West Coast Groundfish Trawl Catch Share Program Five-year Review –Appendices

December 2017

For further information contact the following:

Jim Seger, Council Staff

Abigail Harley, National Marine Fisheries Service West Coast Region

Lisa Pfeiffer, National Marine Fisheries Service Northwest Fisheries Science Center

TABLE OF CONTENTS

APPENDIX A: EX-VESSEL PRICES IN THE SHORESIDE LIMITED ENTRY TRAWL AND CATCH SHARE FISHERY

Table A.1. Average ex-vessel prices per pound (inflation-adjusted 2015 $) for at-sea Pacific whiting, and all species in the shoreside limited entry trawl and catch share fishery, 2009 to 2015, and all species in the shoreside limited entry trawl and catch share fishery, 2009 to 2015. *indicates data were suppressed to maintain confidentiality. Source: Fish ticket and EDC data.

Species	2009	2010	2011	2012	2013	2014	2015
Arrowtooth flounder	$ 0.11	$ 0.11	$ 0.11	$ 0.13	$ 0.12	$ 0.10	$ 0.10
Aurora rockfish	$ 0.49	$ 0.42	*	$ 0.49	$ 0.67	$ 0.61	$ 0.45
Bank rockfish	$ 0.83	$ 0.73	*	$ 0.99	$ 0.93	$ 0.95	$ 0.82
Blackgill rockfish	$ 0.69	$ 0.75	$ 1.54	$ 1.02	$ 0.76	$ 0.81	$ 0.77
Bocaccio rockfish	$ 0.71	$ 0.67	$ 0.71	$ 0.73	$ 0.83	$ 0.74	$ 0.72
Butter sole	$ 0.35	*	*	*	*	$ 0.39	$ 0.39
Canary rockfish	$ 0.59	$ 0.53	$ 0.58	$ 0.55	$ 0.54	$ 0.57	$ 0.56
Chilipepper rockfish	$ 0.68	$ 0.65	$ 0.68	$ 0.72	$ 0.68	$ 0.76	$ 0.71
Cowcod rockfish			$ 0.74	$ 0.63	$ 0.49	$ 0.89	$ 0.83
Curlfin sole	$ 0.35	$ 0.35	$ 0.44	$ 0.37	$ 0.35	$ 0.33	$ 0.31
Darkblotched rockfish	$ 0.56	$ 0.52	$ 0.51	$ 0.52	$ 0.50	$ 0.46	$ 0.46
Dover sole	$ 0.37	$ 0.33	$ 0.44	$ 0.45	$ 0.47	$ 0.47	$ 0.46
English sole	$ 0.34	$ 0.34	$ 0.35	$ 0.37	$ 0.33	$ 0.33	$ 0.31
Flathead sole	*	*	$ 0.33	*	$ 0.33	*	$ 0.31
Greenblotched rockfish	$ 0.65	$ 0.63		*	*	*	*
Greenspotted rockfish	$ 0.73	$ 0.49	*	*	$ 0.47	$ 0.64	$ 0.54
Greenstriped rockfish	$ 0.46	$ 0.46	$ 0.66	*	*	$ 0.56	$ 0.44
Lingcod	$ 0.80	$ 0.89	$ 0.80	$ 0.78	$ 0.77	$ 0.79	$ 0.98
Longspine thornyhead	$ 0.38	$ 0.40	$ 0.48	$ 0.49	$ 0.47	$ 0.46	$ 0.47
Pacific cod	$ 0.52	$ 0.49	$ 0.61	$ 0.63	$ 0.59	$ 0.55	$ 0.60
Pacific ocean perch	$ 0.52	$ 0.52	$ 0.53	$ 0.51	$ 0.51	$ 0.50	$ 0.52
Pacific sanddab	$ 0.48	$ 0.51	$ 0.63	$ 0.59	$ 0.56	$ 0.56	$ 0.55
Pacific whiting: shoreside	$ 0.08	$ 0.09	$ 0.12	$ 0.15	$ 0.13	$ 0.11	$ 0.08
Pacific whiting: at-sea	$ 0.09	$ 0.12	$ 0.11	$ 0.11	$ 0.09	$ 0.09	$ 0.09
Petrale sole	$ 0.99	$ 1.23	$ 1.53	$ 1.54	$ 1.27	$ 1.12	$ 1.21
Redbanded rockfish	$ 0.58	$ 0.57	$ 0.78	$ 1.05	*	$ 0.77	$ 0.75
Redstripe rockfish	$ 0.51	$ 0.49					
Rex sole	$ 0.37	$ 0.35	$ 0.39	$ 0.40	$ 0.40	$ 0.39	$ 0.38
Rock sole	$ 0.41	$ 0.51	$ 0.66	$ 0.82	$ 0.77	$ 0.35	$ 0.36
Rosethorn rockfish	$ 0.54	$ 0.52	$ 0.41	*		$ 0.38	*
Rougheye and blackspotted rockfish							$ 0.52
Rougheye rockfish	$ 0.54	$ 0.54					
Sablefish	$ 2.14	$ 2.21	$ 3.00	$ 2.22	$ 1.93	$ 2.42	$ 2.49
Sand sole	$ 0.84	$ 0.87	$ 1.01	$ 1.01	$ 0.96	$ 0.91	$ 0.90
Sharpchin rockfish	$ 0.54	$ 0.53					
Shortraker rockfish	$ 0.56	$ 0.54					$ 0.54
Shortspine thornyhead	$ 0.69	$ 0.73	$ 0.81	$ 0.84	$ 0.87	$ 0.94	$ 0.87
Silvergray rockfish	$ 0.53	$ 0.54					
Splitnose rockfish	$ 0.42	$ 0.39	$ 0.35	$ 0.29	$ 0.31	$ 0.35	$ 0.35
Starry flounder	$ 0.45	$ 0.30	$ 0.51	$ 0.46	$ 0.46	$ 0.37	$ 0.36
Stripetail rockfish	$ 0.47	$ 0.42		*	*	$ 0.47	$ 0.45
Vermillion rockfish	$ 0.78	*		*	*	*	$ 0.90
Widow rockfish	$ 0.40	$ 0.43	$ 0.47	$ 0.45	$ 0.48	$ 0.45	$ 0.41
Yelloweye rockfish	$ 0.55	$ 0.54	$ 0.57	$ 0.55	$ 0.60	$ 0.60	$ 0.57
Yellowtail rockfish	$ 0.41	$ 0.40	$ 0.53	$ 0.53	$ 0.51	$ 0.51	$ 0.47

APPENDIX B: ANNUAL CATCH LIMITS AND CATCHES AND PERCENT ATTAINMENT BY SPECIES

Table B.1.West Coast Groundfish non-tribal sector allocations and impacts (in mt) since implementation of Amendment 21. Source: Agenda Item F.4, Attachement 2 April 2017: http://www.pcouncil.org/wp-content/uploads/2017/03/F4_Att2_Am21Eval_Apr2017BB.pdf.

	2011			2012			2013			2014			2015		
Species	Alloc	Catch	% Attain	Alloc	Catch	% Attain	Alloc	Catch	% Attain	Alloc	Catch	% Attain	Alloc	Catch	% Attain
Arrowtooth Flounder	12,441	2,532	20.3%	9,472	2,394	25.3%	3,867	2,449	63.3%	3,487	1,749	50.2%	3,240	1,727	53.3%
Chilipepper S. of 40°10'	1,475	317	21.5%	1,331	288	21.7%	1,100	393	35.7%	1,067	312	29.2%	1,203	192	16.0%
Darkblotched	265	103	38.8%	263	88	33.6%	281	122	43.5%	294	108	36.9%	301	103	34.1%
Dover Sole	22,240	7,796	35.1%	22,240	7,024	31.6%	22,240	7,956	35.8%	22,240	6,455	29.0%	45,986	6,227	13.5%
English Sole	18,678	138	0.7%	9,548	147	1.5%	6,376	220	3.5%	5,266	237	4.5%	9,158	325	3.6%
Lingcod	1,869	270	14.4%	1,817	358	19.7%	1,737	346	19.9%	1,644	248	15.1%	1,596	203	12.7%
Longspine N. of 34°27'	1,971	944	47.9%	1,919	892	46.5%	1,865	1,056	56.6%	1,816	884	48.7%	2,968	756	25.5%
Other Flatfish	4,217	710	16.8%	4,217	690	16.4%	4,214	810	19.2%	4,214	841	20.0%	7,691	832	10.8%
Pacific Cod	1,140	258	22.6%	1,140	396	34.7%	1,131	154	13.6%	1,131	166	14.7%	1,036	377	36.4%
POP N. of 40°10'	137	54	39.3%	137	53	38.8%	127	55	43.7%	130	45	34.6%	136	40	29.4%
Petrale Sole	865	810	93.7%	1,040	1,033	99.3%	2,240	2,118	94.6%	2,297	2,316	100.8%	2,450	2,498	101.9%
Sablefish N. of 36°[1]	2,597	2,399	92.4%	2,517	2,187	86.9%	1,878	1,835	97.7%	2,038	1,876	92.1%	2,250	2,177	96.8%
Sablefish S. of 36°	531	453	85.3%	514	223	43.3%	602	87	14.4%	653	198	30.4%	720	161	22.4%
Shortspine N. of 34°27'	1,452	730	50.3%	1,435	711	49.5%	1,407	871	61.9%	1,393	718	51.5%	1,602	717	44.7%
Shortspine S. of 34°27'	50	6	12.2%	50	1	1.9%	50	4	7.4%	50	3	5.3%	50	1	1.3%
Slope RF N. of 40°10’	885	235	26.6%	885	293	33.1%	889	240	27.0%	889	209	23.4%	1,319	143	10.8%
Slope RF S. of 40°10’	377	52	13.8%	377	124	32.9%	376	117	31.2%	379	99	26.3%	424	69	16.3%
Splitnose S. of 40°10’	1,381	40	2.9%	1,454	60	4.1%	1,518	46	3.0%	1,575	65	4.1%	1,620	29	1.8%
Starry Flounder	673	12	1.7%	677	8	1.2%	757	3	0.5%	761	15	1.9%	762	6	0.8%
Widow	491	174	35.6%	491	232	47.3%	1,284	443	34.5%	1,284	710	55.3%	1,711	338	19.8%
Yellowtail N. of 40°10'	3,394	820	24.2%	3,407	1,066	31.3%	3,236	989	30.6%	3,239	1,205	37.2%	4,893	993	20.3%

[1] The Fishery HG for sablefish north of 36° N lat. is the commercial fishery HG (recreational impacts are managed as set-asides). Therefore, only commercial allocations and catches are depicted for non-trawl sectors. The allocation percentages are revised from those specified in the FMP to break down the formal allocations for trawl vs. commercial non-trawl sectors

Table B.2. West coast groundfish trawl sector allocations and impacts (in mt) since implementation of Amendment 21. Source: Agenda Item F.4, Attachement 2 April 2017: http://www.pcouncil.org/wp-content/uploads/2017/03/F4_Att2_Am21Eval_Apr2017BB.pdf**.**

Year	Stocks	Shoreside IFQ				Catcher-Processors				Motherships			
		Initial Alloc.	Final Alloc.	Catch	% Attain.	Initial Alloc.	Final Alloc.	Catch	% Attain.	Initial Alloc.	Final Alloc.	Catch	% Attain.
							2011						
2011	Pacific Whiting	92,817.8	92,817.8	91,185.8	98.2%	75,138.0	75,138.0	71,522.4	95.2%	53,039.0	53,039.0	50,049.8	94.4%
	Canary Rockfish	25.9	25.9	3.7	14.3%	4.8	8.1	0.5	5.6%	3.4	0.1	0.1	78.6%
	Darkblotched Rockfish	250.8	250.8	90.9	36.2%	8.5	12.8	10.3	80.4%	6.0	1.7	1.7	100.0%
	Pacific Ocean Perch	119.6	119.6	46.7	39.0%	10.2	16.7	6.5	39.0%	7.2	0.7	0.7	94.6%
	Widow Rockfish	342.7	342.7	137.6	40.2%	86.7	135.0	24.1	17.8%	61.2	12.9	12.8	99.6%
	Yellowtail Rockfish[1]	3,094.2	3,094.2	738.6	23.9%	NA	NA	14.6	NA	NA	NA	66.7	NA
							2012						
2012	Pacific Whiting	56,902.0	68,661.9	65,661.5	95.6%	46,046.0	55,584.0	55,694.6	100.2%	32,515.0	39,235.0	38,215.5	97.4%
	Canary Rockfish	25.9	25.9	7.2	27.6%	4.8	4.8	0.3	5.6%	3.4	3.4	0.2	4.4%
	Darkblotched Rockfish	248.9	248.9	85.7	34.4%	8.5	8.5	1.4	16.9%	6.0	6.0	1.3	21.0%
	Pacific Ocean Perch	119.5	119.5	48.6	40.7%	10.2	10.2	3.2	31.0%	7.2	7.2	1.4	19.0%
	Widow Rockfish	342.7	342.7	152.6	44.5%	86.7	86.7	42.0	48.4%	61.2	61.2	37.3	61.0%
	Yellowtail Rockfish[1]	3,107.4	3,107.4	963.3	31.0%	NA	NA	32.0	NA	NA	NA	11.0	NA
							2013						
2013	Pacific Whiting	85,697.0	98,296.9	97,621.3	99.3%	69,373.0	79,573.0	78,041.0	98.1%	48,970.0	56,170.0	52,522.3	93.5%
	Canary Rockfish	39.9	39.9	10.2	25.6%	7.4	7.4	0.2	2.4%	5.2	5.2	0.5	9.2%
	Darkblotched Rockfish	266.7	266.7	116.0	43.5%	8.6	8.6	2.1	24.2%	6.1	6.1	4.2	69.6%
	Pacific Ocean Perch	109.4	109.4	50.0	45.7%	10.2	10.2	4.3	41.9%	7.2	7.2	1.1	15.8%
	Widow Rockfish	994.0	994.0	411.6	41.4%	170.0	170.0	15.7	9.3%	120.0	120.0	15.5	13.0%
	Yellowtail Rockfish[1]	2,935.8	2,935.8	719.3	24.5%	NA	NA	78.5	NA	NA	NA	190.9	NA
							2014						
2014	Pacific Whiting	108,935.0	127,835.0	98,714.0	77.2%	88,186.0	103,486.0	103,266.3	99.8%	62,249.0	73,049.0	62,038.3	84.9%
	Canary Rockfish	41.1	41.1	10.5	25.5%	7.6	7.6	0.3	3.7%	5.4	5.4	0.4	6.5%

	Darkblotched Rockfish[2]	278.4	278.4	97.8	35.1%	9.0	6.0	3.4	56.8%	6.3	9.3	7.2	77.5%
	Pacific Ocean Perch	112.3	112.3	41.0	36.5%	10.2	10.2	0.3	3.1%	7.2	7.2	3.6	50.0%
	Widow Rockfish	994.0	994.0	654.3	65.8%	170.0	170.0	16.6	9.7%	120.0	120.0	39.6	33.0%
	Yellowtail Rockfish[1]	2,939.3	2,939.3	1,163.3	39.6%	NA	NA	0.0	NA	NA	NA	41.9	NA
						2015							
2015	Pacific Whiting	112,007.0	124,607.3	58,383.7	46.9%	90,673.0	100,873.0	68,483.9	67.9%	64,004.0	71,204.0	27,660.4	38.8%
	Canary Rockfish	47.3	47.3	44.8	94.8%	8.0	8.0	0.1	0.9%	5.7	5.7	0.1	2.5%
	Darkblotched Rockfish	285.5	285.5	122.4	42.9%	9.2	9.2	5.6	60.4%	6.5	6.5	2.4	36.6%
	Pacific Ocean Perch	118.5	118.5	49.9	42.1%	10.2	10.2	7.0	68.2%	7.2	7.2	1.7	24.2%
	Widow Rockfish	1,306.2	1,306.2	814.6	62.4%	170.0	170.0	17.4	10.3%	120.0	120.0	17.2	14.3%
	Yellowtail Rockfish[1]	4,592.8	4,592.8	1,449.9	31.6%	NA	NA	0.5	NA	NA	NA	86.3	NA

[1]Yellowtail rockfish is managed as a set-aside species for the at-sea whiting trawl sectors (i.e., Catcher-Processors and Motherships) with an annual set-aside amount of 300 mt for both sectors combined.

[2] The original allocation of darkblotched to the Mothership sector (6.3 mt) was increased to 9.3 mt with a transfer of yield from the Catcher-Processors sector by automatic action on October 17, 2014.

Figure B.1. Annual catch limits, landings, and mortality-adjusted discards for historically overfished groundfish FMP species, by catch share (limited entry groundfish trawl sector pre-2011), commercial non-catch share (non-limited entry groundfish trawl sector pre-2011) and tribal fisheries, 2002-2015. OYs and ACLs shown may not reflect final changes, such as inseason adjustments. Source: Somers et al. 2016.

