10' N Lat									
2011	--	--	--	0.00	--	--	--	0.00	0%
2012	--	--	--	0.00	--	--	--	0.00	0%

Table 8. Estimated Pacific halibut discard (mt), discard mortality (mt), legal-sized (≥ 82 cm) mortality (mt), and percent of legal-sized discard by weight in the IFQ fishery by gear or sector, depth, area and year. (*) Confidential data.

Bottom Trawl

Area / Depth (fm) / Year	Total discard (mt)	Total discard mortality (mt)	Estimated legal-sized mortality (mt)	Estimated % legal-sized discarded by weight
North of Pt. Chehalis				
0-60				
2011	7.82	3.51	1.92	55%
2012	4.80	2.44	1.14	47%
> 60				
2011	22.70	11.55	8.15	71%
2012	41.10	22.39	15.49	69%
40° 10' to Pt. Chehalis				
0-60				
2011	11.09	3.38	2.10	62%
2012	7.89	2.98	1.58	53%
> 60				
2011	22.53	12.76	8.79	69%
2012	20.34	11.94	8.43	71%
South of 40° 10' N Lat				
0-60				
2011	0.17	0.15	0.15	100%
2012	*	*	*	*
> 60				
2011	0.16	0.09	0.09	97%
2012	0.84	0.44	0.38	86%
LE California Halibut				
South of 40° 10' N Lat				
2011	0.00	0.00	0.00	0%
2012	*	*	*	*

Midwater Trawl

Area / Year	Total bycatch (mt)	Total discard mortality (mt)	Estimated legal-sized mortality (mt)	Estimated % legal-sized discarded by weight
Non-Hake Shoreside				
North of 40° 10' N Lat				
2011	*	*	*	*
2012	0.05	0.05	0.04	71%
Shoreside Hake				
North of 40° 10' N Lat				
2011	0.03	0.03	0.00	100%
2012	0.00	0.00	0.00	0%

Table 8. continued

Hook-and-Line				
Area / Year	Total bycatch (mt)	Total discard mortality (mt)	Estimated legal-sized mortality (mt)	Estimated % legal-sized discarded by weight
North of 40° 10' N Lat				
2011	6.06	0.97	0.43	45%
2012	14.66	2.34	1.81	77%
South of 40° 10' N Lat				
2011	0.00	0.00	0.00	0%
2012	*	*	*	*

Pot				
Area / Year	Total bycatch (mt)	Total discard mortality (mt)	Estimated legal-sized mortality (mt)	Estimated % legal-sized discarded by weight
North of Pt. Chehalis				
2011	1.03	0.17	0.13	77%
2012	1.27	0.43	0.34	81%
40° 10' to Pt. Chehalis				
2011	2.31	0.71	0.53	74%
2012	0.62	0.08	0.06	74%
South of 40° 10' N Lat				
2011	0.00	0.00	0.00	0%
2012	0.00	0.00	0.00	0%

Table 9. Pacific halibut bycatch (gross discard, mt) by month for vessels fishing bottom trawl gear in the 2012 IFQ fishery. The number of vessels per area-depth-month stratum do not meet confidentiality requirements; therefore we present monthly estimates.

IFQ Fishery 2012 - Bottom Trawl

Month	Expanded Discard (mt)	Sampled Discard (mt)	Total Bycatch (mt)
Jan	0.01	3.77	3.77
Feb	0.02	4.27	4.29
Mar	0.10	6.70	6.80
Apr	0.03	7.99	8.02
May	1.55	8.11	9.65
Jun	0.06	6.10	6.16
Jul	0.14	7.11	7.25
Aug	0.40	6.96	7.36
Sep	0.03	4.03	4.06
Oct	0.00	1.83	1.83
Nov	0.00	2.39	2.39
Dec	0.00	13.62	13.62

Table 10. Pacific halibut length frequencies collected by WCGOP observers during the U.S. west coast groundfish IFQ fishery by gear type, summed across all years. (a) Physical measurement of P. halibut lengths (cm). (b) Visual estimates of P. halibut lengths (cm). Note that there were no physical measurements from vessels fishing with hook-&-line gear. The lower limits on the length intervals are inclusive, while the upper limits are exclusive. Numbers are numbers of individual P. halibut per bin by gear type.

IFQ Fishery 2011-2012

a. Physical measurements

	No. of fish caught with		
Length bin (cm)	Bottom Trawl	Midwater Trawl	Pot
17-22	1	0	0
22-27	1	0	0
27-32	2	0	0
32-37	8	0	0
37-42	13	0	0
42-47	22	0	1
47-52	40	0	0
52-57	85	0	2
57-62	393	0	9
62-67	1208	0	16
67-72	1948	1	31
72-77	2602	1	60
77-82	2217	1	87
82-87	2020	4	111
87-92	1551	1	78
92-97	1198	0	45
97-102	758	0	29
102-107	535	0	11
107-112	372	0	10
112-117	240	0	8
117-122	128	0	4
122-127	73	0	3
127-132	35	0	2
132-137	16	0	2
137-142	8	0	1
142-147	11	0	0
147-152	3	0	0
152-157	1	0	0
157-162	0	0	0
162-167	0	0	0
167-172	0	0	1
172-177	0	0	0
177-182	0	0	0
182-187	0	0	0
187-192	0	0	0
192-197	0	0	0
197-202	0	0	1

b. Visual estimates

	No. of fish caught with		
Length bin (cm)	Bottom Trawl	Pot	Hook and Line
30	0	1	20
40	2	2	101
50	3	1	212
60	4	2	375
70	15	4	427
80	10	11	324
90	8	7	256
100	7	7	179
110	3	1	132
120	7	2	77
130	2	1	29
140	3	0	12
150	2	0	1
160	0	0	1
170	0	0	2
180	0	0	1

Table 11. Number of observed trips, sets, and vessels by year in the non-IFQ fixed gear fisheries, by sector, gear, area, and year.

	LE Sablefish Endorsed			LE Non-Sablefish Endorsed	OA Fixed Gear	
	Longline					
Year	North of Pt Chehalis	South of Pt Chehalis	Pot	Longline	Hook-and-line gears	Pot
	Number of observed trips					
2002	23	47	23	11	0	0
2003	25	25	35	130	41	16
2004	13	35	13	62	42	96
2005	31	73	39	35	34	43
2006	31	34	39	121	10	38
2007	36	40	30	158	50	45
2008	17	60	24	122	58	55
2009	13	34	27	138	68	30
2010	18	127	43	226	69	40
2011	18	84	22	201	68	60
2012	7	86	19	128	34	35
	Number of observed sets					
2002	207	181	247	22	0	0
2003	191	158	362	219	49	50
2004	115	205	139	130	50	185
2005	388	275	491	60	37	50
2006	291	159	288	196	11	39
2007	381	136	154	303	66	72
2008	194	345	329	220	68	74
2009	178	109	67	271	101	45
2010	251	505	314	470	104	69
2011	284	389	227	426	100	84
2012	47	485	351	252	53	70
	Number of observed vessels					
2002	9	18	6	4	0	0
2003	8	8	6	17	13	7
2004	6	13	3	14	14	17
2005	10	18	7	11	10	14
2006	9	10	7	21	7	15
2007	9	14	4	36	25	20
2008	6	13	6	32	33	20
2009	4	6	3	34	33	18
2010	5	20	7	38	37	26
2011	7	20	3	38	40	28
2012	5	16	5	26	24	19

Table 12. Expansion factors and WCGOP observed discard rate by gear type for limited entry (LE) and open access (OA) non-nearshore fixed gear sectors used to expand discard estimates of Pacific halibut to the fleet-wide level.

Fishery		Expansion Factor	Observed Discard Rate Applied	
LE Sablefish Endorsed	Longline Pot	Retained Sablefish	LE Sablefish Endorsed	Longline Pot
LE Non-Sablefish Endorsed	Longline Pot	Retained Groundfish Retained Sablefish	LE Non-Sablefish Endorsed OA Fixed Gear --	Longline Pot
OA Fixed Gear	Hook-and-line Pot	Retained Groundfish	OA Fixed Gear --	Hook-and-line Pot

-- No discard ratio or discard estimate was computed in the OA fixed gear sector for 2002-2006 because the WCGOP only covered OA vessels in California during this time.

Table 13. Total sablefish and groundfish landings (mt) and observed discard ratios for each sector and gear type in the non-nearshore fixed gear fishery. Sablefish landings were used as the discard ratio denominator and expansion factor in all cases except for the limited entry (LE) non-sablefish endorsed and the OA fixed gear sectors, where target species include a variety of groundfish species.

	LE Sablefish Endorsed			LE Non-Sablefish Endorsed		OA Fixed Gear	
	Longline						
	North of Pt Chehalis	South of Pt Chehalis	Pot	Longline	Pot	Hook-and-Line gears	Pot
Expansion factor *(Based on fish tickets)*	*Sablefish landings (mt)*			*Groundfish landings (mt)*	*Sablefish landings (mt)*	*Groundfish landings (mt)*	
2002	384	407	352	625	7	388	109
2003	458	571	604	546	7	548	186
2004	653	653	620	400	11	474	186
2005	586	674	615	553	3	625	379
2006	660	709	582	468	30	495	443
2007	467	605	428	515	2	272	258
2008	394	695	433	642	3	428	241
2009	435	1008	489	808	7	668	373
2010	259	1031	509	1016	17	774	326
2011	223	924	372	1242	24	446	256
2012	200	866	297	795	9	333	126
Observed Pacific halibut discard ratios							
2002	0.33	0.03	0.01	--	--	--	--
2003	0.35	0.05	0.00	0.00	--	--	--
2004	0.24	0.07	0.05	--	--	--	--
2005	0.33	0.02	0.00	--	--	--	--
2006	0.78	0.16	0.03	--	--	--	--
2007	0.22	0.03	0.01	0.00	0.00	0.08	0.00
2008	0.37	0.15	0.02	0.00	0.00	0.10	0.00
2009	0.64	0.04	0.00	0.00	0.00	0.05	0.00
2010	0.26	0.06	0.01	0.00	0.00	0.04	0.00
2011	0.48	0.03	0.01	0.02	0.00	0.03	0.00
2012	0.45	0.06	0.02	0.02	0.00	0.07	0.00

-- No discard ratio is provided for the OA fixed gear sector for 2002-2006 because the WCGOP only covered OA vessels in California during this time. Because 2007-2008 OA pot discard rates were used to estimate LE non-endorsed discard, discard ratios for this sector-gear were excluded.

Table 14. Summary of the percent of observed trips that caught Pacific halibut by sector, gear, and area (where applicable). Observed average, minimum and maximum annual catch and annual discard weights are also provided, along with the percent of Pacific halibut catch weight that was discarded by year.

	LE Sablefish Endorsed			LE Non-Sablefish Endorsed		OA Fixed Gear	
	Longline						
	North of Pt Chehalis	South of Pt Chehalis	Pot	Longline	Pot	Hook-and-Line Gears	Pot
% of observed trips that caught Pacific halibut							
2002	95.7%	46.8%	17.4%	0%	--	0%	0%
2003	100%	52.0%	8.6%	0.8%	--	0%	0%
2004	100%	71.4%	38.5%	0%	--	0%	0%
2005	96.8%	58.9%	33.3%	0%	--	0%	0%
2006	100%	76.5%	56.4%	0%	--	10.0%	0%
2007	94.4%	47.5%	33.3%	1.9%	--	26.0%	6.7%
2008	100%	78.3%	83.3%	3.3%	--	34.5%	5.5%
2009	84.6%	35.3%	33.3%	0.7%	--	38.2%	10.0%
2010	83.3%	47.2%	51.2%	1.3%	--	21.7%	2.5%
2011	88.9%	42.9%	45.5%	6.0%	--	30.9%	6.7%
2012	71.4%	58.1%	31.6%	7.0%	--	32.4%	8.6%
Observed annual catch (mt) of Pacific halibut							
Mean	42.8	11.8	2.0	0.3	--	0.9	0.0
Min	8.3	2.3	0.1	0.0	--	0.1	0.0
Max	118.4	36.6	5.4	1.4	--	1.6	0.0
Observed annual discard (mt) of Pacific halibut							
Mean	37.2	11.7	2.0	0.3	--	0.9	0.0
Min	8.0	2.3	0.1	0.0	--	0.1	0.0
Max	109.6	36.6	5.4	1.4	--	1.6	0.0
% of Pacific halibut catch that was discarded							
2002	77.6%	95.5%	100%	n.o.c.	--	n.o.c.	n.o.c.
2003	80.1%	99.4%	100%	100%	--	n.o.c.	n.o.c.
2004	76.3%	97.3%	100%	n.o.c.	--	n.o.c.	n.o.c.
2005	82.7%	100.0%	100%	n.o.c.	--	n.o.c.	n.o.c.
2006	92.6%	97.5%	100%	n.o.c.	--	100%	n.o.c.
2007	78.0%	100%	100%	100%	--	100%	100%
2008	87.4%	100%	100%	100%	--	100%	100%
2009	100%	100%	100%	100%	--	100%	100%
2010	100%	100%	100%	100%	--	100%	100%
2011	100%	100%	100%	100%	--	100%	100%
2012	96.6%	100%	100%	100%	--	100%	100%

n.o.c. No observed catch of Pacific halibut and thus a % discarded calculation is not possible.

-- No WCGOP observers were deployed for the sector/year/gear type combination.

Table 15. Estimated gross discard (mt) and discard mortality (mt) in the limited entry (LE) sablefish endorsed, LE non-sablefish endorsed, and open access (OA) fixed gear sectors. Estimated discard mortality (mt) was computed by applying a 16% (longline) or 18% (pot) discard mortality rate (DMR) to gross discard estimates. Discard estimates were not initially computed for the 2002 - 2006 OA fixed gear sector because the WCGOP only observed OA fixed gear vessels off of California. To estimate 2002-2006 values, a combined discard rate from the first 2 years of coastwide observation (2007-08) was applied to the 2002-06 period. The results of assuming the 2007-2008 discard rate are shown in brackets.

	LE Sablefish Endorsed				LE Non-Sablefish Endorsed		OA Fixed Gear	
	Longline			Pot	Longline	Pot	Hook-and-Line	Pot
	North of Pt Chehalis	South of Pt Chehalis	Coastwide	Coastwide	Coastwide	Coastwide	Coastwide	Coastwide
Year	Gross Discard Estimate (mt)							
2002	126.6	11.5	138.1	4.0	0.0	‡ [0.0]	‡ [35.2]	‡ [0.2]
2003	161.7	26.7	188.4	0.3	0.2	‡ [0.0]	‡ [49.8]	‡ [0.4]
2004	154.7	48.7	203.4	32.6	0.0	‡ [0.0]	‡ [43.1]	‡ [0.4]
2005	194.4	13.8	208.1	2.6	0.0	‡ [0.0]	‡ [56.7]	‡ [0.8]
2006	516.8	116.0	632.8	15.8	0.0	‡ [0.1]	‡ [44.9]	‡ [0.9]
2007	102.0	20.1	122.2	3.9	1.7	0.00	21.4	0.89
2008	146.3	105.8	252.1	6.6	2.9	0.00	42.2	0.23
2009	280.2	41.6	321.8	0.9	0.3	0.00	36.4	0.27
2010	68.5	65.7	134.3	5.3	0.4	0.00	32.8	0.51
2011	106.6	26.0	132.6	4.1	21.4	0.00	13.6	0.06
2012	90.6	54.4	145.0	6.2	15.8	0.00	24.4	0.41
	Estimated Discard Mortality (mt)							
Year	DMR 16%	DMR 16%	DMR 16%	DMR 18%	DMR 16%	DMR 18%	DMR 16%	DMR 18%
2002	20.3	1.8	22.1	0.7	0.0	-- ‡	-- ‡	-- ‡
2003	25.9	4.3	30.1	0.1	0.0	-- ‡	-- ‡	-- ‡
2004	24.8	7.8	32.5	5.9	0.0	-- ‡	-- ‡	-- ‡
2005	31.1	2.2	33.3	0.5	0.0	-- ‡	-- ‡	-- ‡
2006	82.7	18.6	101.2	2.8	0.0	-- ‡	-- ‡	-- ‡
2007	16.3	3.2	19.5	0.7	0.3	0.00	3.4	0.11
2008	23.4	16.9	40.3	1.2	0.5	0.00	6.8	0.04
2009	44.8	6.7	51.5	0.2	0.0	0.00	5.8	0.05
2010	11.0	10.5	21.5	1.0	0.1	0.00	5.3	0.09
2011	17.1	4.2	21.2	0.7	3.4	0.00	2.2	0.02
2012	14.5	8.7	23.2	1.1	2.5	0.00	3.9	0.07

‡ The LE non-sablefish endorsed pot sector has not been observed by the WCGOP and therefore estimates are based on discard rates from observed OA fixed gear pot vessels. Because the OA fixed gear pot sector was only observed on a coastwide basis in 2007 and 2008, estimates for LE non-sablefish endorsed pot are only available in these years as well.

Table 16. Estimated discard mortality (mt) from each sector of the non-nearshore fixed gear fishery, by year.

	Estimated discard mortality (mt)			
	LE Sablefish Endorsed	LE Non-Sablefish Endorsed	OA Fixed Gear	All Sectors
2002	22.83	0.00	0.00	22.83
2003	30.19	0.03	0.00	30.22
2004	38.42	0.00	0.00	38.42
2005	33.77	0.00	0.00	33.77
2006	104.08	0.00	0.00	104.08
2007	20.25	0.28	3.58	24.11
2008	41.53	0.47	6.79	48.80
2009	51.65	0.04	5.87	57.56
2010	22.44	0.06	5.34	27.85
2011	21.95	3.42	2.19	27.55
2012	24.32	2.53	3.98	30.83

Table 17. Pacific halibut length frequencies collected by WCGOP observers in the LE sablefish endorsed, LE sablefish non-endorsed, and OA fixed gear fisheries, including both pot and longline gears (2002-to present). (a) Physical measures of P. halibut lengths (cm). (b) Visual estimates of P. halibut lengths (cm). Note that observers were only required to collect physical measurements from LE sablefish endorsed vessels starting in 2011. The lower limits on the length intervals are inclusive, while the upper limits are exclusive. Numbers are numbers of individual P. halibut per bin.

Fixed Gear Sectors 2002-2012

a. Physical measurements

Length bin (cm)	No. of fish caught with: Hook-and-Line	No. of fish caught with: Pot
LE Endorsed		
42-47	2	0
47-52	7	0
52-57	9	0
57-62	22	5
62-67	59	10
67-72	135	33
72-77	234	87
77-82	263	86
82-87	210	82
87-92	191	51
92-97	173	36
97-102	118	15
102-107	70	7
107-112	41	3
112-117	32	2
117-122	17	1
122-127	8	5
127-132	1	1
132-137	3	0
137-142	1	0
142-147	0	1
LE Non-endorsed		
67-72	4	0
72-77	10	0
77-82	11	0
82-87	7	0
87-92	14	0
92-97	8	0
97-102	3	0
102-107	4	0
107-112	3	0
112-117	3	0
117-122	2	0
122-127	1	0
132-137	1	0
OA Fixed Gear		
42-47	2	0
47-52	1	0
52-57	1	0
57-62	2	0
62-67	8	1
67-72	6	2
72-77	16	2
77-82	15	1
82-87	20	1
87-92	14	2
92-97	9	0
97-102	7	0
102-107	4	0
107-112	6	1
112-117	1	0
117-122	1	0
122-127	1	0

b. Visual estimates

Length bin (cm)	No. of fish caught with: Hook-and-Line	No. of fish caught with: Pot
LE Endorsed		
20	0	0
30	21	0
40	56	1
50	303	5
60	2950	43
70	4946	104
80	5312	76
90	4228	71
100	2290	35
110	808	16
120	338	9
130	104	2
140	21	3
150	5	0
160	1	0
170	0	0
LE Non-endorsed		
50	2	0
60	11	0
70	29	0
80	36	0
90	22	0
100	14	0
110	8	0
120	9	0
130	4	0
OA Fixed Gear		
40	2	0
50	2	0
60	13	0
70	25	0
80	48	0
90	28	0
100	13	0
110	5	0
120	1	0
130	1	0

Table 18. Pacific halibut physically measured lengths and visual estimates of lengths approximating legal (> 82 cm) versus sublegal definitions (IPHC), collected by the WCGOP in the LE sablefish endorsed, LE non-endorsed, and OA fixed gear sectors (2002-present).

	Pacific halibut lengths	
	Number	Percentage
Physical length		
< 82 cm	952	47%
≥ 82 cm	1069	53%
Visual estimate		
0 - 74 cm	8482	39%
75 - 84 cm	5435	25%
85 - 150 cm	8021	37%

Table 19. Coverage information, bycatch rates, and bycatch estimates for Pacific halibut in the nearshore fixed gear groundfish fisheries by state and year. The WCGOP began observing the California nearshore fishery in 2003 and the Oregon nearshore fishery in 2004. Bycatch estimates in this table are not intended to represent mortality values, as discard mortality rates are not available for the nearshore fixed gear fishery.

		Observed						Total fleet catch of nearshore species (mt)	Estimated		
	Fleet observer coverage rate‡	Number of observed sets	% of sets with Pacific halibut	Pacific halibut bycatch (mt)	Nearshore species retained (mt)	Pacific halibut bycatch rate	SE		Pacific halibut bycatch (mt)	Lower bound (mt)	Upper bound (mt)
Nearshore fixed gear groundfish fisheries											
Oregon											
2002	*not observed*	--	--	--	--	--	--	279	--	--	--
2003	*not observed*	--	--	--	--	--	--	208	--	--	--
2004	4.9%	207	1.9%	0.05	10	0.0048	0.0027	210	1.005	0.002	2.121
2005	6.3%	167	0.6%	0.03	11	0.0028	0.0028	181	0.514	0.002	1.521
2006	11.6%	379	1.3%	0.06	19	0.0032	0.0016	168	0.543	0.005	1.081
2007	8.9%	242	0.4%	0.01	16	0.0005	0.0005	182	0.087	0.002	0.259
2008	7.6%	183	0.5%	0.03	14	0.0019	0.0019	189	0.360	0.002	1.067
2009	6.2%	219	2.3%	0.08	14	0.0058	0.0028	224	1.298	0.060	2.536
2010	7.7%	210	0.5%	0.01	13	0.0005	0.0005	173	0.080	0.002	0.236
2011	8.1%	244	2.0%	0.09	16	0.0056	0.0031	195	1.102	0.002	2.278
2012	10.4%	287	1.4%	0.11	21	0.0055	0.0033	197	1.080	0.002	2.367
California											
2002	*not observed*	--	--	--	--	--	--	380	--	--	--
2003	3.2%	205	0.0%	0.00	8	0.0000	0.0000	255	0.000	0.000	0.000
2004	8.0%	422	0.0%	0.00	23	0.0000	0.0000	288	0.000	0.000	0.000
2005	4.8%	219	0.9%	0.08	13	0.0060	0.0054	280	1.672	0.003	4.604
2006	3.2%	158	0.0%	0.00	8	0.0000	0.0000	258	0.000	0.000	0.000
2007	4.4%	224	0.0%	0.00	12	0.0000	0.0000	273	0.000	0.000	0.000
2008	2.2%	87	0.0%	0.00	7	0.0000	0.0000	294	0.000	0.000	0.000
2009	2.6%	122	0.0%	0.00	7	0.0000	0.0000	260	0.000	0.000	0.000
2010	3.2%	117	0.0%	0.00	7	0.0000	0.0000	219	0.000	0.000	0.000
2011	3.9%	210	0.5%	0.08	8	0.0092	0.0092	216	1.981	0.002	5.862
2012	6.1%	241	1.2%	0.07	12	0.0058	0.0042	200	1.160	0.002	2.790

‡ Coverage rate in the nearshore sector is defined as the proportion of nearshore target species landings that were observed. Nearshore target species are listed in Appendix D.

Table 20. Coverage information, bycatch rates, and bycatch estimates (mt) for Pacific halibut in the pink shrimp trawl fishery. The WCGOP began observing the pink shrimp fishery in 2004, but was not able to observe the fishery in 2006. Bycatch estimates in this table are not intended to represent morality values, as discard mortality rates are not available for the pink shrimp fishery.

	Observed								Estimated		
	Fleet observer coverage rate‡	Number of observed tows	% of tows with Pacific halibut	Pacific halibut bycatch (mt)	Pink shrimp retained (mt)	Pacific halibut bycatch rate	SE	Total fleet catch of pink shrimp (mt)	Pacific halibut bycatch (mt)	Lower bound (mt)	Upper bound (mt)
Pink shrimp trawl fishery											
2002	*not observed*		-	-	-	-	-	25,338	-	-	-
2003	*not observed*		-	-	-	-	-	13,887	-	-	-
2004	6.5%	1027	0.0%	0.00	583,911	0.00000		8,974	0.00	0.00	0.00
2005	3.9%	509	0.2%	2.27	424,683	0.00001	0.00001	10,862	0.06	0.11	0.17
2006	*not observed*		-	-	-	-	-	8,400	-	-	-
2007	6.2%	951	0.2%	15.26	672,663	0.00002	0.00002	10,935	0.25	0.11	0.65
2008	5.2%	840	0.0%	0.00	805,763	0.00000	0.00000	15,375	0.00	0.00	0.00
2009	6.1%	708	0.0%	0.00	881,553	0.00000	0.00000	14,412	0.00	0.00	0.00
2010	11.7%	1654	0.0%	0.00	2,383,305	0.00000	0.00000	20,357	0.00	0.00	0.00
2011	13.9%	2579	0.1%	26.99	4,103,755	0.00001	0.00000	29,460	0.19	0.29	0.43
2012	13.6%	2731	0.0%	0.00	3,987,160	0.00000	0.00000	29,325	0.00	0.00	0.00

‡ Coverage rate in the pink shrimp trawl fishery is defined as the proportion of pink shrimp landings that were observed.

Table 21. Coverage information, bycatch rates, and bycatch estimates (mt) for Pacific halibut in the California halibut trawl fishery. The fishery is comprised of a limited entry component and an open access component. Beginning in 2011, the limited entry component of the California halibut fishery is observed under the IFQ groundfish fishery (see above). Bycatch estimates in this table are not intended to represent morality values, as discard mortality rates are not available for the California halibut fishery.

	Observed								Estimated		
	Fleet observer coverage rate‡	Number of observed tows	% of tows with Pacific halibut	Pacific halibut bycatch (mt)	California halibut retained (mt)	Pacific halibut bycatch rate	SE	Total fleet catch of California halibut (mt)	Pacific halibut bycatch (mt)	Lower bound (mt)	Upper bound (mt)
California halibut trawl fishery											
Limited Entry Sector											
2002	3.4%	52	0.0%	0.000	3.59	0.0000	0.0000	105	0.000	0.000	0.000
2003	18.1%	206	0.0%	0.000	19.10	0.0000	0.0000	106	0.000	0.000	0.000
2004	23.1%	170	0.6%	0.003	31.49	0.0001	0.0001	136	0.015	0.001	0.045
2005	16.2%	233	0.4%	0.005	30.51	0.0002	0.0002	189	0.029	0.002	0.086
2006	12.0%	224	0.9%	0.003	14.29	0.0002	0.0002	120	0.024	0.001	0.062
2007	13.9%	80	1.3%	0.008	5.45	0.0015	0.0015	39	0.058	0.000	0.173
2008	24.7%	118	8.5%	0.083	9.64	0.0086	0.0030	39	0.334	0.107	0.560
2009	6.0%	29	0.0%	0.000	2.90	0.0000	0.0000	48	0.000	0.000	0.000
2010	11.7%	41	0.0%	0.000	6.40	0.0000	0.0000	55	0.000	0.000	0.000
2011	Observed under IFQ Fishery, see Tables 1 & 2										
2012											
Open Access Sector											
2002	*not observed*		-	-	-	-	-	36	-	-	-
2003	7.7%	110	0.0%	0.0	1.98	0.0000	0.0000	26	0.000	0.000	0.000
2004	7.2%	244	1.6%	0.0	5.10	0.0097	0.0058	71	0.686	0.001	1.494
2005	11.6%	360	0.0%	0.0	7.49	0.0000	0.0000	65	0.000	0.000	0.000
2006	*not observed*		-	-	-	-	-	55	-	-	-
2007	6.9%	226	0.0%	0.0	2.69	0.0000	0.0000	39	0.000	0.000	0.000
2008	5.1%	197	0.0%	0.0	2.61	0.0000	0.0000	51	0.000	0.000	0.000
2009	0.8%	30	0.0%	0.0	0.63	0.0000	0.0000	82	0.000	0.000	0.000
2010	3.4%	111	0.0%	0.0	2.35	0.0000	0.0000	69	0.000	0.000	0.000
2011	15.6%	204	0.0%	0.0	12.45	0.0000	0.0000	80	0.000	0.000	0.000
2012	6.3%	77	0.0%	0.0	3.54	0.0000	0.0000	56	0.000	0.000	0.000

‡Coverage rate in the California halibut trawl fishery is defined as the proportion of California halibut landings that were observed.

Table 22. Discard estimates for all fishery sectors observed by the NWFSC Groundfish Observer Program (WCGOP), 2002-2012. Total discard mortality estimates are also provided where discard mortality rates were applied. (*) Confidential data.

	Year	LE bottom trawl (2002-2010)	IFQ fishery (2011 - Present)						Non-nearshore fixed gear			Nearshore fixed gear[1]	Pink shrimp[1]	CA halibut‡[1]	At-sea hake[1]	Total
			Shoreside hake[1]	LE CA halibut[1]	Bottom trawl	Midwater trawl[1]	Hook-and-Line	Pot	LE endorsed	LE non-endorsed	OA					
Gross discard estimates (mt)	2002	524							142.16	0.00	-	-	-	-	1.1	668
	2003	187							188.67	0.17	-	0.000	-	0.000	2.7	378
	2004	212							236.02	0.00	-	1.005	0.000	0.701	1.1	451
	2005	460							210.73	0.00	-	2.186	0.058	0.029	2.0	675
	2006	391							648.55	0.00	-	0.543	-	-	0.8	1041
	2007	294							126.10	1.72	22.25	0.087	0.248	0.058	1.2	446
	2008	305							258.75	2.94	42.42	0.360	0.000	0.334	4.0	614
	2009	385							322.70	0.26	36.64	1.298	0.000	0.000	0.3	746
	2010	265							139.59	0.37	33.33	0.080	0.000	0.000	1.6	440
	2011		0.0	0.0	64.5	*	6.1	3.3	136.68	21.35	13.65	3.082	0.194	0.000	0.6	249
	2012		0.0	*	75.2	0.1	14.7	1.9	151.25	15.78	24.80	2.240	0.000	0.000	0.6	287
Total discard mortality (mt)	2002	345							22.83	0.00	-	-	-	-	1.1	369
	2003	124							30.19	0.03	-	0.000	-	0.000	2.7	157
	2004	133							38.42	0.00	-	1.005	0.000	0.701	1.1	174
	2005	287							33.77	0.00	-	2.186	0.058	0.029	2.0	325
	2006	242							104.08	0.00	-	0.543	-	-	0.8	348
	2007	209							20.25	0.28	3.58	0.087	0.248	0.058	1.2	234
	2008	208							41.53	0.47	6.79	0.360	0.000	0.334	4.0	261
	2009	251							51.65	0.04	5.87	1.298	0.000	0.000	0.3	310
	2010	181							22.44	0.06	5.34	0.080	0.000	0.000	1.6	210
	2011		0.03	0.0	31.4	*	1.0	0.9	21.95	3.42	2.19	3.082	0.194	0.000	0.6	65
	2012		0.00	*	40.4	0.1	2.3	0.5	24.32	2.53	3.98	2.240	0.000	0.000	0.6	77

‡ Since 2011, CA Halibut only includes Open Access sector because the Limited Entry sector is covered under the IFQ Fishery.

" - " Indicates years of incomplete or no observer coverage for which estimates are not available

[1]Mortality rate of 100% applied.

FIGURES

Figure 1. Fish ticket data processing for division into 2012 groundfish fishery sectors after retrieval from the Pacific Fisheries Information Network (PacFIN) database. Grey boxes indicate sectors for which federal observer data is available. Fish ticket processing methods are updated regularly, thus this figure might differ from similar figures in previous reports.

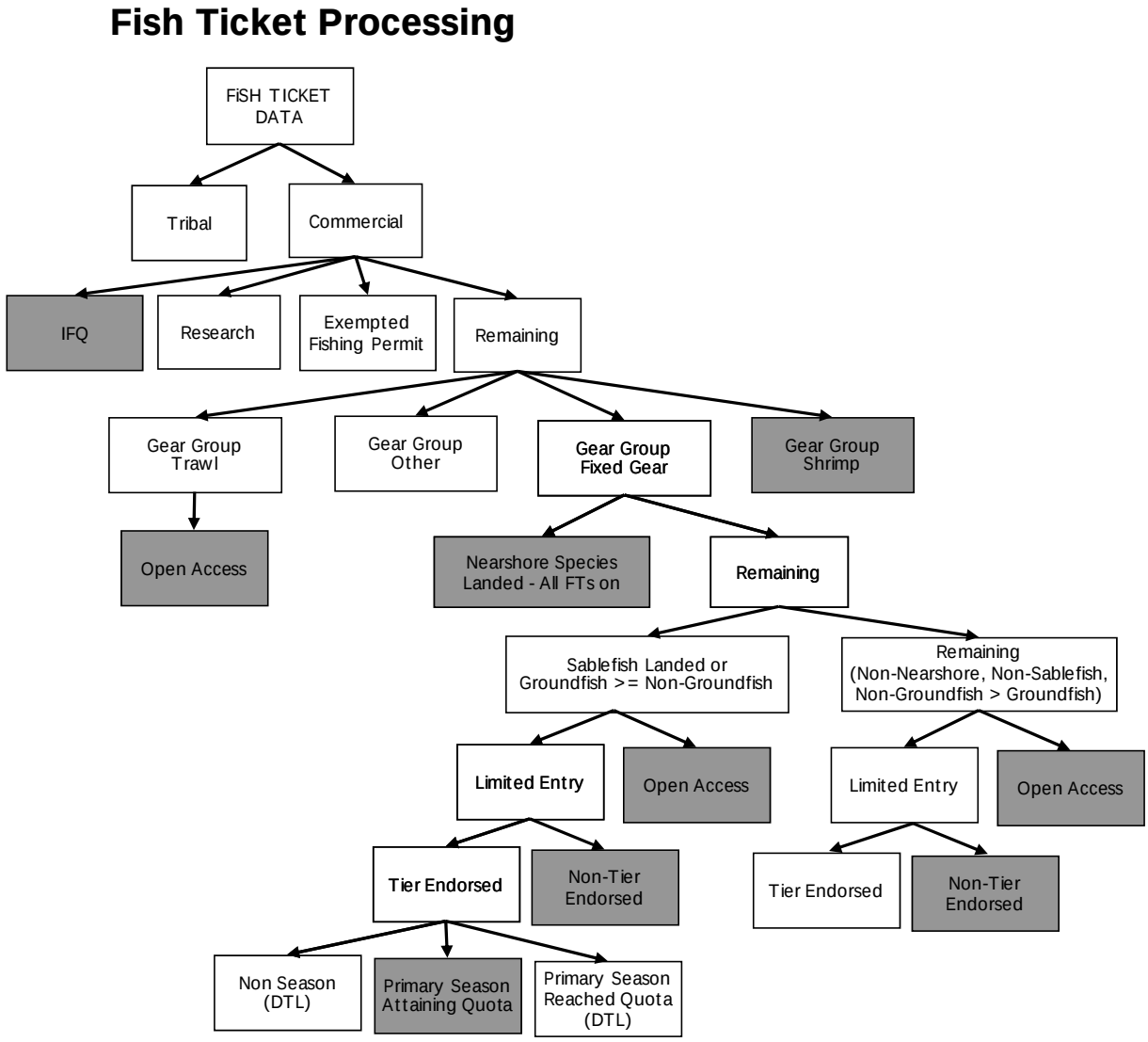


Figure 2a. Spatial distribution of Pacific halibut catch (mt/km^2) observed by the West Coast Groundfish Observer Program, off the U.S. west coast (WA, OR). Gear types observed by the WCGOP include bottom trawl, midwater trawl, shrimp trawl, fixed gear hook-&-line and pot gear. The four catch classifications were defined by dividing the maximum value (2.0697) in half to obtain the 1.0349-2.0697 catch bin. The next lower bin was obtained by dividing the lower bound of the upper bin (1.0348) in half again to obtain the 0.51745-1.0348 catch bin. The remaining observations were allocated into equal proportions into the two lowest classifications. Cells calculated from less than 3 vessels were omitted from the map due to confidentiality.

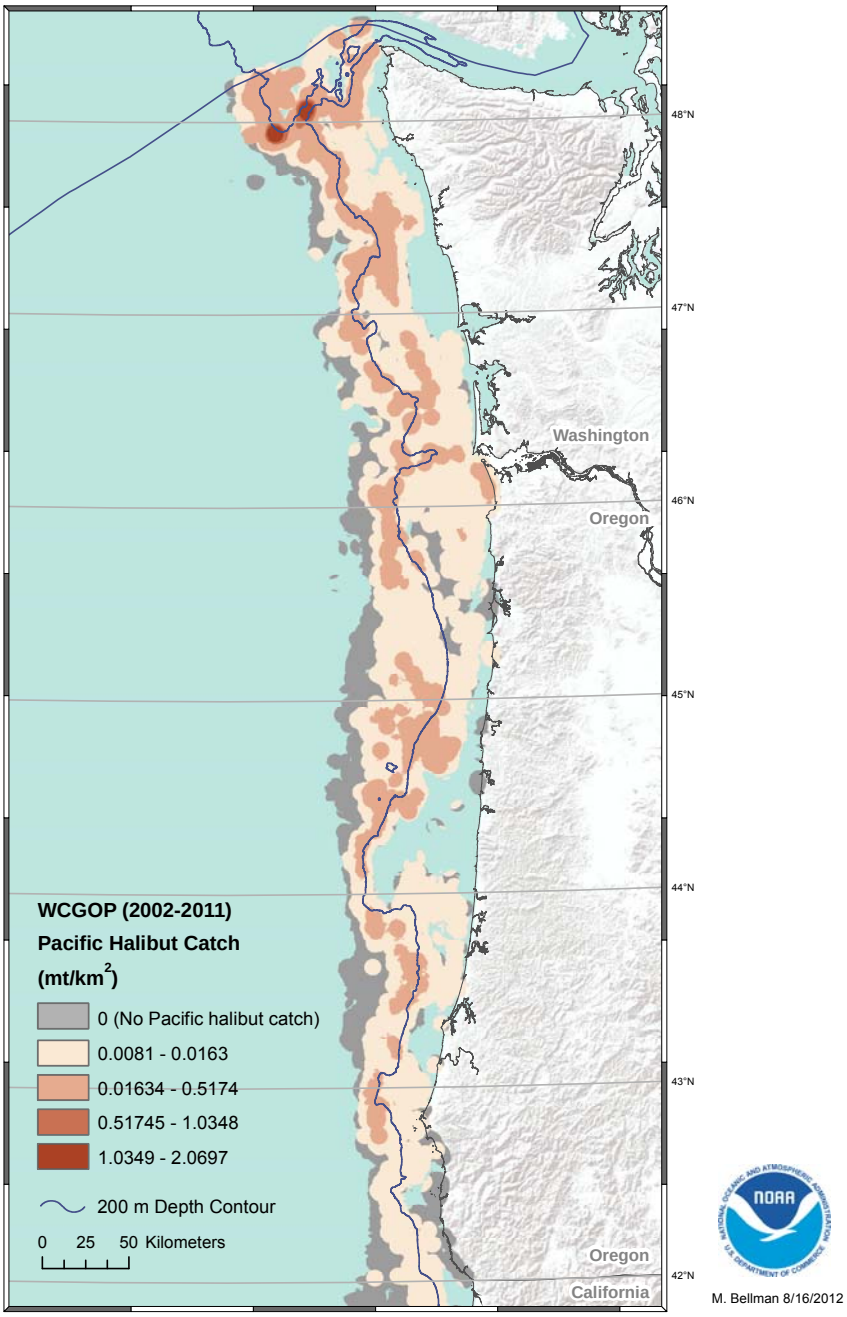


Figure 2b. Spatial distribution of Pacific halibut catch (mt/km^2) and fishing grounds observed by the West Coast Groundfish Observer Program, off the U.S. west coast (CA). See Figure 2a caption for full description.

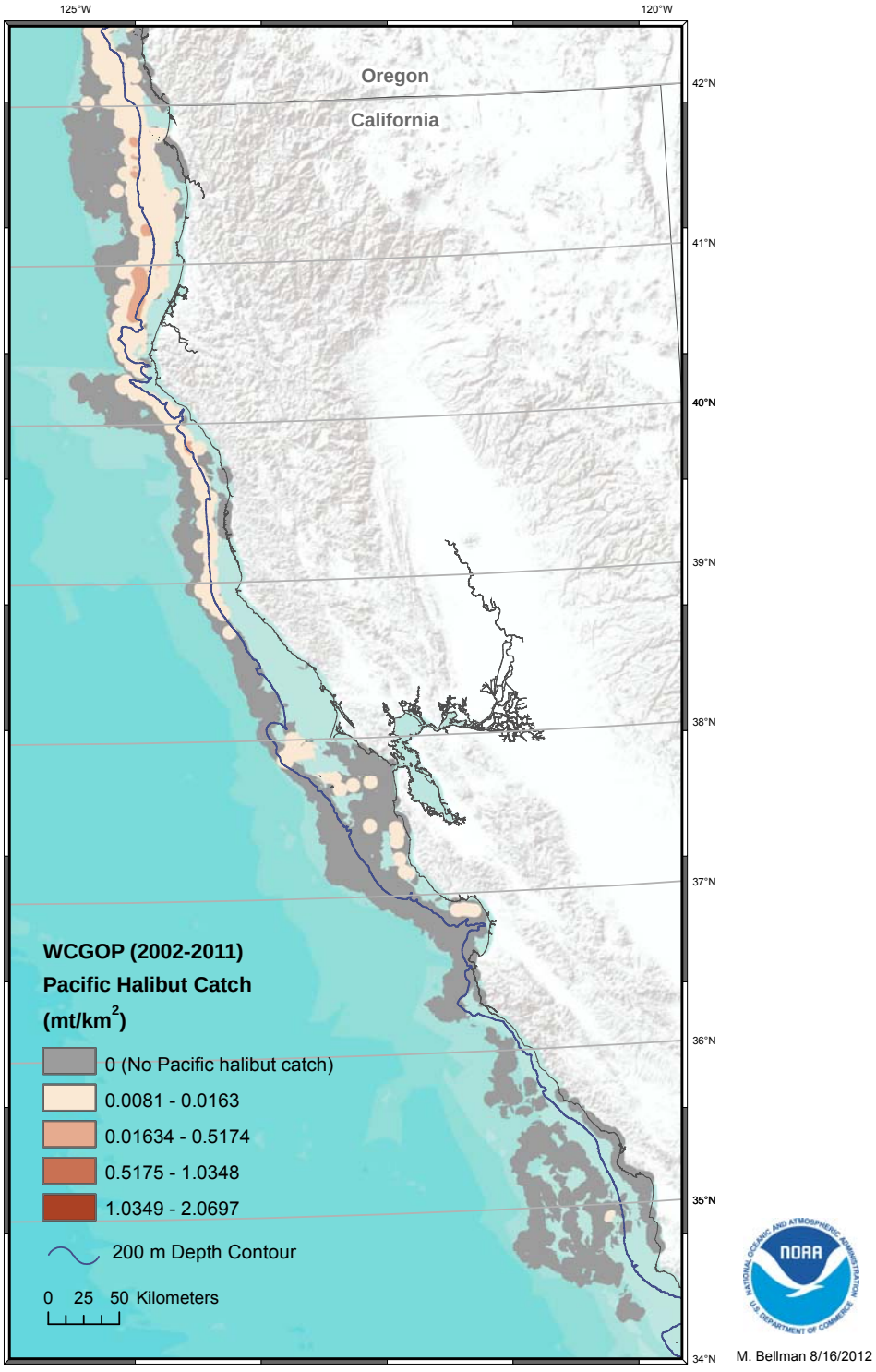


Figure 3. Estimated discard mortality of Pacific halibut in the non-nearshore groundfish fixed gear fishery. Estimates are presented for fixed gear sectors with annual discard estimates exceeding 1 mt, which included all components of the limited entry (LE) sablefish endorsed sector (longline gear (LL) by area and pot gear (POT) coastwide) and the open access (OA) sector using hook-&-line gears. The OA fixed gear sector was only observed in California from 2003-2006 and was not covered in 2002. A fixed average discard rate from 2007 and 2008 data was applied to generate 2002-2006 discard estimates for the OA sector. Although OA 2002-2006 discard estimates are not included in final total mortality summaries, they are shown here for comparison purposes. Other fixed gear sectors include LE non-sablefish endorsed and OA fixed gear vessels fishing with pot gear.

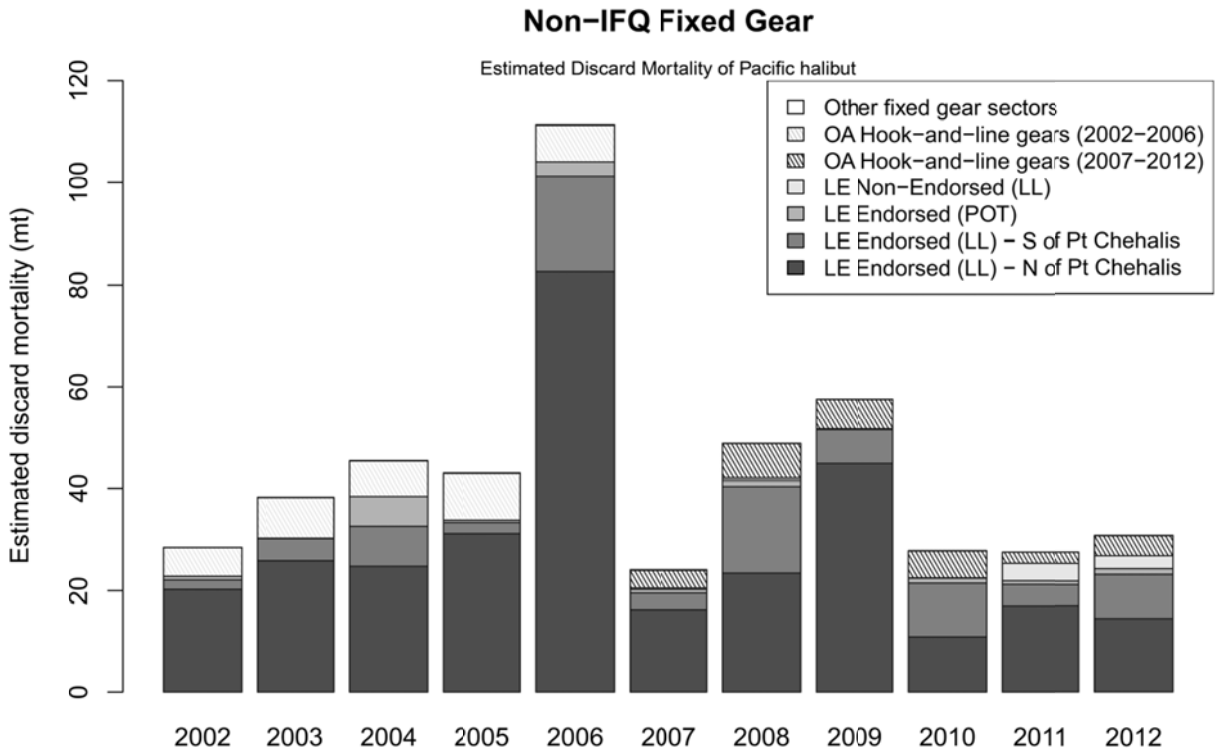


Figure 4. Length frequency distribution of discarded Pacific halibut on WCGOP observed non-IFQ, limited entry (LE) and open access (OA) groundfish fixed gear vessels from September 2003 through December 2012. The majority of Pacific halibut lengths collected in this fishery were visual estimates (grey bars), which are only estimated in 10 cm bins.

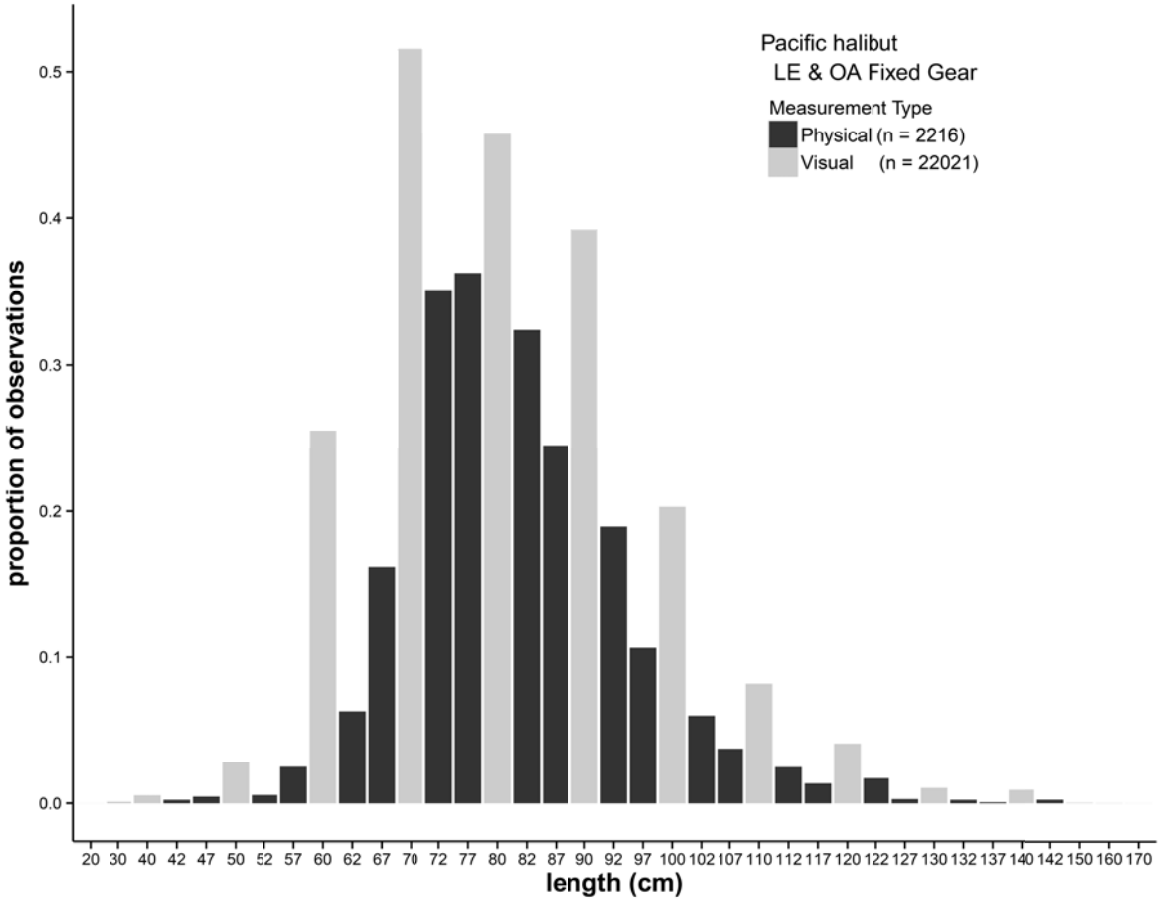
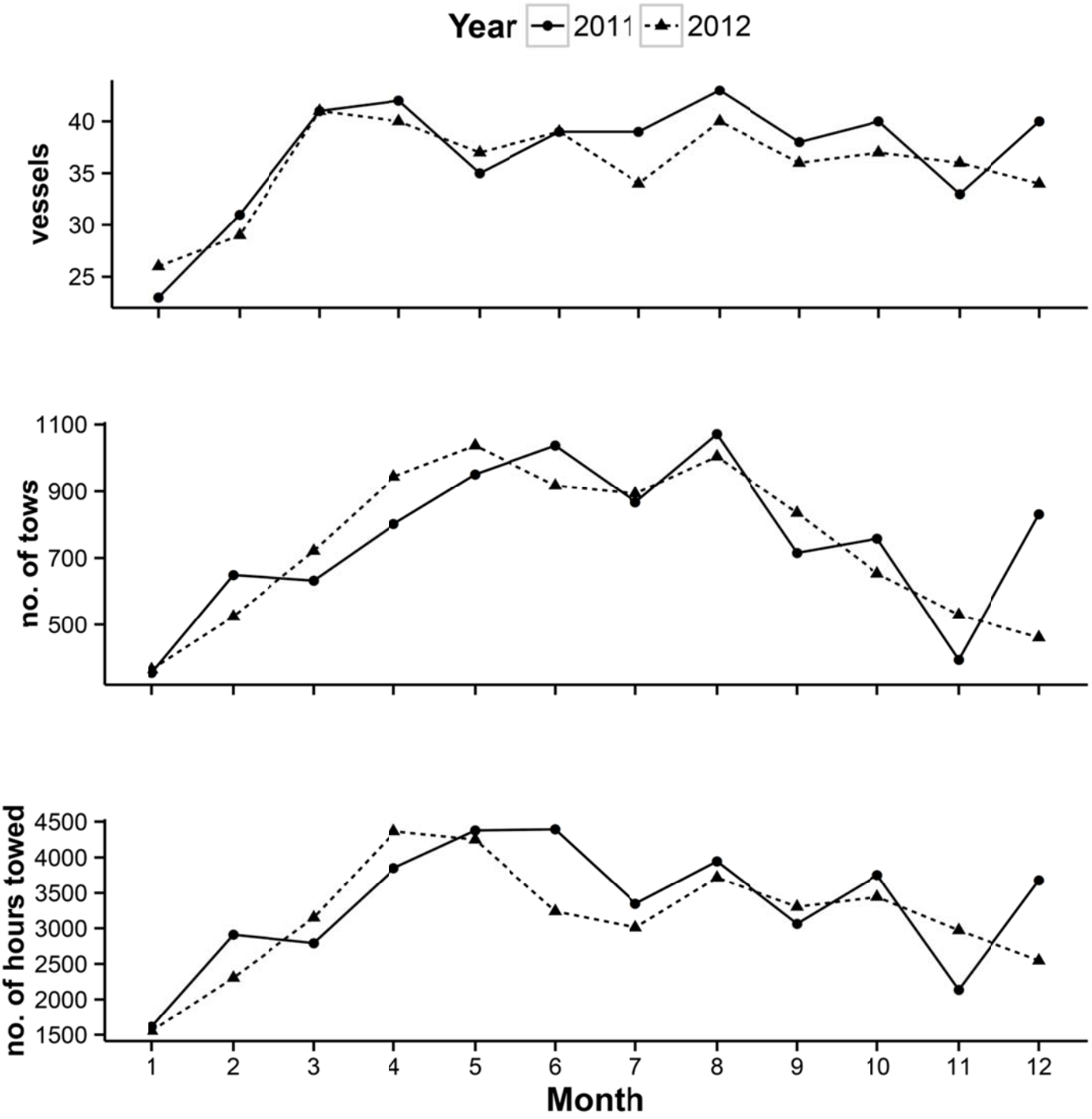


Figure 5. Number of vessels, tows, and tow hours for bottom trawl vessels in the IFQ fishery (excluding LE Califonia Halibut) by month and year.



APPENDIX A

Weighted catch composition data from the IFQ fishery for bottom trawl and pot gears. The frequency within each length bin was weighted based on the following equation:

$$n_{wghtd_l} = n_l \times \frac{W_{st}}{\sum_l w_{stl}} \times \frac{\sum_t W_{st}}{W_{st}} \times \frac{\hat{W}_s}{\sum_t W_{st}} = n_l \times \frac{\hat{W}_s}{\sum_l w_{stl}}$$

where:
n_l: number of measured fish in length bin l
w_{stl}: total weight of length l fish measured, as determined through the IPHC length-weight relationship
W_{st}: total observed discard weight of Pacific halibut on tow t, in stratum s
$\hat{W}_s$: estimated total discard weight of Pacific halibut in stratum s

Table A1. Weighted length frequency distributions for Pacific halibut in the IFQ fishery for bottom trawl and pot gears, by year.

Length	Bottom Trawl		Pot		Length	Bottom Trawl		Pot	
bin (cm)	2011	2012	2011	2012	bin (cm)	2011	2012	2011	2012
0	0.0000	0.0000	0.0000	0.0000	102	0.0058	0.0071	0.0025	0.0085
2	0.0000	0.0000	0.0000	0.0000	104	0.0052	0.0042	0.0024	0.0054
4	0.0000	0.0000	0.0000	0.0000	106	0.0036	0.0035	0.0000	0.0137
6	0.0000	0.0000	0.0000	0.0000	108	0.0027	0.0034	0.0035	0.0012
8	0.0000	0.0000	0.0000	0.0000	110	0.0024	0.0033	0.0014	0.0011
10	0.0000	0.0000	0.0000	0.0000	112	0.0020	0.0022	0.0013	0.0010
12	0.0000	0.0000	0.0000	0.0000	114	0.0016	0.0013	0.0028	0.0020
14	0.0000	0.0000	0.0000	0.0000	116	0.0008	0.0012	0.0005	0.0000
16	0.0000	0.0000	0.0000	0.0000	118	0.0008	0.0007	0.0011	0.0009
18	0.0081	0.0000	0.0000	0.0000	120	0.0005	0.0009	0.0015	0.0000
20	0.0000	0.0000	0.0000	0.0000	122	0.0005	0.0005	0.0029	0.0000
22	0.0000	0.0124	0.0000	0.0000	124	0.0005	0.0003	0.0000	0.0000
24	0.0000	0.0000	0.0000	0.0000	126	0.0003	0.0004	0.0000	0.0000
26	0.0000	0.0000	0.0000	0.0000	128	0.0003	0.0000	0.0008	0.0000
28	0.0000	0.0000	0.0000	0.0000	130	0.0001	0.0000	0.0004	0.0000
30	0.0000	0.0091	0.0000	0.0000	132	0.0001	0.0001	0.0000	0.0000
32	0.0000	0.0073	0.0000	0.0000	134	0.0001	0.0001	0.0007	0.0000
34	0.0000	0.0118	0.0000	0.0000	136	0.0001	0.0000	0.0007	0.0000
36	0.0000	0.0050	0.0000	0.0000	138	0.0000	0.0000	0.0003	0.0000
38	0.0000	0.0120	0.0000	0.0000	140	0.0000	0.0000	0.0000	0.0000
40	0.0015	0.0060	0.0000	0.0000	142	0.0001	0.0000	0.0000	0.0000
42	0.0026	0.0123	0.0000	0.0000	144	0.0001	0.0000	0.0000	0.0000
44	0.0000	0.0027	0.0247	0.0000	146	0.0000	0.0000	0.0000	0.0000
46	0.0004	0.0076	0.0000	0.0000	148	0.0000	0.0000	0.0000	0.0000
48	0.0032	0.0062	0.0000	0.0000	150	0.0000	0.0000	0.0000	0.0000
50	0.0030	0.0078	0.0000	0.0000	152	0.0000	0.0000	0.0000	0.0000
52	0.0045	0.0076	0.0000	0.0000	154	0.0000	0.0000	0.0000	0.0000
54	0.0076	0.0060	0.0129	0.0000	156	0.0000	0.0000	0.0000	0.0000
56	0.0081	0.0066	0.0054	0.0000	158	0.0000	0.0000	0.0000	0.0000
58	0.0201	0.0158	0.0151	0.0000	160	0.0000	0.0000	0.0000	0.0000
60	0.0330	0.0293	0.0670	0.0000	162	0.0000	0.0000	0.0000	0.0000
62	0.0459	0.0445	0.0539	0.0000	164	0.0000	0.0000	0.0000	0.0000
64	0.0573	0.0540	0.0217	0.0377	166	0.0000	0.0000	0.0004	0.0000
66	0.0610	0.0539	0.0136	0.0113	168	0.0000	0.0000	0.0000	0.0000
68	0.0584	0.0628	0.0215	0.0308	170	0.0000	0.0000	0.0000	0.0000
70	0.0780	0.0715	0.0745	0.0239	172	0.0000	0.0000	0.0000	0.0000
72	0.0751	0.0703	0.0908	0.0608	174	0.0000	0.0000	0.0000	0.0000
74	0.0866	0.0666	0.0541	0.0595	176	0.0000	0.0000	0.0000	0.0000
76	0.0648	0.0620	0.0183	0.0295	178	0.0000	0.0000	0.0000	0.0000
78	0.0554	0.0524	0.0744	0.0907	180	0.0000	0.0000	0.0000	0.0000
80	0.0560	0.0487	0.1015	0.0891	182	0.0000	0.0000	0.0000	0.0000
82	0.0468	0.0454	0.0631	0.1473	184	0.0000	0.0000	0.0000	0.0000
84	0.0453	0.0351	0.0543	0.1230	186	0.0000	0.0000	0.0000	0.0000
86	0.0298	0.0283	0.0411	0.0636	188	0.0000	0.0000	0.0000	0.0000
88	0.0271	0.0244	0.0372	0.0659	190	0.0000	0.0000	0.0000	0.0000
90	0.0255	0.0231	0.0473	0.0399	192	0.0000	0.0000	0.0000	0.0000
92	0.0203	0.0196	0.0216	0.0337	194	0.0000	0.0000	0.0000	0.0000
94	0.0169	0.0152	0.0187	0.0260	196	0.0000	0.0000	0.0000	0.0000
96	0.0125	0.0102	0.0153	0.0259	198	0.0000	0.0000	0.0000	0.0000
98	0.0097	0.0093	0.0123	0.0016	200	0.0000	0.0000	0.0001	0.0000
100	0.0079	0.0078	0.0163	0.0062					

Table A2. Percentage of weighted length measurements in each viability condition category, by gear type and year in the IFQ groundfish fishery.

Length bin (cm)	Bottom Trawl						Pot					
	Excellent		Poor		Dead		Excellent		Poor		Dead	
	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
18	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
22	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
26	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
28	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
32	0.0%	50.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
34	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
36	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
38	0.0%	82.3%	0.0%	16.1%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
40	0.0%	86.6%	100.0%	0.0%	0.0%	13.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
42	48.6%	68.8%	51.4%	24.8%	0.0%	6.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
44	0.0%	47.7%	0.0%	0.0%	0.0%	52.3%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
46	0.0%	86.4%	0.0%	13.6%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
48	25.1%	96.9%	25.1%	0.0%	49.8%	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
50	30.0%	68.9%	0.0%	11.1%	70.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
52	24.7%	51.6%	35.9%	14.8%	39.4%	33.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
54	15.9%	58.3%	42.2%	34.2%	42.0%	7.6%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
56	21.0%	43.6%	46.4%	13.5%	32.6%	43.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
58	17.2%	41.1%	31.7%	9.2%	51.1%	49.7%	67.9%	0.0%	0.0%	0.0%	32.1%	0.0%
60	32.4%	34.9%	23.9%	21.9%	43.7%	43.3%	57.3%	0.0%	0.0%	0.0%	42.7%	0.0%
62	36.4%	39.4%	23.2%	21.6%	40.3%	39.0%	38.0%	0.0%	0.0%	0.0%	62.0%	0.0%
64	36.1%	31.6%	19.9%	20.7%	44.0%	47.7%	34.5%	100.0%	0.0%	0.0%	65.5%	0.0%
66	35.5%	34.3%	21.1%	22.6%	43.4%	43.1%	50.0%	100.0%	0.0%	0.0%	50.0%	0.0%
68	42.9%	34.9%	11.8%	21.2%	45.3%	43.9%	69.9%	100.0%	0.0%	0.0%	30.1%	0.0%
70	40.4%	39.4%	20.9%	20.0%	38.8%	40.6%	62.2%	100.0%	3.4%	0.0%	34.4%	0.0%
72	37.0%	31.0%	21.3%	19.7%	41.7%	49.3%	77.3%	85.9%	0.0%	14.1%	22.7%	0.0%
74	38.5%	32.4%	18.0%	21.8%	43.5%	45.8%	69.2%	93.6%	9.1%	6.4%	21.7%	0.0%
76	44.9%	37.0%	17.2%	17.1%	37.9%	45.9%	43.2%	49.7%	0.0%	37.8%	56.8%	12.4%
78	40.3%	33.4%	19.8%	24.5%	39.9%	42.1%	59.1%	63.3%	7.9%	14.6%	33.0%	22.2%
80	45.3%	38.9%	15.9%	19.1%	38.8%	42.0%	57.6%	100.0%	1.7%	0.0%	40.7%	0.0%
82	43.9%	36.3%	21.4%	21.6%	34.7%	42.2%	86.4%	54.9%	5.6%	9.6%	8.0%	35.5%
84	50.5%	40.0%	14.7%	18.7%	34.8%	41.2%	59.3%	73.6%	6.0%	13.2%	34.7%	13.2%
86	45.0%	36.2%	13.7%	22.4%	41.3%	41.4%	85.3%	76.6%	7.4%	7.6%	7.4%	15.8%
88	39.7%	40.2%	16.7%	22.8%	43.6%	37.0%	92.4%	79.3%	0.0%	6.8%	7.6%	13.9%
90	47.0%	42.3%	17.8%	19.8%	35.3%	37.9%	70.5%	68.2%	0.0%	21.4%	29.5%	10.5%
92	48.7%	42.4%	17.7%	19.4%	33.6%	38.2%	55.8%	59.0%	22.1%	23.5%	22.1%	17.4%
94	51.3%	45.7%	20.9%	15.0%	27.7%	39.4%	52.2%	100.0%	23.9%	0.0%	23.9%	0.0%
96	51.2%	42.9%	13.8%	13.7%	35.0%	43.5%	45.6%	80.2%	13.4%	13.1%	41.0%	6.7%
98	50.6%	40.8%	18.1%	16.8%	31.3%	42.4%	53.2%	100.0%	0.0%	0.0%	46.8%	0.0%
100	54.0%	44.7%	18.9%	21.3%	27.2%	34.1%	77.6%	100.0%	0.0%	0.0%	22.4%	0.0%
102	46.2%	52.8%	17.2%	16.8%	36.5%	30.4%	100.0%	34.0%	0.0%	33.0%	0.0%	33.0%
104	54.1%	44.5%	17.4%	11.2%	28.5%	44.4%	100.0%	0.0%	0.0%	50.0%	0.0%	50.0%

Table A2. Continued

Length bin (cm)	Bottom Trawl						Pot					
	Excellent		Poor		Dead		Excellent		Poor		Dead	
	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
106	47.8%	42.0%	20.6%	24.6%	31.6%	33.4%	0.0%	45.4%	0.0%	54.6%	0.0%	0.0%
108	54.8%	45.6%	21.8%	16.1%	23.4%	38.3%	18.5%	100.0%	0.0%	0.0%	81.5%	0.0%
110	53.0%	51.5%	13.1%	13.7%	33.8%	34.8%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%
112	54.1%	54.7%	22.3%	22.6%	23.6%	22.7%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%
114	47.7%	44.8%	27.0%	25.3%	25.3%	29.9%	57.6%	0.0%	0.0%	0.0%	42.4%	100.0%
116	66.7%	41.1%	15.7%	20.8%	17.5%	38.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
118	51.1%	55.2%	11.8%	5.6%	37.1%	39.2%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%
120	45.9%	17.8%	28.8%	17.4%	25.4%	64.8%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
122	54.7%	50.3%	9.3%	38.2%	35.9%	11.5%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
124	35.9%	30.6%	21.4%	55.3%	42.7%	14.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
126	40.5%	35.8%	13.4%	29.4%	46.0%	34.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
128	51.5%	91.8%	36.7%	0.0%	11.8%	8.2%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
130	72.6%	50.6%	27.4%	0.0%	0.0%	49.4%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
132	45.2%	100.0%	25.5%	0.0%	29.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
134	77.8%	100.0%	22.2%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
136	31.9%	100.0%	36.1%	0.0%	31.9%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
138	0.0%	1.5%	100.0%	67.3%	0.0%	31.2%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
140	13.3%	0.0%	86.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
142	24.9%	0.0%	25.4%	100.0%	49.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
144	54.0%	0.0%	46.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
146	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
148	49.5%	0.0%	0.0%	0.0%	50.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
150	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
152	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
154	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
156	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
158	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
160	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
162	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
164	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
166	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
168	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
170	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
172	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
174	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
176	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
178	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
180	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
182	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
184	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
186	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
188	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
190	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
192	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
194	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
196	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
198	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
202	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
204	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
206	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
208	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
210	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table A3. Weighted length frequency distributions for Pacific halibut in the limited entry bottom trawl fishery, 2004-2010.

	Weighted length frequency distribution						
Length bin (cm)	2004	2005	2006	2007	2008	2009	2010
22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
26	0.0000	0.0125	0.0000	0.0000	0.0000	0.0000	0.0000
28	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
32	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
34	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
36	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
38	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
40	0.0048	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
42	0.0000	0.0044	0.0000	0.0000	0.0000	0.0000	0.0000
44	0.0025	0.0012	0.0057	0.0000	0.0000	0.0010	0.0000
46	0.0037	0.0000	0.0094	0.0000	0.0000	0.0009	0.0000
48	0.0000	0.0034	0.0046	0.0000	0.0000	0.0000	0.0000
50	0.0027	0.0068	0.0092	0.0000	0.0007	0.0010	0.0000
52	0.0021	0.0069	0.0080	0.0041	0.0001	0.0053	0.0000
54	0.0156	0.0076	0.0164	0.0042	0.0025	0.0004	0.0000
56	0.0138	0.0211	0.0242	0.0071	0.0022	0.0019	0.0000
58	0.0187	0.0331	0.0322	0.0293	0.0027	0.0091	0.0022
60	0.0400	0.0431	0.0670	0.0593	0.0169	0.0175	0.0056
62	0.0329	0.0719	0.0751	0.0638	0.0285	0.0275	0.0121
64	0.0428	0.0783	0.1001	0.0932	0.0614	0.0545	0.0155
66	0.0532	0.0807	0.0979	0.1150	0.0705	0.0606	0.0185
68	0.0757	0.0845	0.0870	0.0000	0.0599	0.0835	0.0256
70	0.0672	0.0851	0.0986	0.1022	0.0871	0.0971	0.0154
72	0.0774	0.0882	0.0478	0.1029	0.0973	0.0972	0.0314
74	0.0998	0.0746	0.0588	0.0840	0.1023	0.0941	0.0383
76	0.0890	0.0538	0.0461	0.0710	0.0743	0.0697	0.0284
78	0.0658	0.0506	0.0423	0.0539	0.0688	0.0744	0.0349
80	0.0586	0.0427	0.0372	0.0460	0.0599	0.0527	0.0298
82	0.0486	0.0320	0.0258	0.0325	0.0443	0.0434	0.0239
84	0.0337	0.0255	0.0186	0.0316	0.0428	0.0335	0.0227
86	0.0221	0.0166	0.0130	0.0000	0.0300	0.0290	0.0141
88	0.0235	0.0115	0.0120	0.0154	0.0263	0.0290	0.0122
90	0.0193	0.0127	0.0115	0.0168	0.0225	0.0263	0.0100
92	0.0157	0.0092	0.0101	0.0122	0.0179	0.0204	0.0094

	Weighted length frequency distribution						
Length bin (cm)	2004	2005	2006	2007	2008	2009	2010
94	0.0169	0.0108	0.0099	0.0148	0.0164	0.0151	0.0053
96	0.0062	0.0052	0.0066	0.0089	0.0143	0.0087	0.0066
98	0.0034	0.0058	0.0066	0.0091	0.0110	0.0103	0.0067
100	0.0089	0.0045	0.0025	0.0053	0.0080	0.0088	0.0023
102	0.0060	0.0034	0.0029	0.0036	0.0061	0.0069	0.0018
104	0.0065	0.0023	0.0027	0.0041	0.0083	0.0062	0.0021
106	0.0043	0.0029	0.0032	0.0031	0.0059	0.0028	0.0013
108	0.0016	0.0014	0.0019	0.0018	0.0027	0.0025	0.0014
110	0.0048	0.0015	0.0004	0.0017	0.0018	0.0021	0.0009
112	0.0015	0.0007	0.0020	0.0010	0.0016	0.0024	0.0013
114	0.0020	0.0010	0.0007	0.0007	0.0020	0.0017	0.0001
116	0.0026	0.0006	0.0002	0.0000	0.0010	0.0005	0.0005
118	0.0007	0.0004	0.0003	0.0002	0.0004	0.0002	0.0002
120	0.0013	0.0005	0.0002	0.0002	0.0005	0.0003	0.0002
122	0.0008	0.0003	0.0000	0.0004	0.0003	0.0003	0.0002
124	0.0010	0.0002	0.0001	0.0000	0.0003	0.0002	0.0003
126	0.0000	0.0001	0.0002	0.0001	0.0001	0.0002	0.0002
128	0.0002	0.0000	0.0002	0.0000	0.0000	0.0002	0.0000
130	0.0003	0.0002	0.0001	0.0002	0.0000	0.0002	0.0000
132	0.0005	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000
134	0.0006	0.0000	0.0001	0.0000	0.0001	0.0001	0.0000
136	0.0001	0.0001	0.0002	0.0000	0.0000	0.0001	0.0000
138	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000
140	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000
142	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000
144	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
146	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000
148	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
150	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
152	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
154	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
156	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
158	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
160	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
162	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
164	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table A4. Percentage of weighted length measurements in each condition category for the limited entry bottom trawl fishery, 2004-2010.

Length	2004			2005			2006		
bin (cm)	Exc	Poor	Dead	Exc	Poor	Dead	Exc	Poor	Dead
22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
26	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
28	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
32	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
34	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
36	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
38	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
40	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
42	0.0%	0.0%	0.0%	0.0%	88.4%	11.6%	0.0%	0.0%	0.0%
44	0.0%	0.0%	100.0%	0.0%	70.8%	29.2%	0.0%	0.0%	100.0%
46	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
48	0.0%	0.0%	0.0%	22.4%	0.0%	77.6%	0.0%	0.0%	100.0%
50	0.0%	0.0%	100.0%	61.1%	9.9%	29.0%	0.0%	0.0%	100.0%
52	100.0%	0.0%	0.0%	23.6%	31.3%	45.2%	0.0%	0.0%	100.0%
54	75.5%	11.9%	12.6%	10.0%	20.8%	69.2%	16.9%	0.0%	83.1%
56	12.6%	37.9%	49.5%	25.1%	12.7%	62.2%	22.0%	15.2%	62.8%
58	21.4%	25.6%	53.0%	15.1%	29.5%	55.4%	4.1%	20.2%	75.7%
60	58.6%	14.4%	27.0%	18.2%	21.0%	60.8%	12.9%	25.5%	61.6%
62	40.0%	21.6%	38.4%	18.5%	23.7%	57.8%	27.3%	22.3%	50.4%
64	33.4%	18.4%	48.2%	25.2%	28.4%	46.4%	31.5%	21.0%	47.5%
66	23.9%	24.7%	51.4%	20.9%	26.7%	52.3%	29.6%	17.3%	53.0%
68	38.2%	21.9%	39.9%	17.0%	27.5%	55.5%	35.5%	18.8%	45.7%
70	29.5%	18.9%	51.6%	20.1%	30.3%	49.5%	30.2%	16.6%	53.2%
72	22.9%	17.9%	59.2%	20.3%	27.1%	52.6%	37.2%	21.1%	41.8%
74	23.8%	25.5%	50.7%	24.5%	23.4%	52.1%	39.6%	13.9%	46.5%
76	24.0%	23.2%	52.8%	26.8%	29.1%	44.1%	31.2%	19.2%	49.6%
78	18.8%	18.4%	62.9%	18.1%	23.5%	58.4%	35.0%	21.2%	43.8%
80	19.1%	19.6%	61.3%	23.1%	27.9%	49.0%	34.3%	15.4%	50.2%
82	14.4%	26.1%	59.5%	30.4%	25.1%	44.6%	31.7%	27.8%	40.5%
84	21.7%	9.5%	68.9%	27.0%	18.9%	54.0%	30.1%	13.2%	56.7%
86	32.4%	24.0%	43.6%	35.5%	24.7%	39.8%	31.3%	15.0%	53.7%
88	27.8%	14.8%	57.5%	31.2%	27.8%	41.0%	22.9%	12.4%	64.7%
90	30.2%	34.6%	35.2%	28.0%	16.6%	55.4%	23.8%	18.7%	57.5%
92	40.2%	28.1%	31.7%	42.5%	21.7%	35.9%	43.7%	10.7%	45.6%
94	26.1%	33.3%	40.6%	33.4%	16.3%	50.3%	35.3%	7.1%	57.6%
96	19.9%	30.0%	50.1%	34.6%	19.2%	46.2%	16.5%	13.9%	69.6%
98	33.8%	28.4%	37.8%	32.3%	22.8%	44.9%	16.8%	13.0%	70.2%
100	14.6%	26.9%	58.5%	28.1%	17.4%	54.5%	48.5%	9.6%	41.9%
102	16.0%	49.3%	34.7%	43.1%	6.9%	50.0%	13.7%	0.0%	86.3%
104	19.0%	47.5%	33.5%	36.4%	16.2%	47.4%	49.6%	6.4%	44.0%
106	23.6%	22.6%	53.9%	58.4%	11.9%	29.7%	10.4%	22.8%	66.8%
108	27.6%	3.0%	69.4%	28.6%	22.6%	48.8%	42.2%	15.1%	42.6%
110	25.4%	12.6%	62.0%	22.7%	28.1%	49.2%	32.0%	3.1%	64.9%
112	95.8%	1.2%	3.0%	16.2%	0.0%	83.8%	7.2%	14.1%	78.7%
114	0.0%	26.2%	73.8%	24.4%	4.9%	70.7%	38.9%	0.0%	61.1%
116	58.7%	6.9%	34.4%	69.4%	0.0%	30.6%	77.8%	0.0%	22.2%
118	2.7%	7.5%	89.9%	44.9%	35.0%	20.1%	33.8%	31.5%	34.7%
120	5.7%	26.2%	68.0%	9.5%	28.7%	61.8%	0.0%	0.0%	100.0%
122	40.8%	40.3%	18.9%	1.5%	15.2%	83.4%	50.0%	50.0%	0.0%
124	70.3%	14.8%	14.8%	79.9%	0.0%	20.1%	15.6%	0.0%	84.4%
126	0.0%	100.0%	0.0%	89.0%	11.0%	0.0%	47.1%	0.0%	52.9%
128	82.0%	9.0%	9.0%	18.7%	0.0%	81.3%	89.8%	0.0%	10.2%
130	13.5%	0.0%	86.5%	4.9%	47.6%	47.6%	0.0%	0.0%	100.0%
132	100.0%	0.0%	0.0%	20.2%	63.3%	16.5%	0.0%	100.0%	0.0%
134	80.0%	0.0%	20.0%	100.0%	0.0%	0.0%	22.2%	0.0%	77.8%
136	0.0%	0.0%	100.0%	10.5%	16.1%	73.4%	0.0%	0.0%	100.0%
138	0.0%	0.0%	0.0%	15.2%	0.0%	84.8%	0.0%	0.0%	0.0%
140	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%
142	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
144	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
146	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
148	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
150	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
152	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
154	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
156	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
158	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
160	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
162	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
164	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Length	2007			2008			2009		
bin (cm)	Exc	Poor	Dead	Exc	Poor	Dead	Exc	Poor	Dead
22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
26	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
28	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
32	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
34	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
36	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
38	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
40	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
42	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
44	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
46	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
48	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
50	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%
52	33.4%	0.0%	66.6%	100.0%	0.0%	0.0%	99.5%	0.5%	0.0%
54	35.6%	0.0%	64.4%	0.0%	4.4%	95.6%	42.3%	57.7%	0.0%
56	33.9%	0.0%	66.1%	0.0%	0.0%	100.0%	15.7%	65.3%	19.0%
58	9.4%	6.8%	83.8%	3.3%	3.3%	93.3%	51.0%	4.4%	44.6%
60	5.3%	7.4%	87.2%	9.0%	14.3%	76.8%	28.7%	21.9%	49.4%
62	20.8%	9.5%	69.7%	6.1%	15.7%	78.2%	19.3%	19.5%	61.2%
64	18.9%	5.3%	75.8%	17.3%	7.5%	75.2%	38.0%	9.4%	52.6%
66	9.1%	12.5%	78.4%	25.8%	8.9%	65.4%	26.7%	19.7%	53.6%
68	54.5%	45.5%	0.0%	17.4%	13.2%	69.4%	30.1%	17.5%	52.4%
70	16.0%	7.6%	76.4%	13.1%	14.0%	73.0%	27.4%	17.5%	55.1%
72	14.8%	9.1%	76.0%	19.1%	13.7%	67.2%	22.9%	18.3%	58.8%
74	17.6%	16.9%	65.5%	24.8%	13.8%	61.3%	27.7%	14.8%	57.5%
76	14.0%	9.9%	76.1%	21.9%	11.5%	66.6%	26.2%	16.6%	57.2%
78	15.5%	13.4%	71.2%	24.7%	10.4%	64.9%	18.5%	12.1%	69.4%
80	14.7%	11.6%	73.6%	21.2%	11.4%	67.4%	20.5%	14.1%	65.3%
82	14.6%	3.0%	82.4%	21.5%	16.1%	62.4%	16.3%	18.5%	65.2%
84	17.9%	7.0%	75.1%	15.9%	22.8%	61.3%	17.0%	12.0%	71.0%
86	56.6%	43.4%	0.0%	17.6%	22.5%	59.8%	18.6%	15.5%	65.9%
88	12.3%	10.5%	77.1%	18.1%	18.8%	63.1%	20.1%	17.2%	62.8%
90	6.3%	3.7%	90.0%	23.9%	17.1%	59.0%	18.6%	13.6%	67.8%
92	20.7%	8.4%	70.9%	20.9%	25.1%	54.0%	25.3%	11.8%	62.9%
94	17.0%	18.4%	64.6%	18.8%	13.3%	67.9%	15.2%	18.4%	66.4%
96	16.7%	3.6%	79.7%	15.4%	21.3%	63.4%	27.6%	19.6%	52.8%
98	10.4%	8.2%	81.4%	28.4%	29.4%	42.3%	20.2%	16.9%	62.9%
100	15.4%	23.2%	61.4%	15.0%	19.4%	65.6%	13.4%	25.5%	61.1%
102	40.3%	9.2%	50.6%	27.6%	28.4%	44.1%	24.8%	23.8%	51.4%
104	16.7%	15.8%	67.5%	36.6%	11.7%	51.7%	28.0%	8.4%	63.7%
106	30.7%	20.1%	49.2%	34.8%	7.7%	57.6%	24.0%	13.5%	62.5%
108	29.0%	2.3%	68.7%	19.4%	14.2%	66.4%	18.2%	27.7%	54.1%
110	11.7%	45.1%	43.2%	40.2%	8.0%	51.9%	29.6%	10.4%	60.0%
112	26.9%	23.3%	49.8%	25.1%	9.2%	65.7%	14.7%	17.4%	67.9%
114	20.1%	0.0%	79.9%	22.4%	22.7%	54.9%	31.2%	7.4%	61.5%
116	0.0%	0.0%	100.0%	41.6%	4.8%	53.6%	79.5%	0.5%	20.0%
118	0.0%	0.0%	100.0%	25.5%	38.6%	35.9%	40.9%	4.4%	54.6%
120	85.1%	0.0%	14.9%	65.5%	34.5%	0.0%	48.0%	0.7%	51.2%
122	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%	34.7%	0.0%	65.3%
124	0.0%	0.0%	0.0%	0.0%	70.9%	29.1%	26.1%	37.0%	37.0%
126	49.4%	0.0%	50.6%	0.0%	0.0%	100.0%	59.2%	40.8%	0.0%
128	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	55.7%	1.0%	43.3%
130	13.8%	0.0%	86.2%	0.0%	0.0%	0.0%	35.0%	65.0%	0.0%
132	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
134	0.0%	0.0%	0.0%	94.7%	0.0%	5.3%	100.0%	0.0%	0.0%
136	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%
138	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
140	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%	0.0%	0.0%
142	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%	0.0%	0.0%
144	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
146	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
148	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
150	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
152	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
154	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
156	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
158	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
160	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
162	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
164	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Length	2010		
bin (cm)	Exc	Poor	Dead
10	0.0%	100.0%	0.0%
12	0.0%	0.0%	0.0%
14	0.0%	0.0%	0.0%
16	0.0%	0.0%	0.0%
18	0.0%	0.0%	0.0%
20	0.0%	0.0%	0.0%
22	0.0%	0.0%	0.0%
24	0.0%	0.0%	0.0%
26	0.0%	0.0%	0.0%
28	0.0%	0.0%	0.0%
30	0.0%	0.0%	0.0%
32	0.0%	0.0%	0.0%
34	0.0%	0.0%	0.0%
36	0.0%	0.0%	0.0%
38	0.0%	0.0%	0.0%
40	0.0%	0.0%	0.0%
42	0.0%	0.0%	0.0%
44	0.0%	0.0%	0.0%
46	0.0%	0.0%	0.0%
48	0.0%	0.0%	0.0%
50	0.0%	0.0%	0.0%
52	0.0%	0.0%	0.0%
54	0.0%	0.0%	0.0%
56	0.0%	0.0%	0.0%

Length	2010		
bin	Exc	Poor	Dead
58	100.0%	0.0%	0.0%
60	33.4%	0.0%	66.6%
62	15.7%	29.4%	54.9%
64	30.1%	21.2%	48.7%
66	17.8%	15.4%	66.8%
68	15.0%	10.3%	74.8%
70	22.2%	7.4%	70.4%
72	23.6%	17.4%	59.0%
74	13.5%	24.8%	61.7%
76	20.1%	16.9%	63.0%
78	17.0%	17.4%	65.7%
80	10.6%	22.8%	66.6%
82	18.9%	19.9%	61.2%
84	21.9%	25.3%	52.8%
86	14.9%	16.4%	68.7%
88	24.8%	17.8%	57.4%
90	25.8%	24.2%	50.1%
92	5.0%	9.9%	85.1%
94	26.1%	29.2%	44.7%
96	17.4%	39.9%	42.7%
98	14.3%	23.3%	62.4%
100	2.2%	31.0%	66.8%
102	21.7%	20.6%	57.8%
104	18.3%	37.2%	44.6%

Length	2010		
bin	Exc	Poor	Dead
106	2.4%	0.0%	97.6%
108	0.0%	20.1%	79.9%
110	14.2%	58.8%	27.0%
112	39.9%	0.0%	60.1%
114	0.0%	0.0%	100.0%
116	50.0%	0.0%	50.0%
118	0.0%	100.0%	0.0%
120	0.0%	0.0%	100.0%
122	0.0%	0.0%	100.0%
124	0.0%	0.0%	100.0%
126	0.0%	0.0%	100.0%
128	0.0%	0.0%	0.0%
130	0.0%	0.0%	0.0%
132	0.0%	0.0%	0.0%
134	0.0%	0.0%	0.0%
136	0.0%	0.0%	0.0%
138	0.0%	0.0%	0.0%
140	0.0%	0.0%	0.0%
142	0.0%	0.0%	0.0%
144	0.0%	0.0%	0.0%
146	0.0%	0.0%	0.0%
148	0.0%	0.0%	0.0%
150	0.0%	0.0%	0.0%
152	0.0%	0.0%	0.0%
154	0.0%	0.0%	0.0%

APPENDIX B

Manual Pacific Halibut IBQ Expansions for Inseason Management

Inseason reporting to the Vessel Account System

The Vessel Account System (VAS) is a NOAA, Northwest Regional Office (NWR) database that allows fishers to manage their IFQ quota pounds. On a weekly basis, the WCGOP provided trip-level estimates of discarded P. halibut IBQ to the Pacific States Marine Fisheries Commission (PSMFC). The PSMFC then uploaded the data to the VAS. Occasionally, non-automated (i.e., manual) calculations of P. halibut IBQ were necessary. Manual calculations of P. halibut IBQ occurred as observer program staff identified the need and were uploaded directly to the VAS. Scenarios triggering a manual calculation and the equations used for those calculations are given in Table B2 below.

The WCGOP database calculates IBQ weight at the haul-level when the observer collects all the required data elements. The calculation is dependent on which gear type is fished.

Inseason IBQ Weight Calculations for Bottom Trawl Gear

The sampled P. halibut lengths are converted to weight using the IPHC length-weight conversion table (Appendix C). The total weight of P. halibut in the haul is calculated as:

$$W = \frac{w}{n} \cdot N$$

where, for each haul:
W = total weight of P. halibut
w = sampled weight of P. halibut
n = sampled number of P. halibut
N = total number of P. halibut

IBQ weight for each haul is then calculated as:

$$W_{IBQ} = \sum_{c} \left(\frac{w_c}{\sum_c w_c} \cdot W \cdot m_c \right)$$

where, for each haul:

c = viability condition category
W_{IBQ} = IBQ weight (mortality rate applied) of P. halibut
W = total weight of P. halibut in haul
w = sampled weight of P. halibut
m = mortality rate (Table 2)

Inseason IBQ Weight Calculations for Pot Gear

The sampled P. halibut lengths are converted to weight using the IPHC length-weight conversion table. Observers are not always able to sample 100% of all gear units due to time constraints and logistics, therefore sample weights need to be expanded to the haul/set level. The total weight of P. halibut in the set is calculated as:

$$W = \left(\frac{w}{n} \cdot N\right) \cdot \left(\frac{P}{p}\right)$$

where, for each set:
W = total weight of P. halibut
w = sampled weight of P. halibut
n = sampled number of P. halibut
N = total number of P. halibut
P = total number of pots fished
p = sampled number of pots

IBQ weight for each set is then calculated as:

$$W_{IBQ} = \sum_c \left(\frac{w_c}{\sum_c w} \cdot W \cdot m_c\right)$$

where, for each set:
c = viability condition category
W_{IBQ}= IBQ weight (mortality rate applied) of P. halibut
W = total weight of P. halibut in set
w = sampled weight of P. halibut
m = mortality rate (Table 3)

Inseason IBQ Weight Calculations for Hook-&-Line Gear
The visual estimates of Pacific halibut length (10 cm increments) are converted to weight using the IPHC length-weight conversion table. Observers are not always able to sample 100% of all gear units due to time constraints and logistics, therefore sample weights need to be expanded to the haul/set level. The total weight of P. halibut in the set is calculated as:

$$W_{IBQ} = \left(\frac{H}{h} \cdot w\right) \cdot 0.16$$

where, for each set:

W_{IBQ}= IBQ weight (mortality rate applied) of P. halibut
w = sampled weight of P. halibut
H = total number of hooks fished
h = sampled number of hooks
0.16 = IPHC mortality rate applied to hook-&-line gear

Inseason IBQ Weight Manual Calculation Scenarios
In 2012, there were a number of scenarios that resulted in the inability to calculate IBQ weight through the automated process (Appendix B). The most prevalent causes were the pre-sorting of P. halibut by the crew and improper sampling. In these scenarios, observer program staff reviewed the trip and calculated IBQ weight manually.

To determine the most appropriate method to manually calculate IBQ weight (Appendix B), the observer program data management team consulted with the IPHC. For bottom trawl and pot gear, the

IPHC preferred the use of actually measured fish from other properly sampled hauls within the same trip, rather than the use of visually estimated lengths from the haul. All calculations utilized data from the same trip or a different trip from the same vessel. In other words, there was never a circumstance where data from Vessel A was used to calculate IBQ weight for Vessel B.

In addition to scenarios where the observer did not collect all required data, there were also instances of hauls where P. halibut was not sampled by the observer or all the gear was lost. In these instances, properly sampled hauls were used to estimate IBQ weight for the unsampled haul. Methods for expanding P. halibut weight to unsampled or partially sampled hauls varied by gear type.

To calculate P. halibut IBQ weight for unsampled trawl hauls, the sum of all IBQ weight from other properly sampled hauls is divided by the sum of tow duration (hours) from sampled hauls and multiplied by the tow duration of the unsampled haul.

$$W_{IBQ} = \left(\frac{\sum_t w_{IBQ}}{\sum_t d}\right) \times D$$

where, for each tow:
t = tow
W_{IBQ} = unsampled IBQ weight (mortality rate applied) of P. halibut
w_{IBQ} = sampled IBQ weight (mortality rate applied) of P. halibut
d = tow duration (hr) of sampled haul
D = tow duration (hr) of unsampled haul

To calculate P. halibut IBQ weight when trawl gear is lost (i.e., entire net or codend is lost), the sum of all P. halibut expanded species weight from other properly sampled hauls is divided by the sum of tow durations from sampled hauls, multiplied by the tow duration of the unsampled haul. For lost trawl gear, a mortality rate for the "dead" P. halibut viability condition (0.90) is applied.

$$W_{IBQ} = \left(\frac{\sum_t w}{\sum_t d}\right) \times D \times 0.90$$

where, for each tow with lost gear:
t = tow
W_{IBQ} = IBQ weight (mortality rate applied) of unsampled P. halibut
w = weight of sampled P. halibut
d = tow duration of sampled haul
D = tow duration of unsampled haul
0.90 = mortality rate for "dead" P. halibut viability condition for trawl gear

To calculate P. halibut IBQ weight in unsampled fixed gear sets, the sum of all P. halibut IBQ weight from sets with similar properties (i.e., date, depth, target, gear type, area; determined by WCGOP data managers) is divided by the sum of the number of gear units sampled, and the result is multiplied by the total number of gear units fished from the unsampled set.

$$W_{IBQ} = \left(\frac{\sum_t w_{IBQ}}{\sum_t g}\right) \times G$$

where, for each set:
t = set
W_{IBQ} = unsampled IBQ weight (mortality rate applied) of P. halibut
w_{IBQ} = sampled IBQ weight (mortality rate applied) of P. halibut
g = number of sampled gear units (e.g., hooks, pots)
G = total number of gear units (e.g., hooks, pots) fished in the unsampled set

To calculate P. halibut IBQ weight when fixed gear is lost, the sum of P. halibut weight from the sampled portion of the set, or, if all gear is lost, from sets with similar properties is divided by the sum of units sampled, and the result is multiplied by the total hooks from the unsampled set. For any lost fixed gear, a mortality rate for the "dead" P. halibut viability condition (1.0) is applied.

$$W_{IBQ} = \left(\frac{\sum_t w}{\sum_t g}\right) \times G \times 1.0$$

where, for each set with lost gear:
t = set
W_{IBQ} = unsampled IBQ weight (mortality rate applied) of P. halibut
w = sampled IBQ weight of P. halibut
g = number of sampled gear units (e.g., hooks, pots)
G = total number of gear units (e.g., hooks, pots) fished in the unsampled set
1.0 = mortality rate for "dead" P. halibut viability condition for fixed gear

Table B1. The number of vessels and trips that required manual expansions of P. halibut IBQ weight in the 2012 U.S. west coast groundfish IFQ fishery. All values are counts unless otherwise stated.

		Reason for Manual Calculation						
		PHLB scenarios	Unsampled hauls (Trawl)	Lost Gear				
	Year			Trawl	Fixed	Total	IFQ Total	% of total
Vessels	2011	13	16	4	1	24	108**	22.22 *
	2012	9	0	0	0	9	105	8.5
Trips	2011	19	21	4	3	38	2443**	1.56
	2012	10	0	0	0	10	2181	0.46

*Percentage of vessels with manually calculated discard may be included in one or more categories.