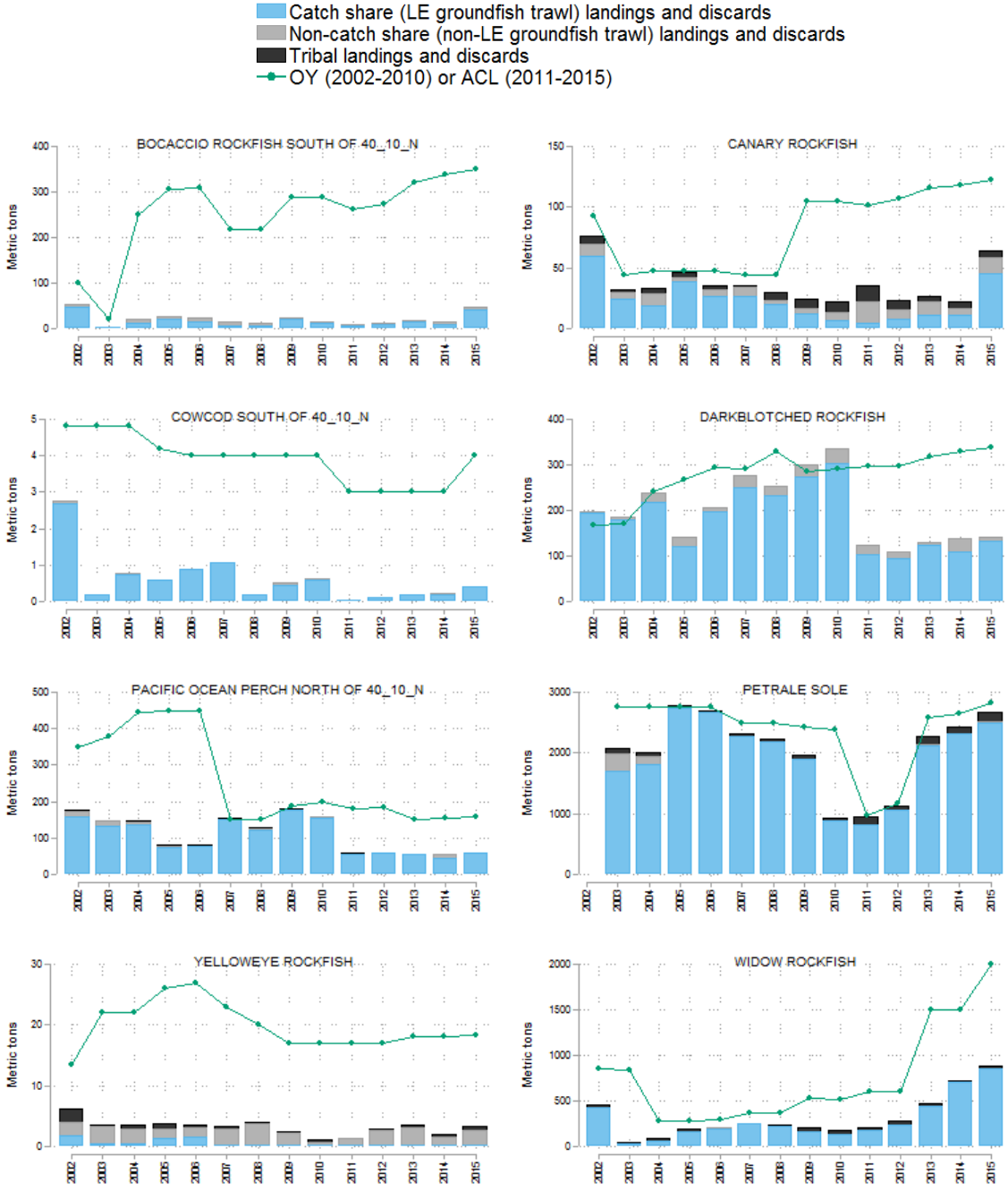
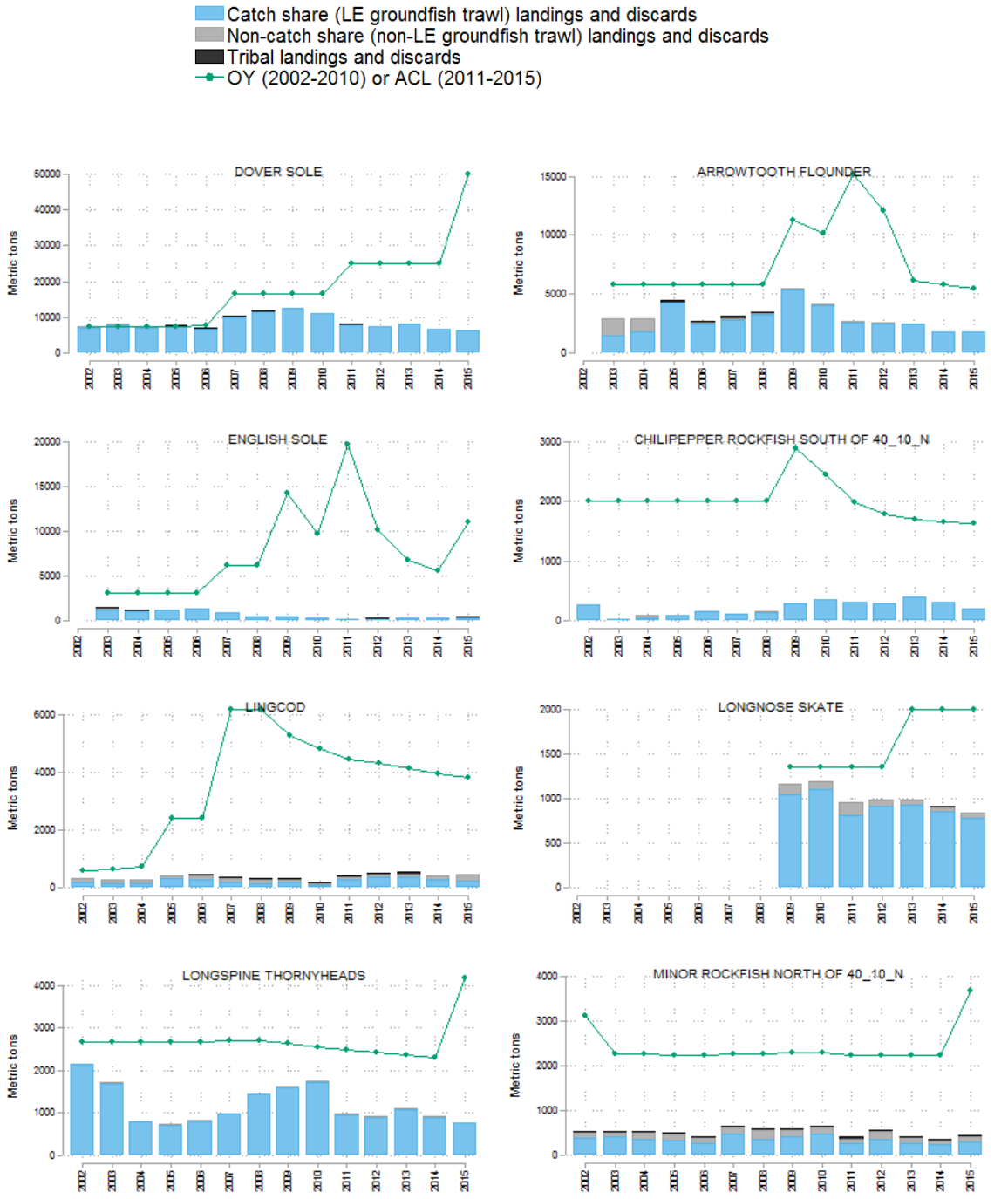
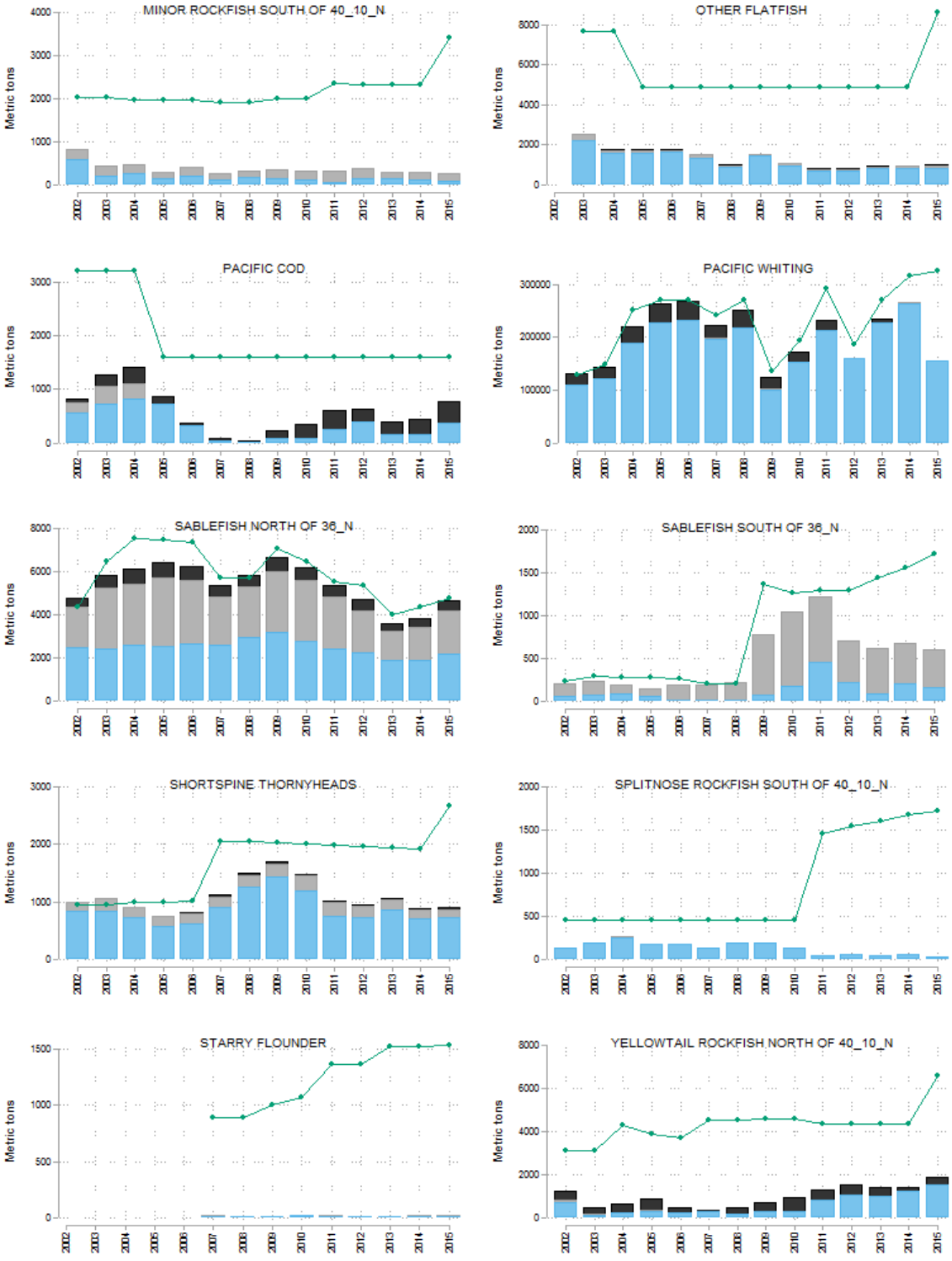


Figure B.2.Annual catch limits, landings, and mortality-adjusted discards for groundfish FMP species, by catch share (limited entry groundfish trawl sector pre-2011), commercial non-catch share (non-limited entry groundfish trawl sector pre-2011) and tribal fisheries, 2002-2015. OYs and ACLs shown may not reflect final changes, such as inseason adjustments. Source: Somers et al. 2016.




MINOR ROCKFISH SOUTH OF 40_10_N
OTHER FLATFISH
PACIFIC COD
PACIFIC WHITING
SABLEFISH NORTH OF 36_N
SABLEFISH SOUTH OF 36_N
SHORTSPINE THORNYHEADS
SPLITNOSE ROCKFISH SOUTH OF 40_10_N
STARRY FLOUNDER
YELLOWTAIL ROCKFISH NORTH OF 40_10_N
Metric tons

APPENDIX C: PACIFIC COAST GROUNDFISH FISHERY SOCIAL SURVEY

Contents

Methods

The sections below describe the methods used to conduct the Pacific Coast Groundfish Fishery Social Survey (PCGFSS). The survey was conducted in 2010, from 2012 to 2013, and from 2015 to 2016.

(A1) Data Collection

The goal of the PCGFSS is to measure sociocultural changes to the groundfish fishery, the associated industry, and related communities, resulting from the catch share program. The study was specifically designed to collect data over time in association with catch share programmatic events, such as the release of QS trading. In order to provide a baseline, data were collected between June and December 2010, prior to implementation of the catch share program. Between June 2012 and February 2013, one year after implementation, a second round of data collection was conducted. One year after the authorization of QS trading, between November 2015 and May 2016, a third round of data collection was conducted. The intent of the third collection was to understand impacts of QS trading, as well as to compare information after several years of operation under the catch share program.

Data were collected using a mixed methodology, including a survey instrument and semi-structured interviews. This methodology was used to maximize the amount and type of information gathered from study participants (Bernard 2000; Russell and Schneidler-Ruff 2014; Schensul, Schensul, and LeCompte 1999). The initial survey was designed and reviewed by industry/community members, as well as fisheries management staff both at the Pacific Fishery Management Council (PFMC) and NMFS West Coast Regional office. This review assisted in ensuring that proper terminology was used and that questions were written with appropriate clarity for targeted respondents. In a few circumstances, questions were slightly altered after the 2010 data collection effort. These changes were made to add categories to questions, where appropriate, or further to clarify questions. As a result, a few survey items may be missing data from 2010 results as the question categories were only present in subsequent survey tools. In situations where this occurred, it is specifically noted. Additionally, new sections were added to the 2012 and 2015/2016 surveys to address information/perspectives related to the catch share program after implementation. The survey tools aim to be applicable to the wide range of roles represented by study participants, which range from QS owners and processors to crew and fishermen's wives.

The goal of the survey is to attempt to survey all known participants of the industry (Bernard 2000; Schensul et al. 1999). These known individuals were initially found through the limited entry permits held prior to the catch share program, and they were cross-referenced with the QS permits databases for the 2012 and 2015/2016 data collection efforts1 Additional participants were sought through snowball sampling, a type of purposive sampling, where referrals were obtained from existing participants to locate new participants (Bernard 2002; Robson 2002). This was necessary to approach participants such as crewmembers and fishermen's wives, where no identifying information is available. Participants from the 2010 baseline collection were approached again for participation in the 2012 and 2015/2016 data collection efforts. Any additional or new participants from the 2012 effort were invited to participate in the 2015/2016 effort. Individuals identified through permit databases and snowball sampling were contacted primarily by phone to schedule a meeting time. Individuals were contacted three times, after which no further contact was pursued. The exception to this was if a participant was a permit owner and address information was available. In this case, a letter and flyer were mailed in addition to the three initial contact attempts.

1 NMFS Fisheries Pacific Coast Fisheries Permit System, West Coast Regional Office. http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish_catch_shares/quota_share_permits_accounts.html. Accessed October 7, 2014.

Surveys were conducted primarily as interviews. Interviews supplemented survey questions, and allowed participants to discuss other related topics. Researchers were distributed throughout the West Coast to increase accessibility to local communities (Table C-1). All surveys and interviews were voluntary and confidential. The survey was also available electronically on the study website, and it could be emailed or mailed (hard copy) upon request. The option to conduct the survey in person was preferred to improve response rates and to reach more remote communities that would be less likely to respond to other forms of data collection (Rea and Parker 1997; Russell and Schneidler-Ruff 2014).

Table C-1. Geographic distribution of researchers for data collection. Source: PCGFSS 2017.

Location of Researcher(s)	Responsible Communities*
Seattle, Washington	All Washington State
	Astoria, Oregon
	Garibaldi, Oregon
	Other Oregon as needed
Newport, Oregon	Newport, Oregon
	Florence, Oregon
	Coos Bay, Oregon
	Brookings, Oregon
	Port Orford, Oregon
Eureka, California	Crescent City, California
	Eureka, California
	Fort Bragg, California
San Francisco, California	Bodega Bay, California
	Princeton/Half Moon Bay, California
	San Francisco, California
Monterey, California	Monterey, California
	Moss Landing, California
	Morro Bay, California

*NOTE: Researchers would travel to other communities within a 25-mile radius of these identified communities to capture viable participation.

Study participants include several types of people connected to the fishery and affiliated fishing communities, including the following: fishermen, vessel owners, vessel operators, groundfish limited entry permit owners, quota allocation recipients/permit owners, crew aboard groundfish/whiting vessels, mothership operations, catcher-processor operations, shoreside processors, first receivers/buyers, as well as other individuals who are stakeholders in the fishery, such as partners or spouses and businesses that are directly tied to the groundfish/whiting communities through the supply of commercial items including—but not limited to—net suppliers, fuel suppliers, equipment suppliers, dry docks, etc. Analysts were also approached by fixed gear fishermen who wished to participate in the study. Resources to conduct this effort were limited to trawl fishery participants, but researchers obtained fixed gear

participation where possible. As a result, the data set contains a limited representation of the fixed gear fishermen. Fixed gear data is treated differently in analysis (see data analysis methods), and all results that contain fixed gear responses are clearly identified.

Survey Instrument and Administration

The survey instrument is extensive, consisting of six or seven sections (Table C-2). As previously mentioned, the 2010 survey was reviewed and adjusted to provide additional clarity for the 2012 survey. Similarly, the 2012 survey was reviewed and adjusted to provide additional clarity for the 2015/2016 survey. The 2012 and 2015/2016 surveys contain an additional section as noted in Table C-2. In conjunction with the survey, or if a participant declined to take the survey, but would participate in an interview, semi-structured interviews were conducted. These interviews provided the opportunity to capture additional information about survey questions, as well as to pursue lines of questions independent of the survey.

Table C-2. Description of survey sections. Source: PCGFSS 2017.

Survey Data Section	Description
Demographic	Can be compared to United States Census data where not otherwise obtainable for fishermen
Individual Participation	Expands to include individual role information, family participation, and job characteristics information
Connections	Collects information to inform social networks within the fishery and communities
Quota Perspectives	Collects information to gauge perceptions of the catch share program and identify key areas of support and concern
Fishermen	Collects information to understand how fishermen fish, what they fish for, how they work with processors, and how they move between fisheries
Processors	Collects information to understand what species are important to processors and why, how they work with fishermen, and how they market and distribute product
2012 and 2015/2016: Quota Allocation Recipients	Collects information to understand leasing and retaining of pounds, management of QS, and how different people manage their allocation

(A2) Quantitative Data Analysis

Dataset Construction

Analysts compiled two types of datasets for each study year (2010, 2012, and 2015/2016): an "all respondent" dataset, and a "return respondent" dataset. Researchers use return respondent data wherever possible as it allows them to more accurately capture change over time; in some situations, however, sample size is limited and return respondent data cannot be used. Sample size is limited when the analysis necessitates using a smaller subset of the sample (i.e., fishermen only or processors only). In these

situations, we use all respondent data. For clarity, where PCGFSS quantitative results are presented, all respondent data are used, unless it is specifically noted otherwise.

Return respondent data

The "return respondent" dataset only includes respondents who participated in the PCGFSS survey in all three years. The goal of using this data is to more accurately capture change over time by eliminating the effects of individual differences, as well as to signal changes within the larger population. Linking the administration of each survey to a programmatic event (for example, the 2012 PCGFSS was administered one year after the catch share program was implemented) allowed us to draw conclusions about the impact of the program on a specific variable.

Where applicable, we conducted significance tests (where "year" was the independent variable) on return respondent data. Such tests were only applied to the "return respondent" data because we determined that this was the most powerful option to capture change over time; thus, all significance tests are paired sample tests (i.e., the sample is the same across years). Significance tests were not run on the entire ("all respondent") dataset. Standard statistical tests require independent samples, meaning that, for instance, people surveyed in one study year are different than those surveyed in other study years (i.e., the samples are independent of one another). The "all respondent" dataset violates this requirement because about one-third of the sample across years contains the same people.

As mentioned before, other advantages of using the "return respondent" dataset and running paired analysis is that it eliminates the effects of individual differences, and functions as a signal for the larger population. For instance, if a significant difference was found between years relative to a specific item, this might signify that a similar association was also occurring in the larger population. This is important because our goal is to characterize the entire population, not just return respondents. However, when "return respondent" analysis is related to the overall population, the composition of return respondents (i.e., role, location of residence) should be considered.

All respondent data

The "all respondent" data set contains data from all survey respondents except those who use fixed gear exclusively (respondents who used fixed gear and also owned or leased groundfish trawl quota are included). When summarizing results for one year (for example, for a question that was only asked during one year of the survey), we used "all respondent" data. When comparing across years, as noted above, we used "all respondent" data when we are unable to use "return respondent data" (see below) due to sample size limitations.

When comparing across years, there are a few limitations in the "all respondent" data, primarily due to the lack of a known sample frame (i.e. a specific list of all individuals of the population of interest from which a sample is obtained), which makes it difficult to tell whether differences between years are due to actual changes in individuals' responses or changes in the sample. For example, changes in the sample may be due to changes in who participates in the fishery, or who participated or refused to participate in the survey. In contrast, "return respondent data" is composed of the same individuals in each study year, which helps address some of these challenges.

Non-IFQ fixed gear data

Non-IFQ fixed gear data were analyzed separately, and they are included when pertinent. Non-IFQ fixed gear participants were welcome to participate; however, due to resource limitations, they were not initially targeted. The sample size of non-IFQ fixed gear participants is much smaller; thus, when this data are presented, confidentiality is protected through aggregation of results.

Variable Construction

New Entrants

We created a new variable in our dataset called "new entrant." This variable is used in Section 3.2.3(b), New Entry. We identified new entrants as respondents who reported receiving a QS permit after program implementation (Section E of the survey asks about QS ownership), including both those who lease quota, and those who own quota. We constructed new entrant variables for both the 2012 and 2015/2016 datasets.

Absentee Owners

We created a new variable in our dataset called "absentee owner." This variable is used in Section 3.2.2(g)(4) in the Absentee Quota Holders subsection. We identified absentee owners as respondents who reported themselves as QS owners or co-owners and not as captains/operators or crewmembers (Section B of the survey asks respondents to identify their role in the fishery). For those who reported themselves as QS owners or co-owners and captains/operators, we confirmed that the boats they operated were trawl participants (Section F of the survey asks about trawl participation of specific boats).

Descriptive Analysis

Survey data were entered, cleaned, and summarized using IBM SPSS version 19. All graphs were created in R Statistical Software (3.1.1). Data being analyzed were mostly discrete data, both nominal and ordinal, and were summarized as percentages. As previously discussed, two types of datasets were used in the analysis: return respondent and all respondent data. In some cases, data were analyzed at a finer scale (using all respondent data), such as when summarizing responses by fishermen only or processors only. Additionally, in Section 3.2.3(c) (Fishing Heritage) and Section 3.1.3 (d) (Safety) in the Economics Performance section, data were analyzed by sorting all respondents based on their participation in the whiting or non-whiting sector. We are currently working on community-level analysis; however, it is not presented in this version of the report due to time constraints.

Missing Data, Not applicable (NA), and Prefer not to answer (PNA)

"Not applicable" (NA) and "prefer not to answer" (PNA) were listed as response options; thus, percentages for these categories are also presented in tables and graphs. There are only a few PNA responses within each survey item; therefore, for simplicity, PNA and NA response categories are grouped together in the results. We identified a few types of missing data: "marked missing," meaning that a question was skipped, and "system missing," meaning that the survey stopped mid-section due to situational limitations. Survey sections that did not apply to a particular respondent (i.e., the Fishermen Section for a respondent who is a processor) were not categorized as missing data or NA. We presented specific response rates for each survey item being summarized in order to communicate the amount of missing responses for that item. We calculated survey item specific response rates (RR) as the total number of respondents—including those responding NA and PNA, but not cases that were marked/system missing—divided by the total number of respondents including NA, PNA, and marked missing.