***Manual calculations due to unsampled or lost gear were performed in 2012. All discard for these events were reported via the automated load process.

Scenario 1: *Total count of PHLB exists with no length or viability data.*

Resolution: Determine an average mortality weight per individual PHLB in the trip from all sampled hauls. Multiply that average by the total count of PHLB to determine an IBQ.

Scenario 2: *Total count of PHLB exists with actual lengths and no viability data.*

Resolution: Determine catch weight for PHLB using the lengths in the haul and then apply that to the total count for a total weight. Determine CATCH_WEIGHT_MORT for all viabilities (E, P, D) from all other properly sampled hauls in the trip and apply to the CATCH_WEIGHT for IBQ estimate.

Scenario 3: *Total count of PHLB exists with visual estimates of PHLB lengths and no viabilities.*

Resolution: The use of visual lengths was discouraged by the IPHC so the most appropriate method is to determine an average IBQ per individual PHLB in the trip from all sampled hauls. Multiply that average by the total count of PHLB to determine an IBQ.

Scenario 4: *Total count of PHLB exists with visual estimates of PHLB lengths and proper in-hand viabilities.*

Resolution: The use of visual lengths was discouraged by the IPHC, so the most appropriate method here would be to determine an average IBQ per individual PHLB in the trip from all sampled hauls. Multiply that average by the total count of PHLB to determine an IBQ.

Scenario 5: *Total count of PHLB does not exist without any length or viability data*

Resolution: Confirm PHLB was present in the haul, and no data was collected on them. Determine an average IBQ per haul for all sampled hauls in the trip. This scenario is unlikely and, to date, has never occurred.

Scenario 6: *Total count of PHLB does not exist with length and no viability data.*

Resolution: Catch weight for the haul will be determined by taking the measured PHLB sample, convert to weight, divided by the number of fish sampled, multiplied by the average number of PHLB for all sampled hauls in the trip. Then the average mortality rates from the sampled hauls are applied to the calculated PHLB weight. and, to date, has never occurred.

Scenario 7: *Total count of PHLB does not exist with length and viability data.*

Resolution: Catch weight for the haul will be determined by taking the length of the PHLB sample, converted to weight, divided by the number of fish sampled, multiplied by the average number of PHLB for all sampled hauls in the trip. Since viabilities and lengths exist, IBQ can be determined using normal protocols and the calculated catch weight. and, to date, has never occurred.

Scenario 8: *Total count of PHLB does not exist with visual length and no viability data.*

Resolution: The use of visual lengths was discouraged by the IPHC so the most appropriate method here would be to determine an average IBQ per haul for all sampled hauls in the trip and apply to this haul as well.

Scenario 9: *Total count of PHLB does not exist with visual length and viability data.*

Resolution: The use of visual lengths was discouraged by the IPHC so the most appropriate method here would be to determine an average IBQ per haul for all sampled hauls in the trip and apply to this haul as well.

Scenario 10: *Observer encounters predated fish that are dead and badly damaged so that accurate biological data cannot be collected.*

Resolution: If properly sampled PHLB exist in the haul they can be used to determine the portion of the catch weight attributed to the predated and non-predated fish. The IBQ for the PHLB not predated would be calculated separately using the data collected in the haul. The IBQ for the predated fish would be the portion of the PHLB catch weight attributed to the predated fish multiplied by the mortality rate for "dead" from the IPHC viability tables for that gear.

If all PHLB in the haul are heavily predated then a catch weight for the haul will need to be determined. This can be done by taking the total count of PHLB in the haul times an average catch weight (not IBQ estimates) per PHLB from other hauls in the trip (or like "sets" if PHLB doesn't exist in any other hauls). The estimated catch weight will then be multiplied by the mortality rate for "dead" from the IPHC viability tables for that gear to determine IBQ. In 2011, there were two instances where a Pacific halibut IBQ was manually calculated due to sand flea predation. In 2012, no sand flea predation was observed.

Table B2. Calculations used in manual Pacific halibut IBQ calculations in the U.S. west coast groundfish IFQ fishery.

SCENARIO	CALCULATION
1	∑CATCH_WEIGHT_MORT for all sampled hauls x CATCH_COUNT for unsampled haul=PHLB IBQ ∑CATCH_COUNT for all sampled hauls

2	CATCH_WEIGHT = Σ SPECIMEN_LENGTH* x CATCH_COUNT #_PHLB_SAMPLED_IFQ CATCH_WEIGHT_MORT = CATCH_WEIGHT_MORT Σ (E) + CATCH_WEIGHT_MORT Σ (P) + CATCH_WEIGHT_MORT Σ (D) CATCH_WEIGHT_MORT Σ (E) = Σ (SPECIMEN_LENGTH* where VIABILITY = E) for all sampled hauls x CATCH_WEIGHT x (.20**) Σ SPECIMEN_LENGTH* for all sampled hauls CATCH_WEIGHT_MORT Σ (P) = Σ (SPECIMEN_LENGTH* where VIABILITY = P) for all for all sampled hauls x CATCH_WEIGHT x (.55**) Σ SPECIMEN_LENGTH* for all sampled hauls CATCH_WEIGHT_MORT Σ (D) = Σ (SPECIMEN_LENGTH* where VIABILITY = D) for all sampled hauls x CATCH_WEIGHT x (.90**) Σ SPECIMEN_LENGTH* for all sampled hauls
3, 4, 5	∑CATCH_WEIGHT_MORT for all sampled hauls x CATCH_COUNT for unsampled haul=PHLB IBQ ∑CATCH_COUNT for all sampled hauls

6, 7	Average CATCH_COUNT for all sampled hauls = ∑CATCH_COUNT for all sampled hauls
	Total # sampled hauls
	CATCH_WEIGHT = Σ SPECIMEN_LENGTH* x Average CATCH_COUNT for all sampled hauls
	#_PHLB_SAMPLED_IFQ
	
	CATCH_WEIGHT_MORT =
	CATCH_WEIGHT_MORT Σ (E) + CATCH_WEIGHT_MORT Σ (P) + CATCH_WEIGHT_MORT Σ (D)
	
	CATCH_WEIGHT_MORT Σ (E) =
	Σ (SPECIMEN_LENGTH* where VIABILITY = E) for all sampled hauls x CATCH_WEIGHT x (.20**)
	Σ SPECIMEN_LENGTH* for all sampled hauls
	
	CATCH_WEIGHT_MORT Σ (P) =
	Σ (SPECIMEN_LENGTH* where VIABILITY = P) for all sampled hauls x CATCH_WEIGHT x (.55**)
	Σ SPECIMEN_LENGTH* for all sampled hauls
	
	CATCH_WEIGHT_MORT Σ (D) =

	Σ (SPECIMEN_LENGTH* where VIABILITY = D) for all sampled hauls x CATCH_WEIGHT x (.90**) Σ SPECIMEN_LENGTH* for all sampled hauls
8, 9	PHLB IBQ = ∑CATCH_WEIGHT_MORT for all sampled hauls Total # of sampled hauls
10	CATCH_WEIGHT_MORT = ∑CATCH_WEIGHT _MORT for the properly sampled PHLB + (CATCH_WEIGHT estimate for the predated PHLB* Mortality rate for "dead" for that fishery)

* Converted to weight using P. halibut length-weight conversion table (Appendix C below)

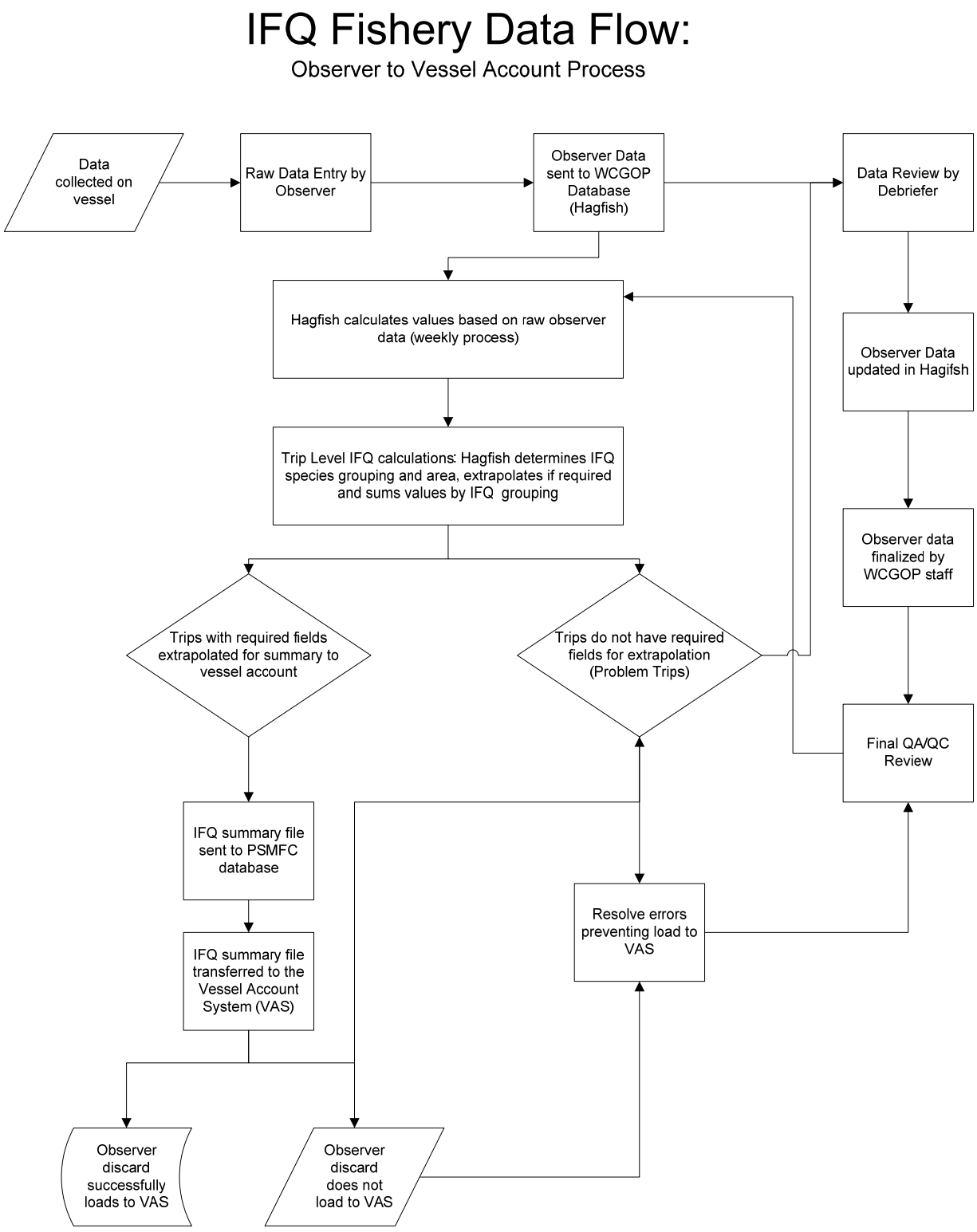
** IPHC mortality rates

APPENDIX C IPHC length weight conversion table for Pacific halibut

Centimeter	Pounds	Kilograms	Centimeter	Pounds	Kilograms	Centimeter	Pounds	Kilograms	Centimeter	Pounds	Kilograms
10	0.02	0.01	71	9.19	4.17	131	66.82	30.31	191	226.70	102.83
11	0.02	0.01	72	9.61	4.36	132	68.48	31.06	192	230.56	104.58
12	0.02	0.01	73	10.05	4.56	133	70.17	31.83	193	234.48	106.36
13	0.04	0.02	74	10.49	4.76	134	71.89	32.61	194	238.45	108.16
14	0.04	0.02	75	10.98	4.98	135	73.66	33.41	195	242.44	109.97
15	0.07	0.03	76	11.44	5.19	136	75.44	34.22	196	246.50	111.81
16	0.07	0.03	77	11.95	5.42	137	77.25	35.04	197	250.60	113.67
17	0.09	0.04	78	12.46	5.65	138	79.08	35.87	198	255.74	116.00
18	0.11	0.05	79	12.99	5.89	139	80.95	36.72	199	258.93	117.45
19	0.13	0.06	80	13.51	6.13	140	82.87	37.59	200	263.17	119.37
20	0.15	0.07	81	14.07	6.38	141	84.79	38.46	201	267.46	121.32
21	0.18	0.08	82	14.64	6.64	142	86.75	39.35	202	271.79	123.28
22	0.20	0.09	83	15.23	6.91	143	88.76	40.26	203	276.17	125.27
23	0.24	0.11	84	15.83	7.18	144	90.79	41.18	204	280.60	127.28
24	0.26	0.12	85	16.45	7.46	145	92.84	42.11	205	285.10	129.32
25	0.31	0.14	86	17.09	7.75	146	94.93	43.06	206	289.62	131.37
26	0.35	0.16	87	17.75	8.05	147	97.05	44.02	207	294.21	133.45
27	0.40	0.18	88	18.41	8.35	148	99.21	45.00	208	298.84	135.55
28	0.46	0.21	89	19.09	8.66	149	101.39	45.99	209	303.51	137.67
29	0.51	0.23	90	19.80	8.98	150	103.62	47.00	210	308.25	139.82
30	0.57	0.26	91	20.53	9.31	151	105.87	48.02	211	313.03	141.99
31	0.62	0.28	92	21.25	9.64	152	108.16	49.06	212	317.86	144.18
32	0.71	0.32	93	22.02	9.99	153	110.50	50.12	213	322.73	146.39
33	0.77	0.35	94	22.80	10.34	154	112.83	51.18	214	327.67	148.63
34	0.84	0.38	95	23.59	10.70	155	115.24	52.27	215	332.65	150.89
35	0.93	0.42	96	24.41	11.07	156	117.66	53.37	216	337.70	153.18
36	1.01	0.46	97	25.24	11.45	157	120.13	54.49	217	342.79	155.49
37	1.10	0.50	98	26.08	11.83	158	122.62	55.62	218	347.93	157.82
38	1.21	0.55	99	26.96	12.23	159	125.16	56.77	219	353.13	160.18
39	1.32	0.60	100	27.87	12.64	160	127.71	57.93	220	358.38	162.56
40	1.43	0.65	101	28.77	13.05	161	130.32	59.11	221	363.69	164.97
41	1.59	0.72	102	29.70	13.47	162	132.96	60.31	222	369.05	167.40
42	1.68	0.76	103	30.67	13.91	163	135.65	61.53	223	374.45	169.85
43	1.81	0.82	104	31.64	14.35	164	138.36	62.76	224	379.92	172.33
44	1.94	0.88	105	32.63	14.80	165	141.12	64.01	225	385.45	174.84
45	2.09	0.95	106	33.64	15.26	166	143.90	65.27	226	391.03	177.37
46	2.25	1.02	107	34.68	15.73	167	146.72	66.55	227	396.67	179.93
47	2.43	1.10	108	35.74	16.21	168	149.54	67.83	228	402.36	182.51
48	2.58	1.17	109	36.84	16.71	169	152.49	69.17	229	408.09	185.11
49	2.76	1.25	110	37.94	17.21	170	155.45	70.51	230	413.91	187.75
50	2.95	1.34	111	39.07	17.72	171	158.42	71.86	231	419.76	190.40
51	3.15	1.43	112	40.21	18.24	172	161.44	73.23	232	425.69	193.09
52	3.35	1.52	113	41.38	18.77	173	164.51	74.62	233	431.66	195.80
53	3.57	1.62	114	42.59	19.32	174	167.60	76.02	234	437.68	198.53
54	3.79	1.72	115	43.81	19.87	175	170.75	77.45	235	443.76	201.29
55	4.01	1.82	116	45.06	20.44	176	173.92	78.89	236	449.91	204.08
56	4.25	1.93	117	46.32	21.01	177	177.14	80.35	237	456.13	206.90
57	4.52	2.05	118	47.62	21.60	178	180.40	81.83	238	462.39	209.74
58	4.76	2.16	119	48.94	22.20	179	183.71	83.33	239	468.72	212.61
59	5.05	2.29	120	50.29	22.81	180	187.06	84.85	240	475.09	215.50
60	5.31	2.41	121	51.65	23.43	181	190.46	86.39	241	481.55	218.43
61	5.62	2.55	122	53.07	24.07	182	193.87	87.94	242	488.05	221.38
62	5.93	2.69	123	54.48	24.71	183	197.36	89.52	243	494.60	224.35
63	6.24	2.83	124	55.93	25.37	184	200.86	91.11	244	501.24	227.36
64	6.57	2.98	125	57.41	26.04	185	204.43	92.73	245	507.92	230.39
65	6.90	3.13	126	58.91	26.72	186	208.03	94.36	246	514.66	233.45
66	7.25	3.29	127	60.43	27.41	187	211.67	96.01	247	521.48	236.54
67	7.61	3.45	128	61.99	28.12	188	214.71	97.39	248	528.36	239.66
68	7.98	3.62	129	63.56	28.83	189	218.50	99.11	249	535.28	242.80
69	8.38	3.80	130	65.17	29.56	190	222.89	101.10	250	542.29	245.98
70	8.77	3.98									

APPENDIX D

Figure D1. IFQ groundfish fishery data flow from the West Coast Groundfish Observer Program (WCGOP) to the Vessel Account System (VAS) of the NW Regional Office.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Fisheries Science Center
2725 Montlake Boulevard East
Seattle, WA 98112-2097

21 May 2013

Ms. Kelly Ames
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

Dear Ms. Ames,

In November 2012, you requested spatial data products depicting Pacific halibut (*Hippoglossus stenolepis*) catch data collected by the West Coast Groundfish Observer Program (WCGOP) and the At-Sea Hake Observer Program (A-SHOP) between 2002 and 2011. Specifically, the request was for maps of Pacific halibut catch further stratified by gear type than had been previously published.

In the enclosed file, Pacific halibut catch (mt/km^2) is depicted separately for observed bottom trawl, midwater trawl, hook-and-line fixed gear types, and pot fixed gear types. Please note the difference in scale between the maps by gear type, as each map is intended to portray the distribution of "high" relative to "low" catch of Pacific halibut. Cells calculated from less than 3 vessels were omitted from the map due to confidentiality.

A density algorithm in ArcGIS™ geographical information system software (Environmental System Research Institute, Incorporated, Redlands, California) was used, based on either fishing set/start coordinates (fixed gear) or a towline model drawn from start to end fishing coordinates (trawl gear). The density algorithm calculates density within a circular search area (radius = 5 km) centered at a grid cell (size 200 m x 200 m). In final products provided, cells with density values calculated from tows/sets made by less than three vessels were removed. Density parameters were chosen in order to minimize data exclusion (due to confidentiality mandates) while still providing a fairly high spatial resolution. Coordinates for fishing events intersecting land, outside the U.S. exclusive economic zone (EEZ), or deeper than 2,000 m were also removed from the spatial analysis.

If you have any questions, need further clarification of the information provided, or if this does not meet your needs, please don't hesitate to contact Marlene Bellman at (206) 860-3360 or marlene.bellman@noaa.gov.

Sincerely,

MCVEIGH.JON.THOMAS.1380447904
Digitally signed by MCVEIGH.JON.THOMAS.1380447904
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=MCVEIGH.JON.THOMAS.1380447904
Date: 2013.05.23 14:11:07 -07'00'

Jon McVeigh
Program Manager
FRAM, Fisheries Observation Science
NOAA/NMFS/NWFSC

Figure 1a. Spatial distribution of Pacific halibut catch (mt/km^2) from **bottom trawl gear** observed by the West Coast Groundfish Observer Program, off the U.S. west coast (WA, OR). The four catch classifications were defined by dividing the maximum value (5.9722) in half to obtain the 2.9862-5.9722 catch bin. The next lower bin was obtained by dividing the lower bound of the upper bin (2.9862) in half again to obtain the 1.4932-2.9861 catch bin. The remaining observations were allocated into equal proportions into the two lowest classifications. Cells calculated from less than 3 vessels were omitted from the map due to confidentiality.

M. Bellman 5/17/2013

Figure 1b. Spatial distribution of Pacific halibut catch (mt/km^2) from **bottom trawl gear** observed by the West Coast Groundfish Observer Program, off the U.S. west coast (CA). See Figure 1a caption for full description.

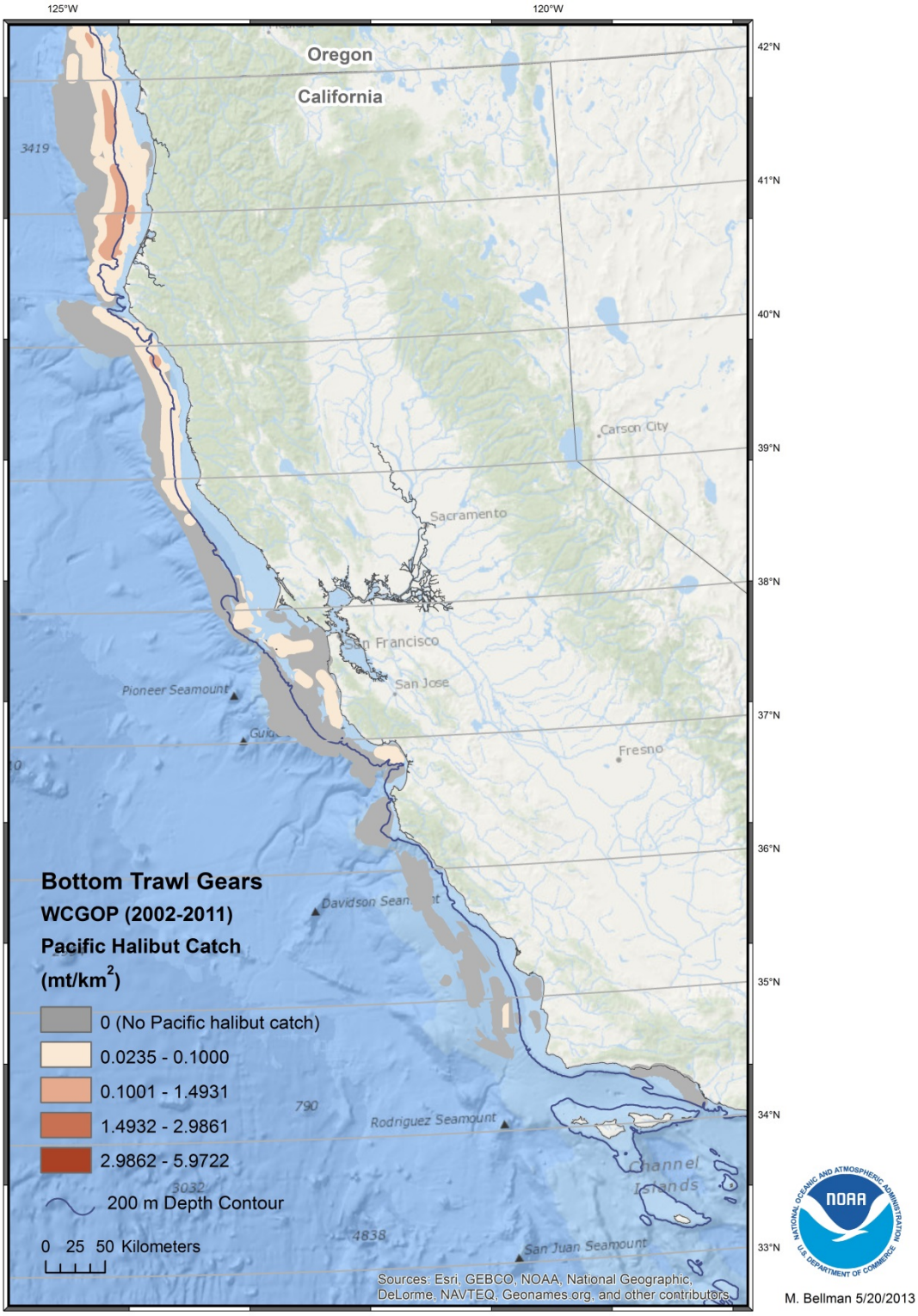


Figure 2. Spatial distribution of Pacific halibut catch (mt/km^2) from **midwater trawl gear** observed by the At-Sea Hake Observer Program, off the U.S. west coast (WA, OR). The four catch classifications were defined by dividing the maximum value (0.1963) in half to obtain the 0.0983-0.1963 catch bin. The next lower bin was obtained by dividing the lower bound of the upper bin (0.0983) in half again to obtain the 0.0492-0.0982 catch bin. The remaining observations were allocated into equal proportions into the two lowest classifications. Cells calculated from less than 3 vessels were omitted from the map due to confidentiality.

Figure 3a. Spatial distribution of Pacific halibut catch (mt/km^2) from **hook-and-line fixed gear** types observed by the West Coast Groundfish Observer Program, off the U.S. west coast (WA, OR). The four catch classifications were defined by dividing the maximum value (1.6805) in half to obtain the 0.8404-1.6805 catch bin. The next lower bin was obtained by dividing the lower bound of the upper bin (0.8404) in half again to obtain the 0.4202-0.8403 catch bin. The remaining observations were allocated into equal proportions into the two lowest classifications. Cells calculated from less than 3 vessels were omitted from the map due to confidentiality.

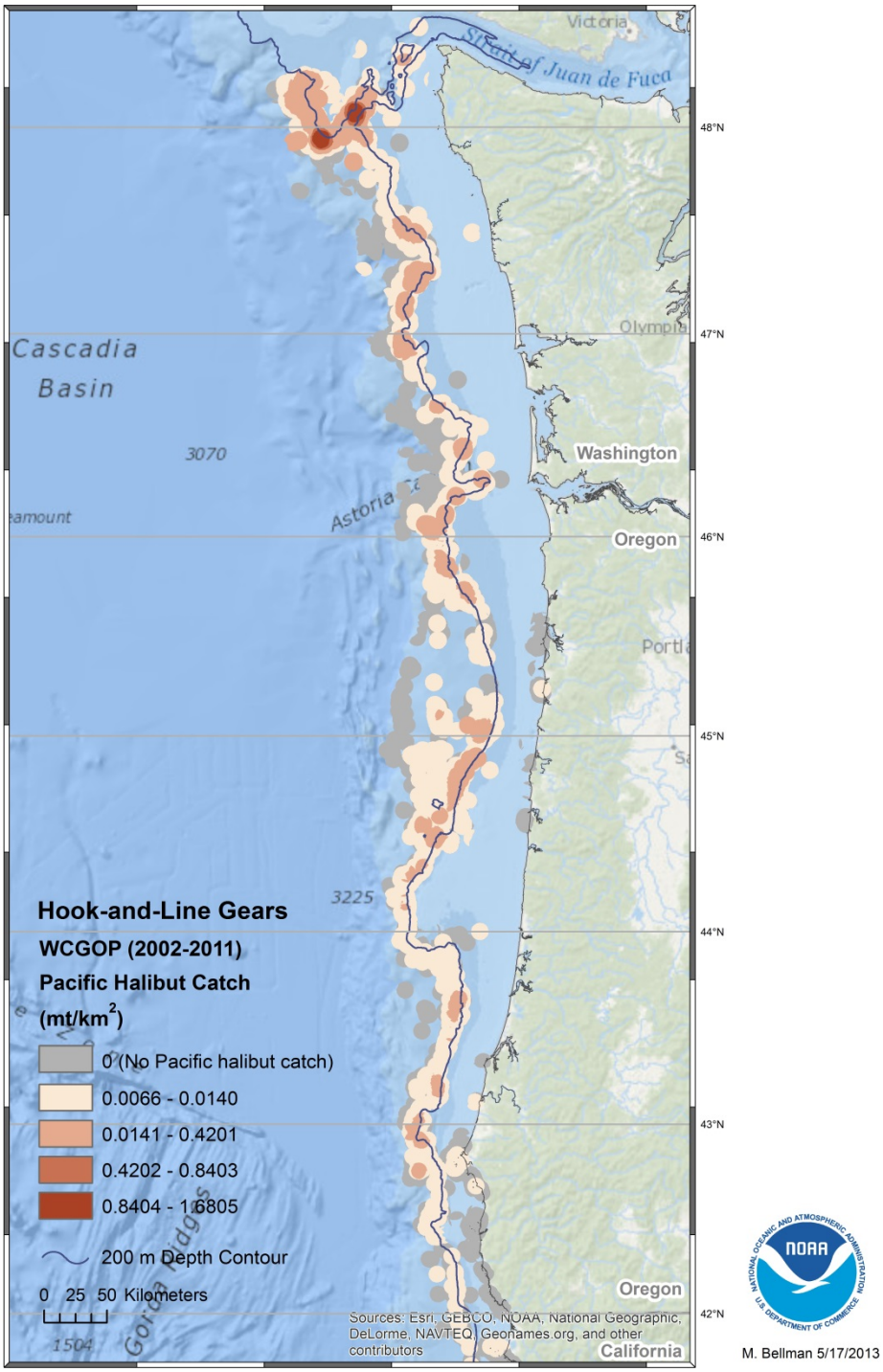


Figure 3b. Spatial distribution of Pacific halibut catch (mt/km^2) from **hook-and-line fixed gear** types observed by the West Coast Groundfish Observer Program, off the U.S. west coast (CA). See Figure 3a caption for full description.

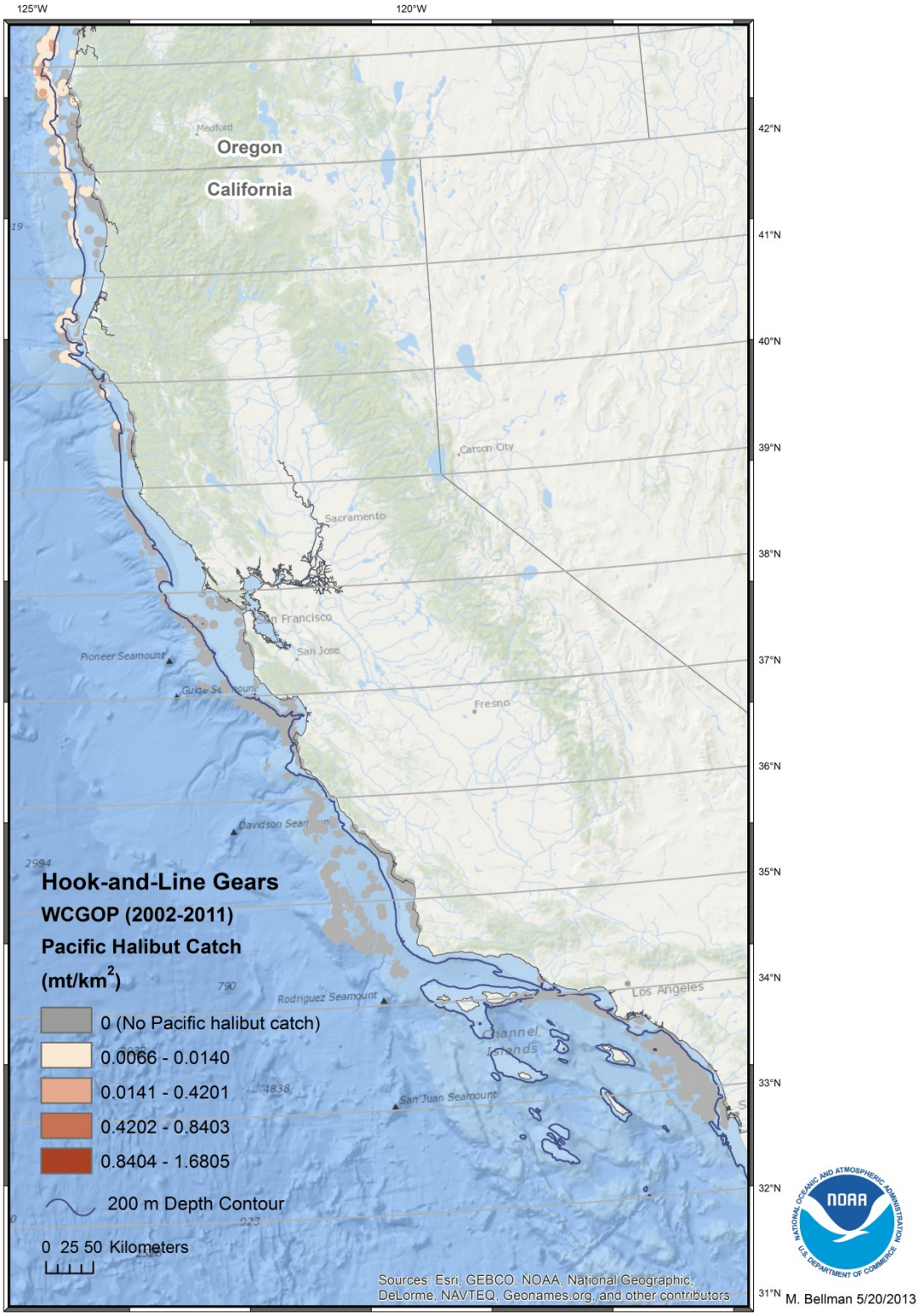


Figure 4a. Spatial distribution of Pacific halibut catch (mt/km^2) from **pot fixed gear** observed by the West Coast Groundfish Observer Program, off the U.S. west coast (WA, OR). The four catch classifications were defined by dividing the maximum value (0.0541) in half to obtain the 0.0272-0.0541 catch bin. The next lower bin was obtained by dividing the lower bound of the upper bin (0.0272) in half again to obtain the 0.0136-0.0271 catch bin. The remaining observations were allocated into equal proportions into the two lowest classifications. Cells calculated from less than 3 vessels were omitted from the map due to confidentiality.

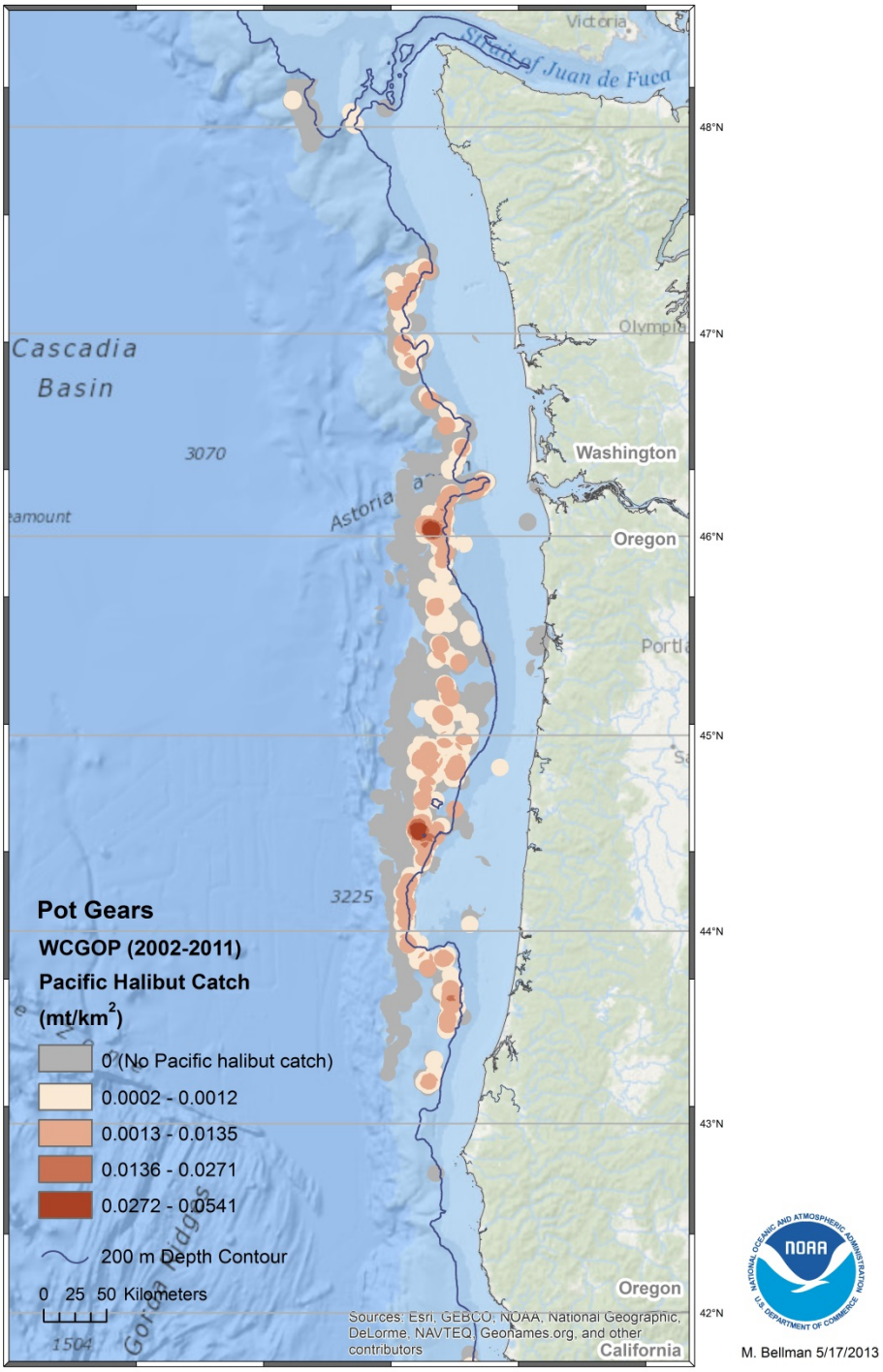
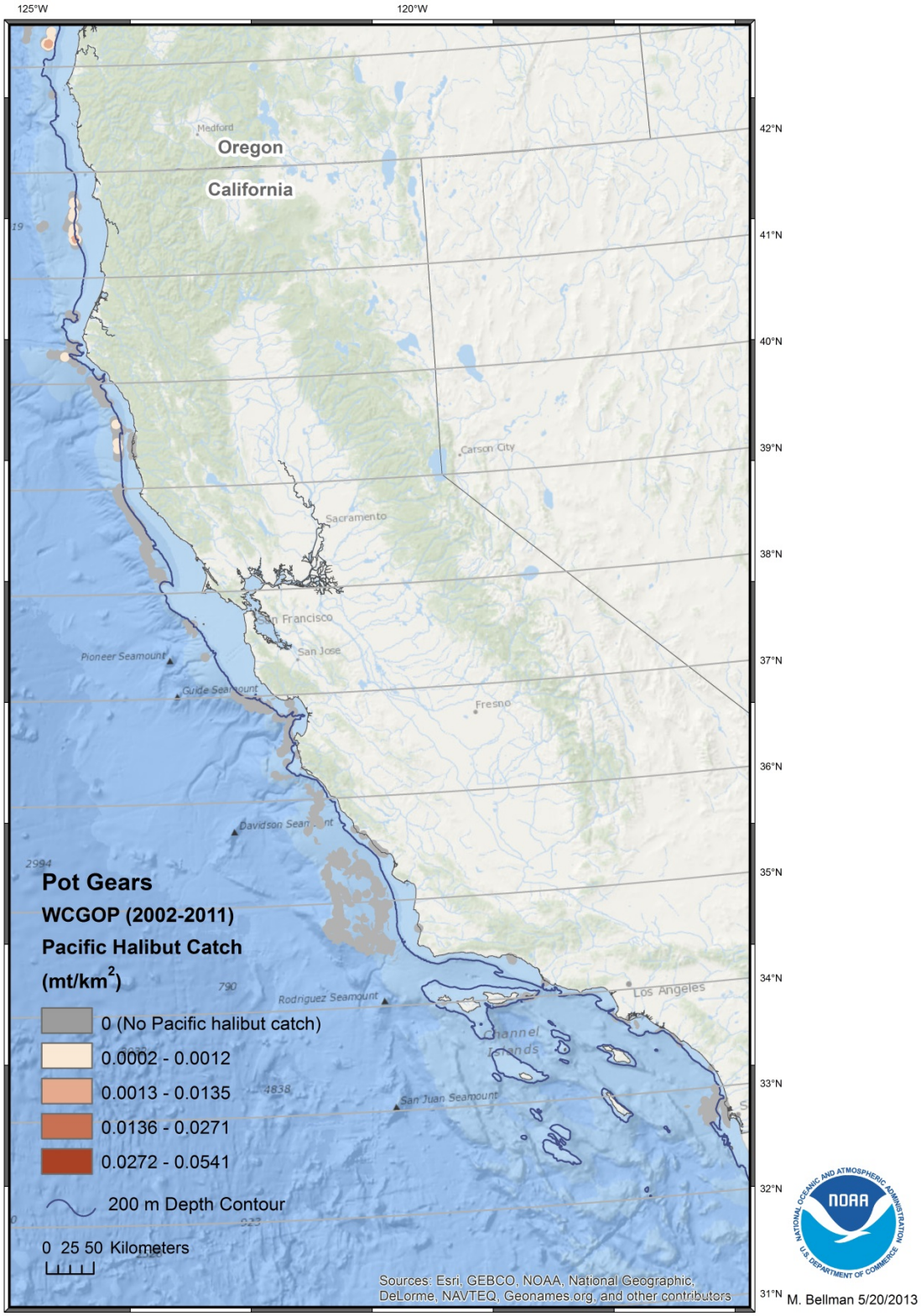


Figure 4b. Spatial distribution of Pacific halibut catch (mt/km^2) from **pot fixed gear** observed by the West Coast Groundfish Observer Program, off the U.S. west coast (CA). See Figure 4a caption for full description.



The following figure (Figure 2a and 2b) is excerpt from Jannot et al. 2012 with all WCGOP observations combined. This is provided for comparison to the above requested figures further stratified by gear type.

Jannot, J.E., A.W. Al-Humaidhi, M.A. Bellman, N.B. Riley and J. Majewski. 2012. Pacific halibut bycatch in the U.S. west coast IFQ groundfish fishery (2011) and non-IFQ groundfish fisheries (2002-2011). NOAA Fisheries, NWFSC Observer Program, 2725 Montlake Blvd E., Seattle, WA 98112.

Figure 2a (Jannot et al. 2012). Spatial distribution of Pacific halibut catch (mt/km^2) observed by the West Coast Groundfish Observer Program, off the U.S. west coast (WA, OR). Gear types observed by the WCGOP include bottom trawl, midwater trawl, shrimp trawl, fixed gear hook-&-line and pot gear. The four catch classifications were defined by dividing the maximum value (2.0697) in half to obtain the 1.0349-2.0697 catch bin. The next lower bin was obtained by dividing the lower bound of the upper bin (1.0348) in half again to obtain the 0.51745-1.0348 catch bin. The remaining observations were allocated into equal proportions into the two lowest classifications. Cells calculated from less than 3 vessels were omitted from the map due to confidentiality.

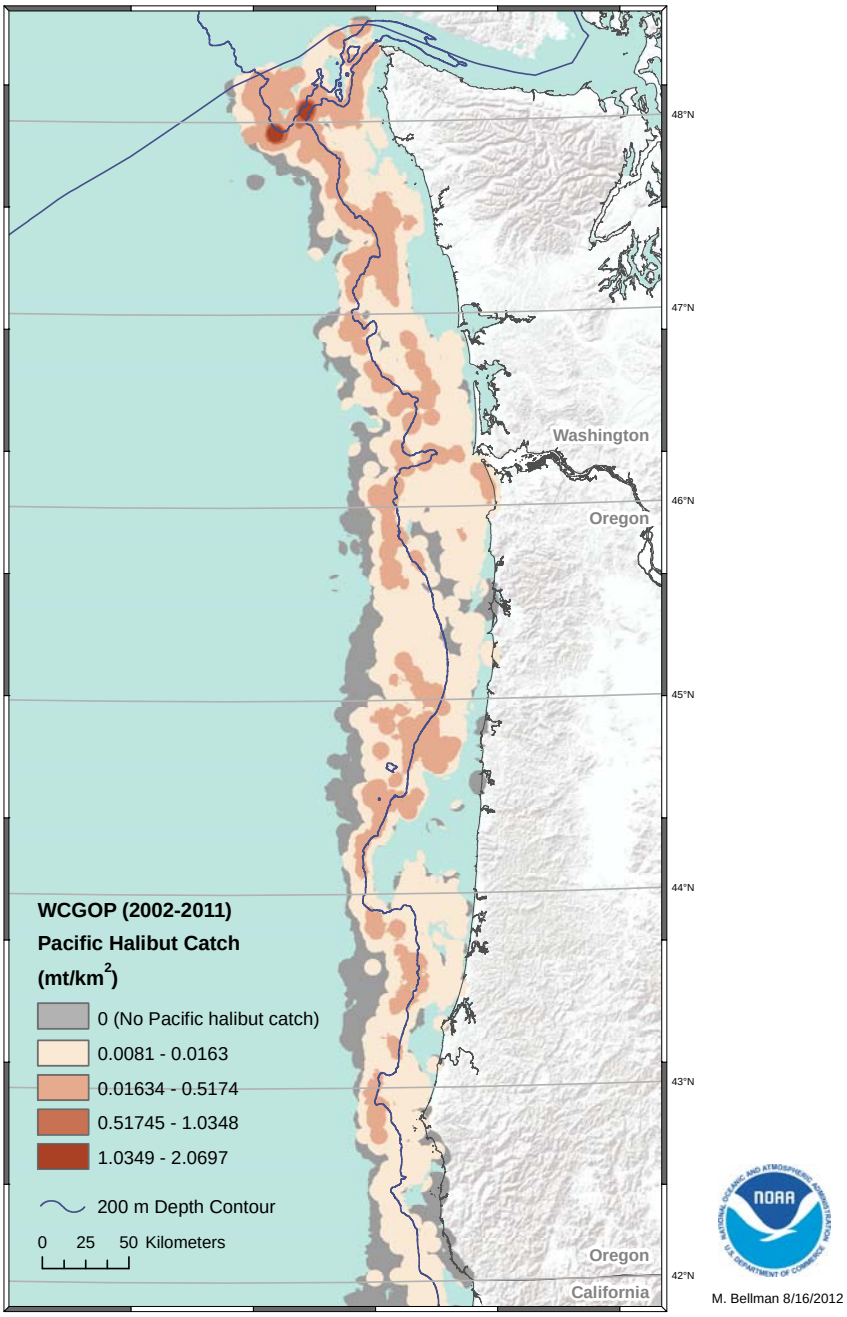
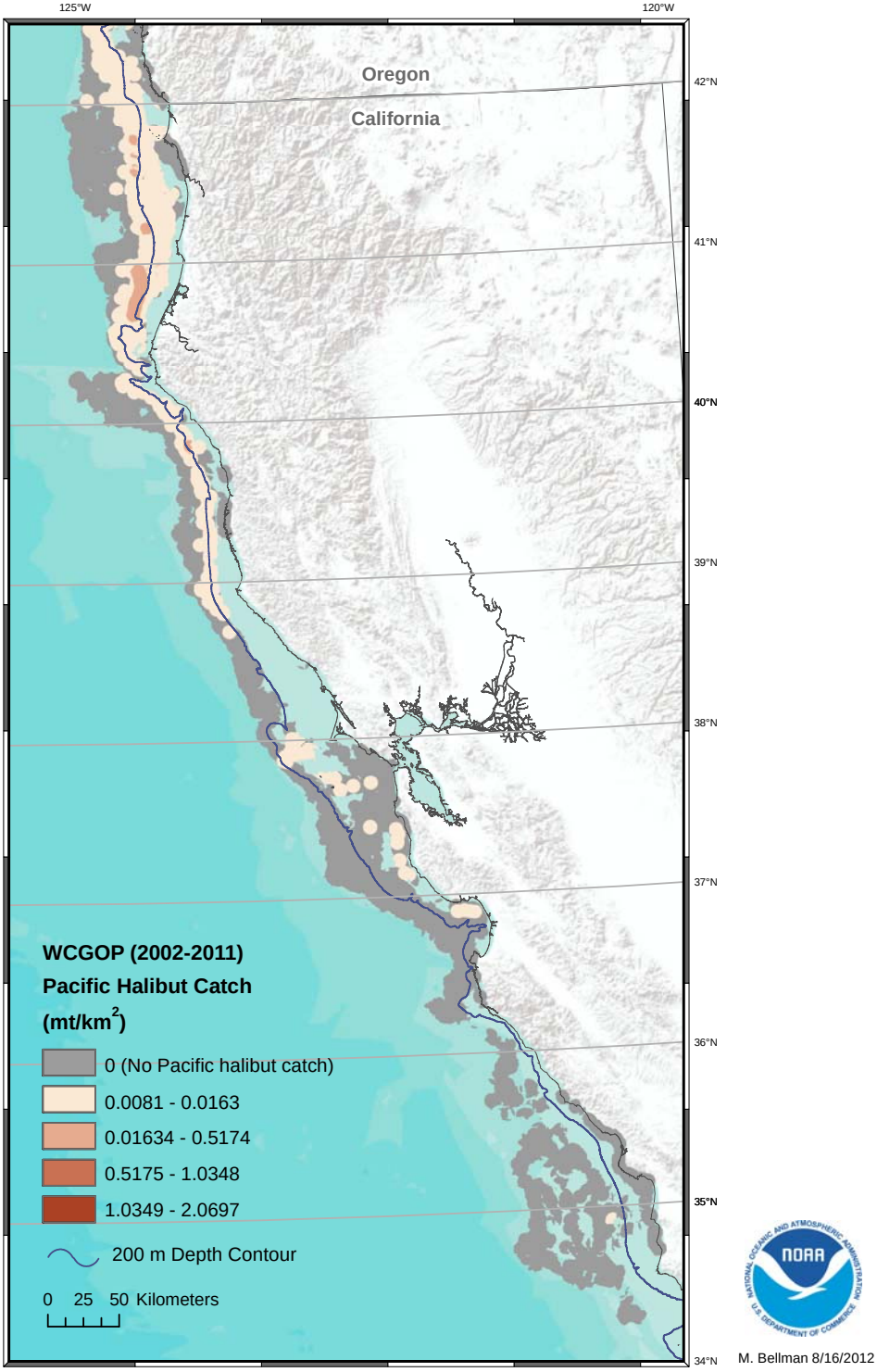


Figure 2b (Jannot et al. 2012). Spatial distribution of Pacific halibut catch (mt/km^2) and fishing grounds observed by the West Coast Groundfish Observer Program, off the U.S. west coast (CA). See Figure 2a caption for full description.