Significance Tests

All significance tests were performed on return respondent data only. For all significance tests, the null hypothesis being tested was that the differences (relative to the response variable) between 2010, 2012, and 2015/2016 are no greater than would be expected due to random variation, while the alternative hypothesis being tested was that the differences between 2010, 2012, and 2015/2016 were too large to be accounted for by random variation. For all significance tests, alpha=0.05, and post-hoc analysis was conducted when the omnibus null hypothesis had been rejected. All analysis for significance tests was performed in R Statistical Software (3.1.1).

Cochran's (Q) test (Cochran 1950)

We used Cochran's Q test to analyze differences between years for dichotomous response variables. Cochran's Q test is an extension of the chi-squared test for paired samples of three or more. For two

samples, Cochran's is equivalent to McNemar's test (McNemar 1949); thus, following significant results from Cochran's test, we used McNemar's with false discovery rate p-value adjustment method for post-hoc analysis.

Friedman's test (Friedman 1937, 1940)

We used Friedman's test to analyze differences between years for ordinal response variables. Friedman's test is a non-parametric extension of repeated measures ANOVA. Friedman's test may also be compared to the Wilcoxon matched-pairs signed-ranks test, except that Friedman's test allows for comparison of three or more repeated measurements (Sheldon et al. 1996).

(A3) Qualitative Data Analysis

Qualitative analysis of PCGFSS interview data for the five-year review began with compiling all the transcribed interview recordings from the 2015/2016 round of PCGFSS data collection (n=258). Collected between November 2015 and May 2016, these interviews accompanied the administration of the survey. This simultaneous collection allowed participants to elaborate on their responses to survey items; it also provided a means of conveying comments and concerns about the catch share program that were not addressed in the survey. Once compiled, interview transcriptions were imported into the qualitative data analysis software, MAXQDA.

In qualitative analysis, a "code" refers to "…a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldana 2015, p. 4). In other words, coding is a means of breaking down speech or text into topical or theme-based categories. Each code then corresponds to a specific topic or theme. Sorting qualitative data into such categories enables the analyst to explore relationships between themes and topics. The interviews were coded using an axial coding approach (Strauss and Corbin 1998). This involved a combination of inductive and deductive thinking in designing a codebook that struck a balance between letting the data speak for itself and highlighting specific areas of interest to industry and the PFMC. The November 2016 annotated outline of the five-year review—which incorporated guidance from public testimony and the Council—was used as a reference to ensure that coding was conducted in a manner that allowed us to address the items therein as directly as possible.

We began by coding a small subset of the interviews. In order to assess inter-coder reliability—or the degree to which an individual researcher's coding of a common text aligns with other researchers' coding (Ryan 1999) — each researcher independently applied the initial codebook to this subset of interviews. Existing methods of agreement estimation (for example, Cohen's kappa) operate on the assumption that each unit of content (i.e., coded segment) is coded with no more than one code. Due to the interconnectedness of themes in the PCGFSS qualitative data, segments frequently were coded with multiple codes to identify the ways in which participants connected various themes. For example, a comment about the difficulty small vessels experience in paying for observer coverage would have been coded with the "observer," "cost," and "small vessels" codes. Thus, while we did use MAXQDA to run Cohen's kappa, the statistic was treated as a rough estimate rather than a definitive measure of inter-coder agreement. The independently coded interview documents were also manually compared to gauge researcher overlap in coding. Based on this assessment, we then discussed, clarified, altered, and augmented our coding scheme, then repeated the inter-coder reliability assessment to ensure that all researchers' understanding and usage of the codes were in accord. Once we reached a reasonable level of inter-coder agreement, the codes were then applied to the rest of the interview collection. Coders communicated regularly, discussing any confusion or inconsistencies that arose during the coding process. A second round of coding followed, which involved applying various sub-codes that captured our initial broad themes on a more fine-grained level. A complete list of codes and sub-codes—and their definitions—can found in Table C-3.

Table C-3. Qualitative Data Codebook. Source: PCGFSS 2017.

Parent Code	Sub-code	Definition
Cost Recovery		Discussion of the cost recovery fee associated with the program
Gear Switching		Discussion of gear switching and how it has impacted specific fishing operations and the fishery in general
Observers		Discussion about observers (for example, costs, the experience of having them on the boat, the people, the data, etc.)
Management Process		Discussion about the management process, including any talk of allocations, the council process, etc.
	Involvement in the process	Discussion about being involved in the management process (attending meetings, filling out required paperwork, etc.)
	Quota allocations	Discussion of quota allocations, both intra- and inter-sector
	Proposed action (by industry)	Discussion of ideas or proposals for changes in any aspect of the management process
	Efficacy	Discussion of the effectiveness and efficiency of management
Markets		Discussion of market conditions, new markets, new competition, extinct markets, extinct competition, prices, etc.
	Quota market	Discussion of buying or leasing quota
Community		Discussion of the ways in which communities have been impacted by catch share and other changing conditions
Infrastructure		Discussion of the state of infrastructure (at all levels: community/communities/coastwide)
	Processors/buyers	Discussion of the number and condition of processors of buyers
	Industry suppliers/services	Discussion of the number and condition of industry supply and service providers
Geographic Shift		Discussion of geographic movements in fishing activity
	Stock-related (target)	Discussion of geographic movements in fishing activity related to target species
	Stock-related (bycatch)	Discussion of geographic movements in fishing activity related to bycatch species
Working in the Industry		Discussion about the number & seasonality of crew and processing jobs (also include industry service/supply jobs); Also: Discussion about the experience of working

		in the industry and how this has been impacted by catch share.
	Income	Discussion of the effects of the catch share program on income
	Running a business	Discussion of the effects of the catch share program on running a fishing business
	Working experience	Discussion of the effects of the catch share program on the on-the-boat experience of harvesting
	Jobs	Discussion of the effects of the catch share program on the number and nature of employment opportunities
Cost		Discussion related to any costs associated with the catch share program
	Leasing	Discussion of any costs associated with quota leasing
Adaptability		Discussion of ways people adapt to catch share and other changes in the fishery/industry
Accumulation & Consolidation		Discussion of consolidation, quota/permit/vessel accumulation, corporate fishing, etc.
Fleet Variation		Discussions that differentiate shoreside vs at-sea, effects of the program on different sizes of boats, gear-switching, etc.
Small Vessels		Discussion of direct and indirect program impacts on small vessels
New Entrants		Discussions related to barriers to entry, high costs to enter, lack of interest due to unstable fishery, general disinterest, etc.
	Graying/retirement	Discussion related to aging of the fishing workforce, retirement, etc.
Impacts on other fisheries		Discussion about any impacts of the program on non-groundfish trawl fisheries, including fishing ground conflicts, increased participation in other fisheries, conflicts between gear-types, etc.
	Other groundfish	Discussion of any impacts to non-catch share groundfish fisheries (open access, tiered black cod) stemming from the catch share program
	Other non-groundfish	Discussion of any impacts to non-groundfish fisheries (shrimp, crab, tuna, etc.) stemming from the catch share program
Exit		Discussion of leaving the fishery/industry (can be the interviewee or others the interviewee is talking about)

Ownership Dynamics		Discussion of relationships between asset owners and fishermen, absentee quota ownership, vessels and permit ownership changing hands or restructuring
	Transfer of ownership	Discussion of transfers of ownership of vessels, permits, and quota, and how these transfers have been impacted by the catch share program
	Collective ownership	Discussion of community quota funds, risk pools, or other forms of asset pooling
	Absentee ownership	Discussion of any situation in which the ownership of some aspect of the fishing business (quota, permit, vessel, etc.) lies with someone/some entity that is not the operator (this includes quota/vessels/permits owned by processing companies)
Fishery Reputation		Discussion about the public perception/market perception/management perception of the fishery
Fish Stocks		Discussion related to the status of (and changes in) fish stocks; also use when allocations/TACs/quota limits/attainment rates are discussed
Safety		Discussion related to safety
CA v. OR Boats		Discussion related to grounds conflicts stemming from Oregon catch share boats going down to California to fish with fixed gear

The 2015/2016 interview data accounts for the bulk of the qualitative data included in this review. There are two reasons for this. First, the timing of this five-year review is such that the 2015/2016 data had not been analyzed prior, thus coding could be carried out in manner that was directly informed by the goals of the review. Interview data from 2010 and 2012 had been previously analyzed and reported on (see Russell et al. 2014, 2016). Due to time constraints, we did not recode 2010 or 2012 data with the codebook developed for the five-year review, though there is naturally a fair degree of overlap with prior years' codebooks. In addition, the participant perspectives in 2015/2016 reflect four or five years of experience under catch share, whereas, in 2012, these perspectives are informed by about one year of working under the new program, and 2010 is baseline data that reflect pre-implementation perspectives. Thus, perspectives put forth in the 2015/2016 data carry the most weight in terms of temporal relevance and familiarity with the program. That said, 2015/2016 data are not utilized exclusively, as various issues discussed in this review have long been on the radar for many PCGFSS participants, and 2012 data are presented where appropriate.

Results

(B1) Response Rates

Response rates have been calculated for the 2010, 2012, and 2015/2016 survey results based on the total response, as well as on the trawl only response rate (Table C-4). Trawl-only responses remove any fixed-gear participation and only reflect participants with any connection to the groundfish trawl industry. Study participants had the option of taking the survey, participating in an interview, or participating in both formats. In 2010, 200 interviews were conducted in total, 24 of which were with two or more respondents. In 2012, 236 interviews were conducted, 26 of which were with two or more people. In 2015/2016, 16 of the 286 total interviews were conducted with two or more people.

Table C-4. Response rates. Source: PCGFSS 2017.

	Survey and Interview	Survey Only	Interview Only	Total Survey	Total Interview	Targeted	Survey Response Rate	Survey + Interview Only Response Rate
Overall								
2010	201	41	32	242	200	379	63.9%	72.3%
2012	235	24	31	259	236	500	51.8%	58.0%
2015/2016	263	14	21	277	286	501	55.3%	59.5%
Trawl Only								
2010	172	38	31	208	171	340	61.2%	70.3%
2012	195	22	25	221	195	386	57.3%	63.7%
2015/2016	225	12	11	237	235	371	63.6%	66.8%

Return Response Rates

This study attempts to understand the impacts of catch share over time. Thus, it targeted many of the 2010 participants in the 2012, and 2015/2016 data collection process. In 2012, 52.4 percent of participants had also participated in 2010 (survey and/or interview). In 2015/2016, 66.2 percent of participants had also participated in either 2010 or 2012 (survey and/or interview). Response rates were also calculated for return survey participation only as some aspects of the analysis focus only on return survey respondents (Table C-5).

Table C-5. Return response rates for surveys only. "Trawl surveys" excludes fixed gear. Source: PCGFSS 2017.

	2010	**2012**	**2015/2016**
Total surveys (n)	242	259	278
Total trawl surveys (n)	208	221	236
Total trawl return surveys (n)*		108	82
Return Response Rate*		48.87	34.7

* For 2015/2016 "total return surveys" and "return response rate" include only respondents who participated in *both* the 2010 and 2012 survey—those who participated in only one of the previous surveys were not categorized as return respondents for 2015/2016.

Non-Response Description

Non-response was recorded by researchers in the participant tracking process. Table C-6 reflects the categories of non-response. The most frequent type of non-response across all years involved situations where there was no response to attempted contacts (primarily by leaving phone messages). Table C-6 has an "other" category, which represents written reasons other than those provided—often reflecting a more in-depth perspective. Where we were able to find some consistency in those descriptions, information provided for the "other" section was further broken down (Table C-7).

Table C-6. Non-response descriptions. Source: PCGFSS 2017.

Reason	Non-response Rate		
	2010	2012	2015/2016
Left messages, No return response	34.2%	36.1%	25.1%
Unable to contact due to bad information	3.4%	16.6%	25.6%
Agreed to participate but unable to arrange	8.5%	13.7%	11.4%
Not applicable to study	-	9.8%	3.8%
Surveys not returned	31.6%	7.3%	3.8%
Immediate decline – Multiple reasons	3.4%	5.4%	12.8%
Immediate decline – No reason	7.7%	2.4%	0.9%
Health Condition Prohibitive/Deceased	0.9%	2.9%	5.7%
Other	10.3%	5.9%	10.9%

Table C-7. Descriptions of the "Other" category of non-response in Table C-6. Source: PCGFSS 2017.

Description	2010	2012	2015/2016
Exit Fishery	-	-	10.0%
Retire	-	-	10.0%
Too Busy	10%	-	13.3%
Participating in a different Fishery	-	15.8%	16.7%
Not Interested	40%	21.1%	23.3%
Other Misc.	50%	63.2%	26.7%

Response rates by state are also provided (Table C-8). This helps determine where the highest levels of participation are located. Oregon shows a steady decline in participation over each year in the "overall" category, which includes anyone who participated including fixed gear participants. However, the "trawl participants only" category has increased in all states, including Oregon.

Table C-8. Response rates by state. Source: PCGFSS 2017.

	WA	OR	CA
2010 Overall	60.0%	60.4%	71.0%
2012 Overall	51.7%	49.0%	54.6%
2015/2016 Overall	54.4%	47.5%	78.8%
2010 Trawl	47.6%	58.7%	68.9%
2012 Trawl	63.6%	51.3%	60.0%
2015/2016 Trawl	76.5%	58.8%	70.7%

(B2) Description of Study Participants

Interview Data: Geographical Distribution of Participants

Table C-9 presents the geographical distribution of 2015/2016 interview participants by community and state. Communities were aggregated based on groupings for the five-year review. The 2010 and 2012 distributions are presented here; however, the focus of the qualitative analysis was on 2015/2016 interviews. More information on 2010 and 2012 interviews can be found in Russell et al. 2014.

Table C-9. Interview respondents' city and state of residence aggregated based on Five-year Review Community Groupings, in percentages. All rounds. Source: PCGFSS 2017.

Community Aggregation	2015/2016	2012	2010
Washington			
Puget Sound Area	6.41	9.87	5.20
Northern WA Coast	0.00	0.00	0.00
South/Central WA Coast	2.49	0.86	1.73
Oregon			
Astoria	10.68	12.02	9.25
Garibaldi	0.36	0.00	0.00
Newport	16.73	11.59	11.56
Coos Bay Area	12.10	9.01	8.67
Brookings Area	3.91	2.58	4.05
California			
San Pedro/LA Port Area	0.00	0.00	0.00
San Diego	0.00	0.00	0.00
Crescent City	2.14	3.00	4.05
Eureka Area	7.12	8.15	13.29
Fort Bragg Area	6.05	9.44	12.72
Bodega Bay Area	1.07	2.58	0.00
San Francisco Area	4.27	4.29	0.00
Half Moon Bay Area	5.34	5.15	7.51
Monterey Area	7.12	7.73	5.20
Morro Bay Area	12.10	13.30	16.76
Santa Barbara Area	2.14	0.43	0.00
Washington	8.90	10.73	6.93
Oregon	43.77	35.20	33.53
California	47.33	54.07	59.54

Survey Data: Comparing Return Respondent and All Respondent Data

To provide clarity for the interpretation of the return respondent analysis, we describe the composition of return respondents compared to all respondents based on their average age, role in the fishing industry, residence location, and support for catch share. Compared to all respondents, return respondents are older (Table C-10).

Table C-10. Mean age (SD) of return respondents in comparison to all respondents across all three study years. Source: PCGFSS 2017.

2010	2012	2015/2016	2010	2012	2015/2016
Return Respondent			***All Respondent***		
52.88 (10.62)	54.67 (10.66)	57.98 (10.75)	50.79 (13.71)	52.88 (11.46)	54.24 (12.23)

Although the return respondent dataset contains the same sample across years, there are fluctuations in how those respondents describe their role in the commercial fishing industry (Table C-11). These fluctuations may reflect year-to-year variation in respondents' capacity within the fishing industry. For example, those who identify as fishing crew vary widely across years, ranging from 2.4 percent to 22 percent. Additionally, these fluctuations reflect shifts in ownership: seven respondents who had identified as limited entry permit owners/co-owners in 2010 did not identify as QS owners/co-owners in 2012 or 2015/2016. Two respondents in 2012 and 2015/2016 who had not identified as limited entry permit owners/co-owners in 2010, identified as QS owners/co-owners. These variations in ownership may be linked to QS allocations.

Table C-11 compares the percentage of respondents in various roles for 2010, 2012, and 2015/2016, using return respondent and all respondent data. In comparison to all respondent data, more return respondents are QS owners/co-owners, vessel owners/co-owners, vessel account owners/co-owners, and captain/operators. Return respondent data also show a slightly higher percentage of absentee owners than the all respondent data category (Table C-11). These differences should be taken into consideration when relating return respondent analysis to all respondent data.

Table C-11. Respondents' self-identified role(s) within the commercial fishing industry, in percentages. All respondent and return respondent data. Source: PCGFSS 2017.

	2010	**2012**	**2015/2016**	**2010**	**2012**	**2015/2016**
Role	***Return Respondent***			***All Respondent***		
QS (Permit) Owner/Co-Owner	50.0*	39.0	43.9	33.2*	31.7	31.6
Absentee Owner	NA	17.1	18.3	NA	14.9	14.5
Vessel Owner/Co-Owner	56.1	54.9	53.7	37.0	36.7	32.9
Vessel Account Owner/Co-Owner	NA	NA	40.2	NA	NA	28.6
QS/QP Manager	NA	NA	30.5	NA	NA	23.8
Risk Pool Manager	NA	NA	8.5	NA	NA	4.7
Broker	NA	NA	2.4	NA	NA	2.6
Captain/Operator	47.6	50.0	51.2	32.2	34.4	33.6
Fishing Crew	11.0	22.0	2.4	18.8	23.5	12.3
Observer	NA	0.0	0.0	NA	5.0	4.3
At-Sea CP/Mothership Owner	2.4	3.7	1.2	1.9	2.7	0.9
At-Sea CP/Mothership Operator	1.2	0.0	1.2	1.0	0.5	0.9
At-Sea CP/Mothership Fisherman	1.2	0.0	0.0	1.0	0.5	0.0
At-Sea CP/Mothership Processing	1.2	0.0	0.0	1.0	0.0	0.0
Vessel Crew (non-fishing/ processing)	0.0	1.2	1.2	0.0	0.5	0.4
Buyer/First Receiver	17.1	13.4	14.6	11.5	10.9	12.8
Shoreside Processor Owner	11.0	9.8	7.3	8.2	5.9	6.4
Shoreside Processor Operator	7.3	11.0	6.1	5.8	7.2	6.0
Shoreside Processor Employee	1.2	2.4	7.3	1.4	5.4	4.7
Fisherman's Wife/Partner/Spouse	2.4	3.7	2.4	4.3	3.6	4.7
Industry Supplier/Service Provider	12.2	12.2	11.0	10.6	15.8	13.2
Business Operations	8.5	22.0	20.7	10.1	17.2	19.1
Other	14.6	13.4	18.3	16.3	22.6	28.5
RR	100	100	100	100	100	100

Notes: "NA" represents a response category that was not listed as an option.

*Ownership in 2010 refers to Limited Entry Permit owners, as this period was prior to the catch share program.

Survey respondents were categorized into communities (groupings reflect Five-year Review Community Groupings) based on the location of their participation in the fishery. In terms of representation at the community level, return respondent and all respondent data reflect similar distributions (Table C-12). When comparing across years, there are no drastic changes in community representation, though there are

slight fluctuations. For return respondents, these fluctuations indicate that some respondents have moved. These values vary slightly from interview participant distribution as not all interview participants completed a survey and vice versa.

Table C-12. Survey respondent community representation based on Five Year Review Community Groupings, in percentages. All respondent and return respondent data. Source: PCGFSS 2017.

	2010	**2012**	**2015/2016**	**2010**	**2012**	**2015/2016**
Community Aggregation	***Return Respondent***			***All Respondent***		
Washington						
Puget Sound Area	11.0	9.9	9.8	7.7	11.8	9.7
Northern WA Coast	0.0	0.0	0.0	0.0	0.0	0.0
South/Central WA Coast	0.0	0.0	0.0	1.4	0.9	2.1
Oregon						
Garibaldi	0.0	0.0	0.0	1.0	0.0	0.4
Astoria	7.3	7.4	7.3	11.1	14.5	12.7
Newport	14.6	14.8	14.6	13.5	15.4	16.1
Coos Bay Area	9.8	8.6	9.8	12.5	11.8	10.6
Brookings Area	3.7	3.7	3.7	3.8	2.7	2.5
California						
San Pedro/LA Port Area	0.0	0.0	0.0	0.0	0.0	0.0
San Diego	0.0	0.0	0.0	0.0	0.0	0.0
Crescent City	2.4	2.5	2.4	2.4	2.7	2.5
Princeton/Half Moon Bay	3.7	4.9	5.6	6.3	3.6	5.9
Eureka Area	11.0	11.1	11.0	10.6	8.1	8.5
Fort Bragg Area	12.2	12.3	12.2	9.6	9.5	6.8
Bodega Bay Area	2.4	2.5	3.7	2.9	1.8	1.3
San Francisco Area	4.9	6.2	4.9	4.8	4.1	5.5
Morro Bay Area	12.2	12.3	12.2	4.8	8.1	7.6
Santa Barbara Area	0.0	0.0	0.0	0.5	0.0	0.4
Monterey Area	4.9	3.7	3.7	5.8	5.0	7.2
Other	0.0	0.0	0.0	1.4	0.0	0.0
NA/PNA	0.0	0.0	0.0	0.0	0.0	0.0
RR	100	100	100	100	100	100

In terms of representation at the state level, return respondent, and all respondent data reflect similar distributions, though there is a higher percentage in Oregon for all respondent data, and a higher percentage in California for return respondent data (Table C-13). Again, variations in return respondent data may indicate that some respondents have moved.