Supplemental Material for SSC Review of NWFSC Observer Program Annual Report on Pacific Halibut bycatch in U.S. west coast groundfish fisheries: Response to 2012 SSC comments and suggestions.

In the 2012 report, we removed the 'retained catch of other species' strata from the IFQ bottom trawl vessels because qualitative information suggested that the incentives of the IFQ system had significantly changed fishing behavior. The strata represents a catch threshold (greater or less than 125 lbs.) for species which are correlated with catch of P. halibut (Heery et al. 2010). As requested by the SSC during the review of the 2012 report, we provide tables that compare the IFQ bottom trawl discard rates and gross discard (Table E1) with the same values for the LE Bottom Trawl fishery during the 2002-2010 period. We also provide coverage summaries (Table E2), expansion calculations (Table E3), viability summaries (Table E4) and discard mortality (Table E5) for the IFQ bottom trawl data using this additional catch threshold stratum. The strata used for the IFQ bottom trawl vessels in the 2013 report are the same as those used in the 2012 report and, thus, this threshold is not used. If the SSC deems the threshold strata relevant to IFQ bottom trawl vessels, we will add the tables below to the 2013 report.

Table E1. A comparison of discard ratios and gross discard estimates of the LE bottom trawl fishery from 2002-2010 versus the IFQ bottom trawl fishery from 2011-2012. Note that observer coverage of the LE bottom trawl fishery from 2002-2010 varied from 9-29% of the total fleet tow hours. IFQ coverage for the 2011-2012 years was greater than 98% of the tow hours.

		0 to 60 fathoms						> 60 fathoms				
		Observed		Estimated				Observed		Estimated		
Area lbs per tow hour Year		Discard ratio (kg/hr)	SE	Gross discard estimate (kg)	95% CI lower	95% CI upper		Discard ratio (kg/hr)	SE	Gross discard estimate (kg)	95% CI lower	95% CI upper
North of Pt Chehalis												
≤ 125 lbs												
LE Trawl	2002	6.85	0.99	6,261	4,483	8,040	**LE Trawl**	5.62	0.89	32,795	22,586	43,004
	2003	1.04	0.40	364	87	640		1.40	0.56	7,354	1,608	13,100
	2004	6.49	1.61	5,235	2,682	7,788		1.34	0.29	3,457	1,979	4,935
	2005	9.75	2.90	5,566	2,325	8,808		12.59	6.94	42,483	0	88,428
	2006	7.84	1.64	9,254	5,453	13,054		5.16	1.06	17,259	10,327	24,190
	2007	11.72	3.56	10,868	4,401	17,335		3.35	1.47	14,420	2,041	26,799
	2008	2.35	0.66	953	428	1,478		1.18	0.20	8,139	5,432	10,846
	2009	7.42	1.50	2,222	1,340	3,104		3.31	0.62	21,963	13,846	30,079
	2010	» 7.05	0.76	626	494	759		0.86	0.26	5,189	2,107	8,271
IFQ B.Trawl	2011	7.43	5.61	238	223	254	**IFQ B.Trawl**	1.91	2.05	3,571	3,551	3,592
IFQ B.Trawl	2012	9.61	11.51	829	779	878	**IFQ B.Trawl**	1.73	1.25	2,510	2,497	2,523
> 125 lbs												
LE Trawl	2002	10.88	1.05	21,973	17,808	26,138	**LE Trawl**	46.28	5.97	367,146	274,388	459,904
	2003	2.55	0.70	3,003	1,388	4,617		20.65	3.40	109,201	73,947	144,455
	2004	12.54	1.55	34,254	25,944	42,564		32.46	4.75	106,598	76,023	137,173
	2005	12.48	1.64	24,818	18,433	31,204		38.88	3.39	236,715	196,312	277,117
	2006	12.34	1.49	23,006	17,566	28,447		45.08	6.66	172,672	122,674	222,669
	2007	14.33	5.30	14,865	4,090	25,641		28.03	6.33	88,142	49,137	127,147
	2008	7.92	1.52	7,428	4,628	10,229		35.53	5.33	145,011	102,366	187,656
	2009	22.15	3.94	14,796	9,634	19,958		38.71	4.42	171,175	132,907	209,443
	2010	» 11.95	0.68	3,208	2,847	3,569		22.16	4.87	57,367	32,681	82,053
IFQ B.Trawl	2011	8.86	1.35	7,126	7,119	7,134	**IFQ B.Trawl**	7.54	0.64	18,076	18,072	18,079
IFQ B.Trawl	2012	6.38	1.44	3,944	3,938	3,950	**IFQ B.Trawl**	7.50	0.77	27,707	27,702	27,712
South of Pt Chehalis												
≤ 125 lbs												
LE Trawl	2002	3.91	0.77	22,477	13,751	31,203	**LE Trawl**	0.44	0.08	26,125	17,061	35,190
	2003	0.32	0.16	1,378	14	2,741		0.20	0.04	9,287	6,016	12,558
	2004	1.10	0.20	4,205	2,743	5,668		0.28	0.04	8,411	5,942	10,881
	2005	2.78	0.39	8,645	6,240	11,049		0.35	0.06	9,438	6,333	12,543
	2006	1.34	0.22	5,333	3,641	7,024		0.27	0.04	7,483	5,384	9,583
	2007	3.70	0.72	14,082	8,728	19,436		0.47	0.06	15,392	11,234	19,550
	2008	1.21	0.27	2,318	1,303	3,334		0.92	0.20	39,272	22,436	56,108
	2009	2.63	0.32	7,680	5,828	9,532		0.84	0.11	46,433	34,095	58,770
	2010	2.66	0.57	4,159	2,425	5,893		0.52	0.08	25,225	17,631	32,819
IFQ B.Trawl	2011	7.50	1.80	3,820	3,814	3,827	**IFQ B.Trawl**	0.14	0.37	3,195	3,191	3,199
IFQ B.Trawl	2012	2.49	0.89	1,394	1,391	1,398	**IFQ B.Trawl**	0.13	0.19	2,695	2,693	2,698
> 125 lbs												
LE Trawl	2002	2.95	0.39	7,799	5,770	9,828	**LE Trawl**	4.00	0.52	39,837	29,604	50,070
	2003	1.91	0.51	4,477	2,122	6,833		4.59	0.48	51,592	41,072	62,112
	2004	3.28	0.54	11,841	8,005	15,678		4.16	0.51	38,425	29,266	47,584
	2005	6.18	0.74	33,875	25,937	41,814		7.58	0.78	98,808	78,787	118,829
	2006	13.50	1.97	75,235	53,665	96,804		6.13	0.70	80,668	62,579	98,756
	2007	11.77	1.37	45,573	35,200	55,947		6.56	0.60	91,034	74,717	107,350
	2008	3.83	0.63	9,030	6,120	11,941		5.80	0.78	93,055	68,584	117,526
	2009	11.83	1.34	26,412	20,557	32,267		7.43	0.89	94,555	72,439	116,672
	2010	5.04	1.09	5,932	3,417	8,446		7.58	0.89	60,770	46,700	74,840
IFQ B.Trawl	2011	3.83	0.46	6,830	6,828	6,832	**IFQ B.Trawl**	1.97	0.25	18,991	18,989	18,992
IFQ B.Trawl	2012	4.26	0.71	6,549	6,546	6,551	**IFQ B.Trawl**	1.86	0.22	17,946	17,944	17,947

» These observed discard ratios were estimated by bootstrapping the means across all previous years (10,000x, with replacement). This was done because the number of observations in these strata were too small (≤ 3 vessels) or not observed, and therefore, direct estimation of discard ratios were either not accurate or not possible.

Table E2. Number of vessels, trips, and tows/sets observed and metric tons of Pacific halibut sampled in the IFQ bottom trawl fishery. All participating vessels carry an observer on all fishing trips under IFQ management (100% observed). Some tows/sets are only partially sampled. Partially sampled tows/sets are included in the "No. of sampled tows", but for clarity, the number of unsampled catch categories in partially sampled tows/sets is provided. Some tows/sets are completely unsampled as noted below. (*) Confidential data.

Area Lbs per tow hour Depth (fm) Year	No. of vessels	No. of trips	No. sampled tows	No. unsampled tows	Sampled tow hours	Unsampled tow hours	P. halibut discard (mt)	P. halibut retained (mt)	Unsampled categories from partially sampled hauls			Coverage rate	
									IFQFF	IFQM	Non-IFQ	% tows sampled	% tow hours sampled
North of Pt. Chehalis													
< 125lbs													
0-60													
2011	5	12	21	0	247	9	0.24	0.00	0	0	1	100%	96.5%
2012	9	21	38	1	564	63	0.83	0.00	0	1	2	97.4%	89.9%
> 60													
2011	18	99	365	2	12770	1639	3.57	0.00	0	3	43	99.5%	88.6%
2012	17	102	276	1	9833	779	2.51	0.00	0	4	15	99.6%	92.7%
>= 125lbs													
0-60													
2011	13	46	282	3	7859	534	7.13	0.00	2	5	9	98.9%	93.6%
2012	13	62	278	4	5515	551	3.94	0.00	0	0	8	98.6%	90.9%
> 60													
2011	19	134	743	3	21962	2583	18.08	0.01	3	5	95	99.6%	89.5%
2012	19	161	1062	9	34440	2099	27.71	0.03	0	16	43	99.2%	94.3%
40° 10' to Pt. Chehalis													
< 125lbs													
0-60													
2011	15	75	216	2	2999	181	3.71	0.00	3	0	7	99.1%	94.3%
2012	16	75	221	2	3395	142	1.32	0.00	0	0	2	99.1%	96.0%
> 60													
2011	55	634	2872	13	132293	6435	3.08	0.00	2	7	93	99.5%	95.4%
2012	52	578	2359	7	112898	5209	2.60	0.01	0	11	82	99.7%	95.6%
>= 125lbs													
0-60													
2011	18	131	899	17	15281	1702	6.77	0.00	9	2	58	98.1%	90.0%
2012	19	147	754	6	12263	1173	6.40	0.00	3	6	27	99.2%	91.3%
> 60													
2011	54	598	2225	16	83773	4695	18.94	0.01	3	7	85	99.3%	94.7%
2012	54	536	2181	19	80383	3327	17.23	0.03	2	16	55	99.1%	96.0%
South of 40° 10' N Lat													
< 125lbs													
0-60													
2011	3	20	39	0	644	83	0.11	0.00	3	0	1	100%	88.6%
2012	*	*	*	*	*	*	*	*	*	*	*	*	*
> 60													
2011	15	230	1014	3	36452	1718	0.11	0.00	3	0	26	99.7%	95.5%
2012	13	232	1139	0	34518	3110	0.10	0.00	1	1	51	100%	91.7%
>= 125lbs													
0-60													
2011	*	*	*	*	*	*	*	*	*	*	*	*	*
2012	*	*	*	*	*	*	*	*	*	*	*	*	*
> 60													
2011	14	120	359	0	7542	478	0.05	0.00	0	0	8	100%	94.0%
2012	12	165	506	3	10035	992	0.72	0.00	0	0	18	99.4%	91.0%

Table E3. Values used to calculate the expanded weight (mt) of Pacific halibut (PHLB) from each unsampled category in the U.S. west coast groundfish IFQ bottom trawl fishery. Unsampled catch weight could be assigned to one of four categories: IFQ flatfish species, IFQ mixed species, non-IFQ species, or all species (IFQ & non-IFQ). The sampled weight (mt), discard ratio, unsampled weight (mt) and estimated Pacific halibut gross discard (mt) are presented within each category, depth, catch threshold (125 pounds per tow hour) of correlated species, management area, area north or south of Point Chehalis, WA and year, from the bottom trawl fisheries. The sum of expanded discard weight (mt) is the sum of the estimated gross P. halibut discard across categories. The sampled PHLB in unsampled hauls is the sampled weight of P. halibut in partially sampled hauls. The sampled discarded PHLB weight (mt) is the sum of sampled PHLB from all observed hauls. The total discard (gross) is the sum of the PHLB in unsampled hauls plus the sampled PHLB. (*) Confidential data.

Area / Lbs per tow hour / Depth (fm) / Year	IFQ Flatfish				Mixed IFQ Species				Non-IFQ Species				All Species (IFQ & Non-IFQ)				Sum of Exp. Discard Weight	Sampled Discarded PHLB	Total Discard
	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard	Sampled Weight	Discard Ratio	Unsampled Weight	Est. Discard			
North of Pt. Chehalis																			
< 125lbs																			
0-60																			
2011	1.05	0.226	0.00	0.00	1.66	0.143	0.00	0.00	1.60	0.000	0.02	0.00	3.27	0.073	0.00	0.00	0.00	0.24	0.24
2012	6.01	0.134	0.00	0.00	6.12	0.132	0.05	0.01	6.38	0.000	0.07	0.00	12.50	0.065	0.27	0.02	0.02	0.81	0.85
> 60																			
2011	30.48	0.107	0.00	0.00	35.50	0.092	0.33	0.03	71.76	0.000	2.43	0.00	107.26	0.030	0.10	0.00	0.03	3.26	3.61
2012	14.55	0.167	0.00	0.00	19.28	0.126	0.10	0.01	74.28	0.000	0.31	0.00	93.56	0.026	11.02	0.29	0.30	2.43	2.81
>= 125lbs																			
0-60																			
2011	56.67	0.124	0.16	0.02	75.85	0.093	5.22	0.48	53.94	0.000	2.64	0.00	129.79	0.054	2.29	0.12	0.63	7.04	7.83
2012	42.32	0.084	0.00	0.00	46.64	0.076	0.00	0.00	36.71	0.000	0.95	0.00	83.35	0.043	0.29	0.01	0.01	3.55	3.96
> 60																			
2011	71.05	0.208	1.03	0.21	92.82	0.160	0.68	0.11	124.73	0.000	12.61	0.00	217.55	0.068	4.69	0.32	0.64	14.81	19.54
2012	63.29	0.413	0.00	0.00	95.61	0.274	2.32	0.64	185.25	0.000	6.53	0.00	561.72	0.186	13.83	1.29	1.92	52.33	38.90
40° 10' to Pt. Chehalis																			
< 125lbs																			
0-60																			
2011	14.12	0.263	0.29	0.08	14.63	0.254	0.00	0.00	30.43	0.000	3.07	0.00	45.06	0.082	1.66	0.14	0.21	3.71	3.93
2012	14.35	0.092	0.00	0.00	15.73	0.084	0.00	0.00	43.20	0.000	0.11	0.00	58.93	0.022	0.28	0.01	0.01	1.32	1.33
> 60																			
2011	69.76	0.042	0.04	0.00	136.90	0.021	2.99	0.06	436.70	0.000	6.40	0.00	573.60	0.005	2.66	0.01	0.08	2.92	3.16
2012	62.62	0.041	0.00	0.00	132.51	0.019	4.47	0.09	354.68	0.000	5.77	0.00	487.19	0.005	2.72	0.01	0.10	2.58	2.70
>= 125lbs																			
0-60																			
2011	75.80	0.079	0.68	0.05	95.81	0.063	2.40	0.15	140.44	0.000	3.69	0.00	236.25	0.025	4.05	0.10	0.31	6.00	7.25
2012	54.72	0.110	0.45	0.05	66.25	0.090	2.35	0.21	97.54	0.000	2.45	0.00	163.78	0.037	1.67	0.06	0.32	5.99	6.72
> 60																			
2011	97.77	0.176	0.74	0.13	187.90	0.092	1.01	0.09	284.14	0.000	11.85	0.00	472.05	0.037	4.88	0.18	0.40	17.24	19.38
2012	111.40	0.150	0.06	0.01	224.08	0.074	2.45	0.18	265.11	0.000	6.62	0.00	489.19	0.034	4.54	0.15	0.35	16.68	17.59
South of 40° 10' N Lat																			
< 125lbs																			
0-60																			
2011	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2012	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
> 60																			
2011	121.62	0.000	0.10	0.00	182.05	0.000	0.00	0.00	175.03	0.001	2.74	0.00	357.08	0.000	1.36	0.00	0.00	0.11	0.12
2012	48.74	0.000	0.01	0.00	97.73	0.000	0.03	0.00	147.02	0.001	6.67	0.00	244.75	0.000	0.00	0.00	0.00	0.08	0.10
>= 125lbs																			
0-60																			
2011	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2012	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
> 60																			
2011	33.28	0.000	0.00	0.00	88.12	0.000	0.00	0.00	41.56	0.001	0.12	0.00	129.68	0.000	0.00	0.00	0.00	0.05	0.05
2012	27.09	0.000	0.00	0.00	157.21	0.000	0.00	0.00	67.50	0.010	0.47	0.00	224.71	0.003	1.93	0.01	0.01	0.67	0.73

Table E4. Pacific halibut viabilities in the U.S. west coast groundfish IFQ bottom trawl fishery by depth, catch threshold (125 pounds per tow hour) of correlated species, management area,area north or south of Point Chehalis, WA, and year. The condition of sampled Pacific halibut was identified as Excellent (Exc), Poor, or Dead (WCGOP manual 2013), consistent with IPHC protocol. The number of fish in each category was weighted based on the length-weight relationship as described in the Methods. (*) Confidential data.

Area / Lbs per tow hour / Depth (fm) / Year	Number of fish				Weighted percentages in each category		
	Exc	Poor	Dead	Total	Exc	Poor	Dead
North of Pt. Chehalis							
< 125lbs							
0-60							
2011	23	1	0	24	92%	8%	0%
2012	36	22	45	103	40%	21%	40%
> 60							
2011	115	33	104	252	49%	15%	36%
2012	80	50	90	220	38%	21%	41%
>= 125lbs							
0-60							
2011	494	136	308	938	56%	14%	29%
2012	278	134	254	666	47%	20%	33%
> 60							
2011	948	406	823	2177	46%	19%	35%
2012	1219	659	1278	3156	41%	21%	39%
40° 10' to Pt. Chehalis							
< 125lbs							
0-60							
2011	379	22	13	414	93%	4%	3%
2012	*	*	*	*	*	*	*
> 60							
2011	115	69	159	343	33%	19%	48%
2012	80	55	156	291	33%	19%	49%
>= 125lbs							
0-60							
2011	*	*	*	*	*	*	*
2012	*	*	*	*	*	*	*
> 60							
2011	852	485	1029	2366	38%	20%	41%
2012	775	392	1044	2211	37%	17%	46%
South of 40° 10' N Lat							
< 125lbs							
0-60							
2011	0	0	6	6	0%	0%	100%
2012	0	0	4	4	0%	0%	100%
> 60							
2011	5	1	3	9	57%	9%	34%
2012	5	1	5	11	49%	9%	42%
>= 125lbs							
0-60							
2011	0	0	4	4	0%	0%	100%
2012	0	0	10	10	0%	0%	100%
> 60							
2011	2	0	3	5	26%	0%	74%
2012	30	6	31	67	49%	9%	42%

Table E4. Estimated gross discard (mt) and discard mortality (mt) of Pacific halibut in the U.S. west coast groundfish IFQ bottom trawl fishery by depth, catch threshold (125 pounds per tow hour) of correlated species, management area, area north or south of Point Chehalis, WA and year. Estimates were allocated to the three condition categories based on information presented in Table E3 DMR = Discard Mortality Rate. (*) Confidential data.

Area / Lbs per tow hour / Depth (fm)		Estimate Gross Discard (mt)				Estimated Discard Mortality (mt)				DMR
	Year	Exc	Poor	Dead	Total	m(Exc)	m(Poor)	m(Dead)	m(Total)	
North of Pt. Chehalis										
< 125lbs										
0-60										
	2011	0.24	0.02	0.00	0.26	0.05	0.01	0.00	0.06	23%
	2012	0.51	0.27	0.51	1.29	0.10	0.15	0.46	0.71	55%
> 60										
	2011	1.84	0.56	1.36	3.76	0.37	0.31	1.22	1.90	51%
	2012	1.20	0.68	1.29	3.17	0.24	0.37	1.16	1.77	56%
>= 125lbs										
0-60										
	2011	5.62	1.43	2.91	9.97	1.12	0.79	2.62	4.53	45%
	2012	2.86	1.23	1.98	6.07	0.57	0.67	1.78	3.03	50%
> 60										
	2011	12.69	5.11	9.53	27.32	2.54	2.81	8.58	13.92	51%
	2012	15.69	8.04	14.96	38.69	3.14	4.42	13.47	21.03	54%
40° 10' to Pt. Chehalis										
< 125lbs										
0-60										
	2011	5.47	0.26	0.16	5.89	1.09	0.14	0.14	1.38	23%
	2012	1.63	0.27	0.24	2.14	0.33	0.15	0.21	0.69	32%
> 60										
	2011	1.61	0.94	2.32	4.87	0.32	0.52	2.08	2.92	60%
	2012	1.38	0.79	2.06	4.23	0.28	0.44	1.86	2.57	61%
>= 125lbs										
0-60										
	2011	7.94	1.34	1.54	10.82	1.59	0.73	1.39	3.71	34%
	2012	6.55	1.41	1.99	9.95	1.31	0.77	1.79	3.88	39%
> 60										
	2011	11.06	5.88	11.94	28.89	2.21	3.24	10.74	16.19	56%
	2012	10.02	4.72	12.66	27.39	2.00	2.59	11.39	15.99	58%
South of 40° 10' N Lat										
< 125lbs										
0-60										
	2011	0.00	0.00	0.18	0.18	0.00	0.00	0.16	0.16	90%
	2012	*	*	*	*	*	*	*	*	*
> 60										
	2011	0.11	0.02	0.07	0.19	0.02	0.01	0.06	0.09	47%
	2012	0.08	0.01	0.07	0.16	0.02	0.01	0.06	0.08	52%
>= 125lbs										
0-60										
	2011	*	*	*	*	*	*	*	*	*
	2012	*	*	*	*	*	*	*	*	*
> 60										
	2011	0.02	0.00	0.06	0.08	0.00	0.00	0.05	0.06	72%
	2012	0.57	0.11	0.48	1.15	0.11	0.06	0.43	0.60	52%

Agenda Item D.1.c
Supplemental GAP Report
September 2013

GROUNDFISH ADVISORY SUBPANEL REPORT ON PACIFIC HALIBUT BYCATCH ESTIMATE

The Groundfish Advisory Subpanel (GAP) heard a presentation from Dr. Jason Jannot (NWFSC) on Pacific Halibut Bycatch in the West Coast U.S. groundfish fisheries. There were a number of questions form GAP members on how some of the numbers came about. There was also a concern from some members of the GAP that the trawl IBQ set-aside might suffer from a use-it or lose-it scenario. The GAP discussed this matter at length, but acknowledged that the trawl set-aside is scheduled for a reduction in 2015, which minimizes this being an issue in the future.

PFMC
09/11/13

Agenda Item D.1.c
Supplemental SSC Report
September 2013

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON PACIFIC HALIBUT BYCATCH ESTIMATE

Dr. Jason Jannot of the NWFSC West Coast Groundfish Observer Program (WCGOP) met with the Scientific and Statistical Committee (SSC) and reviewed the Pacific halibut bycatch report and WCGOP Response to the SSC (Agenda Items D.1.b). The SSC had previously reviewed and commented on the estimation methodology used for the 2011 estimates and there have been relatively minor changes to that methodology for the 2012 estimates.

Dr. Jannot presented the results of analyses that addressed comments made by the SSC during its review of the halibut bycatch report in 2012. There was a relatively large decrease in the halibut total mortality estimate from 2010 to 2011 and, in its 2012 review, the SSC was concerned that some of that decrease could be due to the change in estimation methods. The analyses presented indicated that the decrease was largely due to a decrease in effort. The SSC appreciated the efforts made to address their previous concerns.

The SSC notes that there were differences between the WCGOP and Vessel Accounting System (VAS) estimates of total halibut mortality. However, both numbers were well below the quotas for 2011 and 2012. These differences may be a result of the WCGOP producing estimates by strata (across multiple vessels) while the VAS estimates are produced at the vessel level. Having two estimates, despite their similarity, could be problematic in certain situations. Based on the 2011 and 2012 estimates, both systems are producing similar estimates. If this continues, the need for the separate WCGOP estimates for the IBQ fishery should be assessed.

Dr. Jannot indicated that for the 2013 analysis, estimates for the pink shrimp fishery would be stratified by state and further investigations of the catch threshold stratification would be conducted. The SSC supports both these future analyses.

The SSC considers the bycatch estimates presented for halibut as the best scientific information available and recommends their use for 2014 management. Unless there are significant changes in the estimation methodology, the SSC does not see a need to review these estimates on an annual basis.

PFMC
09/12/13

2014 PACIFIC HALIBUT REGULATIONS

Each September meeting, the Council considers proposed changes to the Pacific halibut regulations. The purpose of this consideration is for adjustments in the annual regulations (primarily in the recreational fishery) or the Catch Sharing Plan (CSP) for Area 2A (Agenda Item D.2.a, Attachment 1), and can include changes in catch allocation among areas or gear groups.

Public meetings were held to solicit proposed changes to the CSP and to present staff proposals for public comment. The Washington Department of Fish and Wildlife (WDFW) held a public meeting on July 24 in Montesano. The Oregon Department of Fish and Wildlife (ODFW) held public meetings on August 6 in Tillamook, August 7 in Newport, August 12 in Brookings, and August 13 in North Bend. The California Department of Fish and Wildlife (CDFW) held a public meeting on July 18 in Eureka. Recommendations resulting from the meetings are included in the reference materials (Agenda Items D.2.b, WDFW Report, D.2.b, ODFW Report, and D.2.b, CDFW Report).

Additionally, the Council's South of Humbug Policy Committee (Committee) met to review the South of Humbug Workgroup (Workgroup) Report on recreational management measure alternatives necessary to reduce harvest of halibut south of Humbug Mountain (Agenda Item D.2.b, Workgroup Report). The outcomes of the Committee meeting are detailed in Agenda Item D.2.b, Committee Report. In summary, the Committee recommends implementing an adaptive management approach with a target of reducing recreational harvest of Pacific halibut in California by approximately 8,900 to 13,300 pounds for the 2014 fishery. The Committee recommends establishing a new management line at the Oregon/California border in the CSP (Alternative 6) and restricting fishing opportunity in the newly-created California Subarea by days of the week (Alternatives 2 and 7) or month (Alternatives 3 and 5). Depending on the season structure, additional management measures, like restricting Pacific halibut retention based on salmon and/or groundfish retention (Alternative 1), may be needed. The Oregon portion, between Humbug Mountain and the Oregon/California border, could be subsumed into the Central Oregon Coast Subarea (Alternative 6a) or become a separate Southern Oregon Subarea (Alternative 6b). Under all alternatives, the Committee recommends no inseason management of the California Subarea.

The Council will take final action on proposed changes for 2014 Area 2A halibut fisheries at the November 2014 Council meeting.

Council Action:

1. Adopt for public review proposed changes for the 2014 Pacific halibut CSP, as necessary.
2. Adopt for public review proposed changes for the 2014 annual fishery regulations, as necessary.

Reference Materials:

1. Agenda Item D.2.a, Attachment 1: 2013 Pacific Halibut Catch Sharing Plan for Area 2A.
2. Agenda Item D.2.b, NMFS Report: Report on the 2013 Pacific Halibut Fisheries in Area 2A.
3. Agenda Item D.2.b, ODFW Report: Oregon Department of Fish and Wildlife Report on Proposed Changes to the Pacific Halibut Catch Sharing Plan for the 2014 Fishery.
4. Agenda Item D.2.b, WDFW Report: Washington Department of Fish and Wildlife Report on Proposed Changes to the Catch Sharing Plan and 2014 Annual Regulations.
5. Agenda Item D.2.b, CDFW Report: California Department of Fish and Wildlife Report on Proposed Changes to the 2014 Pacific Halibut Catch Sharing Plan.
6. Agenda Item D.2.b, Workgroup Report: South of Humbug Pacific Halibut Workgroup Preliminary Management Measures Analyses.
7. Agenda Item D.2.b, Policy Committee Report: Summary of the South of Humbug Pacific Halibut Policy Committee Meeting.
8. Agenda Item D.2.c, Public Comment.

Agenda Order:

a. Agenda Item Overview — Kelly Ames
b. Reports and Comments of Advisory Bodies and Management Entities
c. Public Comment
d. **Council Action**: Adopt for Public Review Proposed Changes for the 2014 Pacific Halibut Catch Sharing Plan and Annual Fishing Regulations

PFMC
08/13/13

2013 PACIFIC HALIBUT CATCH SHARING PLAN FOR AREA 2A

(a) FRAMEWORK

This Plan constitutes a framework that shall be applied to the annual Area 2A total allowable catch (TAC) approved by the International Pacific Halibut Commission (IPHC) each January. The framework shall be implemented in both IPHC regulations and domestic regulations (implemented by NMFS) as published in the *Federal Register*.

(b) ALLOCATIONS

This Plan allocates 35 percent of the Area 2A TAC to U.S. treaty Indian tribes in the State of Washington in subarea 2A-1, and 65 percent to non-Indian fisheries in Area 2A. The allocation to non-Indian fisheries is divided into three shares, with the Washington sport fishery (north of the Columbia River) receiving 36.6 percent, the Oregon/California sport fishery receiving 31.7 percent, and the commercial fishery receiving 31.7 percent. Allocations within the non-Indian commercial and sport fisheries are described in sections (e) and (f) of this Plan. These allocations may be changed if new information becomes available that indicates a change is necessary and/or the Pacific Fishery Management Council takes action to reconsider its allocation recommendations. Such changes will be made after appropriate rulemaking is completed and published in the *Federal Register*.

(c) SUBQUOTAS

The allocations in this Plan are distributed as subquotas to ensure that any overage or underage by any one group will not affect achievement of an allocation set aside for another group. The specific allocative measures in the treaty Indian, non-Indian commercial, and non-Indian sport fisheries in Area 2A are described in paragraphs (d) through (f) of this Plan.

(d) TREATY INDIAN FISHERIES

Thirty-five percent of the Area 2A TAC is allocated to 13 treaty Indian tribes in subarea 2A-1, which includes that portion of Area 2A north of Point Chehalis, WA (46°53.30' N. lat.) and east of 125°44.00' W. long. The treaty Indian allocation is to provide for a tribal commercial fishery and a ceremonial and subsistence fishery. These two fisheries are managed separately; any overages in the commercial fishery do not affect the ceremonial and subsistence fishery. The commercial fishery is managed to achieve an established subquota, while the ceremonial and subsistence fishery is managed for a year-round season. The tribes will estimate the ceremonial and subsistence harvest expectations in January of each year, and the remainder of the allocation will be for the tribal commercial fishery.

(1) The tribal ceremonial and subsistence fishery begins on January 1 and continues through December 31. No size or bag limits will apply to the ceremonial and

subsistence fishery, except that when the tribal commercial fishery is closed, treaty Indians may take and retain not more than two halibut per day per person for subsistence purposes. Ceremonial fisheries shall be managed by tribal regulations promulgated inseason to meet the needs of specific ceremonial events. Halibut taken for ceremonial and subsistence purposes may not be offered for sale or sold.

(2) The tribal commercial fishery season dates will be set within the season dates determined by the IPHC and implemented in IPHC regulations. The tribal commercial fishery will close when the subquota is taken. Any halibut sold by treaty Indians during the commercial fishing season must comply with IPHC regulations on size limits for the non-Indian fishery.

(e) NON-INDIAN COMMERCIAL FISHERIES

The non-Indian commercial fishery is allocated 31.7 percent of the non-Indian share of the Area 2A TAC for a directed halibut fishery and an incidental catch fishery during the salmon troll fishery. The non-Indian commercial allocation is approximately 20.6 percent of the Area 2A TAC. Incidental catch of halibut in the primary directed sablefish fishery north of Point Chehalis, WA will be authorized if the Washington sport allocation exceeds 224,110 lb (101.7 mt) as described in section (e)(3) of this Plan. The structuring and management of these three fisheries is as follows.

(1) Incidental halibut catch in the salmon troll fishery.

Fifteen percent of the non-Indian commercial fishery allocation is allocated to the salmon troll fishery in Area 2A as an incidental catch during salmon fisheries. The quota for this incidental catch fishery is approximately 3.1 percent of the Area 2A TAC. The primary management objective for this fishery is to harvest the troll quota as an incidental catch during the April-June salmon troll fishery. The secondary management objective is to harvest the remaining troll quota as an incidental catch during the remainder of the salmon troll fishery.

(i) The Council will recommend landing restrictions at its spring public meeting each year to control the amount of halibut caught incidentally in the troll fishery. The landing restrictions will be based on the number of incidental harvest license applications submitted to the IPHC, halibut catch rates, the amount of allocation, and other pertinent factors, and may include catch or landing ratios, landing limits, or other means to control the rate of halibut harvest. NMFS will publish the landing restrictions annually in the *Federal Register*, along with the salmon management measures.

(ii) Inseason adjustments to the incidental halibut catch fishery.

(A) NMFS may make inseason adjustments to the landing restrictions, if requested by the Council Chairman, as necessary to assure that the incidental harvest rate is appropriate for salmon and halibut availability, does not encourage target fishing on halibut, and does not increase the likelihood of exceeding the quota for this fishery. In determining whether to make such inseason adjustments, NMFS will consult with the applicable state representative(s), a representative of the Council's Salmon Advisory Sub-Panel, and Council staff.

(B) Notice and effectiveness of inseason adjustments will be made by NMFS in accordance with paragraph (f)(5) of this Plan.

(iii) If the overall quota for the non-Indian, incidental commercial troll fishery has not been harvested by salmon trollers during the April-June fishery, additional landings of halibut caught incidentally during salmon troll fisheries will be allowed in July and will continue until the amount of halibut that was initially available as quota for the troll fishery is taken or until the end of the season date for commercial halibut fishing determined by the IPHC and implemented in IPHC regulation. Landing restrictions implemented for the April-June salmon troll fishery will apply for as long as this fishery is open. Notice of the July opening of this fishery will be announced on the NMFS hotline (206) 526-6667 or (800) 662-9825. Halibut retention in the salmon troll fishery will be allowed after June only if the opening has been announced on the NMFS hotline.

(iv) A salmon troller may participate in this fishery or in the directed commercial fishery targeting halibut, but not in both.

(v) Under the Pacific Coast groundfish regulations at 50 CFR 660.330, fishing with salmon troll gear is prohibited within the Salmon Troll Yelloweye Rockfish Conservation Area (YRCA). The Salmon Troll YRCA is an area off the northern Washington coast and is defined by straight lines connecting latitude and longitude coordinates. Coordinates for the Salmon Troll YRCA are specified in groundfish regulations at 50 CFR 660.70(c) and in salmon regulations at 50 CFR 660.405(c).

(2) Directed fishery targeting halibut.

Eighty-five percent of the non-Indian commercial fishery allocation is allocated to the directed fishery targeting halibut (e.g., longline fishery) in southern Washington, Oregon, and California. The allocation for this directed catch fishery is approximately 17.5 percent of the Area 2A TAC. This fishery is confined to the area south of Subarea 2A-1 (south of Point Chehalis, WA; 46°53.30' N. lat.). This fishery may also be managed with closed areas designed to protect overfished groundfish species. Any such closed areas will be described annually in federal halibut regulations published in the *Federal Register* and the

coordinates will be specifically defined at 50 CFR 660.71 through 660.74. The commercial fishery opening date(s), duration, and vessel trip limits, as necessary to ensure that the quota for the non-Indian commercial fisheries is not exceeded, will be determined by the IPHC and implemented in IPHC regulations. If the IPHC determines that poundage remaining in the quota for the non-Indian commercial fisheries is insufficient to allow an additional day of directed halibut fishing, the remaining halibut will be made available for incidental catch of halibut in the fall salmon troll fisheries (independent of the incidental harvest allocation).

(3) Incidental catch in the sablefish fishery north of Point Chehalis.

If the Area 2A TAC is greater than 900,000 lb (408.2 mt), the primary directed sablefish fishery north of Point Chehalis will be allocated the Washington sport allocation that is in excess of 214,110 lb (97.1 mt), provided a minimum of 10,000 lb (4.5 mt) is available (i.e., the Washington sport allocation is 224,110 lb (101.7 mt) or greater). If the amount above 214,110 lb (97.1 mt) is less than 10,000 lb (4.5 mt), then the excess will be allocated to the Washington sport subareas according to section (f) of this Plan. The amount of halibut allocated to the sablefish fishery will be shared as follows: up to 70,000 lb of halibut to the primary sablefish fishery north of Pt. Chehalis. Any remaining allocation will be distributed to the Washington sport fishery among the four subareas according to the sharing described in the Plan, Section (f)(1).

The Council will recommend landing restrictions at its spring public meeting each year to control the amount of halibut caught incidentally in this fishery. The landing restrictions will be based on the amount of the allocation and other pertinent factors, and may include catch or landing ratios, landing limits, or other means to control the rate of halibut landings. NMFS will publish the landing restrictions annually in the Federal Register.

Under Pacific Coast groundfish regulations at 50 CFR 660.230, fishing with limited entry fixed gear is prohibited within the North Coast Commercial Yelloweye Rockfish Conservation Area (YRCA) and the Non-Trawl Rockfish Conservation Area (RCA). The North Coast Commercial Yelloweye Rockfish Conservation Area YRCA is an area off the northern Washington coast, overlapping the northern part of North Coast Recreational YRCA. The Non-Trawl RCA is an area off the Washington coast. These closed areas are defined by straight lines connecting latitude and longitude coordinates. Coordinates for the North Coast Commercial YRCA are specified in groundfish regulations at 50 CFR 660.70(b). Coordinates for the Non-Trawl RCA are specified in groundfish regulations at 50 CFR 660.73.

(4) Commercial license restrictions/declarations.

Commercial fishers must choose either (1) to operate in the directed commercial fishery in Area 2A and/or retain halibut caught incidentally in the primary directed sablefish fishery north of Point Chehalis, WA or (2) to retain halibut caught incidentally during the salmon troll fishery. Commercial fishers operating in the directed halibut fishery and/or retaining halibut incidentally caught in the primary directed sablefish fishery must send their license application to the IPHC postmarked no later than April 30, or the first weekday in May, if April 30 falls on a weekend, in order to obtain a license to fish for halibut in Area 2A. Commercial fishers operating in the salmon troll fishery who seek to retain incidentally caught halibut must send their application for a license to the IPHC for the incidental catch of halibut in Area 2A postmarked no later than March 31, or the first weekday in April, if March 31 falls on a weekend. Fishing vessels licensed by IPHC to fish commercially in Area 2A are prohibited from operating in the sport fisheries in Area 2A.

(f) SPORT FISHERIES

The non-Indian sport fisheries are allocated 68.3 percent of the non-Indian share, which is approximately 44.4 percent of the Area 2A TAC. The allocation is further divided as subquotas among six geographic subareas.

(1) Subarea management. The sport fishery is divided into six sport fishery subareas, each having separate allocations and management measures as follows.

(i) Washington inside waters (Puget Sound) subarea.

This sport fishery subarea is allocated 23.5 percent of the first 130,845 lb (59.4 mt) allocated to the Washington sport fishery, and 32 percent of the Washington sport allocation between 130,845 lb (59.4 mt) and 224,110 lb (101.7 mt) (except as provided in section (e)(3) of this Plan). This subarea is defined as all U.S. waters east of the mouth of the Sekiu River, as defined by a line extending from 48°17.30' N. lat., 124°23.70' W. long. north to 48°24.10' N. lat., 124°23.70' W. long., including Puget Sound. The structuring objective for this subarea is to provide a stable sport fishing opportunity and maximize the season length. To that end, the Puget Sound subarea may be divided into two regions with separate seasons to achieve a fair harvest opportunity within the subarea. Due to inability to monitor the catch in this area inseason, fixed seasons, which may vary and apply to different regions within the subarea, will be established preseason based on projected catch per day and number of days to achievement of the quota. Inseason adjustments may be made, and estimates of actual catch will be made postseason. The fishery will open in April or May and continue until a dates established preseason (and published in the sport fishery regulations) when the quota is predicted to be taken, or until September 30, whichever is earlier. The Washington Department of Fish and Wildlife will develop recommendations to NMFS on the opening date and weekly structure of the fishery each year. The daily bag limit is one fish per person, with no size limit.

(ii) Washington north coast subarea.

This sport fishery subarea is allocated 62.2 percent of the first 130,845 lb (59.4 mt) allocated to the Washington sport fishery, and 32 percent of the Washington sport allocation between 130,845 lb (59.4 mt) and 224,110 lb (101.7 mt) (except as provided in section (e)(3) of this Plan). This subarea is defined as all U.S. waters west of the mouth of the Sekiu River, as defined above in paragraph (f)(1)(i), and north of the Queets River (47°31.70' N. lat.). The management objective for this subarea is to provide a quality recreational fishing opportunity during May and June. The fishery will open on the first Thursday between May 9 and 15, and continue 2 days per week (Thursday and Saturday) in May as scheduled pre-season, unless there is a quota management closure. If there is no quota management closure in May, the fishery will reopen on the first Thursday in June as an all depth fishery on Thursdays and Saturdays as long as sufficient quota remains. This schedule allows adequate public notice of any inseason action before each Thursday opening. If there is not sufficient quota for an all-depth day, the fishery would reopen in the nearshore areas described below:

A. WDFW Marine Catch Area 4B, which is all waters west of the Sekiu River mouth, as defined by a line extending from 48°17.30' N. lat., 124°23.70' W. long. north to 48°24.10' N. lat., 124°23.70' W. long., to the Bonilla-Tatoosh line, as defined by a line connecting the light on Tatoosh Island, WA, with the light on Bonilla Point on Vancouver Island, British Columbia (at 48°35.73' N. lat., 124°43.00' W. long.) south of the International Boundary between the U.S. and Canada (at 48°29.62' N. lat., 124°43.55' W. long.), and north of the point where that line intersects with the boundary of the U.S. territorial sea.

B. Shoreward of the recreational halibut 30-fm boundary line, a modified line approximating the 30 fm depth contour from the Bonilla-Tatoosh line south to the Queets River. Coordinates for the closed area will be specifically defined annually in federal halibut regulations published in the *Federal Register*.

No sport fishing for halibut is allowed after September 30. If the fishery is closed prior to September 30, and there is insufficient quota remaining to reopen the nearshore areas for another fishing day, then any remaining quota may be transferred inseason to another Washington coastal subarea by NMFS via an update to the recreational halibut hotline. The daily bag limit in all fisheries is one halibut per person with no size limit.

Recreational fishing for groundfish and halibut is prohibited within the North Coast Recreational Yelloweye Rockfish Conservation Area (YRCA). The North Coast Recreational YRCA is a C-shaped area off the northern Washington coast

and is defined by straight lines connecting latitude and longitude coordinates. Coordinates for the North Coast Recreational YRCA are specified in groundfish regulations at 50 CFR 660.70(a) and will be described annually in federal halibut regulations published in the *Federal Register*.

(iii) Washington south coast subarea.

This sport fishery is allocated 12.3 percent of the first 130,845 lb (59.4 mt) allocated to the Washington sport fishery, and 32 percent of the Washington sport allocation between 130,845 lb (59.4 mt) and 224,110 lb (101.7 mt) (except as provided in section (e)(3) of this Plan. This subarea is defined as waters south of the Queets River (47°31.70' N. lat.) and north of Leadbetter Point (46°38.17' N. lat.). The structuring objective for this subarea is to maximize the season length, while maintaining a quality fishing experience. The south coast subarea quota will be allocated as follows: 10% or 2,000 pounds, whichever is less, will be set aside for the nearshore fishery with the remaining amount allocated to the primary fishery. During days open to the primary fishery and seaward of the 30-fm line lingcod may be taken, retained and possessed, when allowed by groundfish regulations. The fishery will open on the first Sunday in May. The primary fishery will be open two days per week, Sunday and Tuesday, in all areas, except where prohibited, and will remain open for three consecutive Sundays and Tuesdays before a management closure the following week to tally the catch. If the primary quota is projected to be obtained sooner than expected the management closure may occur earlier. If there is sufficeient quota remaining following the management closure the fishery would continue two days per week, Sunday and/or Tuesday, until the quota for the primary fishery season is reached or September 30, whichever is earlier. If there is insufficient quota remaining to reopen the primary fishery for another fishing day, the remaining primary fishery quota will be added to the nearshore quota. The nearshore fishery takes place, in the area from 47°31.70’ N. lat. south to 46°58.00’ N. lat. and east of a boundary line approximating the 30 fathom depth contour as defined by the following coordinates:

47°31.70´ N.lat, 124°37.03´ W. long;
47°25.67´ N. lat, 124°34.79´ W. long;
47°12.82´ N. lat, 124°29.12´ W. long;
46°58.00´ N. lat, 124°24.24´ W. long.

During the primary season the nearshore fishery will be open seven days per week. Subsequent to the closure of the primary fishery, the nearshore fishery will continue seven days per week until the remaining quota is projected to be taken. If the fishery is closed prior to September 30, and there is insufficient quota remaining to reopen the nearshore areas for another fishing day, then any remaining quota may be transferred inseason to another Washington coastal subarea by NMFS via an update to the recreational halibut hotline. The daily bag limit is one halibut per person, with no size limit.

Recreational fishing for groundfish and halibut is prohibited within two YRCA's off Washington's southern coast. The South Coast Recreational YRCA and the Westport Offshore YRCA are defined by straight lines connecting latitude and longitude coordinates. Coordinates for these Recreational YRCAs are specified in groundfish regulations at 50 CFR 660.70 (d) and (e) and will be described annually in federal halibut regulations published in the *Federal Register*.