Table C-13. Survey respondent state representation, in percentages. All respondent and return respondent data. Source: PCGFSS 2017.

	2010	**2012**	**2015/2016**	**2010**	**2012**	**2015/2016**
State	***Return Respondent***			***All Respondent***		
Washington	11.0	9.9	9.8	10.6	12.7	11.5
Oregon	35.4	34.6	35.4	41.8	44.3	43.2
California	53.7	55.6	54.9	47.6	43.0	45.3
RR	100	100	100	100	100	100

Survey participants were asked whether they support, or do not support, the catch share program. The percentage of both all and return respondents reporting support for catch share has increased since 2010 (Table C-14). In 2010, return respondents were more supportive of catch share than all respondents; however, in 2012 all respondents were more supportive than return respondents. In 2015/2016, all respondents and return respondents reported similar levels of support for catch share. Conversely, results for both categories across all years indicated decreases for those who did not support the program.

Table C-14. Respondents' reported support for the catch share program. All respondent and return respondent data. Source: PGFSS 2017.

	2010	**2012**	**2015/2016**	**2010**	**2012**	**2015/2016**
	Return Respondent			***All Respondent***		
Support	27.5	36.4	43.0	23.8	48.2	47.1
Do not support	50.0	45.5	41.8	43.5	40.7	36.9
Not sure	22.6	15.6	15.2	29	11.6	16.4
NA/PNA	0	2.6	0	3.6	1.5	3.1
RR	98.8	98.7	98.8	97.5	98.5	97.4

Qualitative Data Description

(C1) Qualitative Data Codebook

The codebook is a compiled list of all qualitative codes and their definitions. It served as a common reference for researchers during the qualitative analysis process. The code definitions in the codebook were discussed and agreed upon before being applied to the interview transcriptions. Having all code

definitions readily available to each researcher during the coding process helped ensure that codes were applied in a consistent manner.

Note on codebook: In order to minimize the potential for inter-coder variability, the number of unique codes was intentionally limited. Where possible, code combinations took the place of unique codes. For instance, there is no "cost" sub-code of the "observers" parent code (or vice versa), despite the fact that cost was quite often central to participants' discussions of observers. Instead, comments regarding the cost of observers were coded with both the "cost" and "observers" parent codes. Coding in this manner effectively created built-in sub-codes represented by the co-occurrence of two or more codes. MAXQDA's Code Relations Browser function enables quick identification of co-occurrence trends among codes, and it was used often during analysis in order to understand the way various themes related to each other within the data set.

(C2) Qualitative Data Frequency Tables

Qualitative code frequency tables provide an indication of the relative prevalence of each of the qualitative codes used to analyze the 2015/2016 PCGFSS interview data. Please note the frequency of the codes does not represent the number of times a word or phrase occurred in the dataset. The code frequency refers to the number of times in the entire dataset that interview participants addressed a subject that aligned with a code definition in our codebook (See Table C-3). The coding scheme consisted of 21 parent (or top-level) codes, plus an additional 20 sub-codes. Parent code occurrences range from 2,088 for the "Working in the Industry" code and 12 for the "CA vs OR boats" code. Table C-17 (below) shows each parent code's total number of occurrences as well as a rank reflecting its usage relative to all other parent codes. This ranking was limited to parent codes in order to limit comparisons to a single level of analysis, rather than comparing parent codes and sub-codes to each other. For clarification, the rank order is 1 as the highest occurrence rank to 21 as the lowest occurrence rank. Table C-18 (below) provides information on sub-codes. The percentage provided under the header, "Percentage of parent code", indicates the proportion of the parent code that was further classified with the sub-code in question. Sub-codes were not applied to all coded segments of parent codes (see Table C-3 for code definitions); thus, percentages of parent codes do not add up to 100 percent. Table C-16 provides a snapshot of the number of parent codes and the total number of coded segments in the overall 2015/2016 dataset.

Table C-16. Overall coding overview. Source: PCGFSS 2017.

Number of parent codes	Total coded segments	
21	10940	

Table C-17. Parent Code Occurrences and Rank. Source: PCGFSS 2017.

Code	**Total occurrences**	**Rank**
Working in the Industry	2088	1
Management Process	1184	2
Cost	962	3
Observers	959	4
Markets	706	5
Adaptability	696	6
Fish Stocks	628	7
New Entrants	587	8
Ownership Dynamics	436	9
Infrastructure	360	10
Community	328	11
Impacts on Other Fisheries	325	12
Safety	271	13
Small Vessels	248	14
Accumulation & Consolidation	240	15(T)
Gear Switching	240	15(T)
Exit	221	17
Fishery Reputation	198	18
Geographic Shift	182	19
Fleet Variation	69	20
Cost Recovery	14	21
CA v. OR boats	12	22

Table C-18. Sub code occurrences and their proportion to their parent code. Source: PCGFSS 2107.

		Sub Code	**Total occurrences**	**Proportion of parent code**
Parent Code	Working in the Industry	Income	217	10.4%
		Running a business	653	31.3%
		Working experience	440	21.1%
		Jobs	242	11.6%
	Management Process	Involvement in the process	119	10.1%
		Quota allocations	290	24.5%
		Proposed action (by industry)	179	15.1%
		Efficacy	154	13.0%
	Markets	Quota pound market	94	13.3%
	Infrastructure	Industry suppliers/services	164	45.6%
		Processors//buyers	98	27.2%
	Geographic Shift	Stock-related (target)	50	42.4%
		Stock-related (bycatch)	14	11.9%
	Cost	Leasing	121	12.8%
	New Entrants/graying	Graying/retirement	84	14.3%
	Impacts on other fisheries	Other groundfish	40	12.3%
		Other non-groundfish	208	64.0%
	Ownership dynamics	Transfer of ownership	59	13.5%
		Collective ownership	41	9.4%
		Absentee ownership	148	34.0%

Table C-19: Summary of proportional distribution of 2015/2016 PCGFSS participant perspectives (* = within relevant sub-sample)

Topic/Perspective	**Description of relevant sub-sample (Number of interviews)**	**Number of interviews containing discussion of topic/perspective***	**Percentage of interviews containing discussion of topic/perspective***
Lowered income due to quota leasing costs	All interviews (N=253)	39	15.4%
Lowered income due to quota leasing costs	Non-owning captains and crew (44)	13	29.5%
Catch shares has made entry into the fishery less feasible	Participants with 2 or more generations of family fishing history (N=88)	53	60.2%
Catch shares has hindered/complicated intergenerational business transferability	Participants with 2 or more generations of family fishing history (N=88)	27	30.7%
Newport has remained a vibrant fishing community since catch shares implementation	Newport participants (N=47)	6	12.8%
Newport has remained a vibrant fishing community since catch shares implementation	Non-Newport participants (N=206)	9	4.4%
Number of active groundfish vessels in Newport has declined since catch shares implementation	Newport participants (N=47)	21	44.7%
Cost disadvantage for small vessel operations under catch shares	All interviews (N=253)	45	17.8%
Catch shares has increased business flexibility	All interviews (N=253)	45	17.8%
Catch shares has decreased business flexibility	All interviews (N=253)	69	27.3%
Catch shares has both increased and decreased different aspects of business flexibility	All interviews (N=253)	15	5.9%
Increase in income due to catch shares	All interviews (N=253)	25	9.9%

Fewer jobs as a result of catch shares	All interviews (N=253)	67	26.5%
More jobs as a result of catch shares	All interviews (N=253)	5	2.3%
Exiting the fishery	All interviews (N=253)	104	41.1%

Supplemental Materials

Information in this section is included to augment any information included in the main body of this document. The tables and figures located in this portion of the appendix may have been deemed too large or extensive to include in the main body of the document. However, we have opted to include these supplemental materials for those who may be interested in more detailed information and additional analysis conducted.

(D1) Section Specific Detailed Results

(D1.1) Absentee Quota Holders (Section 3.2.2(g)(3)(b))

One aspect of the quantitative analysis for Section 3.2.2(g)(4) (Absentee Quota Holders subheading under the Causes of Stress Within Communities Section) involved summarizing responses to survey items F14 (2015/2016), F10 (2012), and E9 (2010), using all respondent data. This survey item was in the Fishermen Section of the survey, and, thus, it only applies to fishermen. The item asked fishermen to rate the quality of their relationships with a variety of people (QS owner/permit owner, vessel owner, vessel account owner (2015/2016 only), captain/operator, crew, and observer) on the most recent groundfish trawl fishery boat(s) that they worked on. In 2012 and 2015/2016, fishermen were also asked if these relationships had changed since implementation of catch share. For the Absentee Quota Holder Section, we considered only relationships with QS owners and vessel owners. Captain/operator and crew relationships are considered in the Changing Nature of Fishery Businesses and Jobs Section.

Additionally, we summarized responses to survey items G9 (2015/2016 and 2012) and F9 (2010), using all respondent data. This survey item was in the Processor Section of the survey; thus, it only applies to processors. Similar to the items in the Fishermen Section, this item asked processors to rate the quality of their relationships with a variety of people (QS owner/permit owner, vessel owner, vessel account owner (only 2015/2016), captain/operator, buyer, distributor, marketer, and laborers) related to the purchasing of trawl caught groundfish. For the Absentee Quota Holder Section, we only considered relationships with QS owners and vessel owners. Captain/operator, buyer, distributor, marketer, and laborer relationships are considered in Section 3.2.2(h), Changing Nature of Fishery Businesses and Jobs.

All tables report percentages for the response options, including NA and PNA, which are grouped together for efficiency. Response rates (RR) are presented as percentages (number of total respondents, not including those marked missing, divided by the number of total respondents, including those marked missing). High instances of NA/PNAs can be attributed to respondents identifying as the role about which they are being queried. For instance, if a respondent identified as a QS owner, they would respond as NA for relationships with QS owner.

Fishermen's Relationships

Table C-20. Reported change in relationships with QS owner, vessel account owner (only 2015/2016), and vessel owner since implementation of catch share, in percentages. Fishermen only. Source: PCGFSS 2017.

	QS Owner	Vessel Account Owner	Vessel Owner
2015/2016			
Yes	4.6	1.9	0.9
No	46.3	41.7	42.5
NA/PNA	49.0	56.5	56.
RR	87.8	87.8	86.9
2012			
Yes	8.2	NA	5.9
No	41.2	NA	41.6
NA/PNA	50.5	NA	52.5
RR	83.6	NA	87.1

Table C-21. Quality of relationships with QS owner, vessel account owner (only 2015/2016), and vessel owner, in percentages. Fishermen only. Source: PCGFSS 2017.

	QS Owner	Vessel Account Owner	Vessel Owner
2015/2016			
Negative	0	0	0
Neutral	1.8	2.7	1.8
Positive	47.7	42.0	42.9
NA/PNA	50.4	55.4	55.4
RR	90.2	90.2	90.2
2012			
Negative	2.6	NA	0.9
Neutral	11.4	NA	12.2
Positive	40.4	NA	38.3
NA/PNA	45.6	NA	48.7
RR	97.4	NA	98.3
2010			
Negative	0	NA	0
Neutral	3.2	NA	1.6
Positive	58.7	NA	59.8
NA/PNA	38.1	NA	38.6
RR	93.3	NA	94.1

Processors' Relationships

Table C-22. Reported change in relationships with QS owner, vessel account owner (only 2015/2016), and vessel owner since implementation of catch share, in percentages. Processors only. Source: PCGFSS 2017.

	QS Owner	Vessel Account Owner	Vessel Owner
2015/2016			
Yes	9.8	5.3	7.5
No	51.2	50.0	70.0
NA/PNA	39.0	44.7	22.5
RR	97.6	92.7	97.6
2012			
Yes	12.5	NA	15.6
No	43.8	NA	46.9
NA/PNA	43.7	NA	37.5
RR	80.0	NA	80.0

Table C-23. Quality of relationships with QS owner, vessel account owner (only 2015/2016), and vessel owner, in percentages. Processors only. Source: PCGFSS 2017.

	QS Owner	Vessel Account Owner	Vessel Owner
2015/2016			
Negative	2.4	2.6	2.4
Neutral	7.3	7.7	9.8
Positive	51.2	46.2	65.9
NA/PNA	39.0	43.6	22.0
RR	97.6	95.1	97.6
2012			
Negative	0	NA	2.9
Neutral	14.3	NA	8.6
Positive	45.7	NA	54.3
NA/PNA	40.0	NA	34.3
RR	87.5	NA	87.5
2010			
Negative	0	NA	0
Neutral	2.8	NA	2.8
Positive	75	NA	75.0
NA/PNA	22.2	NA	22.2
RR	94.7	NA	94.7

(D1.2) Changing Nature of Fishery Businesses and Jobs (Section 3.2.2(h))

This aspect of the quantitative analysis for Section 3.2.2(h), Changing Nature of Fishery Businesses and Jobs, involved summarizing responses to survey items F14 (2015/2016), F10 (2012), and E9 (2010) by using all respondent data. These survey items were in the Fishermen Section of the survey; thus, they only apply to fishermen. The items asked fishermen to rate the quality of their relationships with a variety of people (QS owner/permit owner, vessel owner, vessel account owner [2015/2016 only]), captain/operator, crew, and observer) on the most recent groundfish trawl fishery boat(s) on which they worked. We also summarize responses to F20 (2015/2016), F16 (2012), and E15 (2010) where fishermen were asked to rate the quality of their relationships with a variety of people (buyer/first receiver, processor, mothership) related to the selling of groundfish that they commercially caught with trawl gear. In 2012 and 2015/2016, fishermen were also asked if these relationships had changed since implementation of catch share. For the Changing Nature of Fishery Businesses and Jobs Section, we considered only relationships with captain/operator, crew, buyer/first receiver, processor, and mothership. Relationships with QS owners, vessel owners, and vessel account owners are described in Section 3.2.2(g)(4), Absentee Quota Holders.

Additionally, we summarized responses to survey items G9 (2015/2016 and 2012) and F9 (2010) using all respondent data. This survey item was in the Processor Section of the survey; thus, it applies only to processors. Similar to the items in the Fishermen Section, this item asked processors to rate the quality of

their relationships with a variety of people (QS owner/permit owner, vessel owner, vessel account owner [2015/2016 only], captain/operator, buyer, distributor, marketer, and laborers) related to the purchasing of trawl caught groundfish. For the Changing Nature of Fishery Businesses and Jobs Section, we considered only relationships with captain/operator, buyer, distributor, marketer, and laborers. Relationships with QS owners, vessel owners, and vessel account owners are described in Section (3.2.2(g)(4)), Absentee Quota Holders.

All tables report percentages for the response options, including NA and PNA, which are grouped together for efficiency. RRs are presented as percentages (number of total respondents, not including those marked missing, divided by the number of total respondents, including those marked missing). High instances of NA/PNAs can be attributed to respondents identifying as the role about which they are being asked. For instance, if a respondent identified as a captain/operator, they would respond as not applicable for relationships with captain/operator.

Fishermen's Relationships

Table C-24. Quality of relationships with captain/operator, crew, buyer/receiver, processor, and mothership, in percentages. Buyer/receiver was not a response option in 2010. Fishermen only. Source: PCGFSS 2017.

	Captain/Operator	Crew	Buyer/Receiver	Processor	Mothership
2015/2016					
Negative	0	2.7	0.9	0.9	2.7
Neutral	3.5	9.7	13.0	14.4	1.8
Positive	38.1	79.6	60.0	58.6	10.6
NA/PNA	58.4	8.0	26.1	26.1	85.0
RR	91.9	91.9	94.3	91.0	92.6
2012					
Negative	0	1.8	0.9	4.6	0
Neutral	3.5	15.8	16.4	18.3	3.9
Positive	41.6	74.6	44.5	44.0	13.7
NA/PNA	54.9	7.9	48.2	33.0	82.4
RR	96.6	97.4	94.8	92.4	90.3
2010					
Negative	0	0	NA	5.3	0
Neutral	1.6	8.4	NA	13.2	3.7
Positive	60.9	85.5	NA	63.2	13.4
NA/PNA	37.5	6.1	NA	18.5	82.9
RR	94.8	97.0	NA	98.3	96.5

Table C-25. Reported change in relationships with captain/operator, crew, buyer/receiver, processor, and mothership since implementation of catch share, in percentages. Fishermen only. Source: PCGFSS 2017.

	Captain/Operator	Crew	Buyer/Receiver	Processor	Mothership
2015/2016					
Yes	1.8	4.6	12.0	11.5	5.4
No	41.8	86.2	61.1	60.6	7.2
NA/PNA	56.5	9.2	26.9	27.9	87.4
RR	89.4	88.6	88.5	85.2	91.0
2012					
Yes	2.9	8.1	13.6	12.2	3.1
No	37.9	81.4	39.8	4.9	10.3
NA/PNA	59.2	10.5	46.6	38.8	86.6
RR	88.8	73.5	76.5	83.8	85.8

Processors' Relationships

Table C-26. Quality of relationships with captain/operator, buyer, distributor, marketer, and laborers, in percentages. Processors only. Source: PCGFSS 2017.

	Captain/Operator	Buyer	Distributor	Marketer	Laborers
2015/2016					
Negative	2.6	0	0	0	5.3
Neutral	5.1	2.4	5.0	5.1	7.9
Positive	71.8	39.0	57.5	33.3	65.8
NA/PNA	20.5	58.5	37.5	61.5	21.1
RR	95.1	100	97.5	95.1	92.7
2012					
Negative	0	0	0	3.1	12.5
Neutral	8.8	12.1	12.1	9.4	15.6
Positive	58.8	36.4	36.4	28.1	46.9
NA/PNA	32.30	51.5	51.5	59.4	25.0
RR	85	82.5	82.5	80.0	80.0
2010					
Negative	0	0	2.9	0	0
Neutral	5.6	8.3	8.6	5.9	5.7
Positive	75.0	55.6	57.1	29.4	74.3
NA/PNA	19.4	36.2	31.4	64.7	20.0
RR	94.7	94.7	90.2	89.5	90.2

Table C-27. Reported change in relationships with captain/operators, buyer, distributor, marketer, and laborers since implementation of catch share, in percentages. Processors only. Source: PCGFSS 2017.

	Captain	Buyer	Distributor	Marketer	Laborers
2015/2016					
Yes	7.7	2.4	5.0	0	18.9
No	71.8	39	57.5	38.5	59.5
NA/PNA	20.5	58.5	37.5	61.5	21.6
RR	95.1	100	97.5	95.1	90.2
2012					
Yes	9.7	2.9	3.2	9.4	26.7
No	54.8	47.1	41.9	31.3	43.3
NA/PNA	35.5	50.0	54.8	59.4	30.0
RR	77.5	85.0	77.5	80.0	75.0

(D1.3) Location of Landings (Section 3.1.2(d)(3))

The Location of Landings Section within the Economic Performance section includes some summary results from the PCGFSS. For those who may be interested, detailed results are included here.

Fishermen's Responses

In order to explore the decision-making process related to selling catch, fishermen were asked about the items they consider when deciding where to sell catch (Table C-27). To determine what factors constrained this decision, fishermen were also asked what limited their choice of where to sell catch (Table C-28). These are multiple response items. Additionally, in order to improve clarity, some categories were added after 2010.

Table C-28. Responses (in percentages) to the question: What items are taken into consideration when deciding where to sell the catch? Multiple response item. Fishermen only. Source: PCGFSS 2017.