(iv) Columbia River subarea.

This sport fishery subarea is allocated 2.0 percent of the first 130,845 lb (59.4 mt) allocated to the Washington sport fishery, and 4.0 percent of the Washington sport allocation between 130,845 lb (59.4 mt) and 224,110 lb (101.7 mt) (except as provided in section (e)(3) of this Plan). This subarea is also allocated an amount equal to the contribution from the Washington sport allocation from the Oregon/California sport allocation This subarea is defined as waters south of Leadbetter Point, WA (46°38.17' N. lat.) and north of Cape Falcon, OR (45°46.00' N. lat.). The fishery will open on the first Friday in May or May 1 if it is a Saturday or Sunday, 3 days per week, Friday through Sunday until 80 percent of the subarea allocation is taken. The fishery will reopen on the first Friday in August and continue 3 days per week, Friday-Sunday until the remainder of the subarea quota has been taken, or until September 30, whichever is earlier. Subsequent to this closure, if there is insufficient quota remaining in the Columbia River subarea for another fishing day, then any remaining quota may be transferred inseason to another Washington and/or Oregon subarea by NMFS via an update to the recreational halibut hotline. Any remaining quota would be transferred to each state in proportion to its contribution. The daily bag limit is one halibut per person, with no size limit. No groundfish may be taken and retained, possessed or landed, except sablefish and Pacific cod when allowed by groundfish regulations, if halibut are on board the vessel.

(v) Oregon central coast subarea.

This subarea extends from Cape Falcon (45°46.00' N. lat.) to Humbug Mountain, Oregon (42°40.50' N. lat.) and is allocated 92.0 percent of the Oregon/California sport allocation minus any amount of pounds needed to contribute to the Oregon portion of the Columbia River subarea quota. If the overall 2A TAC is 700,000 pounds (317.5 mt) or greater, the structuring objectives for this subarea are to provide two periods of fishing opportunity in Spring and in Summer in productive deeper water areas along the coast, and provide a period of fishing opportunity in the summer for nearshore waters. If the overall 2A TAC is less than 700,000 pounds (317.5 mt), the structuring objectives for this subarea are to provide a period of fishing opportunity beginning in Spring in productive deeper water areas along the coast, and provide a period of fishing opportunity in nearshore waters. Any poundage remaining unharvested in the Spring all-depth subquota

will be added to either the Summer all-depth sub-quota or the nearshore subquota based on need, determined via joint consultation between IPHC, NMFS and ODFW. If the 2A TAC exceeds 700,000 pounds, any poundage that is not needed to extend the inside 40-fathom (73 m) fishery through October 31 will be added to the Summer all-depth season if it can be used, and any poundage remaining unharvested from the Summer all-depth fishery will be added to the inside 40-fathom (73 m) fishery subquota, if it can be used. If inseason it is determined via joint consultation between IPHC, NMFS and ODFW, that the combined all-depth and inside 40-fathom (73 m) fisheries will not harvest the entire quota to the subarea, quota may be transferred inseason to another subarea south of Leadbetter Point, WA by NMFS via an update to the recreational halibut hotline. The daily bag limit is one halibut per person, unless otherwise specified, with no size limit. During days open to all-depth halibut fishing, no groundfish may be taken and retained, possessed or landed, except sablefish and Pacific cod when allowed by groundfish regulations, if halibut are on board the vessel.

Recreational fishing for groundfish and halibut is prohibited within the Stonewall Bank YRCA. The Stonewall Bank YRCA is an area off central Oregon, near Stonewall Bank, and is defined by straight lines connecting latitude and longitude coordinates. Coordinates for the Stonewall Bank YRCA are specified in groundfish regulations at 50 CFR 660.70 (f) and will be described annually in federal halibut regulations published in the *Federal Register*.

ODFW will sponsor a public workshop shortly after the IPHC annual meeting to develop recommendations to NMFS on the open dates for each season each year. The three seasons for this subarea are as follows.

A. The first season (nearshore fishery) opens the first Thursday in May or on May 1 if it is a Friday or Saturday, 3 days per week, Thursday through Saturday, only in waters inside the 40-fathom (73 m) curve. The fishery continues until the subquota is taken, or until October 31, whichever is earlier and is allocated 12 percent of the subarea quota if the 2A TAC is above 700,000 pounds (317.5 mt) or greater or 25 percent of the subarea quota if the 2A TAC is less than 700,000 pounds (317.5 mt),. Any overage in the all-depth fisheries would not affect achievement of allocation set aside for the inside 40-fathom (73 m) curve fishery. On or after August 15, the IPHC, NMFS, and ODFW will consult to determine whether increasing the inside of 40-fathom fishery open days per week is warranted, with the intent that the subquota for the inside 40-fathom fishery is taken by October 31.

B. The second season (Spring fishery) is an all-depth fishery with two potential openings and is allocated 63 percent of the subarea quota if the TAC is 700,000 pounds (317.5 mt) or greater, or 75 percent of the subarea quota if the subarea if the 2A TAC is less than 700,000 pounds (317.5 mt). Fixed season dates will be established preseason for the first Spring

opening and will not be modified inseason except if the combined Oregon all-depth Spring and Summer season total quotas are estimated to be achieved. Recent year catch rates will be used as a guideline for estimating the catch rate for the Spring fishery each year. The number of fixed season days established will be based on the projected catch per day with the intent of not exceeding the subarea subquota for this season. The first opening will be structured for 2 days per week (Friday and Saturday) if the season is for 4 or fewer fishing days. The fishery will be structured for 3 days per week (Thursday through Saturday) if the season is for 5 or more fishing days. The fixed season dates will occur in consecutive weeks starting the second Thursday in May (if the season is 5 or more fishing days) or second Friday in May (if the season is 4 or fewer fishing days), with possible exceptions to avoid adverse tidal conditions. If, following the "fixed" dates, quota for this season remains unharvested, a second opening will be held. If it is determined appropriate through joint consultation between IPHC, NMFS and ODFW, fishing may be allowed on one or more additional days. Notice of the opening(s) will be announced by NMFS via an update to the recreational halibut hotline. The fishery will be open every other week on Thursday through Saturday except that week(s) may be skipped to avoid adverse tidal conditions. The potential open Thursdays through Saturdays will be identified preseason. The fishery will continue until there is insufficient quota for an additional day of fishing or July 31, whichever is earlier if the 2A TAC is 700,000 pounds (317.5 mt) or greater. If the 2A TAC is less than 700,000 pounds (317.5 mt) the fishery will continue until there is insufficient quota for an additional day of fishing or October 31, whichever is earlier.

C. The last season (summer fishery) is an all-depth fishery that begins on the first Friday in August and is allocated 25 percent of the subarea quota if the 2A TAC is 700,000 pounds (317.5 mt) or greater. If the 2A TAC is less than 700,000 pounds (317.5 mt) then 0 percent of the subarea quota will be allocated to this season. The fishery will be structured to be open every other week on Friday and Saturday except that week(s) may be skipped to avoid adverse tidal conditions. The fishery will continue until there is insufficient quota remaining to reopen for another fishing day or October 31, whichever is earlier. The potential open Fridays and Saturdays will be identified preseason. If after the first scheduled open period, the remaining Cape Falcon to Humbug Mountain entire season quota (combined all-depth and inside 40-fathom (73 m) quotas) is 60,000 lb (27.2 mt) or more, the fishery will re-open on every Friday and Saturday (versus every other Friday and Saturday), if determined to be appropriate through joint consultation between IPHC, NMFS, and ODFW. The inseason action will be announced by NMFS via an update to the recreational halibut hotline. If after the Labor Day weekend, the remaining Cape Falcon to Humbug Mountain entire season quota (combined all-depth and inside 40-fathom (73 m) quotas) is 30,000 lb

(13.6 mt) or more and the fishery is not already open every Friday and Saturday, the fishery will re-open on every Friday and Saturday (versus every other Friday and Saturday), if determined to be appropriate through joint consultation between IPHC, NMFS, and ODFW. After the Labor Day weekend, the IPHC, NMFS, and ODFW will consult to determine whether increasing the Oregon Central Coast bag limit to two fish is warranted with the intent that the quota for the subarea is taken by September 30. If the quota is not taken by September 30, the season will remain open, maintaining the bag limit in effect at that time, through October 31 or quota attainment, whichever is earlier. The inseason action will be announced by NMFS via an update to the recreational halibut hotline.

(vi) South of Humbug Mountain subarea.

This sport fishery subarea is allocated 3.0 percent of the Oregon/California subquota, which is approximately 0.62 percent of the Area 2A TAC. This area is defined as the area south of Humbug Mountain, OR (42°40.50' N. lat.), including California waters. The structuring objective for this subarea is to provide anglers the opportunity to fish in a continuous, fixed season that is open from May 1 through October 31. The daily bag limit is one halibut per person, with no size limit. Due to inability to monitor the catch in this area inseason, a fixed season will be established preseason by NMFS based on projected catch per day and number of days to achievement of the subquota; no inseason adjustments will be made, and estimates of actual catch will be made post season.

(2) Port of landing management. All sport fishing in Area 2A will be managed on a "port of landing" basis, whereby any halibut landed into a port will count toward the quota for the subarea in which that port is located, and the regulations governing the subarea of landing apply, regardless of the specific area of catch.

(3) Possession limits. The sport possession limit on land in Washington is two daily bag limits, regardless of condition, but only one daily bag limit may be possessed on the vessel. The sport possession limit on land in Oregon is three daily bag limits, regardless of condition, but only one daily bag limit may be possessed on the vessel. The sport possession limit on land in California and on the vessel is one daily bag limit, regardless of condition.

(4) Ban on sport vessels in the commercial fishery. Vessels operating in the sport fishery for halibut in Area 2A are prohibited from operating in the commercial halibut fishery in Area 2A. Sport fishers and charterboat operators must determine, prior to May 1 of each year, whether they will operate in the commercial halibut fisheries in Area 2A which requires a commercial fishing license from the IPHC. Sport fishing for halibut in Area 2A is prohibited from a vessel licensed to fish commercially for halibut in Area 2A.

(5) Flexible inseason management provisions.

(i) The Regional Administrator, NMFS Northwest Region, after consultation with the Chairman of the Pacific Fishery Management Council, the IPHC Executive Director, and the Fisheries Director(s) of the affected state(s), or their designees, is authorized to modify regulations during the season after making the following determinations.

(A) The action is necessary to allow allocation objectives to be met.

(B) The action will not result in exceeding the catch limit for the area.

(C) If any of the sport fishery subareas north of Cape Falcon, OR are not projected to utilize their respective quotas by September 30, NMFS may take inseason action to transfer any projected unused quota to another Washington sport subarea.

(D) If any of the sport fishery subareas south of Leadbetter Point, WA are not projected to utilize their respective quotas by their season ending dates, NMFS may take inseason action to transfer any projected unused quota to another Oregon sport subarea.

(ii) Flexible inseason management provisions include, but are not limited to, the following:

(A) Modification of sport fishing periods;

(B) Modification of sport fishing bag limits;

(C) Modification of sport fishing size limits;

(D) Modification of sport fishing days per calendar week; and

(E) Modification of subarea quotas.

(iii) Notice procedures.

(A) Inseason actions taken by NMFS will be published in the *Federal Register*.

(B) Actual notice of inseason management actions will be provided by a telephone hotline administered by the Northwest Region, NMFS, at 206-526-6667 or 800-662-9825 (May through October) and by U.S. Coast Guard broadcasts. These broadcasts are announced on Channel 16 VHF-FM and 2182 kHz at frequent intervals. The announcements designate the channel or frequency over which the

notice to mariners will be immediately broadcast. Since provisions of these regulations may be altered by inseason actions, sport fishermen should monitor either the telephone hotline or U.S. Coast Guard broadcasts for current information for the area in which they are fishing.

(iv) Effective dates.

(A) Inseason actions will be effective on the date specified in the Federal Register notice or at the time that the action is filed for public inspection with the Office of the Federal Register, whichever is later.

(B) If time allows, NMFS will invite public comment prior to the effective date of any inseason action filed with the *Federal Register*. If the Regional Administrator determines, for good cause, that an inseason action must be filed without affording a prior opportunity for public comment, public comments will be received for a period of 15 days after of the action in the *Federal Register*.

(C) Inseason actions will remain in effect until the stated expiration date or until rescinded, modified, or superseded. However, no inseason action has any effect beyond the end of the calendar year in which it is issued.

(v) Availability of data. The Regional Administrator will compile, in aggregate form, all data and other information relevant to the action being taken and will make them available for public review during normal office hours at the Northwest Regional Office, NMFS, Sustainable Fisheries Division, 7600 Sand Point Way NE, Seattle, WA.

(6) Sport fishery closure provisions.

The IPHC shall determine and announce closing dates to the public for any subarea in which a subquota is estimated to have been taken. When the IPHC has determined that a subquota has been taken, and has announced a date on which the season will close, no person shall sport fish for halibut in that area after that date for the rest of the year, unless a reopening of that area for sport halibut fishing is scheduled by NMFS as an inseason action, or announced by the IPHC.

(g) PROCEDURES FOR IMPLEMENTATION

Each year, NMFS will publish a proposed rule with any regulatory modifications necessary to implement the Plan for the following year, with a request for public comments. The comment period will extend until after the IPHC annual meeting, so that the public will have the opportunity to consider the final Area 2A TAC before submitting

comments. After the Area 2A TAC is known, and after NMFS reviews public comments, NMFS will implement final rules governing the sport fisheries. The final ratio of halibut to Chinook to be allowed as incidental catch in the salmon troll fishery will be published with the annual salmon management measures.

Sources:

77 FR 16740 (March 22, 2012)
76 FR 14300 (March 16, 2011)
75 FR 13024 (March 18, 2010)
74 FR 11681 (March 19, 2009)
73 FR 12280 (March 7, 2008)
72 FR 11792 (March 14, 2007)
71 FR 10850 (March 3, 2006)
70 FR 20304 (April 19, 2005)
69 FR 24524 (May 4, 2004)
68 FR 10989 (March 7, 2003)
67 FR 12885 (March 20, 2002)
66 FR 15801 (March 21, 2001)
65 FR 14909 (March 20, 2000)
64 FR 13519 (March 19, 1999)
63 FR 13000 (March 17, 1998)
62 FR 12759 (March 18, 1997)
61 FR 11337 (March 20, 1996)
60 FR 14651 (March 20, 1995)
59 FR 22522 (May 2, 1994)
58 FR 17791 (April 6, 1993)

Agenda Item D.2.b
CDFW Report
September 2013

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE REPORT ON PROPOSED CHANGES TO THE 2014 PACIFIC HALIBUT CATCH SHARING PLAN

At the March 2013 meeting, the Pacific Fishery Management Council (Council) recommended the South of Humbug Pacific Halibut Workgroup (Workgroup) analyze a range of management measures to reduce catches in the recreational Pacific halibut fishery in the South of Humbug management area for the 2014 season (see Agenda Item D.2.b. for the Workgroup report). At that same Council meeting, the International Pacific Halibut Commission (IPHC) informed the Council of its intent to extend the annual stock survey into waters off of Northern California for the first time.

On July 18, 2013, the California Department of Fish and Wildlife (CDFW) conducted a public meeting in Eureka, California, to solicit input on the Council's range of management measures being considered for 2014, provide an update on IPHC's most recent stock assessment, and to provide details on the stock survey plans off Northern California. More than thirty constituents attended the meeting representing recreational private skiff angers, recreational charter vessel owners/operators, commercial anglers, researchers, local officials, a state legislative officer and other interested members of the public. The greatest areas of public interest and support were the IPHC survey expansion into California and the newly formed IPHC Management Strategy Advisory Board, which includes a representative from Northern California. These two developments were viewed as positive opportunities for collaboration between the local community and the Pacific halibut science and management processes. Many individuals in the Northern California communities are interested in collaborating with CDFW, IPHC and educational institutions to support further research on Pacific halibut in California. A number of meeting attendees also spoke in favor of moving the subarea border from Humbug Mountain to the Oregon/California border.

The greatest area of concern identified by the public was the apparent need on the part of government agencies to reduce fishing opportunities for Pacific halibut in 2014, before the IPHC survey results are available for incorporation into the stock assessment. Since survey information collected this year will not be considered for management until 2015, several individuals commented that there should be no additional constraints off California until that time. The public felt strongly that choosing any alternative that reduces opportunities from status quo would further impact the economy on the North coast and, to do so without any information demonstrating a conservation need was not preferable. Stakeholders felt strongly that the California portion of the Pacific halibut stock is thriving, given the recent increases in catch, including catch of large fish, off the California coast. There was no consensus regarding which management alternative, or combination of alternatives, would be preferable for the 2014 season, but some expressed concern with limiting the number of days per week open to Pacific halibut fishing, primarily due to weather constraints. Others expressed a general concern with

maintaining time on the water for halibut fishing, especially if other species like salmon, groundfish or albacore are not available to target or are closed to fishing.

The CDFW would like to extend our appreciation to the IPHC for expanding its stock survey into California, and for coordinating with CDFW staff on the permitting processes required to conduct scientific research in California waters. Since data collected during this survey could aid in future Council decision making, CDFW supports efforts to continue the survey in California and looks forward to further collaborations with IPHC.

REPORT ON THE 2013 PACIFIC HALIBUT FISHERIES IN AREA 2A

(8/12/2013)

The 2013 Area 2A total allowable catch (TAC) of 990,000 lbs set by the International Pacific Halibut Commission (IPHC) was allocated as follows:

Treaty Tribes	346,500 lbs (35%)
Non-Tribal Total	643,500 lbs (65%)
Non-Tribal Commercial	225,400 lbs
Washington Sport	214,110 lbs
Oregon/California Sport	203,990 lbs

All weights in this report are net weight (gutted, head-off, and without ice and slime.) The structure of each fishery and the resulting harvests are described below. Refer to the table at the end of this report for the catches by the tribal, commercial and recreational fisheries.

NON-TRIBAL COMMERCIAL FISHERIES

A quota of 225,400 lbs (31.7% of the non-tribal share + 21,410 lbs for incidental halibut catch in the sablefish primary fishery) was allocated to two fishery components: 1) a directed longline fishery targeting on halibut south of Point Chehalis, WA; and 2) an incidental catch fishery during the salmon troll fisheries off Washington, Oregon, and California. An additional 21,410 lbs were allocated to an incidental catch fishery in the sablefish primary fishery for vessels using longline gear north of Point Chehalis, WA. This allowance for the sablefish primary fishery is only available in years when the overall Area 2A TAC exceeds 900,000 lbs and is taken from the portion of the Washington sport allocation that is above 214,110, as long as the amount is atleast 10,000 lbs.

Incidental halibut catch in the salmon troll fishery

A quota of 30,600 lbs of Pacific halibut (15% of the non-tribal commercial fishery allocation) was allocated to the non-tribal commercial salmon troll fishery in Area 2A as incidental catch during salmon troll fisheries. During the development of the 2013 Catch Sharing Plan (CSP) the management objective for this fishery was changed from May-June to April-June. This change was made in anticipation of the 2014 pre-may salmon fisheries not for the 2013 fisheries. Therefore, in 2013 halibut retention was allowed beginning May 1, eventhough the CSP had already been amended to reflect the April-June timing.

If any of the allocation for this fishery remains after June 30, the fishery may continue to retain incidentally caught halibut in the salmon troll fisheries until the quota is taken. The final catch ratio established preseason by the Council at the April 2013 meeting was one halibut (minimum 32 inches) per three Chinook landed by a salmon troller, except that one halibut could be landed without meeting the ratio requirement, and no more than 15 halibut could be landed per open period. Fishing with salmon troll gear is prohibited within the Salmon Troll Yelloweye Rockfish Conservation Area (YRCA) off the northern Washington Coast. Additionally, the "C-shaped" North Coast Recreational YRCA off Washington is designated as an area to be avoided (a voluntary closure) by salmon trollers.

- Halibut retention was permitted in the salmon troll fisheries began on May 1, 2013, with the following ratio: 1 halibut per each 3 Chinook, except that 1 halibut may be landed without meeting the ratio requirement, and no more than 15 halibut may be possessed or landed per trip.
- Beginning August 1, 2013, the ratio was changed to 1 halibut per each 3 Chinook, expect that 1 halibut may be landed without meeting the ratio requirement, and no more than 5 halibut may be possessed or landed per trip. The goal of this change was to extend the opportunity through the summer.

- As of August 6, 2013, 30,301 lbs were landed.
- The fishery closed on August 8 in the area north of Cape Falcon, Oregon, and on August 10 in the area south of Cape Falcon, Oregon.

Directed fishery targeting on halibut

A quota of 173,390 lbs (85% of the non-tribal commercial fishery allocation) was allocated to the directed longline fishery targeting on halibut in southern Washington, Oregon, and California. The fishery was confined to the area south of Subarea 2A-1 (south of Point Chehalis, WA; 46°53.30' N. lat.). In addition, there are closed areas along the coast defined by depth contours. Between the U.S./Canada border and 40°10' N. lat the western boundary is defined by a line approximating the 100 fm depth contour. The eastern boundary is defined as follows: Between the U.S./Canada border and 46°16' N. lat., the boundary is the shoreline. Between 46°16' N. lat. and 43°00' N. lat, the boundary is the line approximating the 30 fm depth contour. Between 43°00' N. lat and 42°00' N. lat the boundary is the line approximating the 20 fm depth contour. And between 42°00' N. lat and 40°10' N. lat the boundary is the 20 fm depth contour. One-day fishing periods of 10 hours in duration were scheduled every other week by the IPHC starting June 26, 2013. A 32 inch minimum size limit with the head on was in effect for all openings. Vessel landing limits per fishing period based on vessel length were imposed by IPHC during all openings as shown in the following table. Vessels choosing to operate in this fishery could not land halibut in the incidental catch salmon troll fishery, nor operate in the recreational fishery.

2013 fishing period limits (dressed weight, head-off without ice and slime in pounds) by vessel size.

Vessel Class/Size	June 26 Opening	July 10 Opening
A 0 - 25 ft.	755 lbs	250 lbs
B 26 - 30 ft.	945 lbs	315 lbs
C 31 - 35 ft.	1,510 lbs	505 lbs
D 36 - 40 ft.	4,165 lbs	1,390 lbs
E 41 - 45 ft.	4,480 lbs	1,495 lbs
F 46 - 50 ft.	5,365 lbs	1,790 lbs
G 51 - 55 ft.	5,985 lbs	1,995 lbs
H 56+ ft.	9,000 lbs	3,000 lbs

- The June 26 directed commercial fishery resulted in a catch of about 118,000 lbs, leaving approximately 55,390 lbs.
- The July 10 directed commercial opening resulted in an approximate catch of 55,000 lbs. The fishery closed following the July 10 opening.

Incidental halibut catch in the sablefish primary longline fishery north of Point Chehalis A quota of 21,410 lbs was allocated to the limited entry sablefish primary fishery in Area 2A as an incidental catch during longline sablefish operations north of Point Chehalis, WA. The sablefish primary season is open from April 1 to October 31, although incidental halibut retention was not permitted until May 1. Vessels with a groundfish limited entry permit endorsed for both longline gear and with a sablefish tier were permitted to retain up to 75 lbs (dressed weight) of halibut per 1,000 lbs (dressed weight) of sablefish and up to 2 additional halibut in excess of the landing limit ratio. The fishery is confined to an

area seaward of a boundary line approximating the 100-fm depth contour. Fishing is also prohibited in the North Coast Commercial YRCA, an area off the northern Washington coast. In addition, the "C-shaped" North Coast Recreational YRCA off Washington is designated as an area to be avoided (a voluntary closure) by commercial longline sablefish fishermen.

- Through July 2, 2013, this fishery is estimated to have taken 5,823 lbs.

SPORT FISHERIES (Non-tribal)
418,101 lbs (68.3% of non-tribal share, minus 21,410 lbs allocated to the sablefish primary fishery from the Washington sport allocation) was allocated between sport fisheries in the Washington area (36.6%) and Oregon/California (31.7%). The allocations were further subdivided as quotas among six geographic subareas as described below. Unless otherwise noted the daily bag limit in all subareas was one halibut of any size, per person, per day.

Washington Inside Waters Subarea (Puget Sound and Straits of Juan de Fuca).
This area was allocated 57,393 lbs (23.5% of the first 130,845 lbs allocated to the Washington sport fishery, and 32% of the Washington sport allocation between 130,845 and 224,110 lbs). Due to inability to monitor the catch in this area inseason, a fixed season was established preseason based on projected catch per day and number of days to achieve the sub-quota. The Puget Sound eastern sub-area, east of Low Point, was open for two 3-day periods on May 2-4 and May 16-18 (Thursday-Saturday), one 4-day period on May 23-26, Thursday-Sunday, and one 2-day period on May 30-31 (Thursday-Friday). The fishing season in western Puget Sound (west of 123°49.50' W. long., Low Point) is open May 23-26, Thursday – Sunday, and May 30-June 1, Thursday-Saturday and one day on Saturday June 8.

- The estimates for total catch in this area are not yet available.

Northern Washington Coastal Waters Subarea (landings in Neah Bay and La Push).
The coastal area off Cape Flattery to Queets River was allocated 108,030 lbs (62.2% of the first 130,845 lbs allocated to the Washington sport fishery, and 32% of the Washington sport allocation between 130,945 lbs and 224,110 lbs). The fishery was open for four days (May 9, 11, 16, 18, 2013). The "C-shaped" North Coast Recreational YRCA, southwest of Cape Flattery, was closed to sport halibut fishing.

- The estimated total catch for this area is 107,856 lbs, leaving 174 lbs.

Washington South Coast Subarea (landings in Westport)
The area from the Queets River to Leadbetter Point was allocated 42,740 lbs (12.3% of the first 130,845 lbs allocated to the Washington sport fishery and 32% of the Washington sport allocation between 130,845 and 224,110 lbs). This subarea operates with a primary fishery and a nearshore fishery. The primary fishery was open May 5, 7, 12, 14, 19, and closed after the 19th. The nearshore fishery was open everyday between May 5 and 19, 2013.

The nearshore fishery occurs in waters between the Queets River and 47°25.00' N. lat. south to 46°58.00' N. lat., and east of 124°30.00' W. long. The south coast subarea quota was allocated as follows: 2,000 lbs to the nearshore fishery and the remaining lbs (40,740 lbs) to the primary fishery.

- The estimated total catch for this area is 42,085 lbs, leaving 653 lbs.

Columbia River Subarea (Leadbetter Point to Cape Falcon)
This sport fishery subarea was allocated 11,895 lbs, consisting of 2.0% of the first 130,845 lbs allocated to the Washington sport fishery, and 4.0% of the Washington sport allocation between 130,845 lbs and 224,110 lbs, minus 21,410, (which is the amount allocated to incidental take in the sablefish primary fishery), and an equal amount from the Oregon/California sport allocation.

The fishery opened May 3 and is currently open through September 30, 2013, or until the quota is attained.

- The early fishery was open May 3 to July 28 with an estimated catch of 4,725 lbs.
- Catch during the early season resulted in underage of 4,791 lbs, which was added to the late season quota, for a revised late season quota of 7,170 lbs.
- The late season fishery opened August 2 and continues until September 30.
- Through August 4 the estimated late season total catch is 788 lbs.

Oregon Central Coast Subarea (Cape Falcon to Humbug Mountain).
This sport fishery subarea was allocated 203,990 lbs (92% of the Oregon/California sport allocation.

Three seasons were set for this subarea: 1) a restricted depth (inside 40-fm) fishery commenced on May 2 and continued 3 days a week (Thursday-Satuday) until July 26; 2) a fixed Spring season in all depths that was open on May 9-11, 16-18, May 30-June 1, 6-8, 20-22, and; 3) a Summer season in all depths that was open on August 2-3.

- The inside 40-fathom fishery closed on July 26 with an estimated total catch of 22,248 lbs. This was a 790 lbs underage which was added to the summer quota.
- The fixed Spring all-depth season closed on June 22 with an estimated total catch of 145,167 lbs. This resulted in an overage of 24,220 lbs which was deducted from the summer quota.
- The initial Summer all-depth season quota of 47,995 lbs, was revised by the 790 lbs nearshore underage and the 24,220 lbs spring overage resulting in a revised summer quota of 24,565 lbs.
- The Summer all-depth fishery was open August 2-3, and resulted in an estimated catch of 27,069 lbs. This was a 2,504 lbs overage.
- The summer fishery closed on August 3rd.

South of Humbug Mountain, Oregon and off the California Coast Subarea
This sport fishery was allocated 6,063 lbs (3.0% of the Oregon/California quota). This area had a pre-set season of 7 days per week from May 1 to October 31.

- This season is scheduled to remain open through October 31. No total catch estimates are available for this fishery.

TRIBAL FISHERIES
346,500 lbs (35% of the Area 2A TAC) was allocated to tribal fisheries. The tribes estimated that 32,200 lbs would be used for ceremonial and subsistence (C&S) fisheries and the remaining 314,300 lbs were allocated to the commercial fishery. The 2013 management plan was based on a court-order, to use the 2000 season plan, updated to reflect the current allocation and management measures. It contains provisions for both unrestricted fisheries with no landing limits and restricted fisheries with limits as well as a late season or mop-up fishery that can be set up to have no landing limits or with limits, toward the end of the season.

The unrestricted fishery began at noon on March 23 and lasted 48 hours. The unrestricted fishery landed 221,463 lbs in 309 landings.

The restricted fishery had two openers with each tribe choosing to participate in one or the other. The first began at noon on April 3 and lasted 36 hours. This fishery was managed with a landing limit, set at 500 lbs/vessel/day. A makeup restricted fishery was setup on April 15 for 36 hours and it also had a landing limit of 500 lbs/vessel/day for those tribes that did not participate in the earlier opener. There was a total of 74,667 lbs taken in 259 landings during both restricted fisheries.

The first late season fishery (mop-up fishery) took place beginning at noon on May 8 and continued for

12 hours. This late season fishery had a landing limit of 150 lbs. The fishery landed 5783 lbs in 54 landings. A second late season fishery took place on June 6 for 12 hours. The landing limit for this fishery was 200 lbs. The fishery landed 3,572 lbs in 25 landings. A third late season fishery opened on July 13 and continued for 12 hours with a 200 lb landing limit. This fishery landed 471 lbs in 7 landings.

The remaining 8,344 lbs of halibut was allocated by mutual agreement of the halibut tribes to the Quinault Indian Nation to harvest in a special fishery for the 2013 canoe journey that Quinault was hosting this year. The special fishery landed 7,547 lbs in 3 landings.

In all, Treaty tribal fisheries harvested 313,503 lbs in 657 landings. This was an underage of 797 lbs below the commercial allocation. The C&S fishery will continue through December 31 and tribal estimates of catch will be reported by the tribes in January 2014.

Fishery	Dates Held	Pounds Landed	# of Landings
Unrestricted	March 23-25 (48 hr.)	221,463 lbs	309 landings
Restricted, 500 lbs/vessel/day	April 3-4 and April 15-16 (36 hr.)	74,667 lbs	259 landings
Late Season (Mop Up)	May 8, June 6, July 13 (12 hr.)	9,826 lbs	86 landings
Special Fishery	July 22-Aug. 3	7,547 lbs	3 landings
Total		313,503 lbs	657 landings

2013 Area 2A TAC and Catch (in pounds)		(Preliminary data as of 8/12/2013)			
	Quota	Inseason Revised Quota	Catch		% of Quota Taken
TRIBAL INDIAN	346,500		313,503		90.5
Commercial	314,300		313,503		99.7
Ceremonial and Subsistence	32,200			%	0.0
NON-TRIBAL	643,500		564,569		87.7
COMMERCIAL	225,400		209,124		92.8
Troll	30,600		30,301		99.0
Sablefish incidental	21,410		5,823	%	27.2
Directed	173,390		173,000		99.8
SPORT	418,101		349,932		83.7
WA Sport	214,110		149,941		70.0
OR/CA Sport	203,990		194,478		95.3
WA Inside Waters	57,393			*	0.0
WA North Coast	108,030		107,856		99.8
WA South Coast	42,740		42,085		98.5
Columbia River	11,895		5,513	%	46.3
Early Season	9,516		4,725		49.7
Late Season	2,379	7,170	788	%	11.0
OR Central Coast	203,990		194,478		95.3
Inside 40 fathoms	23,038		22,248		96.6
Spring (May-June)	120,947		145,167		120.0
Summer (August- October)	47,995	24,565	27,063		110.2
OR S. of Humbug/CA	6,063			%	0.0
TOTAL	990,000		878,072		88.7
* Complete data not available					
% This fishery is ongoing					

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT ON PROPOSED CHANGES TO THE PACIFIC HALIBUT CATCH SHARING PLAN FOR THE 2014 FISHERY

The Oregon Department of Fish and Wildlife (ODFW) solicited public input via e-mail, phone, and public meetings to discuss proposed changes to the Pacific Halibut Catch Sharing Plan (CSP) for fisheries off of Oregon in 2014. The public meetings occurred on August 6 in Tillamook, August 7 in Newport, August 12 in Brookings, and August 13 in North Bend. Based on public input, ODFW recommends the Pacific Fisheries Management Council (Council) approve the following alternatives for public review:

Allocations

South of Humbug Mountain Subarea

Oregon anglers who fish in the South of Humbug Mountain Subarea and provided input to ODFW were in favor of alternative 6b from the South of Humbug Workgroup report (Agenda Item D.2.a.), creating a new Southern Oregon Subarea.

Alternatives

6a. Separate the South of Humbug Mountain Subarea at the Oregon/California Border, incorporating the Oregon portion into the Central Oregon Coast Subarea

6b. Separate the South of Humbug Mountain Subarea at the Oregon/California Border, creating a new Southern Oregon Subarea from Humbug Mountain to the Oregon/California Border. Allocate 2% of the Central Coast Subarea quota from:

(1) Elimination of the Central Coast Summer All-Depth Fishery. The remaining 23% would be allocated to the Central Coast Nearshore Fishery.
(2) The Central Coast Spring All-Depth Fishery. That fishery would then receive 61% of the area allocation, with the Nearshore and Summer All-Depth Fishery allocations remaining at 12% and 25% respectively.

Rationale

The data availability and inseason action process for Oregon and California operate on different timelines. Separating the South of Humbug Mountain Subarea at the Oregon/California Border would allow each state to manage its area within the constraints of its processes and develop fisheries to meet their state's anglers' requests independently.

Anglers who fish the South of Humbug Mountain Subarea were generally in favor of creating a new Southern Oregon Subarea (Alternative 6b). There is concern that being part of the Central Oregon Coast Subarea will mean greatly reduced seasons (184 days vs. < 40 days) and possible inequality in harvests (annual fish per angler) due to greater halibut abundances to the north and poorer weather conditions to the south.

The Central Coast Summer All-Depth Fishery has high catch per day of Pacific halibut. The fishery is operationally two days in length. Shifting the quota into the Nearshore Fishery would allow more opportunity in terms of available days to fish. Input received at the public meetings suggest that there may be a preference to have opportunity in the Nearshore Fishery. This would also provide allocation to the area between Humbug Mountain and the Oregon/California border without impacting the Central Coast Spring All-Depth and Nearshore Fisheries.

Corrections to CSP language reflecting the current allocation to the Central Coast Subarea is needed. The CSP was not updated properly when changes were made to the Oregon contribution to the Columbia River Subarea in 2012.

Management Measures

Columbia River Subarea

ODFW staff did not receive any recommendations from Oregon anglers for changes to the subarea.

Central Coast Subarea- Nearshore Fishery

Days of the Week Open and Opening Date

Many anglers recommended returning the Nearshore Fishery to seven days per week, rather than the current three days per week and delaying the start of the seven day per week fishery.

Alternatives

1. Status quo (no action): open May 1, three days per week, Thursday-Saturday until the earlier of quota attainment or October 31.
2. Open June 1, seven days per week until the earlier of quota attainment or October 31
3. Open after the spring all-depth season concludes, seven days per week until the earlier of quota attainment or October 31

Rationale

Many anglers who contacted ODFW during the year and during the public input process requested that the Nearshore Fishery be returned to seven days per week. This would allow anglers with varying work and/or leave schedules the opportunity to participate in the fishery. Additionally, anglers expressed their belief that limiting the days of the week resulted in a targeted Nearshore Fishery. During the public meetings, anglers were asked if they still preferred seven days per week being open, even if it meant only an approximately three-week season. Most anglers in attendance still preferred seven days per week. With a short seven days per week fishery, there was discussion on when the fishery should begin. Many preferred delaying the start, so that the fishery occurred after Memorial Day, when more people have time off and more families take vacations and go fishing.

Depth Restriction

To increase the number of Nearshore Fishery days, some anglers proposed limiting the Nearshore Fishery to shoreward of 30 fathoms instead of 40 fathoms (current).

Alternatives

1. Status quo (no action): restrict the Nearshore Fishery to inside of the 40-fathom regulatory line
2. Restrict the Nearshore Fishery to inside of the 30-fathom regulatory line

Rationale

Anglers from the ports south of Newport desire more nearshore days because it would provide them greater opportunity to harvest incidentally caught halibut. Shifting the nearshore depth restrictions from 40 fathoms to 30 fathoms would likely only temporarily increase the length of the season. Catch rates (fish per angler) in the 30-40 fathom depth ranges are similar to those in shallower depth ranges (i.e., 10-20 fathoms and 20-30 fathoms) for ports where anglers fish deeper than 30 fathoms (Figure 1). Therefore, it may only be a matter of time before anglers that customarily fish 30-40 fathom depths would find equally productive shallower water areas. Additionally some ports (Garibaldi, Pacific City, and Charleston) may not be affected at all by a 30-fathom depth restriction because all or nearly all of their nearshore angler trips already occur shallower than 30 fathoms. However, having the same depth restriction for both bottomfish and nearshore halibut was identified as a possible benefit, in addition to perceived additional opportunity.

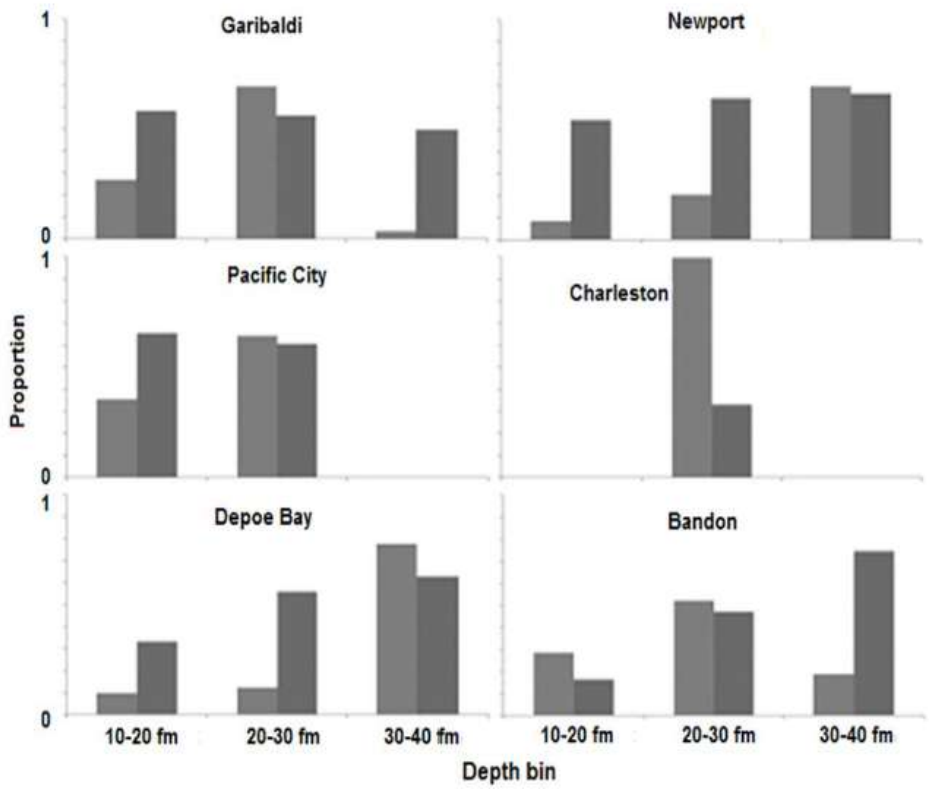


Figure 1. Proportion of nearshore angler trips (light grey) and catch rates (halibut per angler; dark grey) by depth bin for Central Coast Subarea ports.

Central Coast Subarea- Spring and Summer All-Depth Seasons

Season Start Date

Alternatives

1. Status quo (no action): if the Area 2A TAC is < 700,000 pounds the spring (only) all-depth season begins on the second Thursday in May
2. If the Area 2A TAC is < 700,000 pounds the spring (only) all-depth season begins on the first Thursday in June

Rationale

Moving the start date of the combined all-depth season would allow more fishing opportunities during the summer months (June and July). Many anglers have expressed interest in having the fishery open after Memorial Day, so that open days are available when more families take vacations.

Public Input Methods

Minor adjustments to the CSP are needed to provide flexibility in using various methods for collecting public input on alternatives for changes to the CSP to incorporate new survey methods and new technologies. Currently the CSP specifies that ODFW will hold a workshop to set the Central Coast All-Depth dates. As attendance at public meetings has waned in recent years, and advancements in interactive technology develop, this wording has become outdated. The language will be updated to reflect gathering public input on the dates, but will not specify the method by which to do so.

Additional Proposals

Additional proposals received from the public but not forwarded for consideration are included in the Appendix.

Catch Sharing Plan Language

Due to the range of alternatives presented above, ODFW does not have proposed changes to the language in the Catch Sharing Plan for 2014 for the above items. As the range of alternatives is finalized, ODFW will provide draft language revisions to the Catch Sharing Plan, in consultation with staff at the NMFS Northwest Region.

Appendix: Additional Proposals Received

Retention of Other Species

Throughout the season and during the public input process, ODFW regularly hears requests from anglers to allow retention of lingcod, other flatfish, and/or all groundfish during all-depth halibut days. It is ODFW's understanding that changes to retention of groundfish in the halibut fishery are part of the groundfish process including projected impacts to overfished species, and therefore have to be included in the groundfish harvest specifications and management measures analysis and documentation (i.e., the Groundfish Environmental Impact Statement). As such, ODFW is planning on including this in the upcoming groundfish management measures analysis for 2015-2016 and beyond.

Split the Central Oregon Coast Subarea Into Smaller Management Units

Comments were received requesting subdivision of the Central Oregon Coast Subarea allocation (all-depth and/or nearshore) into two or more smaller areas.

ODFW is not supporting a split of the Central Coast Subarea because there is "equality" in the number of halibut harvested per angler among ports. Simply comparing harvests among ports, without factoring in effort, is not a suitable means for determining "fairness."

A split of the Central Coast Subarea has already been tried (1995 through 2003) but was overturned because it failed to increase season lengths in the subarea without Newport. The subarea was split at Florence in 1995 with the objective of increasing season lengths for the southern subarea; Newport is located north of Florence. During the first year of the split, the southern subarea had longer spring all-depth and nearshore seasons than to the north (the summer all-depth fishery was not split). However, seasons thereafter were generally either the same length or shorter to the south due to faster growth in the halibut fisheries in southern ports (Table 1). As a result, anglers from the southern area requested to eliminate the split and recombine the Central Coast Subarea (approved for 2004).

Table 1. Comparison of open days per week and year for spring all-depth and nearshore fisheries for the subareas (North of Florence and South of Florence) when the Central Coast Subarea was split.

	Spring all-depth days open								
Subarea	1995	1996	1997	1998	1999	2000	2001	2002	2003
North of Florence	12	6	8	6	6	5	4	8	9
South of Florence	15	9	6	6	6	5	5	8	8
	Nearshore days open								
North of Florence	37	104	67	91	153				
South of Florence	61	97	60	91	107				

Two-day Spring All-depth Openings Instead of Three-day

The spring all-depth fishery is open three days per week (Thursdays through Saturdays) starting the second week of May, and typically closes around the last week in June.

Some anglers have suggested reducing the open days per week from three to two in order to extend the season into July. They state that the weather in May is often too rough for smaller vessels to go out onto the ocean to fish for halibut and that conditions are better in July. Additionally, families with children in school are less likely to be able to participate in the fishery until school adjourns, which is in mid-June.

However, the majority of anglers prefer having more halibut opportunities during May and June (than July) because they can participate in other fisheries during July (i.e., coho salmon and tuna; see allocation section). Additionally, the vast majority of harvest is by "small boats" (Figure 2), which has not been defined but less than 25 feet is generally considered a "small boat" for ocean fishing.

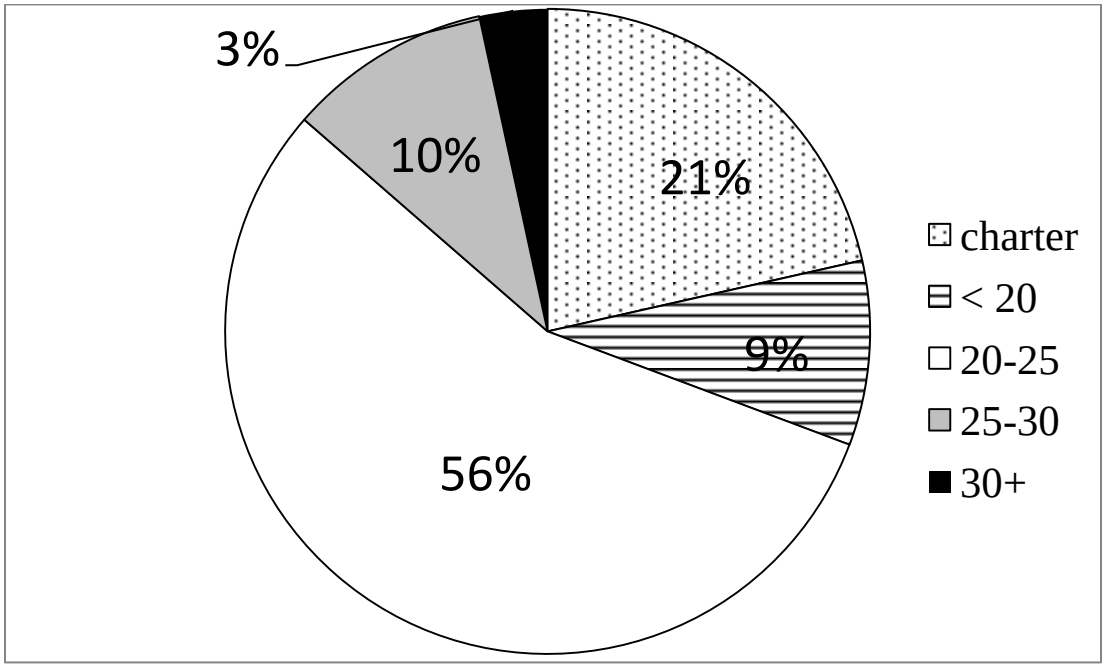


Figure 2. Percentage of halibut harvests by charter vessels, and recreational vessels by hull length (feet).

SUMMARY OF THE SOUTH OF HUMBUG PACIFIC HALIBUT POLICY COMMITTEE MEETING

The South of Humbug Pacific Halibut Policy Committee (Committee) convened on Tuesday, July 30, 2013 in Portland, Oregon. The meeting was broadcast via webinar and, in addition to the meeting location in Portland, opportunity for public comment was provided in Brookings, Oregon and Eureka, California. The following report contains a brief overview of the meeting with a primary focus on the discussion surrounding the management measures presented in the South of Humbug Pacific Halibut Workgroup (Workgroup) Report designed to reduce recreational catch of Pacific halibut in that area.

The meeting began with an overview of the Committee tasks, as established by the Council (see June and September 2012 Council meeting minutes). Ms. Kelly Ames presented the National Marine Fisheries Service (NMFS) trawl survey and West Coast Groundfish Observer Program Pacific halibut data requested by the Committee and Council (Agenda Item D.2.b, NMFS Report, September 2013). Ms. Lynn Mattes and Ms. Melanie Parker provided an overview of the management measures analysis contained in the Workgroup Report (Agenda Item D.2.b, Workgroup Report, September 2013).

Opportunity for public testimony in Portland, Brookings, and Eureka was provided prior to the Committee deliberations, though public comment was only received from Eureka. Many individuals testified in favor of creating a separate California subarea with its own Catch Sharing Plan (CSP) allocation. Several acknowledged the need for management measures to reduce catch and recommended monthly closures (e.g., August), limiting the existing season by days of the week (e.g., Wednesday through Saturday), or prohibiting Pacific halibut retention when salmon and/or groundfish are retained. Almost all commented on the anticipated socio-economic impacts that are anticipated if the season is limited. Several ports rely upon launch services (e.g., Trinidad and Shelter Cove), and there was concern that such services would be removed if there are not sufficient fishing opportunities. Some believe the historical California data are contaminated with California halibut data. Some recommended revisiting the overall CSP allocations.

The Committee acknowledged the Council's responsibility to support sustainable management of Pacific halibut and comply with the CSP. The Committee discussed the need to reduce 2014 recreational catch of Pacific halibut in the South of Humbug Mountain Subarea. The Committee also recognized the negative socio-economic impacts that may occur if some of the more restrictive management measures outlined in the Workgroup Report are implemented. For 2014, the Committee recommends the Council reduce the recreational harvest of Pacific halibut in California by 40 to 60 percent of the average harvest over the last five years (see Table 1, Workgroup Report). If the Council adopts this recommendation, management measures in California would be designed to reduce harvest to between 8,900 and 13,300 pounds. The Committee also acknowledged discussion in the Workgroup Report that the projected levels of harvest under the alternatives are uncertain because the current management measures in this

area have never been modified. Further, the Workgroup did not attempt to predict changes in angler behavior due to changes in management measures (e.g., shifts in catch and/or effort). As such, the Committee recommends an adaptive management approach, similar to those used in other recreational management areas, whereby the ability of management measures to reduce catch are evaluated annually and adjusted, as necessary, for the following year. All of the proposed changes to management measures described below would require modifications to the CSP, which should be proposed in the range of alternatives adopted by the Council at the September meeting.

The Committee recommends Alternative 6, which would add a subarea management line in the CSP at the Oregon/California border (42° N. latitude) and create a separate California subarea with its own CSP allocation. Alternative 6 is preferred because it allows each state to address regional fishery dynamics and independently manage their respective allocations. The Oregon portion, between Humbug Mountain and the Oregon/California border, could be subsumed into the Central Oregon Coast Subarea (Alternative 6a) or become a separate Southern Oregon Subarea (Alternative 6b). The Committee deferred to the Oregon Department of Fish and Wildlife (ODFW) to recommend the preferred approach for the Oregon portion. The Committee acknowledged that Alternatives 6a and 6b result in new areas which will require new allocations in the CSP; however, the Committee did not discuss new allocations, based on Council instructions.

Creating a California Subarea (Alternative 6) is also preferred by the Committee due to the state-specific resources available for monitoring and implementing inseason adjustments to constrain or expand fishing opportunities. ODFW is able to monitor landings on a weekly basis and make inseason adjustments in a timely manner. The California Department of Fish and Wildlife (CDFW) monitors the landings monthly with a six-week time lag before monthly catch estimates become available. Additionally, action to close the 2014 recreational fishery by the Fish and Game Commission would take a minimum of a month. Therefore, the Committee recommends establishing a fixed season structure for the California Subarea for 2014, with no expectation for inseason management. As with other subareas, fishery performance would be evaluated annually and management measures adjusted for the following year, as necessary.

The Committee also discussed the available processes for determining a season structure for the California Subarea. In the Puget Sound Subarea, the season length is calculated after the Pacific halibut catch limit and allocations are established in January. After a series of public meetings, the Washington Department of Fish and Wildlife (WDFW) submits the proposed season dates to the International Pacific Halibut Commission (IPHC) and NMFS for approval and adoption into Federal regulations in the spring. In contrast, season structures for other subareas are established in the fall and are specified in the CSP and regulations in the spring. Given inseason data availability and regulatory time constraints, the Committee recommends the latter approach be applied for the California subarea.

The Committee discussed alternatives that would restrict the days per week available for Pacific halibut retention (Alternatives 2 and 7). Under Alternative 2, the Council recommended that the analysis include at least one weekend day. Catch data by day of the week were unavailable to support the Alternative 2 analysis, and therefore no results were presented in the Workgroup

Report. Under Alternative 7, catch across all days of the week and months were aggregated for the analysis. Additional analysis would be needed under Alternative 7 to account for the variability in monthly catch rates once a particular month is chosen for the fishery. The Committee also acknowledged the uncertainty in predicting angler effort under the days per week model. For example, in the Oregon Central Coast Subarea's nearshore fishery it was assumed that restricting the days per week from seven to three in 2013 would lengthen the number of fishing days and extend the season. However, greater effort in a shorter time period occurred, and there were approximately 30 fishing days in 2013 compared to approximately 80 under the seven days per week fishery under a similar quota. The Committee recommended that the days of the week model be included as an available management measure; however, they cautioned the Council to acknowledge the uncertainty surrounding changes in angler effort and the resulting catch projections.

The Committee recommends the Council consider alternatives that would restrict the months available for Pacific halibut retention in California (Alternatives 3 and 5), based on historical landings (see Figure 2 in the Workgroup Report). Referencing public comment, the Committee noted that closing the peak months (e.g., July and August) and keeping the "shoulder months" open (e.g., May/June and September/October) may provide stability in the communities that do not have other fishing opportunities during those months. However, some Committee members acknowledged that closing the "heart of the fishery" (e.g., July and August) could be very disruptive and contemplated whether limiting the days per week during the peak months would be preferred. Depending on the months chosen, additional management measures, like restricting Pacific halibut retention based on salmon and/or groundfish retention (see Alternative 1 discussion below), may be needed to reduce catch.

Prohibiting Pacific halibut retention when salmon and/or groundfish are retained was also discussed by the Committee (Alternative 1). As stated in the Workgroup Report, the analysis assumes that if such prohibitions are implemented, the catch of halibut that previously occurred on mixed target trips will not otherwise occur. Therefore, the Committee noted that the expected catch reductions under Alternative 1 are uncertain and may not appreciably reduce Pacific halibut catch because of the uncertainty surrounding potential changes in angler behavior (e.g., anglers may respond by taking additional trips to target halibut). The Committee recommended the retention prohibitions be included as an available management measure; however, they cautioned the Council to recognize the uncertainty surrounding the catch projections.

Finally, the Committee noted that Alternative 4, which estimates the expected decrease in Pacific halibut catch as a result of the Marine Protected Areas (MPAs), is not an action alternative. That is, the MPAs have already been implemented by California; therefore, the expected reductions in catch should be applied to any future analysis.

In light of the discussion, recommendations, and conclusions reached by the Committee at this meeting, the Committee also noted that additional public comment on the alternatives would be helpful before or in conjunction with the September Council meeting.

Conclusion

In summary (not prioritized):

1. For the 2014 fishery, the Committee recommends the Council reduce recreational catch of Pacific halibut in California by 40 to 60 percent of the average harvest over the last five years.
2. The Committee recommends the Council take into consideration the uncertainty in the catch projections presented under the alternatives presented in the Workgroup Report when developing the 2014 season structure.
3. The Committee recommends an adaptive management approach whereby the ability of management measures to reduce catch are evaluated annually and adjusted, as necessary, for the following year.
4. The Committee recommends Alternative 6, which would add a management line in the CSP at the Oregon/California border (42° N. latitude) and create a separate California subarea with its own CSP allocation.
5. The Committee deferred to ODFW to recommend the preferred approach for the Oregon portion of the South of Humbug subarea.
6. The Committee recommends a fixed season for the California Subarea be established with no expectation for inseason decisions to manage the fishery.
7. The Committee recommends the Council consider alternatives that would restrict the months available for Pacific halibut retention in California (Alternatives 3 and 5), based on historical landings.
8. The Committee recommends the retention prohibitions also be included as an available management measure.

Committee Members, Portland, Oregon
Ms. Michele Culver, WDFW
Mr. Kevin Duffy, NMFS, Northwest Region
Mr. Stephen Williams, ODFW
Mr. Gregg Williams, IPHC
Ms. Marci Yaremko, CDFW

Attendee List, Portland, Oregon
Ms. Kelly Ames, Council Staff
Ms. Gway Kirchner, ODFW
Mr. Kris Kleinschmidt, Council staff
Ms. Mercedes Krause, Council staff
Ms. Sandra, Krause, Council staff
Ms. Lynn Mattes, ODFW
Mr. Dale Meyer, Arctic Storm Management Group
Ms. Heather Reed, WDFW

Attendee List, Brookings, Oregon
Ms. Jamie Fuller, ODFW
Mr. Craig Good, ODFW
Ms. Laura Green, ODFW

Attendee List, Eureka, California
Mr. Dan Berman, Humboldt Bay Harbor District
Mr. Jack Crider, Humboldt Bay Harbor District
Mr. Ben Doane, Humboldt Area Saltwater Anglers
Mr. Patrick Higgins, Humboldt Bay Harbor District
Mr. Tom Marking, Groundfish Advisory Subpanel Representative
Ms. Mary Marking, Recreational Angler
Mr. John Powell, Humboldt Bay Harbor District
Mr. Tom Weseloh, Assemblymen Chesbro
Mr. Jim Yarnall, Humboldt Area Saltwater Anglers

Attendee List, Monterey, California
Ms. Melanie Parker, CDFW

Web Attendees
Mr. Edward Hibsch, Pacific States Marine Fisheries Commission
Mr. Roger, Lindquist, Public
Mr. Daniel Mintz, Public
Mr. Shannon Davis, Public
Ms. Sarah Williams, NMFS
Ms. Linda ZumBrunnen, ODFW

PFMC
08/14/13

SOUTH OF HUMBUG PACIFIC HALIBUT WORKGROUP PRELIMINARY MANAGEMENT MEASURE ANALYSES

Contents

Conclusions

1. **The Workgroup was able to quantitatively analyze data to produce projected catch estimates for Alternatives 1, 3, 4, 5 and 6, and season length estimate for Alternative 7**
2. **The analysis relied on several assumptions and did not attempt to incorporate potential changes in angler behavior, therefore there is a degree of uncertainty around the expected results**
3. **Expected catch could be reduced by up to 27 percent when retention of halibut on salmon and groundfish trips is prohibited (Alt. 1)**
4. **Expected catch could be reduced more when the number of months that the season is open (Alt 3) is reduced, but significantly shorter seasons than currently allowed would be needed to achieve catch that is close to the recent years' subarea allocations (Alt 5)**
5. **Alternative 6 would allow Oregon and California to develop different management approaches for their respective subareas**
6. **Alternative 7 shows that the season would need to be reduced from 184 days to 32 days to keep catch at the status quo subarea allocation**
7. **Alternatives could be combined or mix and matched to achieve different results, the Workgroup did not analyze combining alternatives**

Workgroup Assignment

In March 2013, the Pacific Fishery Management Council (Council) discussed potential fishery management measures to constrain Pacific halibut catches for the South of Humbug Mountain Subarea (southern Oregon and California; Figure 1) recreational fishery for 2014. The Council requested the South of Humbug Mountain Workgroup (Workgroup) analyze the amount of Pacific halibut catch that would result from the following management measure alternatives:

Alternative 1. Prohibit retention of Pacific halibut on
   a. Both salmon and groundfish trips
   b. Salmon trips
   c. Groundfish trips

Alternative 2. Restrict the days of the week; include at least one weekend day

Alternative 3. Restrict season dates including the following scenarios
   a. Open May through July and September through October
   b. Open May through July 15 and September through October
   c. Open May through June and August through September
   d. Open May through June and September through October

Alternative 4. Evaluate and, if possible, quantify the catch savings resulting from new Marine Protected Areas off the north coast of California that were effective in 2012.

Alternative 5. Examine the potential for harvest reduction of other time and area closures off California.

Alternative 6. Separate the South of Humbug Mountain Subarea at the Oregon/California Border
   a. Incorporate the Oregon portion of South of Humbug Subarea into the Central Coast Subarea
   b. Create new Southern Oregon Subarea

Alternative 7. Additional analysis
   a. Season length based on expected catch per day (Puget Sound methodology)

Figure 1. Map of the West Coast of the United States, with management lines, the Oregon/California Border, and major ports.

The Oregon and California members of the Workgroup conducted analyses and prepared a draft of the report between March and May 2013. The entire Workgroup held a publicly accessible webinar/conference call on June 12, 2013 to discuss the results of the analyses and the draft report. The results of that call were then incorporated into this report, for use by the South of Humbug Pacific Halibut Policy Committee at their July 30, 2013 meeting.

Data Used in Analyses and Assumptions

Oregon Data:

The Oregon Department of Fish and Wildlife's (ODFW) sampling program, the Oregon Recreational Boat Survey (ORBS), is described in detail at:
http://www.dfw.state.or.us/MRP/salmon/docs/ORBS_Design.pdf.

ORBS produces estimates of effort and catch from the ocean boat fisheries. In addition, length and weight measurements from some species are collected. Presently ORBS samples at the top ten to twelve ocean access points on the Oregon coast. In the top five ocean access points, sampling begins earlier in the season than in the other ports, to account for more of the effort. For unsampled ports and times, catch and effort estimates are produced based on previous temporal patterns or catch and effort estimates produced for similar ports. The goal sample rate is approximately 20 percent, to meet salmon coded wire tag requirements. Often the realized sample rate is higher than that, sometimes approaching 40 percent of halibut trips. For most species, effort and catch estimates are produced monthly on a month lag. However, due to the management requirements of salmon and halibut fisheries, those estimates are produced weekly.

California Data:

The California Department of Fish and Wildlife's (CDFW) recreational sampling program, the California Recreational Fisheries Survey (CRFS), provides a comprehensive approach to marine recreational fishery data collection along the entire state coastline. The program operates on a randomly stratified sampling schedule for multiple boat-based or shore modes of angling such as private skiffs, commercial charter vessels, beach and bank, and/or jetties. Anglers are intercepted at these various modes by CRFS samplers on the water or on shore to collect fishing information. This raw data set is referred to as "sample data" and includes: the number, length, and weight (if possible) of fish observed in the catch, along with the angler's demographic and fishing activity information (including fishing location), and angler effort. In addition, the number and condition of discarded fish (alive or dead) is reported by anglers and recorded. Since sample data only cover a portion of the actual fishing effort that takes place, a peer-reviewed statistical method of expanding (or extrapolating) the sample data results in "catch estimates." Catch estimates are statistically generated monthly for all recreationally-caught fish species by mode for each of the five management areas in California. For complete details of the CRFS program, please see the CRFS Methods document available at:
http://www.recfin.org/sites/default/files/documents/CRFS_METHODS_6_9_2011.pdf.

Average Annual Catch 2008-2012 (Baseline Data)

For the analyses in this report, the most recent five years (2008-2012) of catch estimates were used to evaluate predicted catch amounts under each alternative. This time period includes years

with high and low catches of Pacific halibut (especially in California), as well as varying availability of other fishing opportunities, such as salmon and groundfish. In addition, it includes the period when catches of Pacific halibut exceeded the South of Humbug allocation. Estimates are updated from those provided to the Council in September 2012.[1]

The South of Humbug Mountain Subarea annual allocations and average annual catches for the subarea and by individual state are shown in Table 1. The catches are based on catch information from 2008-2012 provided by ODFW and CDFW. The South of Humbug allocation averaged about 6,000 net pounds during this period. A reduction in catch of approximately 75 percent is needed if the Council wishes to keep catches within the Catch Sharing Plan (CSP) subarea allocation (based on the five-year average annual landings).

Table 1. Annual total and average recreational catch of Pacific halibut in the South of Humbug Mountain Subarea from 2008-2012. Data from ODFW and CDFW. Data have been updated since the September 2012 Workgroup report. Data for 2012 are preliminary.

Year	SOH	South of Humbug Catch (net pounds)		
	Allocation	Oregon	California	Total
2008	7,541	-	13,303	13,303
2009	5,872	48	34,847	34,895
2010	5,007	280	23,936	24,216
2011	5,625	9,648	13,637	23,285
2012	6,056	5,130	25,394	30,524
Average	**6,020**	**3,021**	**22,223**	**25,244**

Assumptions:

Due to the variable nature of recreational fishing, combined with the differences between Oregon and California's catch estimation programs, the analysts were required to adopt several assumptions to produce projected catch amounts under each alternative. Not all analyses used the same methods for both states, due to differences in sampling and estimation procedures. For the purposes of this report, each alternative required an evaluation of both Oregon and California datasets from 2008 to 2012 to determine whether estimate or sample data were the most appropriate to use given the temporal and/or spatial nature of the recommended alternatives. If data analysis required finer scale information than was available from estimates, sample data were used. The priority was to use the best available data set for each alternative. However, some alternatives used a combination of sample data for one state and estimate data for the other state when estimates were not available for both. This approach is not expected to have a substantive effect on the results. In other cases, only estimate or sample data were used for both states, or only California information was used. Except where specifically noted, it was assumed that sample data were from a random sample and represented unbiased information. Because most of the catch came from California, in cases where Oregon information was not available, it was

[1] Previously reported in the Workgroup report titled *Ad Hoc South Of Humbug Pacific Halibut Workgroup Report on Biological, Monitoring, Assessment, and Apportionment Issues in Area 2A,* available at http://www.pcouncil.org/wp-content/uploads/F1b_ATT1_SHPHW_SEP2012BB.pdf .

assumed that California information would reflect the entire South of Humbug Mountain Subarea.

The use of catch estimates takes into account potential biases in the actual data collected (missing data, uneven sampling, etc.) as much as possible. When sample data were used, analysts attempted to minimize any apparent biases by weighting the sample data so it would more closely reflect reality. Any potential biases and/or underlying assumptions are discussed as appropriate for individual analyses.

In general, changes in angler behavior due to the imposition of fishery restrictions were not taken into account when determining predicted catch amounts for each alternative. There are a multitude of factors that alter or motivate angler behavior and fishing practices for which data analysis cannot quantify, but affect how closely the estimated impacts will reflect future fishing catch and effort. These factors include but are not limited to: weather, economic expenses (fuel, travel, gear, etc.), regulations, geographic distribution of target fish, availability of other targets, changing fishing areas, and/or social or cultural values. In addition, management changes can have an effect on fishing effort and practices. The perception of a potential constraint to existing regulations can cause unanticipated changes to current fishery effort. All of these factors have the possibility to over- or underestimate the predicted catch amounts under each alternative. The assumptions associated with each alternative are discussed within each section in more depth.

Pacific Halibut Regulations by State

The International Pacific Halibut Commission (IPHC) and National Marine Fisheries Service (NMFS) have authority to regulate all recreational Pacific halibut fisheries on the United States west coast (Washington, Oregon, and California, also known as IPHC Area 2A). Recreational Pacific halibut regulations are set yearly and vary by state (Table 2). Current South of Humbug Mountain Subarea recreational regulations for Pacific halibut provide for an open season from May 1 through October 31, a daily bag limit of one fish, and no minimum size limit or depth restrictions. Additionally, the CSP[2] specifies what regulatory changes can be made inseason. Some recreational regulations for Pacific halibut fisheries in Oregon are coastwide while others depend on the area and/or fishery being prosecuted. A summary is presented in Table 2.

[2] http://www.nwr.noaa.gov/publications/fishery_management/halibut/2013_catch_sharing_plan_area_2a_final.pdf

Table 2. Current (2013) recreational Pacific halibut regulations by state.

State	Bag Limit/ Day	Possession Limit	Annual Bag Limit	Size Limit	Gear Restrictions	Depth Restrictions	Other Restrictions
Washington	1	2 daily limits in any form, except only 1 limit is allowed on a fishing vessel	none	none	one line with up to two hooks	none	**Coastal seasons close when the quota is attained. North Coast (MCAs 3 & 4):** Bottomfishing is restricted to the area inside 20 fathoms May 1- Sept. 30 except, lingcod, Pacific cod and sablefish can be retained seaward of 20 fathoms on days open for halibut fishing. **South Coast (MCA 2):** Bottomfishing is prohibited (except rockfish) seaward of 30 fathoms March 15-June 15 except, lingcod can be retained on days open to halibut fishing. **Columbia River (MCA 1):** Retention of bottomfish except, Pacific cod and sablefish is prohibited if a halibut is onboard. **Puget Sound** seasons have set opening and closing dates established to keep catch within the quota.
Oregon	1	1 daily at sea; 3 daily limits on land	6	none	may be taken by angling with single line, no more than 2 hooks; and by spear	Central Oregon Coast Subarea Nearshore fishery restricted to inside of a line approximating the 40-fm curve, defined by waypoints. All other areas/fisheries are open to all-depth	**Columbia River** and **Central Coast Subareas** close when quota is attained, no bottomfish except sablefish and Pacific cod on all-depth dates. **Central Coast** nearshore bottomfishing and retention prohibited outside of 30 fathoms. **South of Humbug Mountain** season open May 1 through October 31, seven days per week, bottomfishing and retention prohibited outside of 30 fathoms.
California	1	1	none	none	may be taken with hook and line gears; and by spear	none	Season is open from May 1 through October 31

Alternative 1. Prohibit retention of Pacific halibut on salmon and/or groundfish trips

The Council requested an examination of the impact on catch by prohibiting retention of Pacific halibut on salmon and/or groundfish trips.

Data:

Oregon and California recreational sampling programs document information on what specie(s) anglers were targeting while fishing which is used to generate catch estimates. Analysts evaluated how frequently Pacific halibut were landed on trips targeting salmon or groundfish, and whether Oregon and California information was similar enough to be combined into one analysis. There were no expectations about changes in angler behavior as a result of prohibiting mixed target trips that were incorporated into the analysis. Due to the differences in catch estimation methods between the two states, the Oregon and California portions of the analysis were conducted separately. Regarding discards, it is important to note that anglers planning to target groundfish or salmon could continue to target those species and any incidentally-caught Pacific halibut would be discarded. In Area 2A, halibut sport fishery discard mortality is currently not estimated.

Oregon

The trip types where Pacific halibut were caught included "bottomfish," "salmon," "Pacific halibut," and "combo" (salmon plus anything else). For the purposes of the analysis, Oregon's "bottomfish" category was considered to be analogous to a "groundfish" category, and Oregon's "combo" trip type was included in the salmon category. Oregon estimate data were used in the analysis because these trip types provided specific enough information about angler's intent when fishing to separate effort and catch appropriately.

Oregon's Pacific halibut annual catch estimates were summarized within the trip types "Pacific halibut," "salmon," "combo," or "bottomfish" for the five-year period, and from which the proportion of Pacific halibut in each trip type was determined. Those proportions were applied to the Oregon five-year average catch (Table 1) to get an estimated weight of landings in each trip type. These amounts were used to determine predicted catch amounts of Pacific halibut in Oregon under this alternative (Table 3).

California

California trip types are broad, and include "bottomfish" (which encompasses Pacific halibut, all Federal groundfish, plus some additional species) and "salmon." Since the trip type categories used in the estimation process are too broad to delineate between a groundfish and a Pacific halibut trip, sample data were used. This approach assumed that sample data were representative of estimates, and that there were no differences in angler behavior or fish caught between the primary target trip types in this analysis.

The total number of sampled Pacific halibut was summed across all five years within each primary target type category. The proportion of fish that occurred on trips where anglers designated their primary target as "Pacific halibut," "salmon," and/or "groundfish" was

determined, and then those proportions were applied to the average California landings (Table 1) to produce an estimate of Pacific halibut catches in California under the different prohibition options (Table 3**Error! Reference source not found.**).

Table 3. Predicted catch amounts (net pounds) of recreational Pacific halibut associated with the prohibition of retention of Pacific halibut on salmon and/or groundfish trips. Data from ODFW and CDFW.

Alternatives	Predicted Catch Amount (net pounds)		
	Oregon	California	Entire Subarea
1a. Halibut prohibited on salmon and groundfish trips	2,297	16,187	18,484
1b. Halibut prohibited on salmon trips	2,439	17,988	20,427
1c. Halibut prohibited on groundfish trips	2,878	20,423	23,301

Alternative 1a: Prohibit retention of Pacific halibut on salmon and groundfish trips

The analysis showed that the prohibition of Pacific halibut retention on salmon and groundfish trips could result in a predicted catch of 18,484 net pounds for the entire South of Humbug Subarea, which is a 27 percent reduction compared to the average catch estimates (Table 1). The actual reduction in catch may be less than predicted because of unanticipated changes in angler preference. If anglers choose to fish for Pacific halibut over salmon or groundfish, predicted catch amounts could be substantially higher than estimated. Conversely, availability of other highly desirable species may cause anglers to switch targets. Angler preference to target one species or species group over another can be difficult to predict, especially amongst highly prized target species such as Pacific halibut, salmon, and some groundfish (i.e., lingcod). Prohibiting retention of Pacific halibut and salmon and/or groundfish on the same trip could also lead to an increase in regulatory discarding.

Based on anecdotal information, many anglers who encounter rockfish (included in the "groundfish" category) and Pacific halibut on the same trip are encountering the Pacific halibut incidentally to targeting rockfish. Recreational anglers on California's north coast are restricted to fishing no deeper than 20 fathoms (120 feet) when fishing for groundfish (including rockfish) when boat-based groundfish angling is open (generally mid-May to August or October). Pacific halibut are generally encountered in waters 50 fathoms (300 feet) and deeper, so anglers targeting rockfish are generally not fishing in areas where high abundances of Pacific halibut occur. In addition, a closer look at the groundfish category indicated that rockfish are a smaller category within groundfish, so any reductions in catch amounts associated with prohibition of Pacific halibut and rockfish on the same trip would be less than the predicted catch amounts associated with prohibiting Pacific halibut and groundfish on the same trip.

Alternative 1b: Prohibit retention of Pacific halibut on salmon trips

The analysis showed that the prohibition of Pacific halibut retention on salmon trips could result in a predicted catch amount of 20,427 net pounds for the entire South of Humbug Subarea, which

is an 18 percent reduction in catch amounts (Table 3) compared to the average catch estimates (Table 1). Realized changes to catch amounts may differ from those reported in Table 3 for the same reasons relating to salmon provided above under Alternative 1a: Prohibit retention of halibut on salmon and groundfish trips.

Alternative 1c: Prohibit retention of Pacific halibut on groundfish trips

The analysis showed that the prohibition of Pacific halibut retention on groundfish trips could result in a predicted catch amount of 23,301 net pounds for the entire South of Humbug Subarea, which is a nine percent reduction in catch amounts (Table 3) compared to the average catch estimates (Table 1). Realized changes to catch amounts may differ from those reported in Table 3 for the same reasons relating to groundfish and rockfish provided above under Alternative 1a: Prohibit retention of halibut on salmon and groundfish trips.

Additionally, the predicted catch amounts specifically for the "Prohibit retention of halibut on groundfish trips" category may be more uncertain due to the use of sample trip data for California and the need to assume no differences in weight of fish among primary targets. Since anglers fishing for preferred groundfish are restricted to shallow water (less than 20 fathoms), and Pacific halibut in shallow waters would be expected to be smaller, it is likely that if weights of fish had been available, then the actual reduction in catch would be lower.

Enforcement Concerns:

Prohibiting species groups with vastly different regulations may be challenging for enforcement purposes. In California, groundfish and salmon have very clear regulations for stowing groundfish gear when targeting salmon inside Rockfish Conservation Areas (RCA). Conversely, if salmon is brought onboard first and anglers choose to stay inside the RCA to target groundfish, fishing gear is restricted to the use of barbless hooks only. The current balance between groundfish and salmon regulations in California could be further complicated by the prohibition of Pacific halibut in either or both the groundfish and salmon fishery, however, it is noted that these types of regulations have been implemented successfully in Washington and Oregon.

In the Oregon Columbia River Subarea and Central Coast Subarea all-depth fisheries, retention of bottomfish (groundfish) is already prohibited. In the Central Coast Subarea nearshore fishery (inside 40 fathoms), retention of groundfish is allowed, but only in areas open to retention of groundfish (inside 30 fathoms). Retention of salmon is currently allowed during all halibut seasons in Oregon. However, like in California, once a salmon is onboard the vessel, anglers are restricted to use barbless hooks.

Alternative 2. Restrict the days of the week; include at least one weekend day

Currently the South of Humbug Mountain Subarea fishery is open seven days per week. In order to reduce catches and prevent exceeding the South of Humbug Mountain Subarea allocation, the Council requested an examination of the impact on the catch by reducing the number of open fishing days per week. There is precedent in setting recreational Pacific halibut regulations in Area 2A such that fishing is only allowed two days per week, including only Friday and Saturday, or Thursday and Saturday.

Methods for Calculating the Proportion of Catch by Day of Week:

Calculating the proportion of catch by day of the week requires data on daily catch, as well as angler effort. Certain assumptions may also be required which account for any effort shift or change in angler behavior that may be associated with a reduction in the days per week open. In addition, any effort shift that does occur may not be consistent among months.

The following steps would be taken to calculate the proportion of catch by day of week:

1. Determine the total number of Pacific halibut reported for each individual day of the week (DOW).
2. Compare DOW totals from Step 1 to the cumulative total for all days to estimate a proportion of catch per DOW. This assumes that there is no difference in angler behavior by DOW that could affect the number of fish that were caught.
3. Determine the total number of samples by DOW.
4. Compare the DOW totals from Step 3 to the cumulative total for all days to estimate a proportion of samples by DOW.
5. Take the inverse proportion of sampling assignments by DOW.
6. Multiply the inverse proportion of the number of sample assignments by DOW was to produce an adjusted proportion of catch by DOW.

Similar steps would need to be taken to calculate the proportion of angler effort by day of week.

Data Available

An evaluation of available data indicated that the required data elements were not available to complete this analysis in time for inclusion in this report. Catch estimates were not available in Oregon or California on a daily basis; neither state currently produces estimates of angler effort by day of the week. Sample data by day of the week were also not available for Oregon in time to be included in this report. Therefore, only sample catch data from California could be used to analyze this option, assuming that predicted catch amounts represent the entire South of Humbug Mountain Subarea. Using the currently available data will likely provide results that are more uncertain, do not fully account for differences in angler effort by DOW, and may be less likely reflective of actual fishing practices.

Staff attempted to conduct a preliminary analysis on this alternative, but results were felt to be highly uncertain and therefore are not presented in this report. More work is necessary to dig into available data sources to determine whether the additional data exists to inform this alternative. If tasked by the Council, the workgroup could continue to examine this alternative with a goal of providing quantitative predicted catch amounts.

The information that was available did indicate that catch is slightly higher at the end of the week and on Saturdays. Pacific halibut managers in other subareas have anecdotal reports that effort and catch is greatest on Saturday, followed by Sunday, then Friday, with Tuesday and Wednesday having the lowest effort. However, data are not currently available to confirm this.

Alternative 3. Restricted Season Dates

Currently, Pacific halibut in the South of Humbug Mountain Subarea is open from May 1 through October 31 seven days per week. The Council requested the Workgroup attempt to determine predicted catch amounts for four different season structure alternatives:

Alternative 3a. Open May through July and September through October
Alternative 3b. Open May through July 15 and September through October
Alternative 3c. Open May through June and August through September
Alternative 3d. Open May through June and September through October

Data:

Oregon's recreational estimation program is capable of producing catch estimates on a weekly basis, therefore, no modeling limitations were encountered for any of the below alternatives and Oregon estimate information was used unmodified. California's recreational estimation program is limited to producing catch estimates on a monthly basis so an assumption of equal catch and effort distribution during the month was made to analyze option 3b.

The Workgroup examined the pounds of landed catch (in net pounds) by month for Oregon, California, and the entire subarea (Table 4). Using the last five years of data (2008-2012), the cumulative monthly catch was calculated, and then the percentage of the total catch for each month was determined. Additionally, the average catch per month for those same five years was calculated (Table 4 and Figure 2). The results assume that there is no effort shift from closed to open months when calculating predicted catch amounts.

Table 4. Recreational Pacific halibut catch (net pounds) by month. Data for the entire South of Humbug Mountain Subarea, and by state, 2008-2012.

Oregon

Month	2008	2009	2010	2011	2012	Cumulative Monthly Catch (net pounds)	% Total Catch	Avg. Monthly Catch (net pounds)
May	0	48	0	38	774	861	5.7%	172
June	0	0	0	480	715	1,196	7.9%	239
July	0	0	0	1,958	566	2,524	16.7%	505
Aug	0	0	128	5,280	1,592	6,999	46.3%	1,400
Sept	0	0	153	1,891	1,429	3,473	23.0%	695
Oct	0	0	0	0	54	54	0.4%	11
Total	0	48	280	9,648	5,130	15,107		3,021

California

Month	2008	2009	2010	2011	2012	Cumulative Monthly Catch (net pounds)	% Total Catch	Avg. Monthly Catch (net pounds)
May	1,150	510	2,362	501	1,453	5,976	5.4%	1,195
June	1,977	10,600	890	3,154	3,916	20,537	18.5%	4,107
July	3,062	8,019	8,911	1,347	4,552	25,891	23.3%	5,178
Aug	5,503	11,315	9,570	5,170	11,522	43,080	38.8%	8,616
Sept	1,611	4,403	2,202	2,663	3,107	13,986	12.6%	2,797
Oct	0	0	0	801	844	1,645	1.5%	329
Total	13,303	34,847	23,935	13,636	25,394	111,115		22,223

Entire Subarea

Month	2008	2009	2010	2011	2012	Cumulative Monthly Catch (net pounds)	% Total Catch	Avg. Monthly Catch (net pounds)
May	1,150	558	2,362	539	2,227	6,837	5.4%	1,367
June	1,977	10,600	890	3,634	4,631	21,733	17.2%	4,347
July	3,062	8,019	8,911	3,305	5,118	28,415	22.5%	5,683
Aug	5,503	11,315	9,698	10,450	13,114	50,079	39.7%	10,016
Sept	1,611	4,403	2,355	4,554	4,536	17,459	13.8%	3,492
Oct	0	0	0	801	898	1,699	1.3%	340
Total	13,303	34,895	24,215	23,284	30,524	126,222		25,244

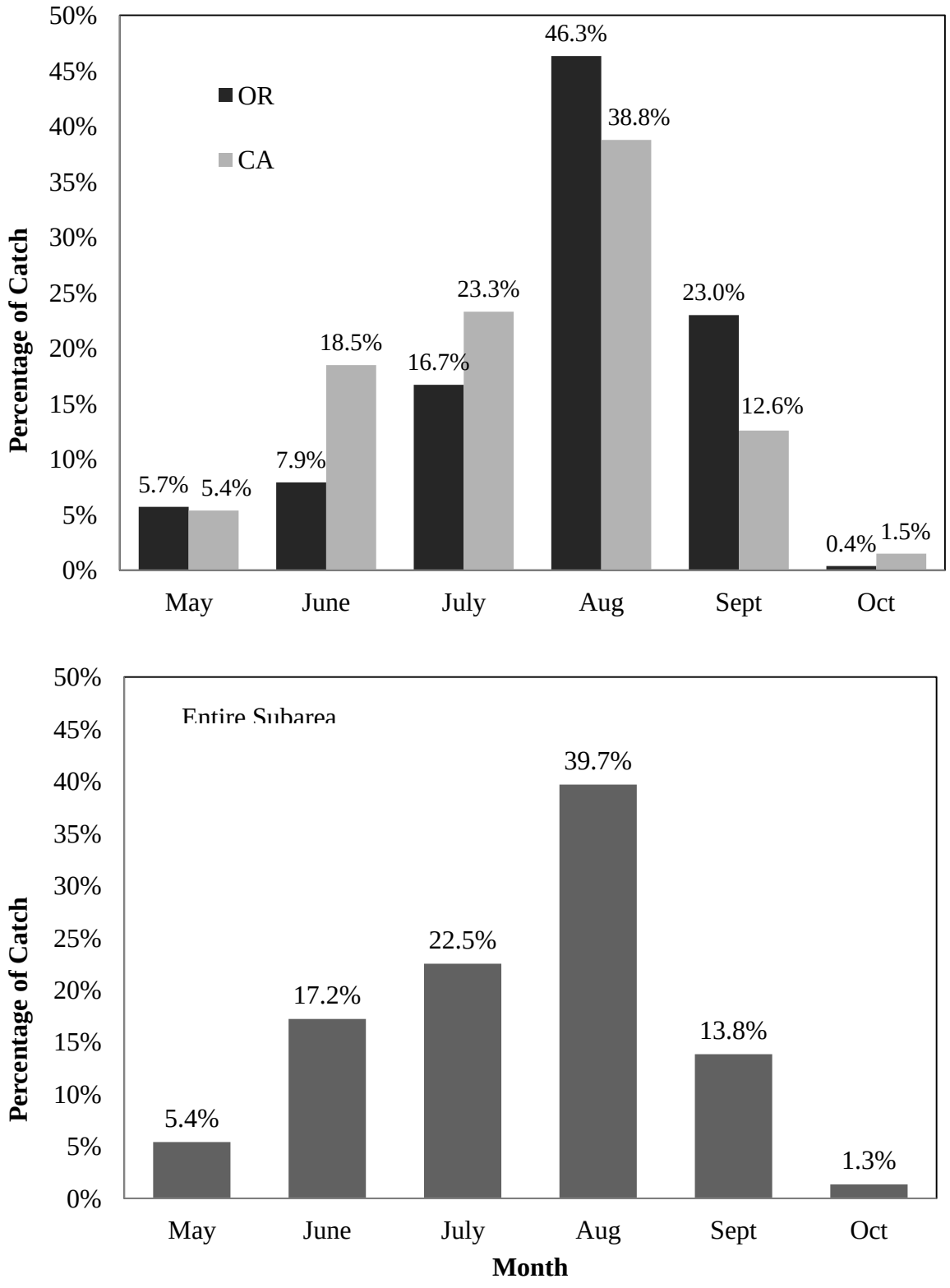


Figure 2. Average monthly percentage of catch for Oregon and California (top panel) and the entire subarea (bottom panel) 2008-2012.

The Workgroup looked at the average monthly catch in net pounds (Table 4) for the Council requested alternatives (3a-d), to determine what the annual predicted catch could be (Table 5).

Table 5. Monthly predicted catch amounts (net pounds) for Council requested season structure alternatives (3a-d) for the entire SOH area and by state. (Black cells indicate closed months, gray cells indicate part of the month being open).

Oregon				
Month	**Alt. 3a. May-July & Sept-Oct**	**Alt. 3b. May-July 15 & Sept-Oct**	**Alt. 3c. May-June & Aug-Sept**	**Alt. 3d. May-June & Sept-Oct**
May	172	172	172	172
June	239	239	239	239
July	505	252		
Aug			1,400	
Sept	695	695	695	695
Oct	11	11		11
Total	1,621	1,369	2,506	1,117

California				
Month	**Alt. 3a. May-July & Sept-Oct**	**Alt. 3b. May-July 15 & Sept-Oct**	**Alt. 3c. May-June & Aug-Sept**	**Alt. 3d. May-June & Sept-Oct**
May	1,195	1,195	1,195	1,195
June	4,107	4,107	4,107	4,107
July	5,178	2,589		
Aug			8,616	
Sept	2,797	2,797	2,797	2,797
Oct	329	329		329
Total	13,607	11,018	16,716	8,429

Entire Subarea				
Month	**Alt. 3a. May-July & Sept-Oct**	**Alt. 3b. May-July 15 & Sept-Oct**	**Alt. 3c. May-June & Aug-Sept**	**Alt. 3d. May-June & Sept-Oct**
May	1,367	1,367	1,367	1,367
June	4,347	4,347	4,347	4,347
July	5,683	2,841		
Aug			10,016	
Sept	3,492	3,492	3,492	3,492
Oct	340	340		340
Total	15,228	12,387	19,221	9,545

As with other analysis conducted in other sections of this report, no attempt was made to account for possible shifts or changes in angler behavior. The analysis makes no attempt to account for shifts in angler effort due to potential closed time periods, but it is very likely some level of shift would occur. While there are no data to estimate such a shift, the very potential for it makes it reasonable to state that the reductions noted are overestimates.

Alternative 3a (May-July & Sept-Oct)

This alternative would retain the majority of recreational halibut fishing opportunity that exists under the current season structure except that recreational halibut fishing would be closed during the month of August. There are generally fishing opportunities for other target species during the proposed closed period (August).

No changes to sampling or estimation programs for either state would be required under this option, as the closure would be a full month.

Alternative 3b (May-July 15 & Sept-Oct)

This alternative calls for a partial closure of one month. The recreational catch estimation programs for California produces estimates of catch on a monthly basis. Modification to the estimation programs will add workload to limited staff and may prevent estimates from being produced in a timely manner. Pacific halibut catch estimation already occurs on a weekly basis for Oregon ports, therefore there would be no increase in workload.

Alternative 3c (May-June & Sept-Oct)

No changes to sampling or estimation programs for either state would be required under this option, as the closure would be a full month.

Alternative 3d (May-June & Sept-Oct)

This alternative could produce the largest decrease to predicted catch amounts under Alternative 3 but would still preserve opportunity at the beginning and end of the season, over Memorial Day and Labor Day and when other opportunities may be less available.

No changes to sampling or estimation programs for either state would be required under this option, as the closure would be a full month.

Alternative 4. Evaluate and, if possible, quantify the catch savings resulting from new Marine Protected Areas off the north coast of California that were effective in 2012

The Council requested the Workgroup evaluate and, if possible, quantify the catch savings resulting from the new Marine Projected Areas (MPAs) off the north coast of California that went into effect on December 19, 2012.

The Marine Life Protection Act was implemented in 1999 and required the CDFW to redesign its system of MPAs to create a network of MPAs and increase its coherence and effectiveness at protecting the state's marine life, habitats, and ecosystems. In late 2012, 28 MPAs north of Alder Creek, near Point Arena (38°57.5’ N. lat) in Mendocino County, California were implemented.

There are three types of MPAs, with varying levels of protection from recreational and commercial fishing. Fishing for Pacific halibut is not allowed inside any of the MPAs, thus all MPAs are treated equally for this analysis.

This analysis builds on information previously assembled by the Workgroup[3]. CRFS sample data that included corresponding catch location information for Pacific halibut were used to determine what percentage of catch occurred in areas that are now newly-created MPAs (Figure 3).

Of the approximately 1,300 Pacific halibut in the California data set that had location information, only 40 fish (2.98 percent of the total; Table 6) were caught in areas which are now MPAs, and closed to recreational Pacific halibut fishing. The calculation of projected catch savings from new MPAs and predicted catch amounts (Table 6) relied on the assumption that recreational anglers will not shift effort into the remaining open areas. Therefore, the catch would be foregone. In addition, the Workgroup assumed that the location of sampled Pacific halibut is representative of all anglers' catch and that anglers accurately reported catch locations.

Table 6. Average recreational Pacific halibut catch (net pounds) and projected catch savings from new MPAs in California from 2008-2012.

Avg. California Catch (net lbs.)	Projected Reductions from MPAs	Expected Catch (net lbs.)
22,223	2.98%	21,561

Given that the majority of Pacific halibut reported by anglers occurred north of Cape Mendocino and not caught in areas that later became MPAs (Figure 3), minimal catch savings could be expected. These data are consistent with information provided in an economic analysis prepared for the North Coast MPA process. In addition, the location of Pacific halibut encounters is also consistent with information previously reviewed by the workgroup from the West Coast Groundfish Observer Program.

It is important to note that these MPAs went into effect in late 2012, so any catch savings associated with the new closed areas is occurring during the 2013 fishery, but would not have affected the data used in this analysis. As a result, these catch savings should be accounted for when selecting any additional measures to reduce Pacific halibut catches in the South of Humbug Mountain subarea.

[3] Previously reported in the Workgroup report titled *Ad Hoc South Of Humbug Pacific Halibut Workgroup Report on Biological, Monitoring, Assessment, and Apportionment Issues in Area 2A*, available at http://www.pcouncil.org/wp-content/uploads/F1b_ATT1_SHPHW_SEP2012BB.pdf.

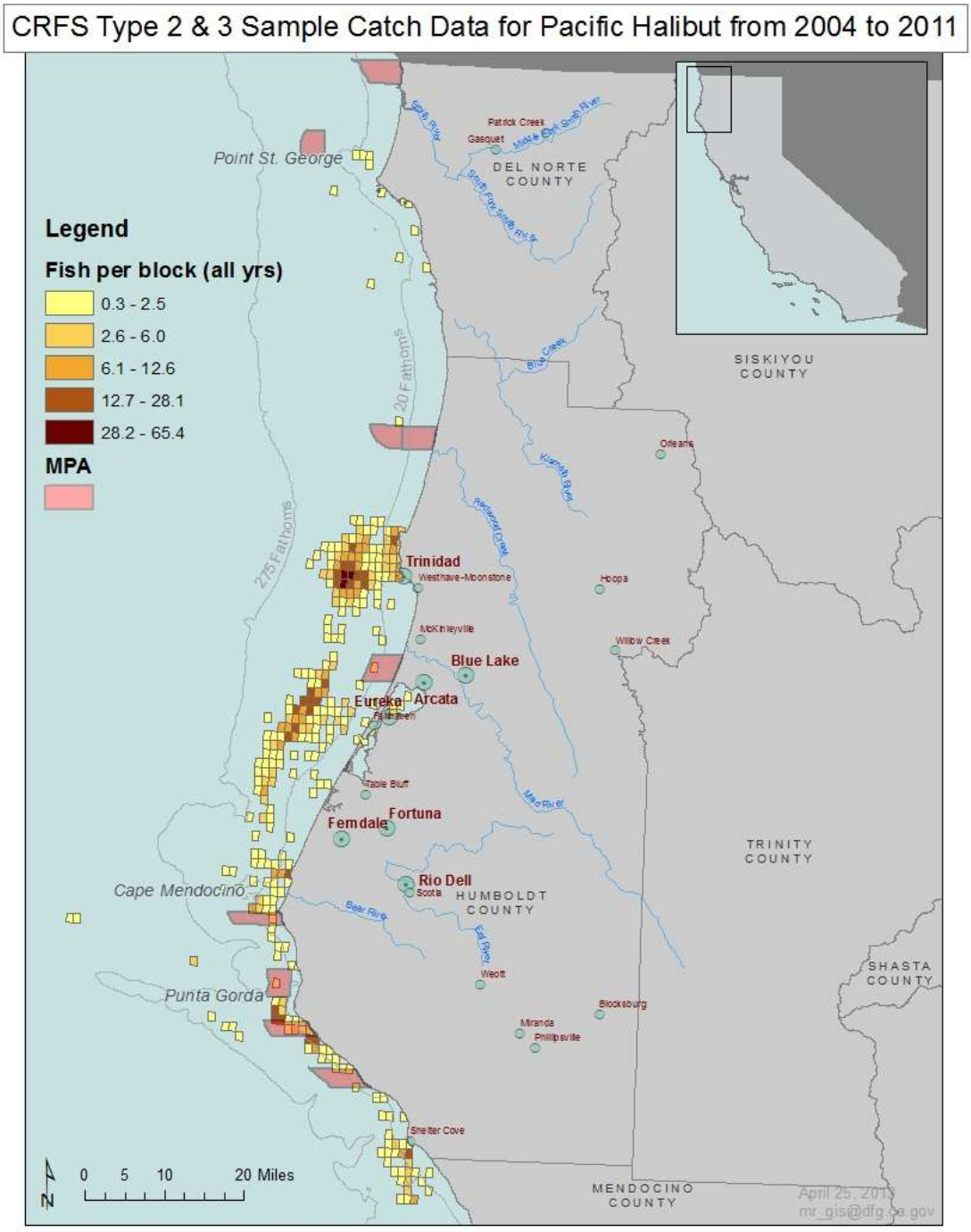


Figure 3. Map of new California north coast MPAs and locations of recreational Pacific halibut catch from 2004-2011. Recreational catch data based on CRFS information from CDFW.