Response Categories	2010	2012	2015/2016
Mutual agreement with buyer	44.6	33.3	29.4
Mutual agreement with processor	29.2	28.9	23.5
Contract with buyer	9.2	2.6	3.4
Contract with processor	3.8	4.4	4.2
Only single buyer available	10.8	10.5	10.1
Best price/market	18.5	25.4	25.2
Mothership or Catcher-Processor	3.1	9.6	5.9
Longstanding relationship	NA*	47.4	52.9
Vessel is owned by processor	NA*	3.5	5.0
Do not know	10.8	7.0	7.6
Other	16.2	15.8	19.3
NA/PNA	5.4	3.5	5.0
RR	96.3	97.4	96.7

Note: Categories were added to the 2012 survey based on participants' responses2.

2 These categories were added in order to improve clarity, and were created based on responses to the "other" category in 2010. For instance, in 2010, 41% of those who responded "other" indicated a longstanding relationship as a response. Longstanding relationship is distinct from a mutual agreement due to the value of time. The longstanding relationship refers to individuals whom have stayed with an entity for what they perceive to be a long time; often spoke of in terms of decades, generations, etc. The mutual agreement category has no temporal limit, it refers to an agreement between two entities that is less formal that a "contract" which is defined as a formal written document.

Table C-29. Responses (in percentages) to the question: What limits your choice of where to sell your fish? Multiple response item. Fishermen only. Source: PCGFSS 2017.

Response Categories	2010	2012	2015/2016
Market	26.6	28.8	31.6
Limited number of processors	41.4	36.9	41.9
Location of processors	20.3	26.1	23.9
Amount purchased by processor	16.4	21.6	24.8
Amount paid for catch by processor	22.7	27.0	19.7
Species purchased by processor	23.4	20.7	13.7
Multiple species required by processor for purchase of all species	7.0	16.2	7.7
Sell/deliver to a Mothership or Catcher-Processor	2.3	10.8	4.3
Vessel is owned by processor	NA*	4.5	6.8
No limitations	7.8	8.1	9.4
Other	29.7	25.2	23.1
NA/PNA	4.7	8.1	5.1
RR	95.5	94.9	95.1

* Category added to the 2012 survey based on participants' responses.

Processors' Responses

In order to explore the decision-making process related to purchasing fish, processors were asked about the items they considered when deciding where to purchase trawl caught groundfish (Table C-29).

Table C-30. Responses (in percentages) to the question: What items are taken into consideration when deciding where to purchase trawl caught groundfish? Multiple response item. Processors only. Source: PCGFSS 2017.

Response Categories	2010	2012	2015/2016
Mutual agreement with fisherman/boat	78.4	47.5	45.0
Contract with fisherman/boat	2.7	7.5	10.0
Relationship with fisherman	NA	60.0	80.0
Company fishing boats	16.2	15.0	25.0
Buyer/first receiver	8.1	12.5	17.5
Contract/agreement with buyer/first receiver	2.7	5.0	10.0
Catcher-Processor	8.1	0.0	0.0
Geographic location (distance from plant)	NA	42.5	32.5
Do not know	2.7	2.5	0.0
Other	37.8	27.5	32.5
NA/PNA	2.7	7.5	5
RR	97.4	100	95.2

(D2) Acronym List

EDF – Environmental Defense Fund

IFQ/ITQ/IQ – Individual Fishing Quota, Individual Transferable Quota, or Individual Quota; alternative terminologies for "catch share" often used by industry members and in academic literature

NA – Not applicable; response option for PCGFSS

OA – Open access

OTC – Oregon Trawl Commission

PCGFSS – Pacific Coast Groundfish Fishery Social Study

PNA – Prefer not to answer; response option for PCGFSS

POP – Pacific ocean perch

RCA – Rockfish Conservation Area

RR – Response rate; reported with PCGFSS data graphs and tables, and refers to question specific response rate

(D3) Citations Used in Appendix

Bernard, H. R. 2000. Social Research Methods: Qualitative and Quantitative Approaches. Sage Publications, Thousand Oaks, CA.

Bernard, H. R. 2002. Research Methods In Anthropology, Third Edition edition. AltaMira Press, Walnut Creek, CA.

Cochran, W.G. 1950. The comparison of percentages in matched samples. Biometrika 37 (3/4): 256-266.

McNemar, Q. 1949. Psychological statistics. New York: John Wiley and Sons.

Rea, L. M., and R. A. Parker. 1997. Designing and Conducting Survey Research: A Comprehensive Guide, Second Edition edition. Jossey-Bass, San Francisco, CA.

Robson, C. 2002. Real World Research, Second Edition edition. Blackwell Publishing, Malden, MA.

Russell, S. M., Sparks, K., Arias-Arthur, A., & Varney, A. 2014. The Pacific Groundfish Fishery Social Study: An Initial Theme Based Report. Seattle (WA): US Department of Commerce. NWFSC Report, 5, 78.

Russell, S. M., Arias-Arthur, A., Sparks, K., & Varney, A. 2016. West coast communities and catch share: The early years of social change. Coastal Management, 44(5), 441-451.

Russell, S., and M. Schneidler-Ruff. 2014. The U.S. Whale Watching Industry of Greater Puget Sound: A Description and Baseline Analysis. U. S. D. o. Commerce, editor. NOAA, Seattle, WA.

Ryan, G. 1999. Measuring the typicality of text: Using multiple coders for more than just reliability and validity checks. Human Organization, 58(3), 313-322.

Saldaña, J. 2015. The coding manual for qualitative researchers. Sage.

Schensul, S. L., J. J. Schensul, and M. D. LeCompte. 1999. Essential Ethnographic Methods; Observations, Interviews, and Questionnaires, volume 2. AltaMira Press, Lanham, MD.

Sheldon, M.R., Fillyaw, M.J., and Thomson, W.D. 1996. The use and interpretation of the Friedman test in the analysis of ordinal-scale data in repeated measures designs. Physiotherapy Research International 1 (4): 221-228.

Strauss, A., & Corbin, J. 1998. Basics of qualitative research. 1998. Thousand Oaks

APPENDIX D: PORT PROFILES

For each port identified as active after 2005 (Section 3.2, Table 3-82), this appendix provides a pair of tables that summarizes available infrastructure information. Seattle is also included because of its importance as a port for the at-sea fleet, as well as the involvement of area residents in ownership of fishing assets such as QS (see Table D-2b). The first table in each pair covers infrastructure on fuel docks; ice plants; cold storage; processors; berths and moorage; gear storage yards; boat hoists, lifts, cranes, and shipyards; marine supply stores; dredging; and local USCG stations. Pre-catch share information about these infrastructure elements is primarily summarized from the text of Community Profiles for West Coast and North Pacific Fisheries Washington, Oregon, California, and other states of the United States (NMFS 2007). Information on current conditions was derived mainly from interviews of enforcement personnel, port samplers, port managers, and members of industry, many of whom were knowledgeable about the infrastructure in a number of ports. The second table in each pair covers numbers of buyers active in the ports, vessels owned by port residents, numbers of vessels active in the ports, groundfish limited entry permits and quota owned by port residents, and indicators of the importance of groundfish to the fishing industry in the port (port groundfish ex-vessel revenue as a percent of all ex-vessel revenue for the port) and the importance of the port to the West Coast fishery production (port ex-vessel revenues as a percent of coast wide ex-vessel revenues). Many of these data elements are included elsewhere in the Community Performance Section, but they are brought together for each port in a single location in this appendix.

Table D1a. Bellingham Washington, commercial-fishery-related infrastructure.

Bellingham Bay/Whatcom County	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[3]	Yes (up to 50-foot vessels, larger vessels receive truck deliveries at a lower price than dock).	Ice sales: ice blower system in place Public refrigeration (also some in Mt. Vernon and Burlington, but not used by harvesters).	At least nine in the early 2000s.	Squalicum harbor has several marinas providing berthing for about 1,200 commercial and pleasure. There is additional berthing on the Whatcom Creek Waterway that can accommodate a few 100-foot vessels. Additionally there are three large deep-draft piers 25- to 30-foot MLLW.	Web lockers and outdoor gear and vessel storage.	Mobile and Floating Cranes. Dry docks to handle 300-foot to 400-foot vessels. Two travel lifts that lift and swing. One can swing 100 tons or so. Upwards of a 60- to 70-foot vessel. Shipyards are also available nearby in Blaine.	Two vessel suppliers.	Maintenance dredging in 2003.	USCG Station Bellingham and the cutters Terrapin and Sea Lion (stationed in Fairhaven, WA). Other USCG support in the area includes the cutters Blue Shark (Everett). Also see Neah Bay for additional USCG assets in the area.
Catch shares (2011 to 2016).[4]	No Change.	No Change.	At least four remain (some of the decline may have preceded 2011.	No Change.	New indoor facility for gear storage.	No Change.	One vessel supply store remains.	Port requested COE dredging for 2016 to 2017.	No change.[5]

[3] Data from NMFS (2007) port profiles, unless otherwise noted.
[4] Personal communication, Russ Mullins, February 16, 2017, unless otherwise noted.
[5] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D1b. Bellingham Washington, and northern Puget Sound region, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

	Trawl-caught-Groundfish Buyers	Numbers of Vessels Owned by Residents		Numbers of IFQ Vessels Delivering			Permits/Quota Held in Community6			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following: the Following:		
		All	Groundfish Trawl	Nonwhiting Trawl	Whiting Trawl	Gear-switched	LE Trawl Permits	Non-whiting QS	Whiting QS	Nonwhiting	Whiting	Nonwhiting	Whiting	All Species (Groundfish and Other)
1998	2	174	1	5	-	-	2							
2000	2	165	1	7	-	-	2							
2004	2	110	2	6	-	-	3							
2009	1	109	4	5	-	-	2							
2010	1	104	3	7	-	-	2							
2011	1	105	2	4	-	2	2	1.8%	0.1%					
2015	2	89	1	3	-	2	2	1.3%	0.1%					
Northern Puget Sound[7]														
1998	4	443	7	8	1	-	8			5.7%	Conf	4.6%	Conf	9.9%
2000	3	411	9	12	-	-	8			7.3%	-	6.9%	-	8.9%
2004	4	322	3	6	-	-	6			3.4%	-	6.2%	-	9.3%
2009	1	304	4	5	-	-	2			Conf	-	Conf	-	9.2%
2010	1	313	3	7	-	-	2			Conf	-	Conf	-	10.0%
2011	1	318	3	4	-	2	2	3.5%	4.0%	Conf	-	Conf	-	8.2%
2015	2	270	2	3	-	2	2	3.0%	2.7%	Conf	-	Conf	-	10.7%

Conf = not displayed due to confidentiality.

[6] Location assigned based on addresses as listed in permit files.

[7] Northern Puget Sound includes Bellingham, Blaine, and La Conner and other Whatcom County, Skagit County, San Juan County, Island County, and Snohomish county ports/towns.

Table D2a. Seattle Washington, commercial-fishery-related infrastructure.

Seattle	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/ Dry Dock	Marine/ Vessel Supply Stores,	Dredging	USCG
Pre-catch shares.[8]	NR.	NR.	Seven processors.	Pier 90 and Pier 91 (12 berths for barges and factory trawlers). Commercial moorage at the Bell Street Pier, Maritime Industrial Center, Terminal 30, and Fishermen's Terminal. Fishermen S Terminal provides moorage for more than 700 workboats and commercial fishing vessels, lineal moorage of 2,500 feet, and 371 stalls.	NR.	NR.	NR.	Naturally deep harbor at Pier 90 and 91. Very occasional dredging to maintain the passage, berthing, and dry docks in the ship canal.[9]	13th USCG District headquarters
Catch shares (2011 to 2016).[10]	Available. No big changes.	Ice readily available. Cold storage and refrigeration facilities are stable.	Many processors of different types. A rapidly growing industry in terms of the number of new processors. A few new processors every year. Adding 12 processors in next month due to commissions classification of king crab as red, brown, and blue.	No change. Difficult time maintaining a tenant in Terminal 25. (Vessels are increasingly going to Tacoma for offloading)	Available. No major changes.	Available. No major changes.	Available. No major changes.	No change.	No change.

[8] Data from NMFS (2007) port profiles, unless otherwise noted.

[9] For example, dry dock dredging project for 2017 last dredged in 1976 (http://www.seattle.gov/dpd/LUIB/AttachmentProject3023827ID79863023827.pdf); maintain berthing (http://www.ecy.wa.gov/programs/sea/fed-permit/pdf/201201261WQC10451.pdf).

[10] Personal communication, Eric Olsen, April 26, 2017, unless otherwise noted.

Table D2b. Seattle Washington and southern Puget Sound region, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[11]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following: the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Nonwhtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Nonwhiting	Whiting	Nonwhiting	Whiting	All Species (Groundfish and Other)
1998	-	140	23	-	-	-	24							
2000	-	134	27	-	-	-	24							
2004	-	102	11	-	-	-	24							
2009	-	88	17	-	-	-	28							
2010	-	85	22	-	-	-	27							
2011	-	78	24	-	-	-	29	9.7%	17.3%					
2015	-	85	24	-	-	-	30	8.7%	23.5%					
Southern Puget Sound														
1998	-	354	28	-	-	-	29			-	-	-	-	-
2000	-	339	31	-	-	-	29			-	-	-	-	-
2004	-	287	12	-	-	-	25			-	-	-	-	-
2009	-	250	19	-	-	-	30			-	-	-	-	-
2010	-	255	24	-	-	-	30			-	-	-	-	-
2011	-	248	28	-	-	-	32	9.7%	17.3%	-	-	-	-	-
2015	-	246	25	-	-	-	32	8.7%	23.5%	-	-	-	-	-

Conf = not displayed due to confidentiality.

[11] Location assigned based on addresses as listed in permit files.

Table D3a. Neah Bay, Washington, commercial-fishery-related infrastructure.

Neah Bay Strait of Juan de Fuca (protected by small island and breakwaters)	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/ Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[12]	One commercial (Tribal Run).	No.	No.	Neah Bay Marina - 200 commercial and sportfishing vessels (moorage for 30- to 200-foot vessels).	No.	No vessel hoists/lifts.	No.	COE maintenance dredging for fish gap in eastern breakwater. Periodic Tribal dredging of navigation channel.[13]	USCG Sta. Neah Bay. Other USCG support in the area includes the cutters Osprey (Port Townsend), and Cuttyhunk, Adelie, Wahoo, Swordfish (Port Angeles); USCG Station Port Angeles; Air Station Port Angeles (helicopters); and USCG Station Quillayute River (La Push). Also, see Bellingham for additional USCG assets in the area.
Catch shares (2011 to 2016) .[14]	Recently upgraded.	New ice plant. No cold storage (trucked out).	No (a startup is being contemplated).	New berthing docks.	No.	No (Pr. Angeles is nearest).	No.	No change.	No change.[15]

[12] Data from NMFS (2007) port profiles, unless otherwise noted.
[13] NOAA, Sanctuaries and Reserves Division. Proposed Olympic Coast National Marine Sanctuary: Environmental Impact Statement. US Department of Commerce, 1993.
[14] Personal communication, Dan Chadwick, February 10, 2017, unless otherwise noted.
[15] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D3b. Neah Bay Washington and northern Washington coast region, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

	Trawl-caught-Groundfish Buyers	Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[16]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following: the Following:		
		All	Groundfish Trawl	Non-whtg Trawl	Non-whiting	Whiting	Non-whiting	Non-whiting	Whiting	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	2	4	-	10	-	-	-							
2000	6	4	-	11	-	-	-							
2004	2	4	-	5	-	-	-							
2009	1	3	-	1	-	-	-							
2010	1	2	-	1	-	-	-							
2011	-	3	-	-	-	-	-	-	-					
2015	-	2	-	-	-	-	-	-	-					
Northern Washington Coast[17]														
1998	2	74	2	10	-	-	-			9.8%	-	3.1%	-	3.9%
2000	6	62	2	11	-	-	-			9.9%	-	3.5%	-	3.4%
2004	2	52	2	6	-	-	-			3.0%	-	2.6%	-	4.4%
2009	1	47	-	1	-	-	-			Conf	-	Conf	-	4.0%
2010	1	49	1	1	-	-	-			Conf	-	Conf	-	4.2%
2011	-	44	-	-	-	-	-	-	-	-	-	-	-	3.6%
2015	-	43	-	-	-	-	-	-	-	-	-	-	-	4.2%

[16] Location assigned based on addresses as listed in permit files.
[17] Northern Washington Coast Area includes Neah Bay, La Push, Port Angeles, Port Townsend, Sequim and other Clallam County and western Jefferson County ports/towns.
Conf=not displayed due to confidentiality.

Table D4a. Westport Washington, commercial-fishery-related infrastructure.

Westport Westhaven Cove, Grays Harbor	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Fish Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Commercial Marine/Vessel Supply Stores	Dredging	USCG
Pre catch shares.[18]	Yes .	Yes.	At least three.	650-vessel moorage capacity for vessels up to 200 feet. 170-foot moorage dock.	Yes.	No.	Yes.	Annual dredging in the outer harbor.	USCG Sta. Grays Harbor.
Catch shares (2011 to 2016) .[19]	No change.	Very large new cold storage.	Three.	No change.	No.	No change.	No change.	No change.	No change.[20]

[18] Data from NMFS (2007) port profiles, unless otherwise noted.
[19] Personal communication, Dan Chadwick, February 10, 2017, unless otherwise noted.
[20] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D4b. Westport, Washington, and central/southern Washington Coast region, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

	Trawl-caught-Groundfish Buyers	Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[21]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following: the Following:		
		All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	5	67	3	13	4	-	4							
2000	3	61	3	12	7	-	4							
2004	3	68	-	4	6	-	1							
2009	3	65	1	7	7	-	1							
2010	2	62	2	4	10	-	1							
2011	1	69	-	1	6	4	1	0.6%	6.8%					
2015	1	58	2	3	6	-	1	0.7%	6.8%					
Central/Southern Washington Coast (same as Ilwaco) [22]														
1998	5	270	8	16	6	-	11			4.0%	Conf	4.5%	Conf	14.0%
2000	3	263	6	12	8	-	9			2.0%	Conf	3.0%	Conf	14.4%
2004	3	264	4	4	6	-	7			Conf	Conf	Conf	Conf	15.3%
2009	4	252	7	7	9	-	7			1.5%	Conf	3.8%	Conf	16.5%
2010	3	242	6	4	11	-	6			Conf	Conf	Conf	Conf	17.4%
2011	3	257	4	4	8	9	8	3.9%	10.8%	Conf	Conf	Conf	Conf	19.0%
2015	2	235	7	16	7	1	9	3.7%	10.8%	Conf	Conf	Conf	Conf	20.7%

[21] Location assigned based on addresses as listed in permit files.
[22] Central/South Washington Coast Area includes Westport, Ilwaco, Chinook, Copalis, Grays Harbor, Willapa , other Grays Harbor County and Pacific County ports/towns, and other lower Columbia River ports.
Conf=not displayed due to confidentiality.

Table D5a. Ilwaco Washington, commercial-fishery-related infrastructure.

Ilwaco Harbor, Baker Bay on Columbia River	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[23]	Two.	Ice available. Cold storage for bait (processor has cold storage for own use).	One.	54 commercial fishing vessels and 610 pleasure craft (June 2005) 800-slip marina.	No.	Two small boat hoists (recreational) and a 50 ton travel lift for fairly large commercial vessels). Dry boat storage Full service work yard.	Yes.	Periodic entrance dredging by the ACOE. Port maintains the marina area.[24]	USCG Station Cape Disappointment (largest search and rescue station on the Northwest Coast) is co-located with the USCG National Motor Lifeboat School.
Catch shares (2011 to 2016) .[25]	One.	No change.	No change.	Upgrading commercial docks.	No.	No change to hoists. Now three enclosed bays for inside work and an enclosed shop (there has been one for a long time, and two more were added)	No change.	Recent COE commitment to several years of dredging.	No change.[26]

[23] Data from NMFS (2007) port profiles, unless otherwise noted.
[24] Whittaker, Luke. "Dredging Underway at Port of Chinook." Chinook Observer. January 31, 2017. http://www.chinookobserver.com/co/local-news/20170131/dredging-underway-at-port-of-chinook.
[25] Personal communication, Dan Chadwick, February 10, 2017, unless otherwise noted.
[26] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D5b. Ilwaco/Chinook, Washington, and central/southern Washington Coast region, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[27]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following: the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	2	27	-	5	2	-	-							
2000	1	25	-	2	2	-	-							
2004	1	24	-	-	1	-	-							
2009	1	20	-	-	2	-	-							
2010	1	20	-	-	2	-	-							
2011	2	22	2	4	4	5	3	1.3%	0.7%					
2015	1	21	2	1	1	1	4	1.3%	0.8%					
Central/southern Washington Coast (same as Westport)[28]														
1998	5	270	8	16	6	-	11			4.0%	Conf	4.5%	Conf	14.0%
2000	3	263	6	12	8	-	9			2.0%	Conf	3.0%	Conf	14.4%
2004	3	264	4	4	6	-	7			Conf	Conf	Conf	Conf	15.3%
2009	4	252	7	7	9	-	7			1.5%	Conf	3.8%	Conf	16.5%
2010	3	242	6	4	11	-	6			Conf	Conf	Conf	Conf	17.4%
2011	3	257	4	4	8	9	8	3.9%	10.8%	Conf	Conf	Conf	Conf	19.0%
2015	2	235	7	16	7	1	9	3.7%	10.8%	Conf	Conf	Conf	Conf	20.7%

[27] Location assigned based on addresses as listed in permit files.
[28] Central/southern Washington Coast area includes Westport, Ilwaco, Chinook, Copalis, Grays Harbor, Willapa , other Grays Harbor County and Pacific County ports/towns, and other lower Columbia River ports/towns on the Washington side of the river.
Conf = not displayed due to confidentiality.