Alternative 5. Examine the potential for harvest reduction of other time and area closures off California

The Council requested that the Workgroup also consider any other alternatives deemed appropriate in reducing predicted catch amounts. With that in mind, the Workgroup investigated additional modifications to the season structure with the goal of reducing predicted catch amounts to recent years' allocation amounts (Table 1).

Using the methodology and assumptions presented in Alternative 3, three additional season structure scenario alternatives (5a-c, below) were developed to evaluate open month combinations that would result in predicted catch amounts (Table 7) that are similar to the recent average subarea catch set-aside (approximately 6,000 net pounds).Those seasons would be:

- Alternative 5a.—Open May and September-October
- Alternative 5b.—Open July and October
- Alternative 5c.—Open May-June and October

Table 7. Monthly and total catch (in pounds net weight) for Alternatives 5a-c, resulting in predicted catch amounts that are similar to the last few years' SOH subarea set aside. (Black cells indicate closed months.)

Oregon			
Month	**Alt. 5a. May & Sept-Oct**	**Alt. 5b. July & Oct**	**Alt. 5c. May-June & Oct**
May	172		172
June			239
July		505	
Aug			
Sept	695		
Oct	11	11	11
Total	878	516	422

California			
Month	**Alt. 5a. May & Sept-Oct**	**Alt. 5b. July & Oct**	**Alt. 5c. May-June & Oct**
May	1,195		1,195
June			4,107
July		5,178	
Aug			
Sept	2,797		
Oct	329	329	329
Total	4,321	5,507	5,632

Entire Subarea			
Month	**Alt. 5a. May & Sept-Oct**	**Alt. 5b. July & Oct**	**Alt. 5c. May-June & Oct**
May	1367		1,367
June			4,347
July		5,683	
Aug			
Sept	3492		
Oct	340	340	340
Total	5,199	6,023	6,054

For the Oregon portion of the South of Humbug Mountain Subarea, all of the season structure alternatives analyzed (Table 7) result in catches less than half of the current subarea allocation. For the California portion of the South of Humbug Mountain Subarea, similar to the subarea as a whole, only season structure alternatives 5a-c (Table 7) result in catches below the current subarea allocation.

Alternative 5a
No changes to sampling or estimation programs for either state would be required under this option, as the closure would be a full month.

Alternative 5b
No changes to sampling or estimation programs for either state would be required under this option, as the closure would be a full month.

Alternative 5c
No changes to sampling or estimation programs for either state would be required under this option, as the closure would be a full month.

Alternative 6. Separate the South of Humbug Mountain Subarea at the Oregon/California Border and Incorporate the Oregon Portion into the Central Oregon Coast Subarea

The Council requested that the Workgroup look at splitting the South of Humbug Mountain Subarea at the Oregon/California Border. The Oregon portion, between Humbug Mountain and the border, could then be included in the Central Oregon Coast Subarea (Alternative 6a.) or become a separate southern Oregon subarea (Alternative 6b.). The area south of the Oregon/California border would then be a separate California Subarea.

From 1990 to 1998, the CSP provided a separate subarea allocation for California (South of 42° N. lat.) based on expectations of incidental catch. In 1999, the portion of Oregon south of Humbug Mountain was subsumed into the California subarea to provide anglers in the southern portion of Oregon, where catches of Pacific halibut were also very low, a longer fishing season.

Alternative 6a. Incorporating the Oregon portion of South of Humbug Subarea into the Central Coast Subarea
Incorporating the Oregon portion into the Central Coast subarea (Figure 4) would require anglers in those ports (Gold Beach and Brookings) to follow the regulations for the Central Coast, which are much different than are currently in place for South of Humbug subarea. These changes would be: separate nearshore and all-depth fisheries, limited number of open days each week, and no retention of groundfish on days open to all-depth fishing. Additionally, the total number of fishing days per week for those ports would be reduced.

The impact to the Central Oregon Coast Subarea fisheries, in most years, would be minimal due to the low effort and harvest coming from the addition of the ports south of Humbug Mountain. If a similar pattern to 2011 were to occur again, the addition of those two ports could reduce the total number of days open for the Central Oregon Coast Subarea, likely by only one or two days.

If included in the Central Oregon Coast Subarea, the impact to the ports south of Humbug Mountain would be much greater. This would be due to the substantially fewer number of fishing days from what is currently available. The Central Coast Subarea All-depth fisheries have been open 15-20 days per year for the last four years, and the nearshore fishery has been closing in

mid-July. Currently the South of Humbug Mountain Subarea is open seven days per week, for a total of 184 open days.

As ORBS already does weekly tracking for Gold Beach and Brookings, there would be no increased workload associated with this change. If California became its own subarea again, the CDFW does not plan to modify current catch tracking procedures.

Figure 4. New subareas under Alternative 6a, in which the Oregon portion of the South of Humbug Mountain Subarea is included in the Central Oregon Coast Subarea, and a new California Subarea is created.

Alternative 6b. New Southern Oregon Subarea

If a new Southern Oregon Subarea were created (south of Humbug Mountain to the Oregon/California Border; Figure 5), ODFW would have the ability to monitor inseason on a weekly basis, the same as other areas in Oregon. The ports contained in this new area are already sampled and reported as part of the ORBS sampling and data program. No changes or modifications would be required. This new management area would add one more area to monitor, which would lead to some additional, likely minor, management requirements (i.e. public meetings, conference calls). These additional management requirements would likely not add significantly to the workload of the state managers.

Creating a new southern Oregon subarea would allow for the potential for regulations to be different than those for the Central Oregon Coast Subarea, such as open dates, retention of bottomfish, and depth restrictions that are similar to what currently occurs. This would create the least amount of change from the current fishery occurring in those ports. It should have minimal impact to the Central Oregon Coast Subarea. However, the Council would need to modify the CSP to account for this new area.

Figure 5. New subareas under Alternative 6b, in which the South of Humbug Mountain Subarea is divided into a new Southern Oregon Subarea and a new California Subarea is created.

Separate California Management Area (South of 42°)

Catch tracking and management would be more straightforward if the waters off California were made a separate subarea, given the differences between the states in creel sampling, catch estimation, and regulatory processes and timelines. A separate management subarea for California could be accompanied by changes to the present CDFW catch tracking and estimation programs, if more active management of Pacific halibut is deemed appropriate for California. Currently, California does not conduct inseason tracking of Pacific halibut and catch estimates

are reviewed post-season (usually available by spring of the following year). Additional staff resources would be needed to begin any inseason tracking, although this need would be independent of the need for a separate California management area. Although modifications to the CRFS estimation programs could allow for more refined Pacific halibut management in California, California's CRFS program presently does not have a separate trip type for anglers targeting Pacific halibut. This modification may be warranted if more active management was considered by the Council. Additionally, should inseason management actions for Pacific halibut become necessary for the California recreational fishery, amendments to state regulations would likely be required.

As a combined region (the status quo), in which the majority of the catch originates from California waters, southern Oregon anglers would be subjected to more restrictive management measures mainly needed to control California catch. However, if California was its own management area, then northern California and southern Oregon anglers might have more options for fishing available to them in different areas depending on the regulations in place at the time. Under current regulations, central Oregon anglers may head south to fish when their areas close – due to the longer South of Humbug season. If southern Oregon is subsumed into central Oregon, those anglers might have to head further south to fish in California when their fishery is closed. Conversely, if southern Oregon were its own separate area, central Oregon anglers might go there, or California anglers might head north in search of better fishing opportunities.

Alternative 7. Additional Analysis: Season Length Based on Expected Catch per Day (Puget Sound Methodology)

Inseason management of the Pacific halibut quota is not possible in the Washington Puget Sound subarea. As such, set season opening and closing dates are established preseason using data from the most recent year's recreational fisheries such as catch per unit of effort and average weight by month and area. The Puget Sound season setting process occurs after the IPHC Annual Meeting when the Area 2A catch limit (CL) and allocations are announced, which allows seasons to be set appropriately to that year's halibut quota. Stakeholder input is gathered through public meetings to evaluate trade-offs with alternative season structures and maximize the number of fishing days that are available for the subarea. The CSP language for this subarea is written in a way that provides the flexibility to develop season dates that are in balance with the current season's quota. The workgroup felt the similarities between the management approach in the Puget Sound subarea and the California portion of the South of Humbug warranted exploration of the Puget Sound season-setting process as an alternative for the South of Humbug area.

Currently, 184 days per year are open to fishing for Pacific halibut in the South of Humbug Subarea. The CSP states that a fixed season for the South of Humbug subarea will be established preseason "based on projected catch per day and number of days to achievement of the subquota." As the Council directed the Workgroup to also consider other alternatives, the Workgroup attempted to evaluate the Puget Sound methodology, and develop a catch per day model for the South of Humbug Mountain Subarea.

Analyses to determine the expected catch per day were conducted following the methodology used in the Puget Sound area, and described in the Workgroup Report from September 2012[4]. An assumption was made that catch rates were the same throughout the season so that a day in July would have the same expected catch as a day in May or October.

The expected number of days available to fishing depends on the quota allocated to this subarea. Since the 2014 TAC will not be known until late January 2014, analyses were conducted to determine the days available to fishing associated with a range of subarea quota amounts (Table 8).

Separate analyses were conducted using California and Oregon estimate data combined, or only California data; catch per day was calculated as total weight or total number of fish per day. Catch estimates by weight were divided by the available days to determine weight by day. To calculate expected number of fish catch per day, the weight by day values were divided by the average weight of fish.

The results indicate an expected catch per day of approximately 189 pounds in both areas, but due to differing average weight per fish for the two areas, 10 fish per day are expected in the South of Humbug Mountain Subarea, and 11 fish per day are expected in the California-only area.

The number of days available to fishing under any of the options in Table 9 is considerably less than is currently available. If the subarea allocation for 2014 were to remain the same as the 2013 amount, only 32 days would be available for fishing. Table 9 shows a range of days available to fishing under varying South of Humbug subarea allocations for the entire area and for California only. There is no difference in number of days available to fishing between the two areas because the amount of catch coming from Oregon is relatively small.

[4] http://www.pcouncil.org/wp-content/uploads/F1b_ATT1_SHPHW_SEP2012BB.pdf

Table 8. Expected number of days available to fishing in 2014 for a range of potential South of Humbug Mountain Subarea allocation amounts. Data from ODFW and CDFW.

Percent Change to Subarea Allocation	Allocation Amount (net pounds)	Days Available to Fishing	
		South of Humbug Area	CA Only
+25%	7,579	40	40
+20%	7,276	38	38
+10%	6,669	35	35
+5%	6,366	34	34
SQ (no reduction)	6,063	32	32
-5%	5,760	32	32
-10%	5,457	29	29
-15%	5,154	27	27
-20%	4,850	26	26
-25%	4,547	24	24

Applying the methodology used in Puget Sound to the South of Humbug subarea would require additional work to evaluate catch per day and variability in catch rates by month. Stakeholder input would be needed to determine preferred dates and a season structure that balances fishing interests with variability in catch rates throughout the season in a way that keeps catch under the subarea allocation.

For example, the number of days available to fishing could be higher or lower depending on what days of the week or month are chosen to be open to fishing. If days in May, September, or October are chosen, actual catch per day may be lower than predicted, so additional days could be available to fishing to attain the subarea quota. If days during June, July, or August are chosen to be open to fishing, actual catch per day may be higher than predicted, and the subarea quota could be attained earlier than predicted.

Additional Options Considered but Rejected

Additional options were discussed by the work group but rejected for the following reasons:

1. Re-implementation of a minimum size limit
    a. Other west coast states do not currently have a minimum size limit for recreationally-caught Pacific halibut.
    b. Preliminary analysis suggested a minimum size limit of 40 inches would be required before any reductions to predicted catch amounts could be realized.
2. Implementation of depth restrictions
    a. Lack of data to provide a basis for the analysis.
    b. Differing depth restrictions that currently exist in Oregon and California for rockfish retention.

Conclusions

The findings of the analysis conducted by the Workgroup are summarized Table 9 below.

Based on the above analysis, the workgroup provides the following conclusions:

1. **The Workgroup was able to quantitatively analyze data to produce projected catch estimates for Alternatives 1, 3, 4, 5 and 6, and season length estimate for Alternative 7.**
2. **The analysis relied on several assumptions and did not attempt to incorporate potential changes in angler behavior, therefore there is a degree of uncertainty around the expected results.**
3. **Expected catch could be reduced by up to 27 percent when retention of halibut on salmon and groundfish trips is prohibited (Alt. 1).**
4. **Expected catch could be reduced more when the number of months that the season is open (Alt 3) is reduced; but significantly shorter seasons than currently allowed would be needed to achieve catch that is close to the recent years' subarea allocations (Alt 5).**
5. **Alternative 6 would allow Oregon and California to develop different management approaches for their respective subareas.**
6. **Alternative 7 shows that the season would need to be reduced from 184 days to 32 days to keep catch at the status quo subarea allocation.**
7. **Alternatives could be combined or mix and matched to achieve different results, the Workgroup did not analyze combining alternatives.**

Table 9. Summary of Alternatives analyzed and predicted catch amounts for each Alternative and the 2013 South of Humbug Mountain allocation and average 2008-2012 catch estimates.

Alternative		Expected Catch		
		Oregon	**California**	**Entire Subarea**
Alternative 1: Prohibit Retention halibut on Salmon or Groundfish Trips	1a. Prohibit halibut on salmon and groundfish trips 1b. Prohibit halibut on salmon trips 1c. Prohibit halibut on groundfish trips	2,297 2,439 2,878	16,187 17,988 20,423	18,484 20,427 23,301
Alternative 2: Days of the Week		Data not sufficient/available to produce a projected estimate of expected catch		
Alternative 3: Season Structure	3a. May – July, Sep – Oct 3b. May – July 15, Sep – Oct 3c. May – June, Aug – Sep 3d. May – June, Sep – Oct	1,621 1,369 2,505 1,116	13,607 11,018 16,716 8,429	15,228 12,387 19,221 9,545
Alternative 4: MPA Savings	Effective 2012	3,021	21,561	24,582
Alternative 5: Additional Time/Area Closures	5a. May, Sep – Oct 5b. July, Sep 5c. May – June, Oct	878 516 422	4,321 5,507 5,632	5,199 6,023 6,054
Alternative 6: Separate the S. of Humbug Mt. Subarea at the OR/CA border	6a. Incorporate the Oregon portion of S. of Humbug subarea into the Central OR coast subarea 6b. Create a new southern OR subarea	Expected catch would be dependent on alternatives implemented in conjunction with this alternative		
Alternate 7: Puget Sound Methodology	The number of days the fishery would be open would be reduced from 184 to 32 to keep the expected catch to the 2013 subarea allocation.	Expected catch would be dependent on additional analysis and stakeholder input.		
2013 SOH allocation				6,063
Average 2008-2012 Catch		3,021	22,223	25,224

Additional Background Information

At the July 30, 2013 South of Humbug Mountain Policy Group meeting and webinar, the Policy Group requested the Workgroup provide some additional background information. The additional information is presented in tables below.

Table 10. Average weight (in pounds) of landed Pacific halibut by state and the entire subarea, 2008-2012.

Year	Oregon	California	Entire Subarea
2008	N/A	14.9	14.9
2009	24.0	20.2	20.2
2010	25.5	19.9	20.0
2011	21.1	18.1	19.2
2012	20.3	19.7	19.8
5-year Avg.	20.9	18.9	19.2

Table 11. Oregon number of landed fish per angler trip (top panel) and pounds of landed fish per angler trip by month and trip target type. Data from 2008-2012 combined. In Oregon, "combo" trip types means the angler was targeting salmon plus "something" else.

Fish per Angler Trip

Month	Halibut	Bottomfish	Salmon/Combo
May	0.16	0.13	0.11
June	0.24	0.10	0.04
July	0.36	N/A	0.02
Aug	0.38	0.01	0.09
Sept	0.22	0.04	0.05
Oct	0.15	N/A	0.00
Total	0.30	0.02	0.04

Pounds of Halibut per Angler Trip

Month	Halibut	Bottomfish	Salmon/Combo
May	3.41	1.49	2.26
June	6.10	1.99	0.83
July	7.43	N/A	0.40
Aug	7.85	0.13	1.71
Sept	4.47	1.35	0.93
Oct	2.01	N/A	0.00
Total	6.18	0.65	0.71

Table 12. California number of landed fish per angler trip (top panel) and pounds of landed fish per angler trip by month and trip target type. Data from 2008-2012 combined. In California, "bottomfish" trip types includes: Pacific halibut, federally-managed groundfish, and several other groundfish-related species.

Fish per Angler Trip

Month	Salmon	Bottomfish	Other
May	0.006	0.016	-
June	0.008	0.030	0.013
July	0.004	0.028	0.043
August	0.015	0.046	0.570
September	0.012	0.064	0.025
October	N/A	0.017	N/A
Total	0.005	0.023	0.023

Pounds of Halibut per Angler Trip

Month	Salmon	Bottomfish	Other
May	0.097	0.277	-
June	0.158	0.571	0.240
July	0.075	0.570	0.881
August	0.268	0.832	10.357
September	0.214	1.121	0.437
October	N/A	0.199	N/A
Total	0.103	0.428	0.427

Table 13. Average number of angler trips by month and trip target type for Oregon, 2008-2012. In Oregon, "combo" trip types means the angler was targeting salmon plus "something" else.

Month	Halibut	Bottomfish	Salmon/Combo
May	57	3	22
June	17	31	51
July	60	0	201
Aug	148	259	219
Sept	82	5	52
Oct	5	0	297
Total	369	299	842

Table 14. Average number of angler trips by month and trip target type for California, Mendocino and Humboldt management areas only, 2008-2012. In California, "bottomfish" trip types includes: Pacific halibut, federally-managed groundfish, and several other groundfish-related species.

Month	Salmon	Bottomfish	Other
May	1,487	1,819	8
June	2,404	3,659	182
July	2,971	5,677	349
August	2,375	5,140	4
September	856	1,497	43
October	-	448	-
Total	10,093	18,240	585

PFMC
08/14/13

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE REPORT ON PROPOSED CHANGES TO THE 2014 PACIFIC HALIBUT CATCH SHARING PLAN

The California Department of Fish and Wildlife (CDFW) proposes the following amendments be included among the range of alternatives provided for public review for the 2014 Catch Sharing Plan (CSP). Text excerpts below are from the 2013 CSP, and proposed amendments are shown in strikeout/underline.

PACIFIC HALIBUT CATCH SHARING PLAN FOR AREA 2A

(a) FRAMEWORK

This Plan constitutes a framework that shall be applied to the annual Area 2A total allowable catch (TAC) approved by the International Pacific Halibut Commission (IPHC) each January. The framework shall be implemented in both IPHC regulations and domestic regulations (implemented by NMFS) as published in the *Federal Register*.

(b) ALLOCATIONS

This Plan allocates 35 percent of the Area 2A TAC to U.S. treaty Indian tribes in the State of Washington in subarea 2A-1, and 65 percent to non-Indian fisheries in Area 2A. The allocation to non-Indian fisheries is divided into four shares, with the Washington sport fishery (north of the Columbia River) receiving 36.6 percent, the Oregon~~/California~~ sport fishery receiving 30.7 percent, the California sport fishery receiving [a value from within the range of 1.4 – 2.1] percent, and the commercial fishery receiving 31.7 percent. Allocations within the non-Indian commercial and sport fisheries are described in sections (e) and (f) of this Plan. These allocations may be changed if new information becomes available that indicates a change is necessary and/or the Pacific Fishery Management Council takes action to reconsider its allocation recommendations. Such changes will be made after appropriate rulemaking is completed and published in the *Federal Register*.

CDFW Comments: Establishing a stand-alone California sport allocation in the CSP is consistent with the South of Humbug Policy Committee (SOHPC) recommendation #4 - to add a management line in the CSP at the Oregon/California border, and create a separate California subarea with its own CSP allocation. Consistent with SOHPC recommendation #1, CDFW proposes the 2014 California sport allocation be established as a percentage from within the range of 1.4 to 2.1 percent, which, using the 2013 Area 2A TAC of 990,000 pounds as the benchmark, would equate to a harvest target of 8,900-13,300 pounds. This target reflects the SOHPC's recommendation that the Council reduce recreational catch in California by 40 to 60 percent of the average harvest over the past five years (22,223 pounds).

In the 2013 CSP, Subdivision (f)(vi) provides that the South of Humbug Mountain subarea is allocated 3.0 percent of the Oregon/California Sport subquota, or 0.951 percent of the non-

Indian allocation. California proposes this 0.951 percent be rounded up to 1 percent and reassigned to the new California sport allocation, i.e., contributing 1 percent to the proposed California sport allocation that would be established from within a range of 1.4 to 2.1 percent. This reassignment would result in a proposed Oregon sport allocation of (31.7- 1) 30.7 percent.

(c) SUBQUOTAS

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(d) TREATY INDIAN FISHERIES

****

(e) NON-INDIAN COMMERCIAL FISHERIES

****

(f) SPORT FISHERIES

The non-Indian sport fisheries are allocated 68.3 percent of the non-Indian share, which is approximately 44.4 percent of the Area 2A TAC. The allocation is further divided as subquotas among six geographic subareas.

(1) Subarea management. The sport fishery is divided into six sport fishery subareas, each having separate allocations and management measures as follows.

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(iv) Columbia River subarea.

This sport fishery subarea is allocated 2.0 percent of the first 130,845 lb (59.4 mt) allocated to the Washington sport fishery, and 4.0 percent of the Washington sport allocation between 130,845 lb (59.4 mt) and 224,110 lb (101.7 mt) (except as provided in section (e)(3) of this Plan). This subarea is also allocated an amount equal to the contribution from the Washington sport allocation from the Oregon~~/California~~ sport allocation

****

(v) Oregon central coast subarea.

This subarea extends from Cape Falcon (45°46.00' N. lat.) to Humbug Mountain, Oregon (42°40.50' N. lat.) and is allocated 92.0 percent of the Oregon~~/California~~ sport allocation minus any amount of pounds needed to contribute to the Oregon portion of the Columbia River subarea quota.

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(vi) California subarea.
This sport fishery subarea is allocated [1.4 – 2.1] percent of the non-Indian subquota, which is approximately [TBD] percent of the Area 2A TAC. This area is defined as the area south of the California/Oregon border (42° N. lat.), and includes all California waters. The structuring objective for this subarea is to provide anglers the opportunity to fish in a, fixed season that is open from May 1 through [July 15 or July 31] and [September 1 through] October 31. [Additionally, the retention of salmon on a trip where Pacific halibut are retained is prohibited.] OR [Additionally, the days of the week open to fishing during the open season are (Tuesday), Wednesday, Thursday, Friday and Saturday.] The daily bag limit is one halibut per person, with no size limit. Due to inability to monitor the catch in this area inseason, a fixed season will be established preseason by NMFS based on projected 2014 seasonal catch. No inseason adjustments will be made, and estimates of actual catch will be made post season.

CDFW Comments: The range of alternatives for California subarea management measures proposed above corresponds to restricted season date Alternatives 3A and 3B from the SOH Workgroup Report (Agenda Item D.2.b), and Alternatives 1b and 2. Applied individually, Alternative 3A is projected to result in estimated catch of 13,607 pounds for the subarea, while Alternative 3B is projected to result in estimated catch of 11,018 pounds. Alternative 3A and 3B would be used singly or in combination with Alternative 1B or Alternative 2, as shown above. Alternative 1B, preventing mixed trips for halibut and salmon, is projected by the Workgroup to result in 18 percent catch savings for California. Alternative 2, closing days of the week including one weekend day, would generate additional savings, and CDFW proposes consideration of an alternative which would close fishing on Sunday, Monday (and Tuesday) during the open season (i.e., reduce the number of open days to four or five days per week). California also expects projected catches, generated from an average of catches during 2008-2012, will be further reduced by approximately 2.98 percent, in response to the implementation of new Marine protected areas along California's north coast late in 2012 (described in Alternative 4 of the SOH Workgroup Report). CDFW proposes consideration of Alternative 3A or 3B individually; 3A plus 1B or 2, or 3B plus 1B or 2; all of which fall within the SOHPC-recommended catch reduction of 40 to 60 percent off California in 2014.

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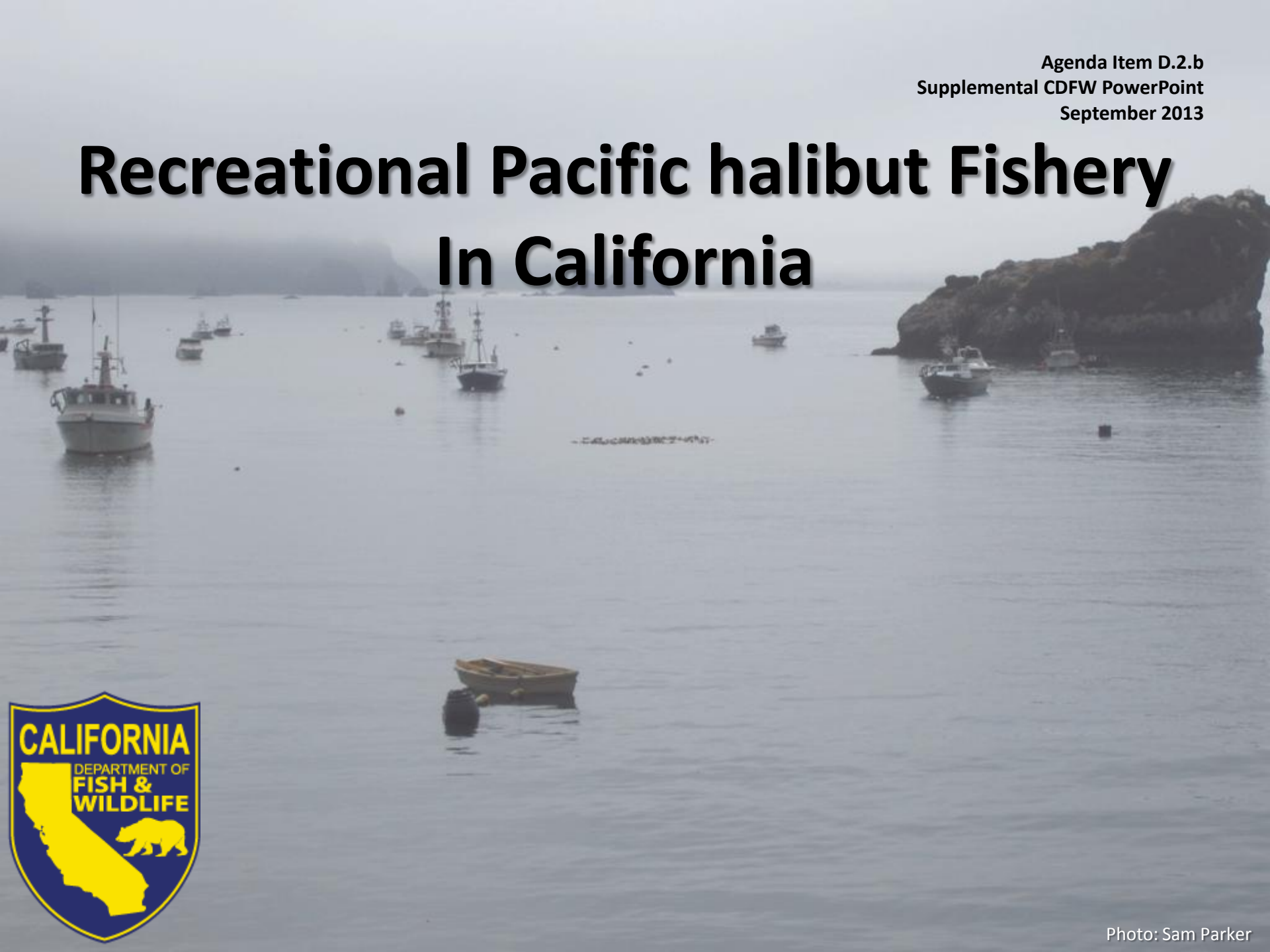
PFMC
09/12/13

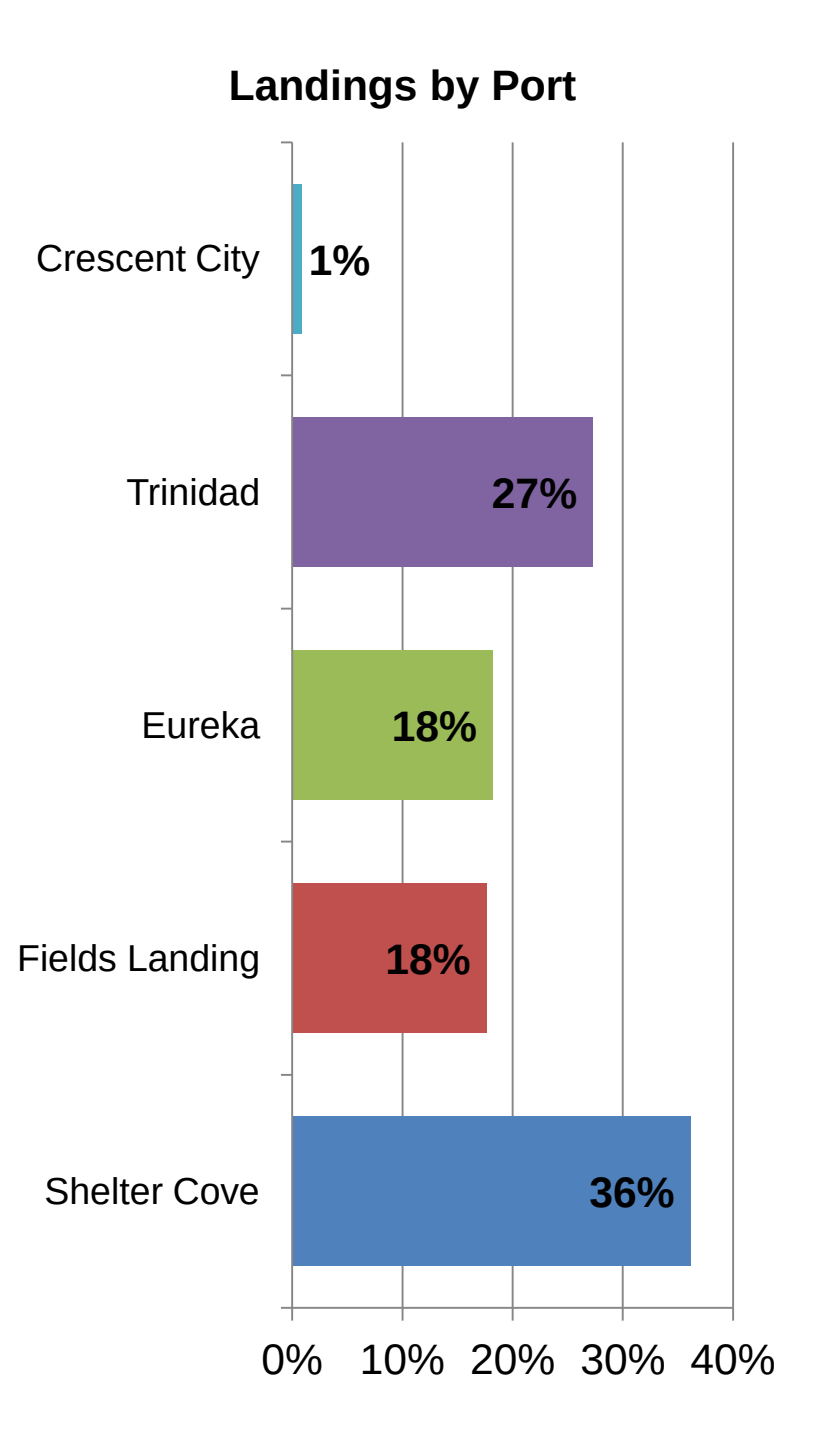
Agenda Item D.2.b
Supplemental CDFW PowerPoint
September 2013

Recreational Pacific halibut Fishery In California



CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

Photo: Sam Parker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Eureka
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Fields Landing
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Shelter Cove
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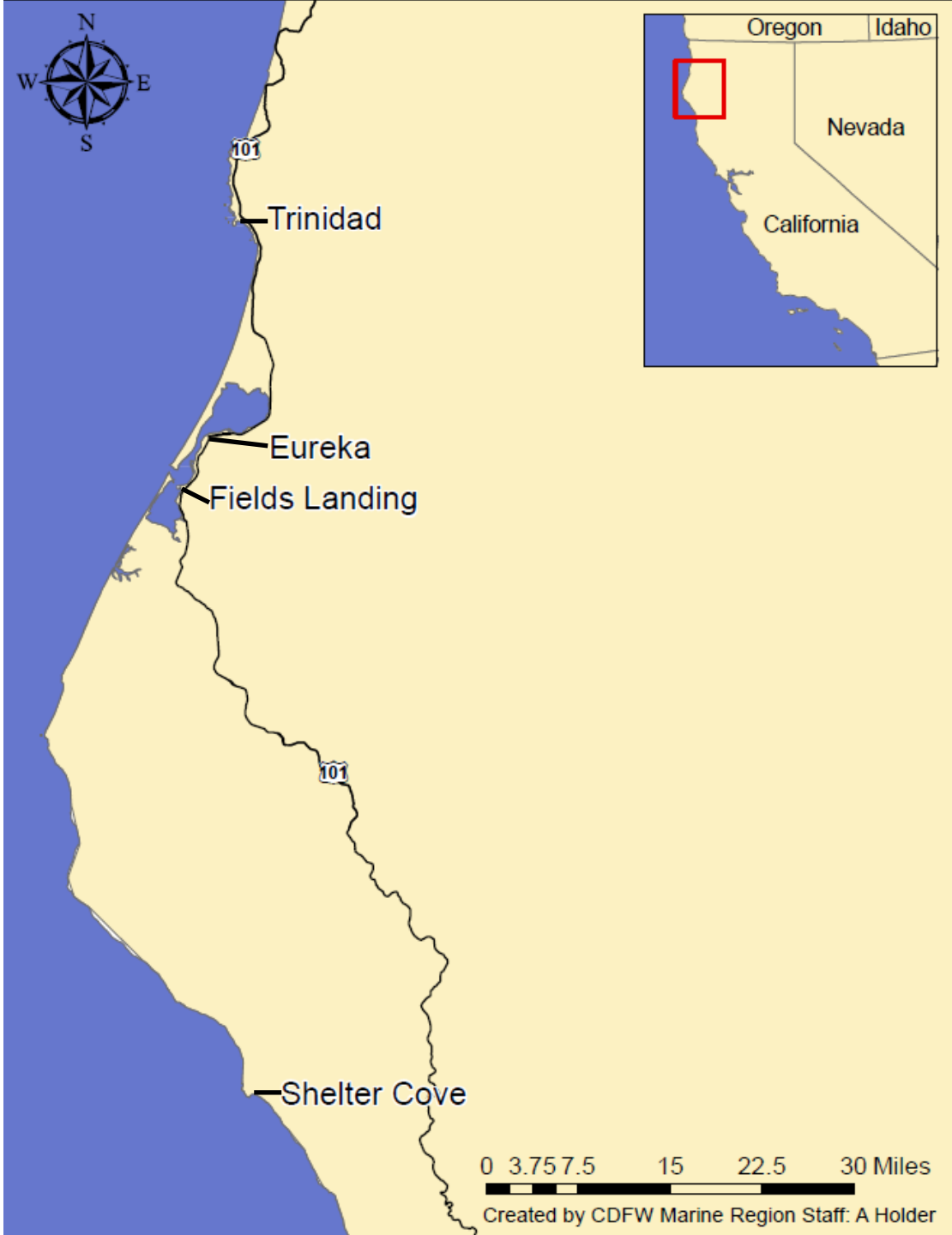
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0 3.75 7.5 15 22.5 30 Miles
Created by CDFW Marine Region Staff: A Holder

Availability of Launching Facilities in Shelter Cove

Photo: Courtney Embry

Availability of Launching Facilities in Shelter Cove

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AUGUST						

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Photo: Courtney Embry

Availability of Launching Facilities in Trinidad Harbor

Photo: Sam Parker

Availability of Launching Facilities in Trinidad Harbor

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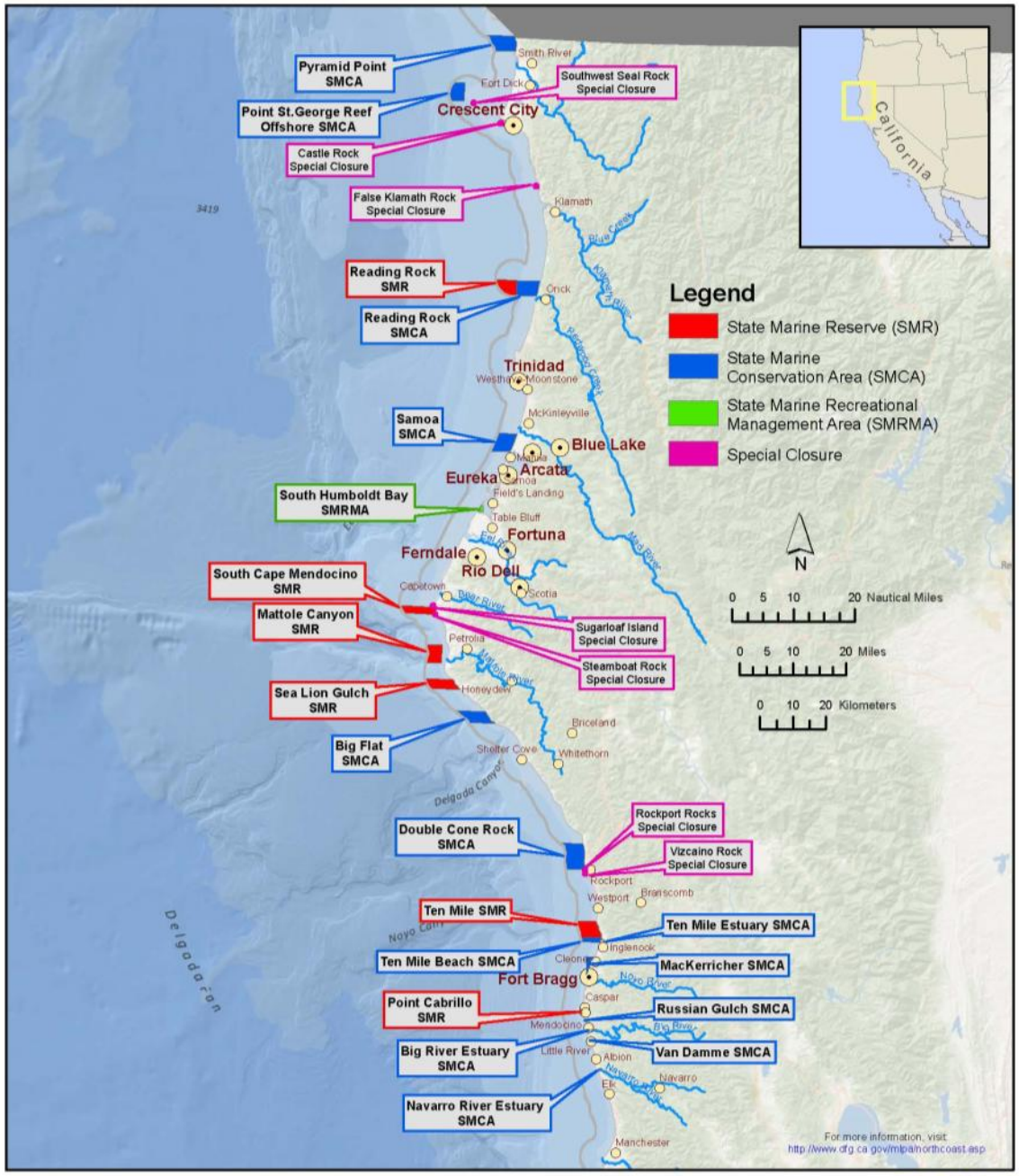
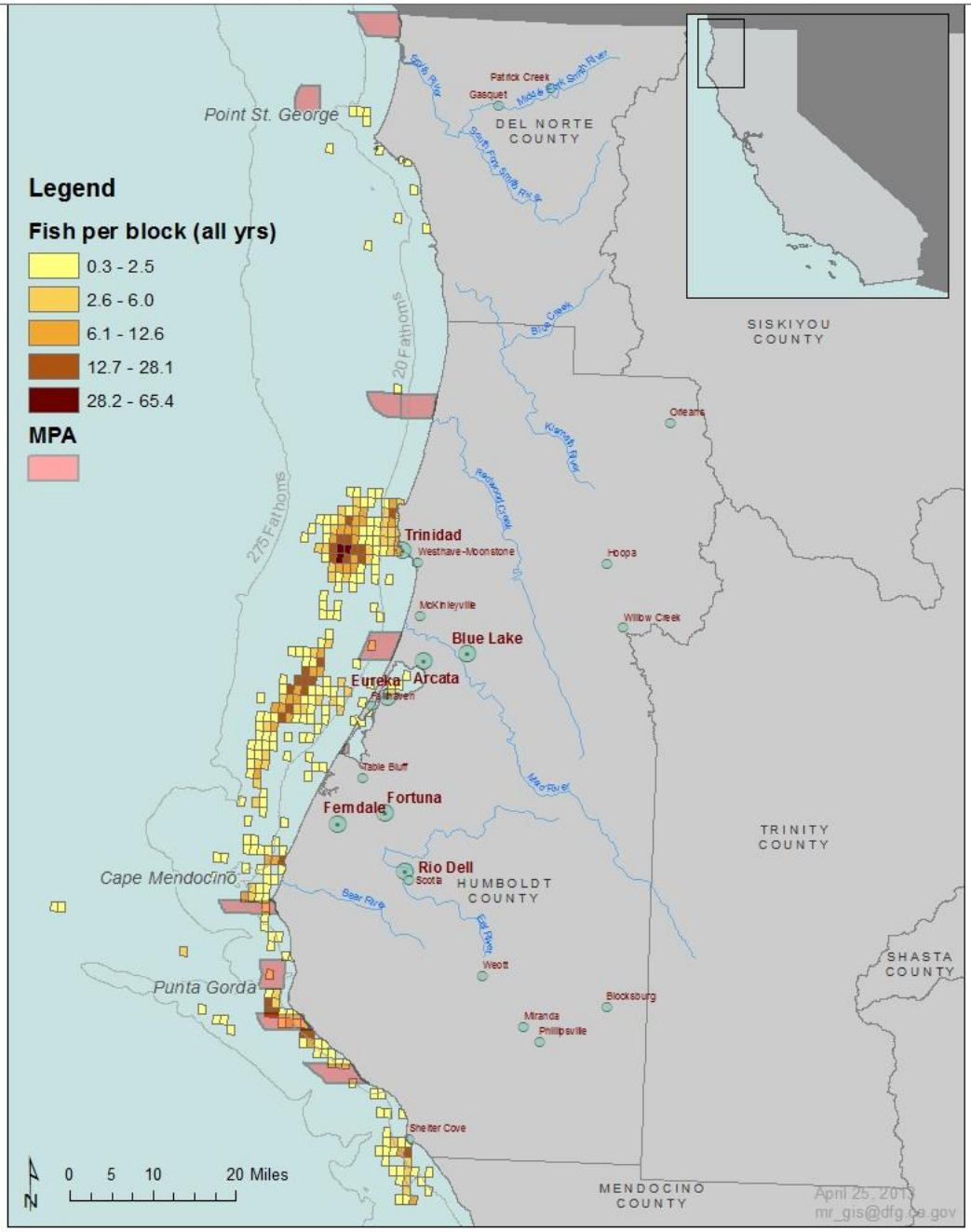
Photo: Sam Parker



Created by CDFG Marine Region GIS - June 13, 2012 - mr_gis@dfg.ca.gov

CRFS Type 2 & 3 Sample Catch Data for Pacific Halibut from 2004 to 2011



Agenda Item D.2.b
Supplemental EC Report
September 2013

ENFORCEMENT CONSULTANTS REPORT ON 2014 PACIFIC HALIBUT REGULATIONS

The Enforcement Consultants (EC) has reviewed Agenda Item D.2.b and provides comment on proposals submitted in both the Oregon Department of Fish and Wildlife (ODFW) and Washington Department of Fish and Wildlife (WDFW) reports.

ODFW Report: The Central Coast Subarea "Depth Restriction" Alternative 2 proposes moving the nearshore recreational halibut fishery restriction to the 30 fathom line from the current 40 fathom line. Part of the rationale for this change is to extend the length of the nearshore season. Under current regulations that are in effect during a halibut nearshore fishery, groundfish retention is also allowed, but only inside of 30 fathoms. Normally, the EC would support the condensing of multiple fathom line restrictions; however, in this case the EC is making a status quo recommendation. The heaviest angling pressure for halibut in the Central Coast Subarea occurs out of Newport, Oregon. Much of the halibut effort out of Newport occurs beyond 30 fathoms; however few anglers approach the 40 fathom limit. We believe that a 30 fathom restriction will result in anglers pushing beyond the deadline (30 fathom line) and, ultimately, increased calls for service and enforcement actions.

WDFW Report: Proposal two for the Columbia River Subarea, which extends from Leadbetter, Washington to Cape Falcon, Oregon, recommends the creation of a nearshore fishery shoreward of 30 fathoms. The nearshore fishery for the area south of Cape Falcon currently has a 40 fathom restriction while the nearshore fishery north of Leadbetter, Washington has a 30 fathom restriction. To maintain consistency with each states current regulations, the EC proposes that if a nearshore fishery is adopted in the Columbia Subarea that the fathom restriction be 30 fathoms from Leadbetter, Washington to the Oregon/Washington state line and 40 fathoms from the state line south to Cape Falcon. This will likely reduce confusion for anglers that are used to fishing Oregon or Washington waters and ease the increased workload burden placed upon enforcement.

PFMC
09/12/13

GROUNDFISH ADVISORY SUBPANEL REPORT ON THE 2014 PACIFIC HALIBUT REGULATIONS

The Groundfish Advisory Subpanel (GAP) heard a presentation from Ms. Heather Reed, Ms. Lynn Mattes and Ms. Marci Yaremko on proposed 2014 halibut regulations.

In general, the GAP agrees with sending out for public review the options listed in the attachments from the respective states and workgroup under this agenda item with one modification and one additional option.

For modification: The GAP suggests the proposed Columbia River Subarea season changes in the Washington Report (Agenda Item D.2.b, WDFW report) be clarified to reflect that the regulations would include both the Washington and Oregon portions of the Subarea and is supported by the state of Oregon. The change to fishing shoreward of 30 fathoms (instead of the current 40 fathoms) would match up with Washington regulations and may also extend the season.

Additional proposal: In California, the GAP recommends the Council consider an option for analysis that would include "days of the week" besides the option for monthly block closures in mid-summer that keep the spring and fall months open. This option would potentially lessen the socio-economic impact to the smaller ports such as Shelter Cove and Trinidad that do not have an option for a fall halibut fishery.

The GAP is concerned the Council is once again in the difficult position of making management control decisions without the benefit of scientific data that will not be available from the IPHC until a month after the final decision is made in November.

PFMC
09/11/13

INTERNATIONAL PACIFIC HALIBUT COMMISSION

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September 6, 2013

Ms. Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 N.E. Ambassador Place, Suite 101
Portland, OR 97220-7204

Dear Chair Lowman:

In light of several halibut issues on the upcoming Council meeting agenda, including the Halibut Catch Sharing Plan and the South of Humbug Policy Group report, the IPHC staff would like to provide comment with regard to the 2013 IPHC summer assessment survey conducted off the west coast, including northern California.