Table D6a. Astoria (including Hammond and Warrenton) Oregon, commercial-fishery-related infrastructure.

Columbia River, Skipanon Waterway	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[29]	Two.	NR[30]	At least four seafood processors in Astoria and at least four in Warrenton in 2000.	East Basin (com and rec) 82 slips West Basin Marina 335 slips Warrenton Marina 370 slips for commercial and recreational vessels. Hammond marina (primarily recreational, some commercial).	Yes.	10-acre boatyard. In-water and Upland Vessel Storage. Three boatyards; two have lifts; the third uses a ramp. 88-ton travel lift.	Yes.	Maintenance dredging is required for the Skipanon Channel and in the Hammond Basin as well as the Port of Astoria's piers and boat basins.[31]	USCG Station Cape Disappointment is located across the river on the Washington side (see Ilwaco). USCG Sector Columbia River and Air Station Astoria (helicopters), as well as the USCG Cutter Fir ("The Bar Tender") are located in Astoria. as well as the
Catch shares (2011 to 2016).[32]	Two (one affiliated with processor).	Six cold storages and ice plants (one cold storage not in use). All are connected to fish plants.	Eight processors. Three previously active processors no longer have facilities in the area.	Substantial renovations in progress or needed. For example, Astoria's east marine basin dock structure is unsafe for vehicles. Most commercial vessels are in Warrenton marina.	Yes (Warrenton).	One of the boatyards will be closing soon (superfund site).	Yes.	No change.	No change.[33]

[29] Data from NMFS (2007) port profiles, unless otherwise noted.
[30] Not covered in the NMFS (2007) port profiles.
[31] http://www.dailyastorian.com/Local_News/20141128/merkley-again-helps-port-of-astoria-dredge; https://www.oregon.gov/LCD/OCMP/docs/Public_Notice/Warrenton_ComprehensivePlan.pdf; https://www.oregon.gov/LCD/OCMP/docs/Public_Notice/Warrenton_ComprehensivePlan.pdf.
[32] Personal communication, Sheryl M. Flores, February 17, 2017, unless otherwise noted.
[33] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

http://portofastoria.com/.

Table D6b. Astoria, Oregon, and Astoria area activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

	Trawl-caught-Groundfish Buyers	Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[34]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following: the Following:		
		All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	7	159	27	35	16	-	29							
2000	7	177	24	45	17	-	26							
2004	2	179	13	27	6	-	15							
2009	5	162	17	32	12	-	16							
2010	6	168	17	29	15	-	16							
2011	4	167	16	18	17	3	13	9.7%	6.3%					
2015	4	160	11	23	12	4	13	8.8%	6.2%					
Astoria Area[35]														
1998	7	172	28	35	16	-	29			33.1%	10.2%	18.4%	35.4%	6.9%
2000	7	190	24	45	17	-	26			24.8%	10.6%	21.4%	38.8%	8.3%
2004	2	193	13	27	6	-	15			25.2%	conf	28.5%	conf	5.8%
2009	5	174	17	32	12	-	16			24.5%	6.1%	26.3%	36.8%	6.9%
2010	6	182	17	29	15	-	16			19.3%	6.1%	27.2%	21.8%	6.5%
2011	4	183	18	18	17	3	13	9.7%	6.3%	conf	21.0%	conf	45.8%	7.2%
2015	4	174	11	23	12	4	13	8.8%	6.2%	29.4%	10.2%	39.6%	42.1%	7.9%

[34] Location assigned based on addresses as listed in permit files.
[35] Astoria Area includes Astoria, Hammond, Warrenton, Cannon Beach, Gearhart, other Clastop County ports/towns, and other lower Columbia River ports/towns on the Oregon side of the river.
Conf = not displayed due to confidentiality.

Table D7a. Garibaldi, Oregon, commercial-fishery-related infrastructure.

Tillamook Bay - shallow draft harbor	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[36]	One.	NR.[37]	At least one processing company.	Wet/dry moorage.	NR.	NR.	NR.	Periodic maintenance dredging for the boat basin area.[38]	USCG Station, Tillamook Bay.
Catch shares (2011 to 2016).[39]	Two (one is small and was not included in previous profile, primarily used by the recreational fishery) Most fuel for commercial vessels is trucked in.	No change. Minimal capacity. Two in connection with processors.	Four processors (two operating out of the same building)	Moorage for 277 vessel.[40] No significant changes in berths and moorage. New dock with heavy cranes for moving things on/off vessels.	Gear storage available. Gear shed demolished. No other changes.	Dry dock storage area.	No change. Nearest in Astoria.	Maintenance dredging in marinas. Dredging needed. Challenging bar crossing for smaller vessels (sensitive to weather/ wave conditions).	No change.[41]

[36] Data from NMFS (2007) port profiles, unless otherwise noted.
[37] Not covered in the NMFS (2007) port profiles.
[38] http://www.dredgingtoday.com/tag/garibaldi/
[39] Personal communication, Sheryl M. Flores, February 17, 2017, unless otherwise noted.
[40] Source: http://portofgaribaldi.org/
[41] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D7b. Garibaldi Oregon and Tillamook area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

	Trawl-caught-Groundfish Buyers	Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[42]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following: the Following:		
		All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	2	21	4	3	-	-	2							
2000	2	21	5	2	-	-	4							
2004	3	26	5	3	-	-	4							
2009	1	25	5	2	-	-	4							
2010	1	24	5	1	-	-	4							
2011	-	22	2	-	-	-	4	2.2%	1.5%					
2015	-	13	-	-	-	-	4	2.4%	1.5%					
Tillamook Area[43]														
1998	2	65	5	3	-	-	4			conf	-	conf	-	0.4%
2000	2	73	6	2	-	-	6			conf	-	conf	-	0.6%
2004	3	81	7	3	-	-	6			1.3%	-	0.2%	-	1.0%
2009	1	77	5	2	-	-	4			conf	-	conf	-	0.6%
2010	1	72	5	1	-	-	4			conf	-	conf	-	0.5%
2011	-	67	2	-	-	-	4	2.2%	1.5%	-	-	-	-	0.5%
2015	-	57	5	-	-	-	4	2.4%	1.5%	-	-	-	-	0.4%

Conf = not displayed due to confidentiality

[42] Location assigned based on addresses as listed in permit files.
[43] Tillamook Area includes Garibaldi, Nehalem, and other Tillamook County ports/towns.

Table D8a. Newport Oregon (including South Beach and Toledo), commercial-fishery-related infrastructure.

Yaquina Bay	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/Boatyards/ Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares. [44]	Yes (full service).	NR.[45]	Four processing plants.	Commercial harbor: Moorage for approximately 400 commercial vessels. Facilities for five large transient vessels. South Beach: 540 moorage slips. Four-lane launch ramp.	NR.	220 feet of floating docks for dockside vessel repair.	NR.	-	USCG Helicopter Station. USCG Station Yaquina Bay.51 Other nearby assets include, to the north, USCG Station Depot Bay and, to the south, USCG Station Siulsaw River and USCG Station Umpqua River (Winchester Bay). 51
Catch shares[46] (2011 to 2016).	One full service fuel dock and another less-used dock associated with a processor. Fuel truck deliveries.	One cold storage (not new). Four ice plants (one new).	Four facilities with processing capabilities (one has separate facilities for groundfish crab and shrimp).	New/refurbished international dock with berths for larger vessels. Upgrades to existing pilings.	Yes. No change except that there used to be a large in door barn the provided partially weathered in storage for trawl gear.	300-foot, fixed-service dock with four hoists and shipwright.[47] Toledo expanded boatyard and dry dock.[48] Riverbend for smaller vessels.	One main store.	Periodic maintenance dredging. [49] [50]	No change.[51]

[44] Data from NMFS (2007) port profiles, unless otherwise noted.
[45] Not covered in the NMFS (2007) port profiles.
[46] Personal communication, Scott Malvitch, February 16, 2017, unless otherwise noted.
[47] http://portofnewport.com/commercial-marina/index.php
[48] Personal communication, Scott Malvitch, February 16, 2017, and http://www.fishermensnews.com/story/2014/10/01/features/port-of-toledo-enhances-operations-for-commercial-fishermen/278.html.
[49] U.S. Army Engineer District. Yaquina Bay and River Channels and Breakwaters O&M: Environmental Impact Statement. Portland OR, 1975.
[50] Gomberg, David. "The Dredge Report." News Lincoln County, September 24, 2014. http://www.newslincolncounty.com/archives/124935.
[51] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D8b. Newport Oregon (including South Beach and Toledo) and Newport area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

	Trawl-caught-Groundfish Buyers	Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[52]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following: the Following:		
		All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	5	107	48	31	16	-	32							
2000	5	103	44	36	11	-	31							
2004	4	105	28	21	13	-	21							
2009	7	111	35	25	11	-	21							
2010	5	104	32	20	14	-	21							
2011	4	102	27	8	15	5	20	7.6%	32.4%					
2015	3	112	25	9	11	4	17	7.3%	26.0%					
Newport Area[53]														
1998	5	159	56	31	16	-	39			21.5%	15.8%	9.2%	42.0%	5.3%
2000	5	152	52	36	11	-	38			16.2%	11.7%	11.9%	36.8%	7.0%
2004	4	155	35	21	13	-	27			conf	9.9%	Conf	40.6%	7.4%
2009	7	153	43	25	11	-	25			16.4%	5.1%	16.7%	28.8%	6.5%
2010	5	152	39	20	14	-	25			conf	11.0%	conf	34.0%	5.6%
2011	4	146	33	8	15	5	24	8.8%	40.8%	8.3%	14.1%	11.5%	27.5%	6.5%
2015	3	155	30	9	11	4	21	8.6%	34.4%	14.4%	9.5%	15.1%	30.7%	6.2%

Conf = not displayed due to confidentiality.

[52] Location assigned based on addresses as listed in permit files.

[53] Newport Area includes Newport, South Beach, Toledo, Blodgett, Siletz, and other Lincoln County ports/towns.

Table D9a. Coos Bay Oregon (including Charleston and North Bend), commercial-fishery-related infrastructure.

Coos Bay	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/Boatyards/ Dry Dock	Marine/ Vessel Supplies Stores	Dredging	USCG
Pre catch shares.[54]	NR.[55]	NR.	Five processors in Coos Bay (2000) 3 in Charleston, 2 in Coos Bay.	95-99% of commercial fishing vessels in Charleston boat basin where there are 550 moorages including 200 occupied by commercial fishing vessel.	NR.	NR.	Marine suppliers.	NR.	USCG Group/Air Station North Bend USCG Station Coos Bay (in Charleston) 59 USCG Cutter Orcas in Coos Bay.59
Catch shares (2011 to 2016).c	One fuel dock but arrange for delivery by truck.	Three ice plants: port owns one; another is associated with a processor and may sell to vessels depending on quantities available; the third does not sell to vessels. No public cold storage. A few processors have their own.	Lost a few processors. There are two that process fish and crustaceans and two that deal with slime eels.	No major changes.	No major changes. Port rents some gear storage space in fenced yard. Most fishermen have their own space.	New 100-ton travel lift (2017),[56] otherwise no major changes. 60-ton travel lift; 200-ton marine ways; 7.5-ton forklift. Upland vessel storage; full service boatyard; Charleston: upland vessel area for do-it-yourself vessel repair projects. Floating dry dock.[57]	One major and one smaller store. Another major store opened, but then closed.	Ongoing maintenance dredging and a channel deepening project.[58]	Changed to USCG Sector, North Bend. No other changes.[59]

[54] Data from NMFS (2007) port profiles, unless otherwise noted.
[55] Not covered in the NMFS (2007) port profiles.
[56] http://www.portofcoosbay.com/travellift
[57] http://www.portofcoosbay.com/shipyardhome/
[58] http://www.portofcoosbay.com/projects/
[59] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D9b. Coos Bay, Oregon, (including Charleston and North Bend) and Coos Bay area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[60]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	7	94	29	32	1	-	23							
2000	4	107	24	30	1	-	23							
2004	4	111	17	19	4	-	16							
2009	6	84	29	23	3	-	25							
2010	6	96	30	22	4	-	25							
2011	3	98	22	13	2	3	24	13.7%	5.0%					
2015	2	87	18	12	-	1	24	13.8%	5.0%					
Coos Bay Area[61]														
1998	8	178	32	32	1	-	26			49.6%	conf	14.1%	conf	3.5%
2000	4	192	26	30	1	-	26			29.0%	conf	13.8%	conf	4.6%
2004	5	195	19	19	4	-	18			9.8%	conf	12.9%	conf	6.7%
2009	6	152	31	23	3	-	27			17.5%	conf	13.6%	conf	5.0%
2010	6	171	32	22	4	-	27			16.4%	conf	16.1%	conf	4.6%
2011	3	172	25	13	2	3	26	14.5%	5.1%	8.4%	conf	9.9%	conf	5.6%
2015	2	167	20	12	-	1	26	14.7%	5.1%	conf	-	conf %	-	4.4%

Conf = not displayed due to confidentiality.

[60] Location assigned based on addresses as listed in permit files.

[61] Coos Bay area includes Coos Bay, Bandon, Florence, Winchester, and other Coos County ports/towns.

Table D10a. Brookings Oregon (including Charleston and North Bend), commercial-fishery-related infrastructure.

Mouth of the Chetco River-Shallow draft harbor	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Vessel Supplies Stores	Dredging	USCG
Pre-catch shares.[62]	Yes.	NR.[63]	At least one.	Two transient docks. 671 slips. Basin One - recreational. Basin Two - commercial.	NR.	Full service boatyard. Heavy travel-lift services.	NR.	NR.	USCG Station Chetco River.
Catch shares (2011 to 2016). [64]	No change – port run (in need of maintenance).[65]	One cold storage and ice plant – port run (closed Feb, 2017).65	One.	After 2011 tsunami – all new steel pilings and some new dock – capacity not substantially changed.	Yes (abundant).	Large crane for moving gear. Travel lift – about 50-foot vessel maximum.	No change. Closest in Crescent City.	Maintenance dredging and recent dredging in response to disasters.[66]	No change.[67]

[62] Data from NMFS (2007) port profiles, unless otherwise noted.
[63] Not covered in the NMFS (2007) port profiles.
[64] Personal communication, Craig Good, February 19, 2017, unless otherwise noted.
[65] www.portofbrookingsharbor.com/fuel--ice--maintenance.html
[66] Tsunami - www.currypilot.com/csp/mediapool/sites/CurryPilot/News/story.csp?cid=4307004&sid=919&fid=151; flooding, https://www.fema.gov/news-release/2016/06/20/fema-awards-port-brookings-more-400k-dredging.
[67] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D10b. Brookings, Oregon, and Brookings area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[68]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Nonwhiting	Whiting	Nonwhiting	Whiting	All Species (Groundfish and Other)
1998	2	57	11	15	-	-	9							
2000	4	62	7	11	1	-	9							
2004	3	58	4	8	-	-	5							
2009	2	51	8	10	-	-	6							
2010	2	46	8	11	-	-	6							
2011	2	48	6	8	-	-	4	1.8%	3.8%					
2015	3	69	4	5	-	1	4	2.1%	3.8%					
Brookings Area[69]														
1998	2	125	15	15	-	-	13			20.6%	-	3.8%	-	2.3%
2000	4	140	11	11	1	-	12			20.0%	conf	4.1%	conf	2.0%
2004	3	141	7	8	-	-	8			4.0%	-	2.7%	-	3.5%
2009	2	122	10	10	-	-	9			conf	-	conf	-	2.5%
2010	2	126	10	11	-	-	9			conf	-	conf	-	1.6%
2011	2	127	8	8	-	-	9	4.8%	4.8%	conf	-	conf	-	1.8%
2015	3	139	6	5	-	1	9	4.9%	4.8%	16.4%	-	6.1%	-	2.2%

[68] Location assigned based on addresses as listed in permit files.

[69] Brookings Area includes Brookings, Gold Beach, Port Orford, and other Curry County ports/towns.

Conf = not displayed due to confidentiality.

Table D11a. Crescent City California, commercial-fishery-related infrastructure.

Crescent Harbor (manmade on Pacific Ocean)	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Vessel Supplies Stores	Dredging	USCG
Pre-catch shares.[70]	NR.[71]	Ice plant and cold storage.	One processor.	Recreational and commercial.	NR.	Boatyard.	Marine supply store.	NR.	In 2000, the USCG Cutter Dorado was homported in Crescent City; it was part of USCG Group Humboldt Bay.
Catch shares (2011 to 2016).	One (commercial and recreational).	Ice plant and several cold storage facilities.	Two processors.	Tsunami devastated - reconstructed with major improvements.	Several gear storage yards.	Boatyard capable of handling large vessels and a travel hoist for smaller vessels.	No change.	Yes; (5-year cycle).[72]	No change.[73]

[70] Data from NMFS (2007) port profiles, unless otherwise noted.

[71] Not covered in the NMFS (2007) port profiles.

[72] http://www.spn.usace.army.mil/Missions/Projects-and-Programs/Projects-by-Category/Projects-for-Navigable-Waterways/Crescent-City-Harbor-/

[73] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D11b. Crescent City, California, and Crescent City area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[74]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	6	124	19	29	5	-	12							
2000	6	108	13	24	2	-	12							
2004	2	92	3	3	1	-	1							
2009	3	81	3	7	5	-	2							
2010	4	80	2	5	7	-	2							
2011	1	75	-	2	-	-	2	0.9%	0.1%					
2015	-	69	-	-	-	-	2	0.9%	0.1%					
Crescent City Area[75]														
1998	6	134	19	29	5	-	13			21.7%	conf	7.1%	conf	4.1%
2000	6	113	13	24	2	-	13			15.1%	conf	4.7%	conf	3.0%
2004	2	98	3	3	1	-	2			conf	conf	conf	conf	5.1%
2009	3	86	3	7	5	-	2			conf	conf	conf	conf	3.7%
2010	4	85	2	5	7	-	2			conf	3.9%	conf	4.1%	1.9%
2011	1	79	-	2	-	-	2	0.9%	0.1%	conf	-	conf	-	1.2%
2015	-	71	-	-	-	-	2	0.9%	0.1%	-	-	-	-	1.2%

Conf = not displayed due to confidentiality.

[74] Location assigned based on addresses as listed in permit files.

[75] Crescent City Area includes Crescent City and other Del Norte County ports/towns.

Table D12a. Eureka, California, (including Fields Landing), commercial-fishery-related infrastructure.

Humboldt Bay Harbor	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Vessel Supplies Stores	Dredging	USCG
Pre-catch shares.76	NR.77	NR.	At least one.	Woodley Island Marina - 237 slips Eureka Public Marina 167 berths. Eureka Public Marina 167 berths	NR.	NR.	NR.	NR.	USCG Station at Humboldt Bay.
Catch shares (2011 to 2016).78	One in commercial bay.	One portable ice plant (owned by city). No public cold storage (City or Eureka has a grant to build one).	Two processors.	No changes.	Yes, recently relocated to Samoa Peninsula.	Dry docks. 150-ton travel lift (Fields Landing). Marine railway on Samoa Peninsula (recently reopened).	Yes.	Yes (annual) bar and entrance channel. 79	No change.80

[76] Data from NMFS (2007) port profiles, unless otherwise noted.

[77] Not covered in the NMFS (2007) port profiles.

[78] Personal communication: Suzie Howser, February 15, 2017, unless otherwise noted.