We have recently read several comments which conclude that the 2013 survey results will have no bearing on decisions regarding the 2014 fishery. This is incorrect. In fact, the 2013 survey results will be part of the data set used in our assessment to estimate the coastwide exploitable biomass, and also to apportion the biomass among regulatory areas, including Area 2A. While we are unable to make the survey results public until we present the results of the staff's assessment to the Commission in early December, the current year's survey data have always been used for the subsequent year's fishery decisions.

Ms. Heather Gilroy of the IPHC staff will be attending the September meeting of the Council, and will be able to elaborate on this or other issues at the Council's pleasure.

Sincerely yours,

Bruce M. Leaman
Executive Director

cc: IPHC Commissioners

South of Humbug Mountain Workgroup and Policy Group Summary

Alternatives Analyzed

- Alternative 1. Prohibit retention of Pacific halibut on:
  - a. Both salmon and groundfish trips
  - b. Salmon trips
  - c. Groundfish trips
- Alternative 2. Restrict the days of the week; include at least one weekend day

Alternatives Analyzed

- Alternative 3. Restrict season dates including the following scenarios
  a. open May through July and September through October
  b. open May through July 15 and September through October
  c. open May through June and August through September
  d. open May through June and September through October

Alternatives Analyzed

- Alternative 4. Evaluate and if possible, quantify the catch reductions resulting from new MPAs off the north coast of California that were effective in 2012

- Alternative 5. Examine the potential for harvest reduction of other time and area closures off California

Alternatives Analyzed

- Alternative 6. Separate the South of Humbug Subarea at the OR/CA Border
  a. Incorporate the Oregon Portion of the South of Humbug Subarea into the Central Oregon Coast Subarea
  b. Create a new Southern Oregon Subarea

- Alternative 7. Additional Analysis
  a. Season length based on expected catch per day (Puget Sound Methodology)

Average Annual Recreational Landings

Year	SOH Allocation	SOH Landings (net pounds)		
		Oregon	California	Total
2008	7,541	-	13,303	13,303
2009	5,872	48	34,847	34,895
2010	5,007	280	23,936	24,216
2011	5,625	9,648	13,637	23,285
2012	6,056	5,130	25,394	30,524
Average	**6,020**	**3,021**	**22,223**	**25,244**

Table 1, Page 6

Alternative 1.

Alternatives	Percent Reduction	Predicted Catch Amount (net pounds)		
		Oregon	California	Entire Subarea
1a. No salmon and groundfish	27%	2,297	16,187	18,484
1b. No salmon	19%	2,439	17,988	20,427
1c. No groundfish	8%	2,878	20,423	23,301

Table 3, Page 10

Alternative 2.

- Analysis was attempted
- Neither state produces catch or effort estimates on daily basis
- Results highly uncertain, therefore not presented
- In general, results indicated that catch is slightly higher at the end of the week and on Saturdays
- Other areas have seen effort shifts and “derby” mentality with changes in open days of the week

Alternative 3.

Month	Alt. 3a. May-July & Sept-Oct	Alt. 3b. May-15 July & Sept-Oct	Alt. 3c. May-June & Aug-Sept	Alt. 3d. May-June & Sept-Oct
May	1,367	1,367	1,367	1,367
June	4,347	4,347	4,347	4,347
July	5,683	2,841		
Aug			10,016	
Sept	3,492	3,492	3,492	3,492
Oct	340	340		340
Total	15,228	12,387	19,221	9,545

Table 5, Page 16

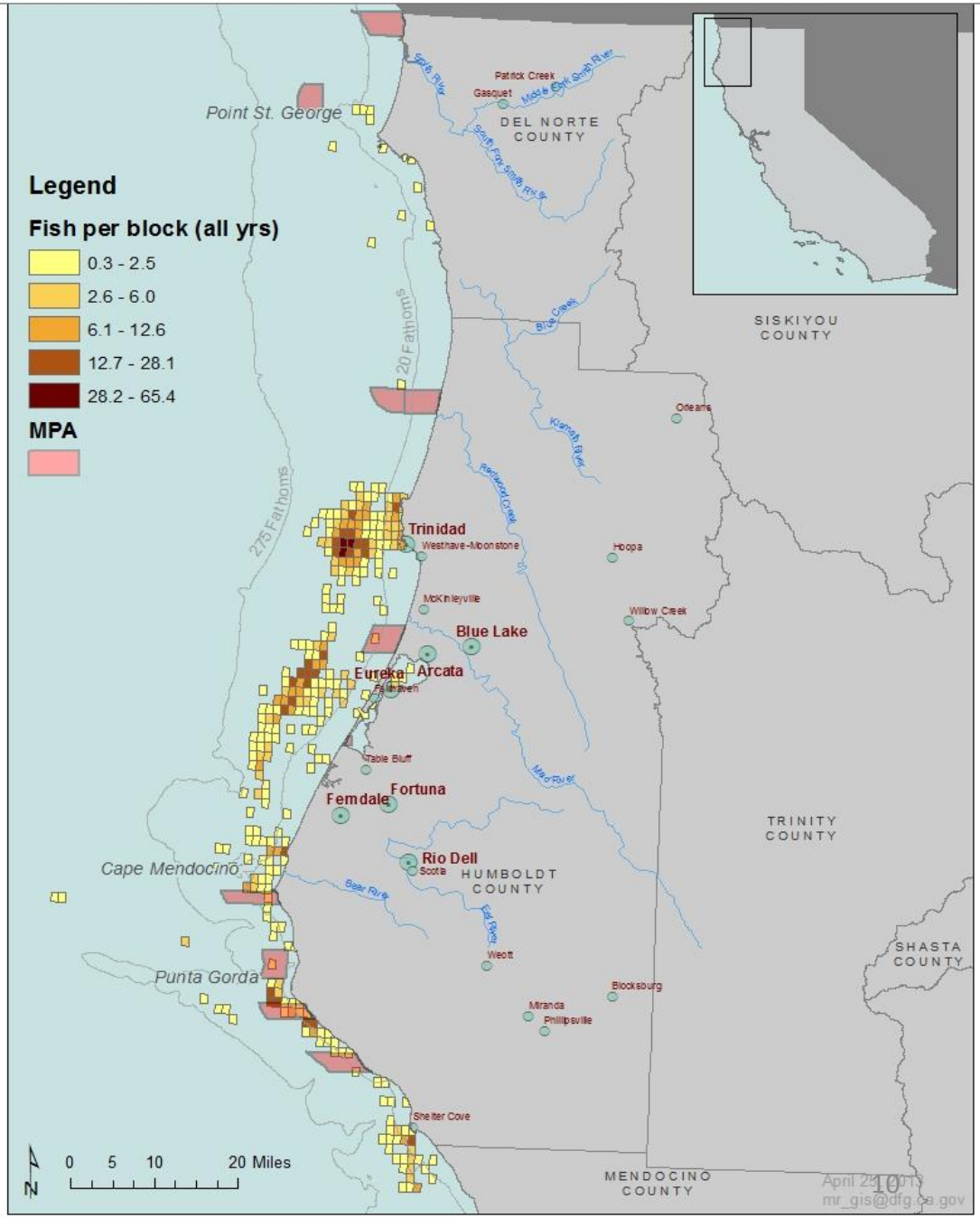
Alternative 4.

Avg. California Catch (net lbs.)	Reductions from MPAs	Expected Catch (net lbs.)
22,223	2.98%	21,561

Table 6, Page 18

Figure 3, Page 19

CRFS Type 2 & 3 Sample Catch Data for Pacific Halibut from 2004 to 2011



Alternative 5.

Month	Alt. 5a. May & Sept-Oct	Alt. 5b. July & Oct	Alt. 5c. May-June & Oct
May	1,367		1,367
June			4,347
July		5,683	
Aug			
Sept	3,492		
Oct	340	340	340
Total	**5,199**	**6,023**	**6,054**

Table 7, Page 21


Alternative 6a.
N
Leadbetter Point
Columbia River Subarea
Cape Falcon
Central Oregon Coast Subarea
New California Subarea
OR/CA Border
Westport
Astoria
Garibaldi
Portland
Salem
Newport
Coos Bay
Medford
Brookings
Crescent City
Eureka
Washing
Oregon
California
Gorda Ridges
0 5 10 20 30 40
Miles


Alternative 6b.
N
Leadbetter Point
Columbia River Subarea
Cape Falcon
Humbug Mountain
New Southern Oregon Subarea
Central Oregon Coast Subarea
New California Subarea
OR/CA Border
Westport
Astoria
Garibaldi
Portland
Salem
Newport
Coos Bay
Medford
Brookings
Crescent City
Eureka
Washin
Oregon
California
Gorda Ridges
0 5 10 20 30 40
Miles

Alternative 7.

Percent Change to Sub-quota	Quota Amount (net pounds)	Days Available to Fishing	
		Entire Subarea	CA Only
+25%	7,579	40	40
+20%	7,276	38	38
+10%	6,669	35	35
+5%	6,366	34	34
Status Quo	6,063	32	32
-5%	6,033	32	32
-10%	5,457	29	29
-15%	5,154	27	27
-20%	4,850	26	26
-25%	4,547	24	24

Table 8, Page 27

Workgroup Conclusions

1. Did not attempt to incorporate or estimate potential changes in angler behavior
2. Expected catch could be reduced by up to 27% if halibut retention prohibited on salmon and bottomfish trips
3. Expected catch could be reduced more when the number of months that the season is open is reduced (Alternatives 3 and 5)
    a. Significantly shorter seasons than currently available would be necessary

Workgroup Conclusions

5. Alternative 6 would allow Oregon and California to develop different management approaches for their respective subareas
6. Alternative 7 shows that the season would need to be reduced from 184 days to 32 days to keep catch to recent allocation
7. Did not analyze combining alternatives, but the Council could mix and match

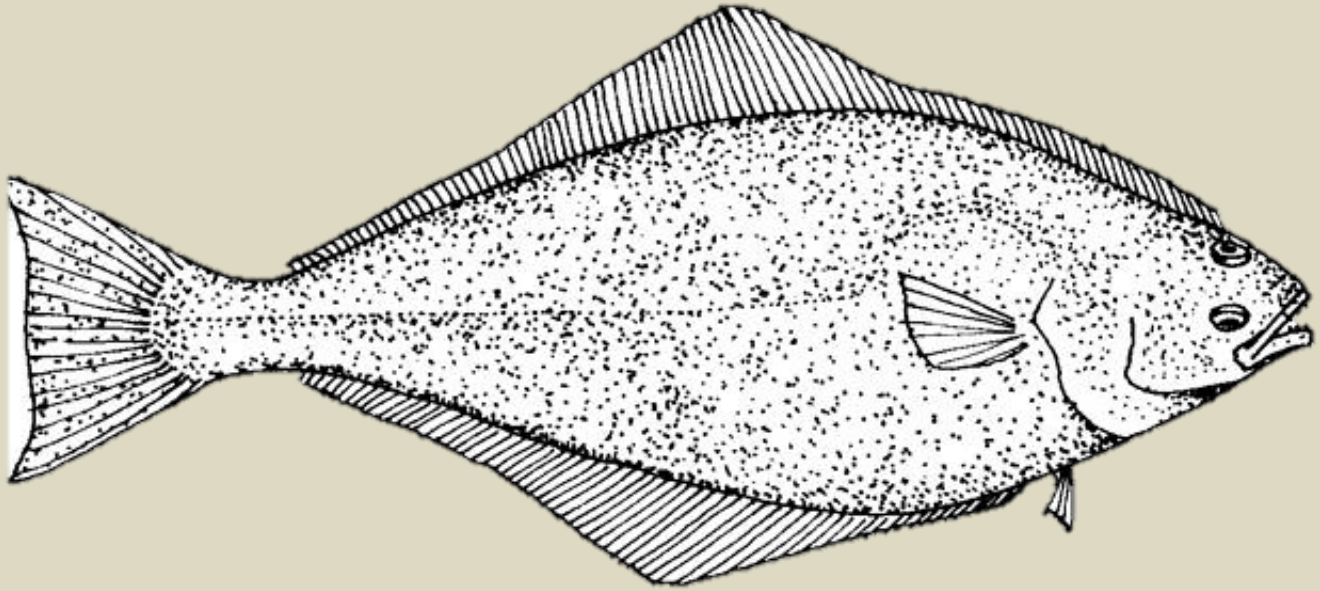
Policy Group Conclusions

1. For 2014, reduce recreational catch in California by 40-60 % of the 5-year average
2. Take into consideration the uncertainty in the workgroup projections when developing season structure
3. Recommends an adaptive management approach to evaluate and adjust management measures annually
4. Recommends Alternative 6, separate at the OR/CA border

Policy Group Conclusions

5. Defer to ODFW to recommend the preferred approach for the Oregon (Alternatives 6a vs. 6b) portion of the subarea
6. Recommends a fixed season for the California subarea be established with no expectation for inseason decisions
7. Recommends Council consider alternatives that would restrict the months available in California, based on historical landings
8. Recommends the retention prohibitions also be included as an available management measure

Questions?



Alternatives		Expected Catch		
		Oregon	California	Entire Subarea
Alternative 1: Prohibit Retention of Salmon or Groundfish	• 1a. Prohibit salmon and groundfish • 1b. Prohibit salmon • 1c. Prohibit groundfish	2,297 2,439 2,878	16,187 17,988 20,423	18,484 20,427 23,301
Alternative 2: Days of the Week	Insufficient Data for Analysis			
Alternative 3: Season Structure	• 3a. Closed Aug • 3b. Closed 15 July-Aug • 3c. Closed July & Oct • 3d. Closed July & Aug	1,621 1,369 2,505 1,116	13,607 11,018 16,716 8,429	15,228 12,387 19,221 9,545
Alternative 4: MPA Savings	Effective 2012	3,021	21,561	24,582
Alternative 5: Additional Time/Area Closures	• 5a. Closed June-Aug • 5b. Open July & Oct • 5c. Closed July-Sep	878 516 422	4,321 5,507 5,632	5,199 6,023 6,054
Alternative 6:	Split SOH area at the OR/CA border			
Puget Sound Methodology	Reduce days open from 184 to 24-40			
2013 SOH allocation				**6,063**
Average 2008-2012 Catch		3,021	22,223	25,224

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE REPORT ON 2014 PACIFIC HALIBUT REGULATIONS

WDFW recommends the following modifications to Agenda Item D.2.b WDFW Report on proposed changes to the Pacific Halibut Catch Sharing Plan for the Columbia River Subarea be considered for public review.

3. Revise the bottomfish restrictions in this subarea such that lingcod retention would be allowed when halibut are onboard.

a. Allow lingcod retention when halibut are on board on Thursday s through Sundays from the first Thursday in May until the first Thursday in August or, until 80 percent of the subarea allocation is taken whichever occurs first, in the area seaward of 30 fathoms.

b. Allow lingcod retention when halibut are on board seven days per week in the area shoreward of 30 fathoms.

c. Allow lingcod retention throughout the entire halibut season.

PFMC
09/12/13

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE REPORT ON PROPOSED CHANGES TO THE CATCH SHARING PLAN AND 2014 ANNUAL REGULATIONS

The Washington Department of Fish and Wildlife (WDFW) held a recreational halibut meeting to discuss proposed changes to the Pacific Fishery Management Council's Catch Sharing Plan (CSP) for 2013, in Montesano, on July 24, 2013. Stakeholders representing Washington's three coastal halibut management areas attended the meeting and provided their input on potential changes to the CSP.

Stakeholders from the North Coast which includes La Push and Neah Bay, (Marine Catch Areas (MCA) 3 and 4) were interested in an option that would reduce the days of the week that the fishery is open from two days per week, Thursday and Saturday, to one day per week, Saturday. The proposal would retain the two day per week structure for the first week, (Thu, Sat) and would shift to one day per week, (Sat) after that. There was no consensus on this proposal but WDFW is recommending the proposal be adopted for public review in order to solicit additional input.

In addition to the proposals recommended by stakeholders, WDFW is proposing changes to the North Coast CSP language to clarify the quota management closure and remove the provision allowing a nearshore fishery.

Stakeholders from the Washington portion of the Columbia River subarea which includes Ilwaco and Chinook, (MCA 1) offered proposals designed to; better achieve the quota by increasing the days of the week the fishery is open, allow incidental halibut retention in the area shoreward of 30 fathoms, and allow lingcod retention when halibut is on board. The proposal to increase the number of days per week that the fishery is open would revise the current three days per week, Friday through Sunday, to four days per week, Thursday through Sunday. Stakeholders also proposed that a set aside of 1,500 pounds or 10% of the subarea quota, whichever is less, be reserved to allow for incidental halibut retention while bottomfishing in the area shoreward of 30 fathoms. Another proposal for this area would allow lingcod retention when halibut are on board. Two options are being proposed relative to lingcod retention; 1) allow lingcod retention during the entire halibut season and, 2) allow lingcod retention only during the early season.

Stakeholders from the South Coast management subarea which includes Westport, (MCA2) had no proposed changes to the CSP.

WDFW supports the following options for changes to the 2014 Pacific Halibut Catch Sharing Plan CSP for Area 2A, section (f) SPORT FISHERIES, be approved for public review, in addition to the status quo alternative.

WDFW Proposed CSP Changes for the North Coast Subarea

1. Revise the CSP language to more clearly describe the management closure and remove the provision for a nearshore fishery when there is not enough quota for another off-shore fishing day.

Rationale: A management closure during the third week following the season opening has been used for several years. The closure provides WDFW time to tally the early season catch against the quota and provide sufficient notice to stakeholders regarding additional fishing days. The closure also has the potential to increase the chances that the fishery will extend into June provided there is sufficient quota. The provision to allow a nearshore fishery has not been used for several years due to increased impacts to yelloweye rockfish that occur when the halibut fishery is directed to the nearshore area. Clarifying the language regarding the closure and removing the nearshore fishery language from the CSP plan would better match the intent of the management approach for this subarea. These changes have also been incorporated into the proposed North Coast Subarea Season Changes.

North Coast Subarea Season Changes

1. Revise the days of the week that the fishery is open so that the fishery is open on Saturdays only after the first week of fishing which maintains the status quo days per week of Thursday and Saturday are open.

   Rationale: Changing the season structure to one day per week (Sat) after an opening week with status quo days per week (Sat and Thu) is intended to spread the fishery out over a longer time period.

Columbia River Subarea Season Changes

1. Revise the days of the week that the season is open from Friday through Sunday to Thursday through Sunday. Changing the days of the week that the fishery is open would also require changing the early season opening date from the first Friday in May to the first Thursday in May and the late season opening date from the first Friday in August to the first Thursday in August.

   Rationale: This change would allow for more fishing opportunity in an area where the total season catch has been below the set aside.

2. Revise the subarea allocation such that 1,500 pounds or 10% of the subarea allocation, whichever is less, is set aside for a nearshore fishery in the area shoreward of 30 fathoms with the remaining allocation divided such that 80 percent is reserved for the early season and 20 percent is reserved for the late season.

   Rationale: This change would allow for halibut that are currently being caught incidentally while anglers are targeting bottomfish in the nearshore area shallower than 30 fathoms to be retained. Halibut fishing effort in this area has been low in recent years and reserving some of the subarea allocation for incidental catch should not reduce the number of fishing days available to the early and late seasons. Allowing incidental

halibut retention in the nearshore area will convert discarded fish into retained fish and improve the recreational fishing experience in this area.

3. Revise the bottomfish restrictions in this subarea such that lingcod retention would be allowed when halibut are onboard.

    a. Allow lingcod retention throughout the entire halibut season
    b. Allow lingcod retention only during the early season

    Rationale: This change would allow lingcod to be retained when halibut are onboard. Currently lingcod that are caught when halibut are onboard are discarded. This option would improve the halibut fishing experience in an area where recreational halibut effort has been low. Option 3a would allow lingcod retention when halibut are on board during the entire halibut season. Option 3b would allow lingcod retention only during the early season.

Considered but Rejected

A proposal for the North Coast subarea was to reserve a portion of the subarea quota for incidental halibut retention seven days per week in the area shoreward of 20 fathoms. Enforcement of an incidental fishery restricted to the area shoreward of 20 fathoms would require significant on the water enforcement presence and monitoring the halibut quota on a seven day a week basis for an extended period of time would be difficult for WDFW's sampling program, particularly if the halibut season overlaps with the salmon season. The CSP currently allows the season to reopen in the area shallower than 30 fathoms when there is not enough quota remaining for another off shore day, however, this provision has not been used in recent years due to high encounters with yelloweye rockfish during this fishery. Due to concerns with increased yelloweye rockfish encounters this proposal is not being recommended for public review and WDFW proposes to remove the 30 fathom neashore option from the North Coast CSP language.

Catch Sharing Plan Language

(f) SPORT FISHERIES

The non-Indian sport fisheries are allocated 68.3 percent of the non-Indian share, which is approximately 44.4 percent of the Area 2A TAC. The allocation is further divided as subquotas among six geographic subareas.

(1) Subarea management. The sport fishery is divided into six sport fishery subareas, each having separate allocations and management measures as follows.

(ii) Washington north coast subarea.

WDFW Proposed CSP Changes for the North Coast Subarea:
This sport fishery subarea is allocated 62.2 percent of the first 130,845 lb (59.4 mt) allocated to the Washington sport fishery, and 32 percent of the Washington sport allocation between 130,845 lb (59.4 mt) and 224,110 lb (101.7 mt) (except as provided in section (e)(3) of this Plan). This subarea is defined as all U.S. waters west of the mouth of the Sekiu River, as defined above in paragraph (f)(1)(i), and north of the Queets River (47°31.70' N. lat.). The management objective for this subarea is to provide a quality recreational fishing opportunity during May and June. The fishery will open on the first Thursday between May 9 and 15, and continue 2 days per week (Thursday and Saturday) in May for two weeks, with ~~as scheduled pre-season, unless there is~~ a quota management closure scheduled for the third week. ~~If there is no quota management closure in May,~~ If sufficient quota remains, the fishery will reopen on the ~~first~~ following Thursday or Saturday.~~in June as an all depth fishery on Thursdays and Saturdays as long as sufficient quota remains.~~ This schedule allows adequate public notice of any inseason action before each ~~Thursday~~ opening. ~~If there is not sufficient quota for an all-depth day, the fishery would reopen in the nearshore areas described below:~~

~~WDFW Marine Catch Area 4B, which is all waters west of the Sekiu River mouth, as defined by a line extending from 48°17.30' N. lat., 124°23.70' W. long. north to 48°24.10' N. lat., 124°23.70' W. long., to the Bonilla-Tatoosh line, as defined by a line connecting the light on Tatoosh Island, WA, with the light on Bonilla Point on Vancouver Island, British Columbia (at 48°35.73' N. lat., 124°43.00' W. long.) south of the International Boundary between the U.S. and Canada (at 48°29.62' N. lat., 124°43.55' W. long.), and north of the point where that line intersects with the boundary of the U.S. territorial sea.~~

~~Shoreward of the recreational halibut 30-fm boundary line, a modified line approximating the 30 fm depth contour from the Bonilla-Tatoosh line south to the Queets River. Coordinates for the closed area will be specifically defined annually in federal halibut regulations published in the *Federal Register*.~~

No sport fishing for halibut is allowed after September 30. If the fishery is closed prior to September 30, and there is insufficient quota remaining to reopen ~~the nearshore areas~~ for another fishing day, then any remaining quota may be transferred inseason to another

Washington coastal subarea by NMFS via an update to the recreational halibut hotline. The daily bag limit in all fisheries is one halibut per person with no size limit.

Recreational fishing for groundfish and halibut is prohibited within the North Coast Recreational Yelloweye Rockfish Conservation Area (YRCA). The North Coast Recreational YRCA is a C-shaped area off the northern Washington coast and is defined by straight lines connecting latitude and longitude coordinates. Coordinates for the North Coast Recreational YRCA are specified in groundfish regulations at 50 CFR 660.70(a) and will be described annually in federal halibut regulations published in the *Federal Register*.

North Coast Subarea Proposed Season Changes:

This sport fishery subarea is allocated 62.2 percent of the first 130,845 lb (59.4 mt) allocated to the Washington sport fishery, and 32 percent of the Washington sport allocation between 130,845 lb (59.4 mt) and 224,110 lb (101.7 mt) (except as provided in section (e)(3) of this Plan). This subarea is defined as all U.S. waters west of the mouth of the Sekiu River, as defined above in paragraph (f)(1)(i), and north of the Queets River (47°31.70' N. lat.). The management objective for this subarea is to provide a quality recreational fishing opportunity during May and June. The fishery will open on the first Thursday between May 9 and 15, and continue 2 days per week (Thursday and Saturday) during the first week, the fishery would be open Saturday only during the second week with a quota management closure scheduled for the third week. ~~in May as scheduled pre-season, unless there is a quota management closure. If there is no quota management closure in May, t~~The fishery will reopen the Saturday following the management closure and continue on Saturdays only ~~on the first Thursday in June as an all depth fishery on Thursdays and Saturdays~~ as long as sufficient quota remains. This schedule allows adequate public notice of any inseason action before each Saturday~~Thursday~~ opening. ~~If there is not sufficient quota for an all-depth day, the fishery would reopen in the nearshore areas described below:~~

~~A. WDFW Marine Catch Area 4B, which is all waters west of the Sekiu River mouth, as defined by a line extending from 48°17.30' N. lat., 124°23.70' W. long. north to 48°24.10' N. lat., 124°23.70' W. long., to the Bonilla-Tatoosh line, as defined by a line connecting the light on Tatoosh Island, WA, with the light on Bonilla Point on Vancouver Island, British Columbia (at 48°35.73' N. lat., 124°43.00' W. long.) south of the International Boundary between the U.S. and Canada (at 48°29.62' N. lat., 124°43.55' W. long.), and north of the point where that line intersects with the boundary of the U.S. territorial sea.~~

~~B. Shoreward of the recreational halibut 30-fm boundary line, a modified line approximating the 30 fm depth contour from the Bonilla-Tatoosh line south to the Queets River. Coordinates for the closed area will be specifically defined annually in federal halibut regulations published in the *Federal Register*.~~

No sport fishing for halibut is allowed after September 30. If the fishery is closed prior to September 30, and there is insufficient quota remaining to reopen ~~the nearshore areas~~ for another fishing day, then any remaining quota may be transferred inseason to another Washington coastal subarea by NMFS via an update to the recreational halibut hotline. The daily bag limit in all fisheries is one halibut per person with no size limit.

Recreational fishing for groundfish and halibut is prohibited within the North Coast Recreational Yelloweye Rockfish Conservation Area (YRCA). The North Coast Recreational YRCA is a C-shaped area off the northern Washington coast and is defined by straight lines connecting latitude and longitude coordinates. Coordinates for the North Coast Recreational YRCA are specified in groundfish regulations at 50 CFR 660.70(a) and will be described annually in federal halibut regulations published in the *Federal Register*.

(iv) Columbia River subarea.

This sport fishery subarea is allocated 2.0 percent of the first 130,845 lb (59.4 mt) allocated to the Washington sport fishery, and 4.0 percent of the Washington sport allocation between 130,845 lb (59.4 mt) and 224,110 lb (101.7 mt) (except as provided in section (e)(3) of this Plan). This subarea is also allocated an amount equal to the contribution from the Washington sport allocation from the Oregon/California sport allocation. The Columbia River subarea quota will be allocated as follows: 10% or 1,500 pounds, whichever is less, will be set aside to allow incidental halibut retention in the area shoreward of 30 fathoms, with the remaining amount allocated such that 80 percent is reserved for an early season beginning in May. This subarea is defined as waters south of Leadbetter Point, WA (46°38.17' N. lat.) and north of Cape Falcon, OR (45°46.00' N. lat.). The fishery will open on the first ~~Friday~~ Thursday in May or May 1 if it is a Friday, Saturday or Sunday, ~~3~~4 days per week, Thursday~~Friday~~ through Sunday until 80 percent of the subarea allocation is taken. The fishery will reopen on the first ~~Friday~~ Thursday in August and continue 3 days per week, ~~Friday~~Thursday-Sunday until the remainder of the subarea quota has been taken, or until September 30, whichever is earlier. Subsequent to this closure, if there is insufficient quota remaining in the Columbia River subarea for another fishing day, then any remaining quota may be transferred inseason to another Washington and/or Oregon subarea by NMFS via an update to the recreational halibut hotline. Any remaining quota would be transferred to each state in proportion to its contribution. The daily bag limit is one halibut per person, with no size limit.

Lingcod retention Option 1:
No groundfish may be taken and retained, possessed or landed, except lingcod, sablefish and Pacific cod when allowed by groundfish regulations, if halibut are on board the vessel.

Lingcod Retention Option 2:

No groundfish may be taken and retained, possessed or landed, except lingcod, sablefish, and Pacific cod when allowed by groundfish regulations, if halibut are on board the vessel. Lingcod retention when halibut are on board is only permitted during the early season; until 80 percent of the subarea quota is taken or until the first Thursday in August whichever occurs first.

HUMBOLDT AREA SALTWATER ANGLERS INC

August 1, 2013

Dan Wolford, Chairman
Pacific Fishery Management Council
7700NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

RE: South of Humbug Policy Committee Recommendations

Dear Mr. Wolford:

The Humboldt Area Saltwater Anglers, Inc. (HASA) wish to express their appreciation to the International Pacific Halibut Commission (IPHC), the members of the South of Humbug Workgroup (Workgroup) and the South of Humbug Mountain Pacific Halibut Policy Committee (Committee) for their efforts in resolving recreation Pacific halibut quota issues in the South of Humbug subarea (SOH). We appreciate our ability to be involved and to have an opportunity to comment during the Committee meeting on July 30, 2013.

The Committee appeared to conclude that the following measures would assist in achieving the catch reduction necessary for the 2014 Pacific halibut season in the SOH:

1. Workgroup Alternative 6: Separate the SOH at the Oregon/California border.
    a. The Committee seemed to favor sub option 6a: Incorporate the Oregon portion of the SOH into the Central Oregon coast subarea.
2. Reduce the recreational catch in the California SOH by 40% to 50% of the five year average catch of 22,223 net pounds. The Committee seemed to favor utilizing some combination of the workgroup Alternatives 3a, 3b and 3d to accomplish the desired reduction.

The HASA supports the utilization of the above alternatives to set the catch limit for the 2014 Pacific halibut season. While other alternatives were reviewed and discussed, we feel the above alternatives provide the most angler opportunity and the best support for the economic viability of the commercial passenger fishing vessels and the recreational fishing dependent businesses in the California SOH.

We urge the Pacific Fisheries Management Council to seriously consider the efforts of the Workgroup and Committee as well as supporting the economic base of the California SOH subarea by providing the most Pacific halibut fishing opportunity for the recreational anglers.

Sincerely,

Cliff Hart

Cliff Hart
President of Humboldt Area Saltwater Anglers, Inc.

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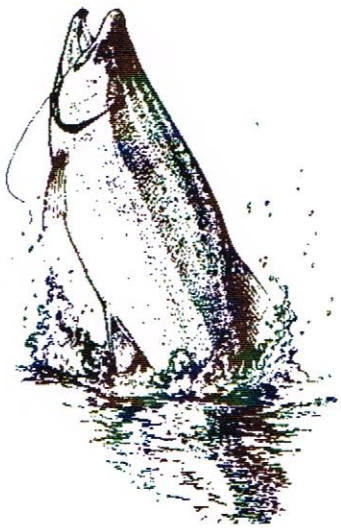
Oregon South Coast Fishermen

P. O. Box 2709 • Harbor, OR 97415



August 13, 2013

Pacific Fisheries Management Council
Dorothy Lowman, Chair
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

Dear Chair Lowman and Council Members,

The Oregon South Coast Fishermen is the largest sport fishing organization in Curry County, with nearly 100 members who are actively involved with the Oregon STEP program and heavily involved in local fisheries management programs. Our membership includes several small boat owners who fish primarily out of the Port of Brookings Harbor. We thank you for this opportunity to comment on the South of Humbug Pacific Halibut Workgroup Preliminary Management Measure Analysis.

After careful review of the draft workgroup document dated July 2013, participation in a workgroup webinar and a thorough discussion at the public meeting held in Brookings, Oregon on August 12, 2013 we offer the following comments from our organization.

We support Alternative 6b., the establishment of a new subarea from Humbug Mountain to the Oregon/California Border. Our decision is based on several factors:

1. Maintaining the current Humbug Mtn. to Mexico subarea is impractical given the different harvest monitoring and management programs in California and Oregon. Port sampling in Oregon is already in place and is greatly facilitated by having only two Ports, Brookings and Gold Beach, to sample. Oregon sampling is real time and with direct observation of landed catch, which aids in accurate reporting of length and species. Oregon can quickly respond to in season adjustments and closures. Oregon has a seasonal limit for halibut. In essence, Oregon can manage a quota fishery effectively while California is better suited to manage a fishery based on a set number of days on the water to achieve a harvest target.

2. An alternative to salmon fishing is important for Oregon Ports in the Klamath Management Zone. While we have enjoyed liberal ocean salmon seasons over the last three years, the historic record shows that in most years our salmon fishing opportunities will be limited by Klamath River impacts, particularly in August and mid to late July. It is important to the local community to have a unique fishing opportunity available to attract fishermen and provide stability to our local community. This is particularly important to Brookings which does not have the robust estuary fishery that

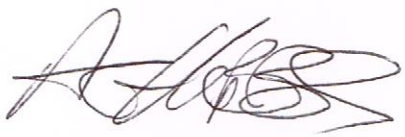
exists at Gold Beach on the Rogue River. We are particularly concerned with maintaining the local bait and tackle businesses that are already competing with Fred Meyer and Bi Mart and who are totally dependent on income from fishermen. Based on the data available, inclusion in the Central Oregon Coast subarea would most likely not provide much fishing opportunity in August and late July.

3. Weather south of Cape Blanco is unique. Wind on the ocean is a limiting factor for fishing along all of the Oregon Coast. The area south of Cape Blanco is unique in that during periods of very high temperatures in the northern portion of the Sacramento Valley and inland valleys of Oregon, a deep thermal trough forms off the northern California Coast which produces strong winds along the coastline from Port Orford to Northern California. These high winds, often gale force, essentially shut down fishing in Gold Beach, Brookings and Crescent City for periods of up to two weeks, while ocean areas north and south are not as severely affected. The positive effect of these winds is increased upwelling and cooler near shore ocean temperatures, which are beneficial for salmon fishing but which place us at a disadvantage when trying to "compete" with Central Oregon Ports for quota.

We ask that you support the establishment of a new subarea from Humbug Mountain to the Oregon/California Border and that we be allocated a small quota of between 4000 and 6000 pounds of Pacific halibut. We would foresee no changes to the current season structure until we have had time to assess the development and progress of this fishery.

Thank you for this opportunity to provide input to this important decision.

Sincerely,



Tony Hobbs, President

cc: Roy Elicker, Director ODFW
Gway Kirchner, ODFW
Ted Fitzgerald, Port of Brookings/Harbor

Agenda Item D. 2.
Public Comment
September 2013

August 21, 2013
Ms. Dorothy M. Lowman, Chair
Pacific fishery Management Council
7700 NE Ambassador PL, suite 101
Portland, OR 97220

Dear Ms. Lowman and Council Members,

Since October 2011 the Council has addressed the halibut catch south of Humbug Mountain, Southern Oregon and Northern California. The Council has formed a work committee and a policy committee to bring suggestions to the Council so this area will stay within its halibut allotment.

I attended the last work group webinar, the last phone-in policy meeting, the public meeting with CDFW in Eureka and a phone-in with CDFW. From this information and my reading I have come up with the following suggestions to help reduce the Halibut catch in the south of Humbug Mountain area. I have placed them in the order of importance.

1. Move the control line to the California/Oregon border. Oregon and California have different regulations. Anglers in Oregon can travel south and continue fishing after the central Oregon allocation has been reached whereas California anglers only have a 0.62% of the 2A allotment of halibut.

2. No combo trips of halibut and salmon. I believe this will reduce the halibut catch by more than 19% that the work group proposes. For now in California, if an angler catches their salmon limit early, as they have in the last two years, then they will halibut fish for a few more hours. Halibut is too valuable as a game fish and too limited to become just another fish in an angler's daily multiple species catch.

3. At the last work group webinar, California produced the percentage of halibut that was caught each day of the week. I was very disappointed that this information was not given to the policy group nor was it given at the CDFW public meeting in Eureka. If the control line is moved to the California/Oregon border, then days of the week become a very viable option. With the control line moved and no combo trips with salmon, I believe we could fish four days a week, Wednesday, Thursday, Friday and Saturday; this option would reduce our harvest by about 50%, the goal stated by the Policy Committee.

I believe this is a fair effort to reduce the halibut catch that would meet the Committee recommendation. Since there has been a halibut survey done in Northern California this year, but the data will not be available until December, it seems premature to severely close down halibut fishing until that data is presented and California receives a fair and equitable amount of the 2A halibut allotment.

Thank you for your consideration.

Mary Marking
1456 Whitmire Ave
McKinleyville, CA 95519
707-839-2073

D.2.
Public Comment

August 21, 2013

Ms. Dorothy Lohman, Chairwoman
Pacific Fishery Management Council
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Re: Agenda Item D.2. Pacific Halibut Management in the South of Humbug Mt. Subzone of 2A

Dear Chairwoman Lohman:

In October of 2011, the IPHC expressed concern to the Council regarding the harvest level in the South of Humbug Subzone (SOH). That prompted action by the Council to appoint a Committee to study alternatives for the SOH and report back to the Council. The Committee then appointed a Working Group to detail specific information and develop data regarding various Alternatives that could be considered by Management to reduce the harvest within the SOH. The Committee met in December 2011 and reported back to the Council in March 2012. The Committee recommended the following:

- the IPHC extend their survey efforts down to the Punta Gorda, California area
- that the Working Group provide data for the following management options:
- Prohibit targeting of P. halibut on salmon and groundfish trips
- Restricting the days of the week; including at least one weekend day
- Open May through July 15 and September through October
- Open May through June and August through September
- Examine the potential for harvest reduction of other time and area closures off California

These options were detailed in 6 Alternatives discussed at length by the Working Group in a Webinar on June 12, 2013. Following that meeting CDFW held a meeting on July 18, 2013 in Eureka to present these alternatives to the public and gather public comment (about 30 anglers were in attendance). It was of interest that the days of the week data (Alternative 2) presented at the Working Group meeting was omitted, even though very specific information had been presented at the June 12 webinar meeting. The discussion focused around Alternative 6 to move the management line down to the 42 degree line(CA/Ore border), Alternative 1 for harvest rates during combined salmon/and or rockfish trips; and finally, monthly closures were discussed (Alternative 3 & 5). Alternative 4 was deemed unimportant (MPA affects) and essentially dismissed. The public was evenly split in opinion to consider Alternative 2 and Alternative 3, and Alternatives 1 and all agreed to implement Alternative 6 to move the management line. The Policy Committee concluded by proposing to consider moving the management line (Alt 6) and close halibut fishing in August and the last two weeks in July.

Those monthly closures would effectively reduce catch by about 50% to an estimate 12,000 to 13,000 pound annual harvest. The effects of "effort shift" would have to be followed. Greg Williams of the IPHC also related the California Survey was concluded but the results would not be published until December of 2013.

CDFW then held and additional teleconference with the public on July 30, 2013 to solicit our comments on how we the public would react and how we would be affected by an August closure for halibut (with the latter two weeks closed in July as a back-up position); and moving the management line down to the 42 degree line at the CA border. Basically the six options had been whittled down to two options at this point (Alternatives 3 and 6).

The Council has scheduled the September Meeting for a preliminary preferred alternative to be put out for public review with a final decision to be made in November of this year.

My first impression is that any action should be tabled until March of 2014 so that the IPHC can provide us with the first survey completed in California for over thirty years. Why is there a rush to implement harsh management measures to reduce harvest in the SOH when the data necessary to assist in this decision will not be released until after the Council has acted? The Council has sufficient time in the spring and early summer of 2014 to institute management measures, if deemed necessary, since only August and the latter half of July is being considered by the Committee.

However, if the Council is determined to move forward on the Alternatives as presented by the Committee I would choose the following options in this order of importance:

1. That Alternative 6 to move the management line to the CA/Ore border be implemented.
2. That Alternative 2 (restrict days of the week) remain in consideration.

As the California Sports Representative I have all the private boaters and Charter Fishers to be concerned about. If we restrict August and the portions of July we have effectively eliminated halibut opportunity for Shelter Cove and the bulk of the halibut season for Trinidad. Recall that Shelter Cove Rockfish season closes after Labor Day and the early season is rough, windy and has little halibut success. July and August are the bulk of the halibut season and Trinidad will suffer approximately a 50% loss of their business in moorings and tourist interest. Halibut has become a very serious fishery for out-of-area tourists. Some Charter Operators expressed that 50% of their summer booking interest is for halibut fishing only, as salmon can be caught over the entire coast north of Half Moon Bay. Many Charter Operators cease operation after the salmon season in early September and move to the rivers to augment their business. Trinidad removes their mooring from Trinidad Bay after the salmon season since launching from private boaters reduces launches from over twenty per day to less than five per day on average. Also, south winds begin to blow making launch operation risky and difficult. Loss of the July and August months for halibut will be a severe revenue loss to these boat launch operations.

Every Charter Boat Operator I spoke with, with the exception of one, would rather have three days per week over the length of the season rather than block closures. If the goal is to reduce harvest by 50%, the days of the week option is every bit as valid as any other option presented, and it does not unduly penalize Shelter Cove and Trinidad with their launch operations. Blocking out the summer months for halibut will surely favor the locals who live around Humboldt Bay but will effectively eliminate the launch facilities and out-of-area fishers who do not travel past the end of August.

3. If the Salmon combo trips were eliminated that would allow probably one more day per week on the water, since the majority of halibut caught are by those who first fish for salmon and switch over to halibut once their salmon limit is achieved.

No matter what option is applied, "effort shift" will occur. Our area has historically had a long history of halibut landing and is being only allocated 0.62%, while Washington State has about 70% when the tribal effort is included and Oregon has the remainder of about 29.4%. Perhaps that formula was deemed appropriate in 1988 when these allocations were first instituted, but conditions have changed and the CSP should be re-examined in the near future. Halibut is an economically valuable fishery for our area. We believe the current allocation is unfair, lacks parity and the CSP is based on outdated population estimates. We respectfully request the Council address this concern in the coming year to correct this inequity. Thank you for your consideration.

Tom Marking, GAP Representative
1456 Whitmire Avenue,
McKinleyville, CA 95519

HUMBOLDT BAY
HARBOR, RECREATION, AND CONSERVATION
DISTRICT
(707) 443-0801
P.O. Box 1030
Eureka, California 95502-1030

August 29, 2013

Ms. Dorothy M. Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Re: North Coast California Government Pacific Halibut Management Resolution

Dear Ms. Lowman,

Attached you will find a Resolution from the Humboldt Bay Harbor, Recreation and Conservation District that makes specific requests regarding North Coast California Pacific halibut management in 2014. We have helped organize North Coast California governments so that they can become participants in regional co-management of fish stocks, including Pacific halibut. Because many of these communities recognize the inordinate value of Pacific halibut sportfishing access to our regional economy and quality of life, we anticipate your Council will receive similar requests after your September 2 comment deadline.

Thank you for your consideration of our request. We look forward to working with the Pacific Fisheries Management Council, International Pacific Halibut Commission, and the California Department of Fish and Wildlife to maintain access to recovering Pacific halibut stocks while also sustaining them for future generations.

Sincerely,

Mike Wilson, Chair

CC: Ms. Deborah Wilson-Vandenberg, Marine Region Manager
California Department of Fish and Wildlife
20 Lower Ragsdale Drive, Suite 100
Monterey, CA 93940

Gregg Williams, Research Program Manager
International Pacific Halibut Commission
2320 W. Commodore Way Suite 300
Seattle, WA 98199-1287

HUMBOLDT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT

RESOLUTION NO. 2013-11

A RESOLUTION CONCERNING NORTH COAST CALIFORNIA GOVERNMENT PACIFIC HALIBUT MANAGEMENT

WHEREAS, the governments of coastal cities, counties, harbor districts and community services districts of Northwestern California have come together as the North Coast Local Agency Coordinating Committee, which is organized by the Humboldt Bay Harbor, Recreation and Conservation District; and

WHEREAS, the group works together to protect fisheries resources, but also to maintain fishing access to healthy stocks of marine fish species, including Pacific halibut; and

WHEREAS, the commercial trawl fleet once harvest tens of millions of pounds annually of species, such as Petrale, Dover and English Sole, but these fisheries have been greatly reduced. This trawl fishery reduction has caused a huge decrease in catch and landings in all North Coast ports and a sharp decline in this sector of our economy. The reduction in fishing effort has greatly reduced the by-catch of Pacific halibut, and there is minimal directed commercial fishing effort on the species in the waters of California and the North Coast; and

WHEREAS, the historic Pacific halibut landings on the North Coast averaged 400,000 pounds and reached levels as high as 1 million pounds historically. The International Pacific Halibut Commission (IPHC) and Pacific Fisheries Management Council (PFMC) have created a South of Humbug Mountain Management Zone within Zone 2A that extends from southern Oregon to the Mexican border and includes the entire coast of California, and this management zone spans two states with different regulations and different management methods and is cumbersome and impractical; and

WHEREAS, a catch-share of 0.62% was allocated to management area South of Humbug Mountain, as a target based on old data that has now changed into a not-to-exceed quota; and

WHEREAS, South of Humbug Mountain fishermen began to exceed this quota in years since 2008 and fishing restrictions in 2014 are being considered based on exceeding a non-scientific quota; and

WHEREAS, the Humboldt Area Salt Water Anglers, the UC Cooperative Extension, and Humboldt State University are working cooperatively to collect size and age data on Pacific halibut in northern California and providing it to the IPHC in 2013; and

WHEREAS, the IPHC collected data on the North Coast in 2013 using standard long line methods used throughout the Pacific Northwest to gauge the health and abundance of Pacific halibut stocks, but decisions made regarding the 2014 season for South of Humbug Mountain will be set before IPHC North Coast data are available for use; and

WHEREAS, North Coast governments strongly favor conserving and protecting marine fisheries resources, which allows continued access for sport fishers and charter boat enterprises that constitute important contributions to the North Coast economy and quality of life.

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of the Humboldt Bay Harbor, Recreation and Conservation District as follows:

North Coast governments hereby request that the IPHC and PFMC 1) give California an exclusive management zone that does not include parts of southern Oregon, 2) that any 2014 restrictions on access to North Coast Pacific halibut stocks be deferred until newly collected data are available, and 3) the IPHC expeditiously calculate and implement a science-based Pacific halibut quota.

PASSED AND ADOPTED by the Board of Commissioners of the Humboldt Bay Harbor, Recreation and Conservation District at a duly called meeting held on the 22 day of August 2013, by the following polled vote:

AYES: Newman, Dale, Wilson, Marks

NOES:

ABSENT: Higgins

MIKE WILSON, President
Board of Commissioners

ATTEST:

PATRICK HIGGINS, Secretary
Board of Commissioners

CERTIFICATE OF SECRETARY

The undersigned, duly qualified and acting Secretary of the HUMBOLDT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT, does hereby certify that the attached Resolution is a true and correct copy of RESOLUTION NO. 2013-11 entitled,

A RESOLUTION CONCERNING NORTH COAST CALIFORNIA GOVERNMENT PACIFIC HALIBUT MANANGEMENT

as regularly adopted at a legally convened meeting of the Board of Commissioners of the HUMBOLDT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT, duly held on the 22 day of August 2013; and further, that such Resolution has been fully recorded in the Journal of Proceedings in my office, and is in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this 22 day of August 2013.

PATRICK HIGGINS, Secretary
Board of Commissioners