[79] http://humboldtbay.org/dredging

[80] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D12b. Eureka, California, (including Fields Landing) and Eureka area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[81]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	4	83	32	18	1	-	23							
2000	4	74	24	23	5	-	23							
2004	2	52	7	14	3	-	6							
2009	2	41	9	12	2	-	7							
2010	2	45	8	12	3	-	7							
2011	2	39	3	9	1	-	6	2.2%	1.3%					
2015	2	39	3	9	5	-	6	2.5%	1.3%					
Eureka Area/Humboldt County[82]														
1998	5	164	37	37	9	-	27			34.5%	0.7%	10.5%	1.4%	3.8%
2000	4	145	28	34	7	-	27			44.1%	4.1%	11.5%	4.6%	2.5%
2004	2	127	10	14	3	-	8			conf	3.1%	conf	7.3%	4.2%
2009	2	102	11	12	2	-	10			23.4%	0.2%	11.5%	0.6%	3.1%
2010	2	112	9	12	3	-	10			conf	conf	conf	conf	2.1%
2011	2	110	4	9	-	-	8	3.0%	1.3%	conf	-	conf	-	1.5%
2015	2	130	4	9	-	-	8	3.1%	1.3%	conf	-	conf	-	1.5%

Conf = not displayed due to confidentiality.

[81] Location assigned based on addresses as listed in permit files.

[82] Eureka Area includes Eureka, Fields Landing, Trinidad, and other Humboldt County ports/towns.

Table D13a. Fort Bragg California, commercial-fishery-related infrastructure.

Noyo Harbor (on Noyo River)	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[83]	Yes.	Ice plant.	Three processors.	265 commercial vessel berths (fully occupied)	NR.[84]	10,000 pound hoist with a 8-foot beam.	NR.	Yes (periodic).	USCG Station Noyo River within the harbor.
Catch shares (2011 to 2016) .[85]	No (gone for around five years). Vessels refuel from fuel company truck.	Ice plant for public. No public cold storage. Cold storage associated with processors.	Two processors.	No significant changes.	Yes. Harbor district provides and storage available in shipyard.	No changes. There is also a marine way with two ramps capable of handling vessels up to about 60 feet long.	Yes. One small store and dedicated space in another.	Yes (periodic).	No change.[86]

[83] Data from NMFS (2007) port profiles, unless otherwise noted.

[84] Not covered in the NMFS (2007) port profiles.

[85] Personal communication, Michelle Norvell, February 23, 2017, unless otherwise noted.

[86] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D13b. Fort Bragg, California, and Fort Bragg area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[87]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	5	103	13	17	-	-	13							
2000	4	127	13	17	-	-	13							
2004	3	100	7	10	-	-	8							
2009	8	59	7	7	-	-	7							
2010	6	75	7	7	-	-	7							
2011	4	78	7	6	-	1	8	5.6%	0.3%					
2015	4	79	6	6	-	1	8	6.0%	0.3%					
Fort Bragg Area[88]														
1998	5	158	13	17	-	-	13			39.6%	-	7.2%	-	2.3%
2000	4	192	13	18	-	-	13			24.6%	-	6.6%	-	2.6%
2004	3	142	7	10	-	-	9			17.7%	-	6.9%	-	2.0%
2009	8	90	7	7	-	-	8			35.4%	-	8.7%	-	1.6%
2010	6	116	7	7	-	-	8			29.1%	-	8.8%	-	1.4%
2011	4	125	7	6	-	1	9	6.0%	0.3%	20.7%	-	8.1%	-	1.8%
2015	4	142	6	6	-	1	9	6.6%	0.3%	25.7%	-	9.1%	-	2.1%

Conf = not displayed due to confidentiality.

[87] Location assigned based on addresses as listed in permit files.
[88] Fort Bragg Area includes Fort Bragg, Ablion, Point Arena, and other Mendocino County ports/towns.

Table D14a. Bodega Bay, California, commercial fishery-related infrastructure.

Bodega Harbor	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[89]	Yes (two in association with marinas).[90]	NR.[91]	One.	Several docks. Four marinas. Spud Point 244 berths (80 % commercial fishery). Mason's 115 berths. Port Bodega 95 berths.	NR.	No boatyard.	NR.	Yes.	USCG Station Bodega Bay.
Catch shares (2011 to 2016).	One remaining. Accessible for commercial vessels.	No change. One ice plant (run by the county). No cold storage.	No change (smokers for recreational fish).	Mason's closed (a couple years back)	No public storage.	No hoists or lifts.	None.	Periodic (11-year cycle).[92]	No change.[93]

[89] Data from NMFS (2007) port profiles, unless otherwise noted.

[90] http://parks.sonomacounty.ca.gov/Get_Outdoors/Spud_Point_Marina.aspx

[91] Not covered in the NMFS (2007) port profiles.

[92] http://parks.sonomacounty.ca.gov/About_Us/News/Army_Corps_Funds_Bodega_Bay_Dredging_Studies.aspx

[93] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D14b. Bodega Bay, California, and Bodega Bay area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[94]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	6	59	1	15	-	-	3							
2000	6	56	-	10	-	-	3							
2004	3	46	-	2	-	-	3							
2009	2	26	-	2	-	-	3							
2010	1	30	-	1	-	-	2							
2011	-	33	-	1	-	-	2	0.8%	0.1%					
2015	-	30	-	-	-	-	2	0.8%	0.1%					
Bodega Bay Area														
1998	6	161	1	15	-	-	6			12.2%	-	2.2%	-	2.2%
2000	6	169	-	10	-	-	6			7.6%	-	1.2%	-	1.6%
2004	3	145	-	2	-	-	5			conf	-	conf	-	1.7%
2009	2	77	-	2	-	-	3			conf	-	conf	-	0.4%
2010	1	90	-	1	-	-	2			conf	-	conf	-	1.8%
2011	1	108	-	1	-	1	2	0.8%	0.1%	conf	-	conf	-	2.2%
2015	-	113	-	-	-	-	2	0.8%	0.1%	-	-	-	-	0.7%

Bodega Bay Area includes Bodega Bay, Bolinas, Point Reyes, Tomales, and other Sonoma County and Marin County ports.

Conf = not displayed due to confidentiality.

[94] Location assigned based on addresses as listed in permit files.

Table D15a. San Francisco, California, commercial-fishery-related infrastructure.

San Francisco Bay	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery Related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[95]	Yes.	Ice (cold storage, NR).	At least 12.	Berthing at Fishermen's Wharf.	NR.[96]	Two dry docks. Full service ship repair.	Yes.	NR.	USCG Marine Safety Office.
Catch shares (2011to 2016).	Yes.	No change. Ice and cold storage.	Eight large scale processors and four transitory for wet fish.	Berthing at Fishermen's Wharf. Vessels offload and have permanent berthing at other bay area ports such as Vallejo.[97]	Crab pot storage on Pier 45.	Haul outs and main Shipyards are in east bay.	Yes.	Naturally deep areas in some part of Port of San Francisco do not require significant dredging.[98] Ongoing maintenance dredging throughout the bay.[99]	No change.[100]

[95] Data from NMFS (2007) port profiles, unless otherwise noted.

[96] Not covered in the NMFS (2007) port profiles.

[97] Space-intense activities such as shipyards, gear storage, and berthing tend to occur in other parts of the bay away from San Francisco proper due to limited waterfront space and high real estate prices.

[98] http://www.bcdc.ca.gov/seaport/seaport.pdf

[99] https://www3.epa.gov/region9/water/dredging/ltms/

[100] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D15b. San Francisco, California, and San Francisco area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[101]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	5	54	7	10	-	-	8							
2000	8	56	6	17	-	-	7							
2004	4	41	4	7	-	-	5							
2009	3	30	4	4	-	-	3							
2010	4	26	1	5	-	-	3							
2011	2	28	1	3	-	1	3	1.4%	0.1%					
2015	-	16	-	-	-	-	3	1.5%	0.1%					
San Francisco area (same as Half Moon Bay)[102]														
1998	11	306	12	18	-	-	16			12.9%	-	4.4%	-	4.2%
2000	14	260	13	24	-	-	17			15.4%	-	5.5%	-	3.4%
2004	10	221	9	14	-	-	14			6.3%	-	6.1%	-	4.9%
2009	6	162	7	8	-	-	7			10.5%	-	3.2%	-	1.9%
2010	6	156	6	9	-	-	9			3.9%	-	3.4%	-	4.0%
2011	5	187	7	6	-	3	9	3.7%	0.3%	2.7%	-	2.8%	-	5.0%
2015	3	205	5	2	-	1	9	3.9%	0.3%	1.7%	-	0.9%	-	3.1%

Conf = not displayed due to confidentiality.

[101] Location assigned based on addresses listed in permit files.

[102] San Francisco area includes San Francisco, Alameda, Berkeley, Oakland, Princeton, Richmond, and other San Francisco County and San Mateo County ports/cities.

Table D16a. Half Moon Bay/Princeton, California, commercial-fishery-related infrastructure.

Half Moon Bay/Pillar Point Harbor - manmade harbor on the Pacific Ocean	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery Related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre catch shares.[103]	Yes.	Ice making facility (cold storage NR).[104]	One.	Dock with 369 berths.	NR.	NR.	NR.	NR.	Closest in San Francisco.
Catch shares (2011 to 2016). [105]	Yes (two; no change).	One ice facility for commercial vessels (recreational vessels can also use). The two main fish receivers also have cold storage.	Two (mainly processing sablefish).	No significant changes.	Several gear storage locations in Princeton.	No hoists for vessels (cargo hoists only). Smaller vessels are pulled out for maintenance and repair. Local fabrications shops also server commercial fleet.	Yes, one gear store serves commercial vessels.	Yes.[106]	No change.[107]

[103] Data from NMFS (2007) port profiles, unless otherwise noted.

[104] Not covered in the NMFS (2007) port profiles.

[105] Personal communication: James Ober, February 21, 2017, unless otherwise noted.

[106] http://www.stormsurf.com/page2/forecast/forecast/hmb_dredge.html

[107] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D16b. Half Moon Bay/Princeton, California, and San Francisco area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[108]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	8	21	3	10	-	-	6							
2000	7	19	5	11	-	-	7							
2004	7	18	5	8	-	-	7							
2009	3	15	3	4	-	-	2							
2010	3	16	3	4	-	-	4							
2011	3	17	4	3	-	2	4	1.2%	0.1%					
2015	3	21	2	2	-	1	4	1.2%	0.1%					
San Francisco Area (same as Half Moon Bay) [109]														
1998	11	306	12	18	-	-	16			12.9%	-	4.4%	-	4.2%
2000	14	260	13	24	-	-	17			15.4%	-	5.5%	-	3.4%
2004	10	221	9	14	-	-	14			6.3%	-	6.1%	-	4.9%
2009	6	162	7	8	-	-	7			10.5%	-	3.2%	-	1.9%
2010	6	156	6	9	-	-	9			3.9%	-	3.4%	-	4.0%
2011	5	187	7	6	-	3	9	3.7%	0.3%	2.7%	-	2.8%	-	5.0%
2015	3	205	5	2	-	1	9	3.9%	0.3%	1.7%	-	0.9%	-	3.1%

Conf = not displayed due to confidentiality.

[108] Location assigned based on addresses as listed in permit files.

[109] San Francisco Area includes San Francisco, Alameda, Berkeley, Oakland, Princeton, Richmond, and other San Francisco County and San Mateo County ports/cities.

Table D17a. Moss Landing, California, commercial-fishery-related infrastructure.

Moss Landing Harbor on Old Salinas River	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery Related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[110]	Yes.	NR.[111]	Four processing or offloading facilities (two fish buyers with small-scale processing facilities).	743 berths. In 2001, 125 vessels and 175 transient vessels.	NR.	Boatyard with travel lift.	Small supply store.	NR.	Closest in Monterey.
Catch shares (2011 to 2016). [112]	Yes (no change).	No ice plants (sent in by truck). No public cold storage (cold storage in connection with processors/first receivers)	One processor.	No major changes.	No changes. Harbor has gear storage yards and sheds available for rent (no change).	No changes.	No changes. Small chandlery at boatyard.	Yes.[113]	No change.[114]

[110] Data from NMFS (2007) port profiles, unless otherwise noted.

[111] Not covered in the NMFS (2007) port profiles.

[112] Personal communication: Robert Puccinelli, February 22, 2017, unless otherwise noted.

[113] http://content.cdlib.org/view?docId=kt667nb1cg&brand=calisphere&doc.view=entire_text

[114] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D17b. Moss Landing, California, and Monterey area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[115]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	8	18	1	11	-	-	1							
2000	8	26	1	11	-	-	1							
2004	7	20	-	8	-	-	1							
2009	1	11	-	1	-	-	-							
2010	1	8	-	1	-	-	-							
2011	1	10	-	1	-	2	-	-	-					
2015	2	7	-	2	-	2	-	-	-					
Monterey Area (same as Monterey)[116]														
1998	11	231	6	15	-	-	9			25.6%	-	5.4%	-	2.6%
2000	10	244	8	16	1	-	9			10.8%	conf	3.5%	conf	3.1%
2004	8	211	5	8	-	-	9			8.6%	-	4.2%	-	2.5%
2009	4	109	3	3	-	-	18			7.4%	-	1.7%	-	1.4%
2010	4	140	2	2	-	-	17			3.6%	-	2.1%	-	2.7%
2011	3	175	3	2	-	2	16	10.1%	0.5%	5.2%	-	2.5%	-	2.2%
2015	2	189	2	2	-	2	12	7.9%	0.1%	conf	-	conf	-	3.2%

Conf = not displayed due to confidentiality.

[115] Location assigned based on addresses as listed in permit files.

[116] Monterey Area includes Monterey, Moss Landing, Santa Cruz, and other Santa Cruz County and Monterey County ports/towns.

Table D18a. Monterey, California, commercial-fishery-related infrastructure.

Monterey Bay	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrigeration	Processors	Fishery Related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[117]	Yes, at marina.	NR.[118]	At least one. Field workers identified four processing facilities and fish buyers (combined).	Municipal Wharf II (commercially oriented). Municipal Marina: 413 Slips (20- to 50-foot vessels) 6 end ties for 40- to 75-foot vessels. Breakwater Cove marina: 90-slip private marina and boatyard with fuel dock. 180 private mooring buoys for vessels up to 100 feet.	NR.	Boatyard at marina.	Chandlery by marina office.	NR.	USCG Station Monterey and a 110-foot cutter.
Catch shares (2011 to 2016).[119]	No change.	Limited ice making on wharf. Ice blocks trucked in from Salinas, shaved, and blown onto vessels. Some shovel ice onto truck in Salinas. Processors have own cold storage.	No processing facilities.	Breakwater marina has expanded since 2007. Eight 60-foot berths. One 220-foot finger pier tie-up on both sides. City is also working on expansion for commercial fleet in conjunction with USCG facility.	Reduction in covered gear storage space. Now limited to nets on trailers. May be funding a dry storage yard.	Two boatyards (no change). 80-ton travel lift (27-foot beam) (replaced a 60-ton left). Handles vessels up to about 65 feet. Carry deck crane (replaced with newer). Planning to expand dry storage yard.	No commercial vessel suppliers (no change).	City has 8-foot dredge for marina and 10-year permit to return navigation channel to original depth.	No change.[120] Also, port has a 30-foot fireboat capable of offshore rescues and tows.

[117] Data from NMFS (2007) port profiles, unless otherwise noted.

[118] Not covered in the NMFS (2007) port profiles.

[119] Personal communication: Steve Scheiblauer, February 14, 2017, unless otherwise noted.

[120] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D18b. Monterey, California, and Monterey area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[121]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	3	69	3	4	-	-	5							
2000	3	57	4	5	1	-	5							
2004	2	50	3	2	-	-	5							
2009	3	29	2	2	-	-	17							
2010	3	35	1	1	-	-	17							
2011	2	47	2	1	-	-	16	10.1%	0.5%					
2015	-	31	1	-	-	-	11	7.9%	0.1%					
Monterey Area[122]														
1998	11	231	6	15	-	-	9			25.6%	-	5.4%	-	2.6%
2000	10	244	8	16	1	-	9			10.8%	conf	3.5%	conf	3.1%
2004	8	211	5	8	-	-	9			8.6%	-	4.2%	-	2.5%
2009	4	109	3	3	-	-	18			7.4%	-	1.7%	-	1.4%
2010	4	140	2	2	-	-	17			3.6%	-	2.1%	-	2.7%
2011	3	175	3	2	-	2	16	10.1%	0.5%	5.2%	-	2.5%	-	2.2%
2015	2	189	2	2	-	2	12	7.9%	0.1%	conf	-	conf	-	3.2%

Conf = not displayed due to confidentiality.

[121] Location assigned based on addresses as listed in permit files.

[122] Monterey Area includes Monterey, Moss Landings, Santa Cruz and other Santa Cruz County and Monterey County ports/towns.

Table D19a. Morro Bay, California, commercial-fishery-related infrastructure. Source: PacFIN.

Morro Bay Harbor	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrigeration	Processors	Fishery Related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[123]	NR.[124]	NR.	No large processors.	Morro Bay Harbor 150 offshore moorings. 50 slips for commercial vessels and about 400 berths. Morro Bay Marina 24 moorings, 16 slips (recreational).	NR.	NR.	NR.	NR.	USCG Station Morro Bay.
Catch shares (2011 to 2016).	One.	Ice house; no cold storage.	No processors.	Small amount of expansion – added dock space for commercial passenger fishing vessels).	Limited public storage in the harbor.	One small-boatyard (cannot haul out large vessels).	Two small vessel supply stores in the harbor.	Project under way in. Last dredging was 7 years previous.[125]	No change.[126]

[123] Data from NMFS (2007) port profiles, unless otherwise noted.

[124] Not covered in the NMFS (2007) port profiles.

[125] http://morrobayrotary.org/Stories/all-about-dredging

[126] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D19b. Morro Bay, California, and Morro Bay area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database..

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[127]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	Trawl-caught-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	8	54	3	11	-	-	4							
2000	6	51	2	11	-	-	4							
2004	6	37	3	8	-	-	3							
2009	3	29	-	1	-	-	-							
2010	-	32	-	1	-	-	-							
2011	9	46	4	1	-	2	-	-	-					
2015	1	45	2	2	-	2	5	3.0%	0.4%					
Morro Bay area (same as Avila)[128]														
1998	8	169	9	17	-	-	7			29.0%	-	5.5%	-	2.4%
2000	6	158	7	15	-	-	7			11.1%	-	1.9%	-	1.6%
2004	6	115	5	7	-	-	5			29.2%	-	5.0%	-	0.9%
2009	3	88	1	1	-	-	1			4.2%	-	0.7%	-	1.0%
2010	-	96	1	-	-	-	1			-	-	-	-	1.0%
2011	10	120	7	1	-	13	1	0.7%	0.0%	30.6%	-	8.1%	-	1.2%
2015	1	135	2	1	-	7	5	3.9%	0.5%	conf	-	conf	-	1.9%

Conf = not displayed due to confidentiality.

[127] Location assigned based on addresses as listed in permit files.

[128] Morro Bay area includes Morro Bay, Avila, and other San Luis Obispo County ports/towns.

Table D20a. Avila, California, commercial-fishery-related infrastructure.

San Luis Obispo Bay	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[129]	Yes.	Ice (cold storage NR).[130]	None.	Three piers. Two piers are open to the public.	Commercial gear storage.	Boat hoist.[131] Dry dock and boat repair facilities.	NR.	NR.	Closest in Morro Bay.
Catch shares (2011 to 2016).	Yes.	One ice house no cold storage (fish sold fresh into markets).	?????	No change.	Close to the harbor, there is a harbor-owned storage area.	One shipyard that most vessels in the county use. Can handle up to around a 50-foot vessel. Travel hoist for vessels up to around 30 feet.	No (one in San Luis Obispo).	Maintenance dredging.[132]	No change.[133]

[129] Data from NMFS (2007) port profiles, unless otherwise noted.

[130] Not covered in the NMFS (2007) port profiles.

[131] http://www.sanluisobispo.com/news/local/article39131787.html

[132] http://portsanluis.com/DocumentCenter/View/813

https://documents.coastal.ca.gov/reports/2008/12/W11a-12-2008.pdf

[133] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D20b. Avila, California, and Morro Bay area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

		Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[134]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
	-Groundfish Buyers	All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	3	13	-	10	-	-	-							
2000	2	5	-	8	-	-	-							
2004	1	2	-	5	-	-	-							
2009	-	1	-	-	-	-	-							
2010	-	3	-	-	-	-	-							
2011	1	2	-	-	-	1	-	0.7%	0.0%					
2015	-	4	-	-	-	-	-	0.9%	0.0%					
Morro Bay area (same as Morro Bay) [135]														
1998	8	169	9	17	-	-	7			29.0%	-	5.5%	-	2.4%
2000	6	158	7	15	-	-	7			11.1%	-	1.9%	-	1.6%
2004	6	115	5	7	-	-	5			29.2%	-	5.0%	-	0.9%
2009	3	88	1	1	-	-	1			4.2%	-	0.7%	-	1.0%
2010	-	96	1	-	-	-	1			-	-	-	-	1.0%
2011	10	120	7	1	-	13	1	0.7%	0.0%	30.6%	-	8.1%	-	1.2%
2015	1	135	2	1	-	7	5	3.9%	0.5%	conf	-	conf	-	1.9%

[134] Location assigned based on addresses as listed in permit files.

[135] Morro Bay area includes Morro Bay, Avila, and other San Luis Obispo County ports/towns.

Conf=not displayed due to confidentiality.

Table D21a. Santa Barbara, California, commercial-fishery-related infrastructure.

Santa Barbara Harbor (manmade) on Santa Barbara Channel	Fuel Dock	Ice Plant/ Sales Cold Storage/ Refrig.	Processors	Fishery-related Berths and Moorage (excludes shipping and government, e.g., USCG)	Gear storage/ gear yard	Boat Hoists, Lifts, and Cranes Shipyard/ Boatyards/Dry Dock	Marine/ Vessel Supply Stores	Dredging	USCG
Pre-catch shares.[136]	Yes.	NR.[137]	Three processors.	1,100 mooring space for pleasure and comercial vessels. Loading dock.	NR.	Marine services and repairs.	NR.	NR.	Closest is USCG Station Channel Islands. One USCG Patrol Boat in Santa Barbara.
Catch shares (2011to 2016).[138]	No Change.	Ice plant and sales. No public cold storage.	None in Santa Barbara proper.	No changes.	Yes (in town).	Small vessel hoist and shipyard for repair of smaller pleasure and commercial vessels.	Yes.	Maintenance dredging.[139]	No change.[140]

[136] Data from NMFS (2007) port profiles, unless otherwise noted.

[137] Not covered in the NMFS (2007) port profiles.

[138] Personal communication: Weston Boyle, February 28, 2017, unless otherwise noted.

[139] http://www.thelog.com/local/army-corps-of-engineers-assesses-impacts-of-santa-barbara-harbor-dredging/

[140] Personal communication, Brian Corrigan, February 1, 2017: USCG reports no shifts in cutter homeport shifts, air station relocations, or boat station relocations relative to the start of the trawl catch share program.

Table D21b. Santa Barbara, California, and Santa Barbara area, activity and ownership by residents. Source: PacFIN and Pacific Coast Groundfish IFQ Database.

	Trawl-caught-Groundfish Buyers	Numbers of Vessels Owned by Residents		Numbers of Vessels Delivering			Permits/Quota Held in Community[141]			Fishery as a Percent of Local Ex-vessel Revenue		Local Area as a Percent of Coastwide Ex-vessel Revenue of the Following:		
		All	Groundfish Trawl	Non-whtg Trawl	Whiting Trawl	Gear Switched	LE Permits	Non-whiting QS	Whiting QS	Non-whiting	Whiting	Non-whiting	Whiting	All Species (Groundfish and Other)
1998	-	126	-	-	-	-	-							
2000	-	116	-	1	-	-	-							
2004	-	86	-	1	-	-	-							
2009	-	86	-	-	-	-	-							
2010	-	81	-	-	-	-	-							
2011	-	86	-	-	-	-	-							
2015	1	96	-	-	-	3	-							
Santa Barbara area[142]														
1998	1	312	1	1	-	-	2			conf	-	conf	-	5.4%
2000	1	278	-	2	-	-	2			conf	-	conf	-	7.8%
2004	1	220	-	1	-	-	1			Conf	-	Conf	-	6.1%
2009	-	207	-	-	-	-	-			-	-	-	-	10.5%
2010	-	192	-	-	-	-	-			-	-	-	-	8.5%
2011	-	210	-	-	-	-	-			-	-	-	-	7.2%
2015	1	243	-	-	-	3	-			Conf	-	Conf	-	6.5%

[141] Location assigned based on addresses as listed in permit files.

[142] Santa Barbara area includes Santa Barbara, Oxnard, Port Hueneme, Ventura, and other Santa Barbara County and Ventura County ports/towns.

Conf=not displayed due to confidentiality.

APPENDIX E: WCGOP DATA COLLECTION PROTOCOLS

Details of the data collection protocol of the Westcoast Groundfish Observer Program (WCGOP). Information is adapted from Somers et al. 2016a, pages 6-8.

NMFS established the WCGOP program in 2001. The purpose is to collect information on resources being discarded at sea. The WCGOP combined data from multiple sources to estimate groundfish mortality: landing receipts, onboard observer data, electronic monitoring (EM) data, and discard mortality rates.

Information on landings as well as species composition data are collected by state agencies and submitted to the Pacific Fisheries Information Network (PacFIN) regional database, which is maintained by the Pacific States Marine Fisheries Commission. Fish tickets (fleet-wide landing receipts) provide information on retained catch for shoreside sectors of the commercial groundfish fishery on the U.S. West Coast. Each state has a slightly different fish ticket format and are generally moving in the direction of electronic submissions (Oregon now allows fish tickets to be completed and submitted electronically). Species composition sampling is conducted for market categories (either a single species or a mixture of species). PacFIN then applies the percentage of weight of each species within market categories obtained from species composition sampling to the fish ticket data used in analyses. Additionally WCGOP analysts work to assign landed weights from sampled market categories to individual species whenever possible.

NMFS runs separate observer programs for different sectors of the groundfish fishery. The WCGOP observes IFQ shore-based sectors, limited entry (LE) and open access (OA) fixed gear, state-permitted nearshore fixed gear sectors, as well as several fisheries that incidentally catch groundfish, including the California halibut trawl and pink shrimp trawl fisheries. The A-SHOP Program focuses on the at-sea Pacific whiting fishery.

Observer data from each of these groundfish sectors were used to estimate discards. Total mortality estimates were summarized from the A-SHOP Program data for the both the at-sea catcher-processor (CP) and mothership (MS) sectors. Information on data collection methods used in each observed fishery can be found in WCGOP manuals (NWFSC 2016a, 2016b, 2016c), and estimates of observer coverage, observed catch, and a summary of observed fishing depths for each sector are also available.[143]

[143] http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/sector_products.cfm

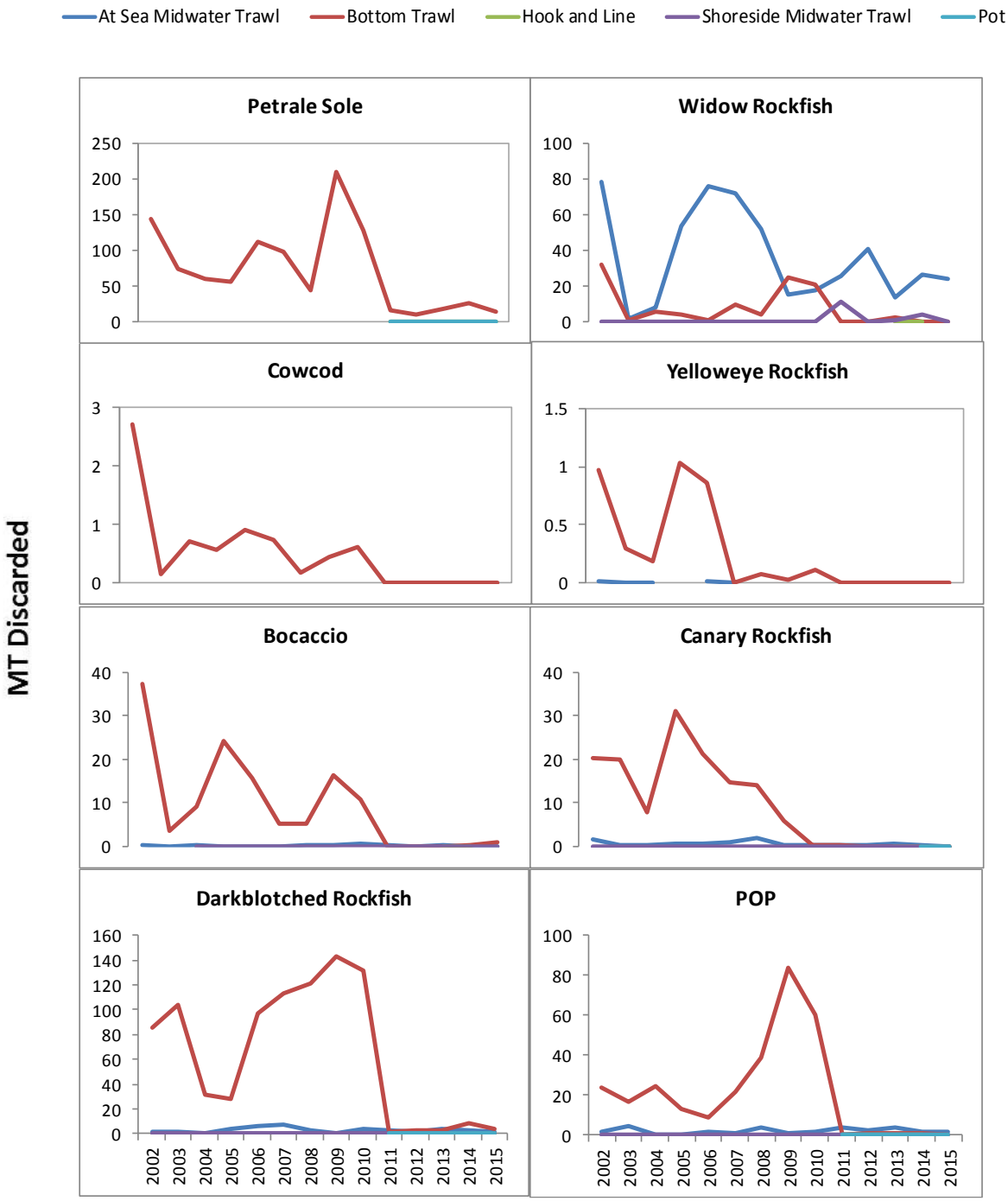
The sampling protocol the WCGOP uses focuses primarily on the portion of catch discarded at sea. Some species are landed, but are ultimately discarded at the dock. For these species or groups, only some are consistently coded in PacFIN fish ticket landings data (and thus are accounted for as possible in landing weights in the WCGOP data). To improve accuracy, haul-level retained catch recorded by the WCGOP observers are reconciled with trip-level fish ticket records. Since observer retained catch weight estimates are often visual estimates, the WCGOP data are adjusted to equal the legally binding measurement from the matching fish ticket(s).

NMFS maintains confidentiality of persons and businesses, per MSA requirements. NMFS guidance recommends the rule of three, which states the following: "Information from at least three participants in the fishery must be aggregated/summarized at a temporal and spatial level to protect not only the identity of a person or a business, but also any business information." Information on QS and QP holdings by a vessel can be released

The percentage of fishing trips that carried an observer has varied between fisheries and through time. The at-sea whiting fisheries have had 100 percent or near 100 percent observer coverage on processing vessels since the mid-1970s through current. Comparatively, the LE trawl had from 14 to 24 percent coverage from 2001 to 2010, which shifted to 100 percent or close to 100 percent observer coverage for all at-sea and shorebased catcher vessels with the start of the catch share program (Somers 2016b). Starting in 2015, for vessels fishing under the EM exempted fishing permit (EFP), discard of IFQ species was recorded by the EM systems. At that time, EM was also used to record small amounts of operational discards by at-sea catcher vessels participating in the EM EFP as part of the mothership co-op fishery.

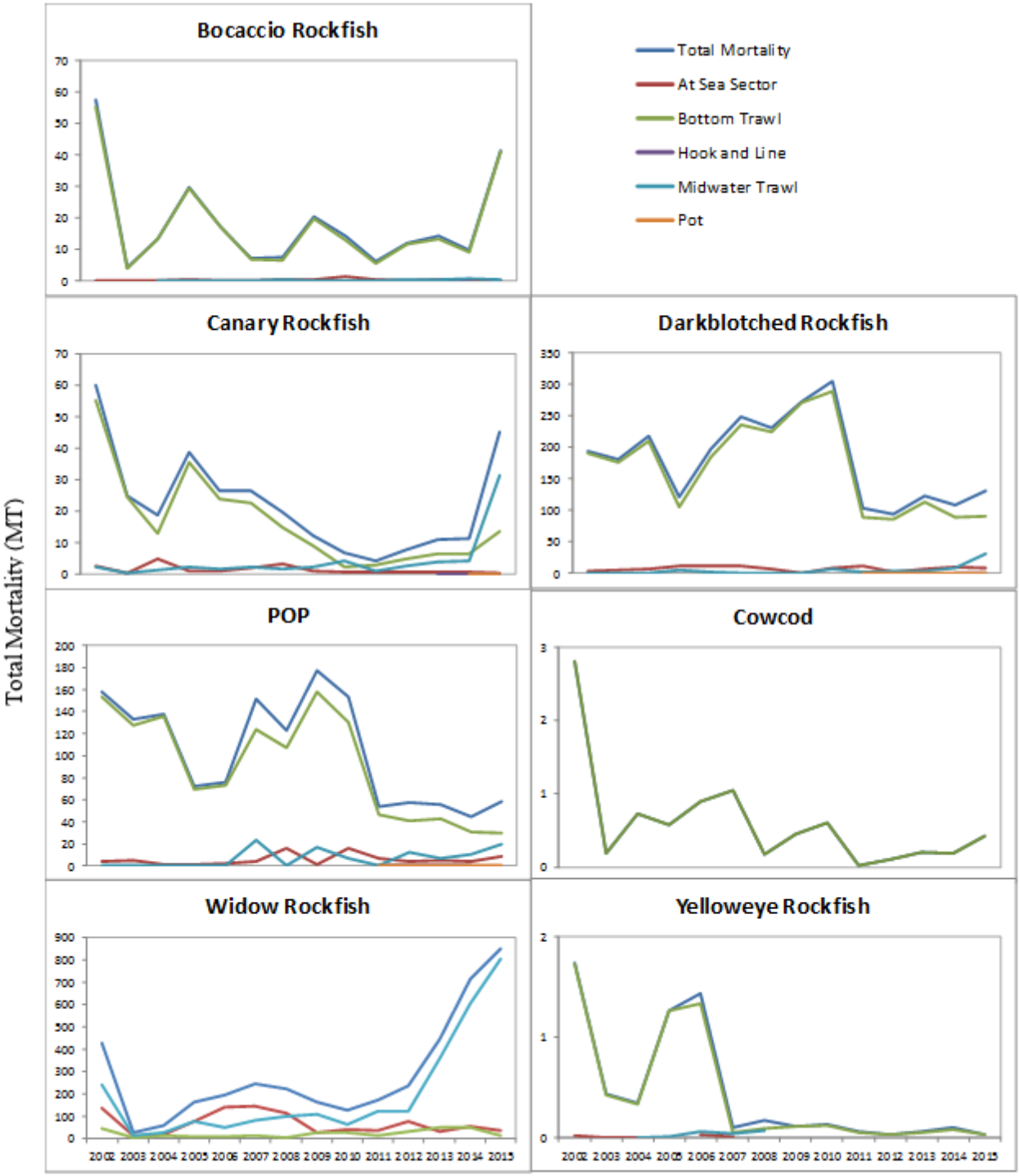
APPENDIX F: SPECIES-SPECIFIC DISCARDS THROUGH TIME

Species-specific discards through time by sector. The at-sea sector includes CPs and MSs. The shoreside midwater trawl included an EFP from 2002 to 2010 that was a full retention fishery and, thus, had no discards



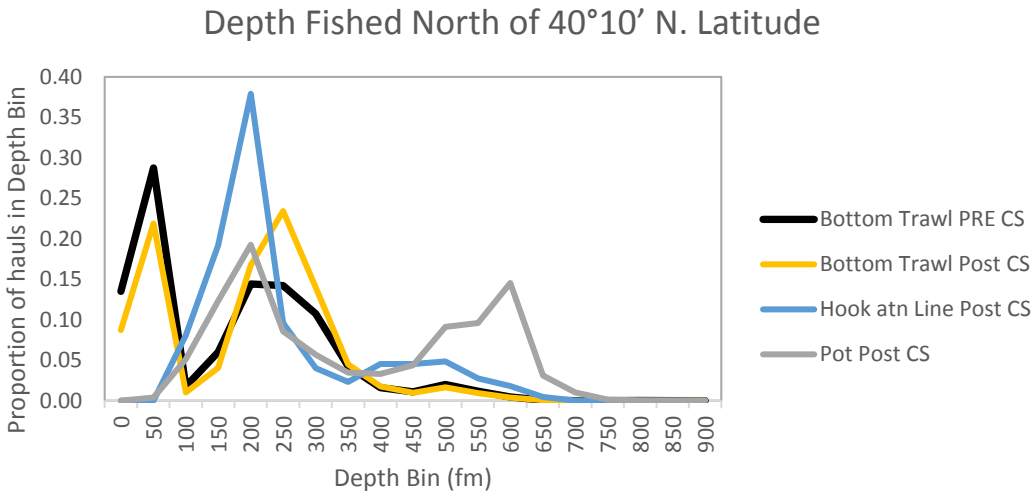
APPENDIX G: SPECIES-SPECIFIC TOTAL MORTALITY BY SECTOR

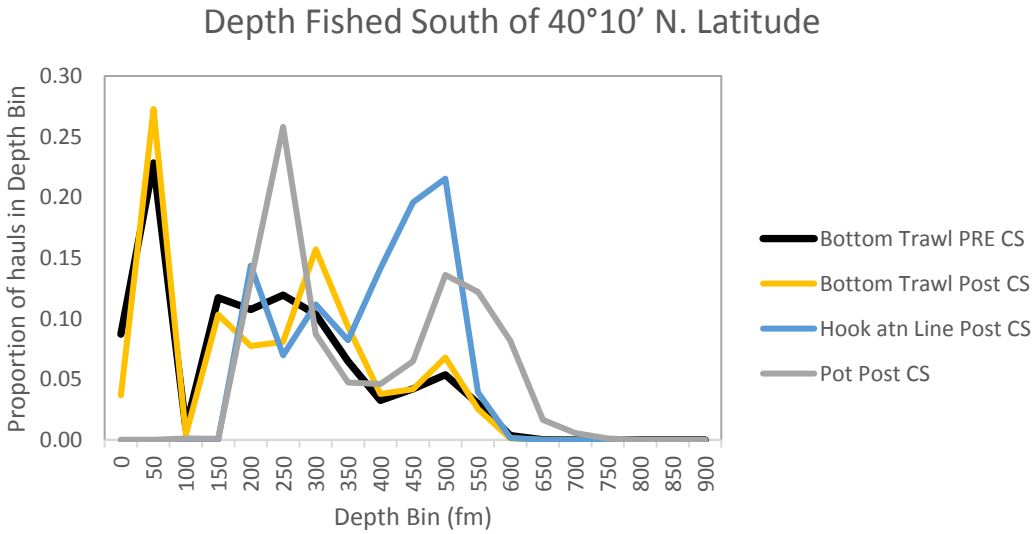
Appendix G. Species-specific total mortality through time by sector. The at-sea sector includes CPs and MSs. The shoreside midwater trawl included an EFP from 2002 to 2010 that was a full retention fishery and, thus, had no discards.

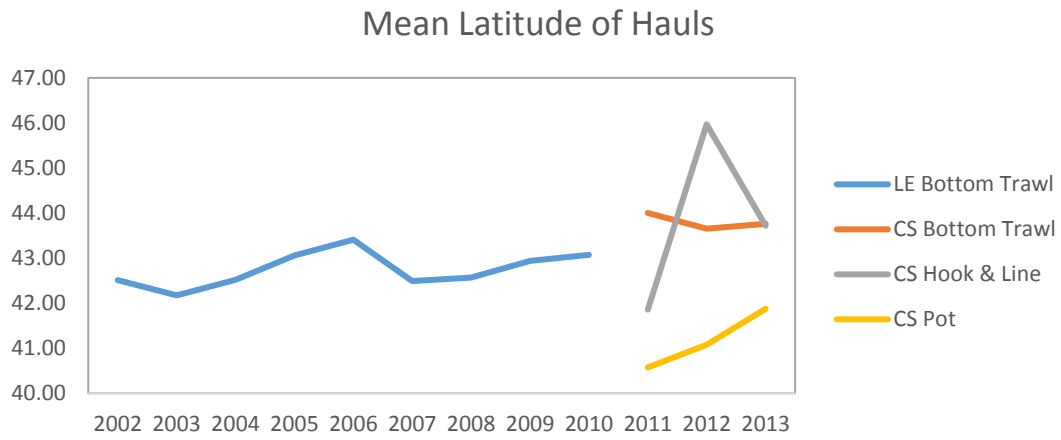


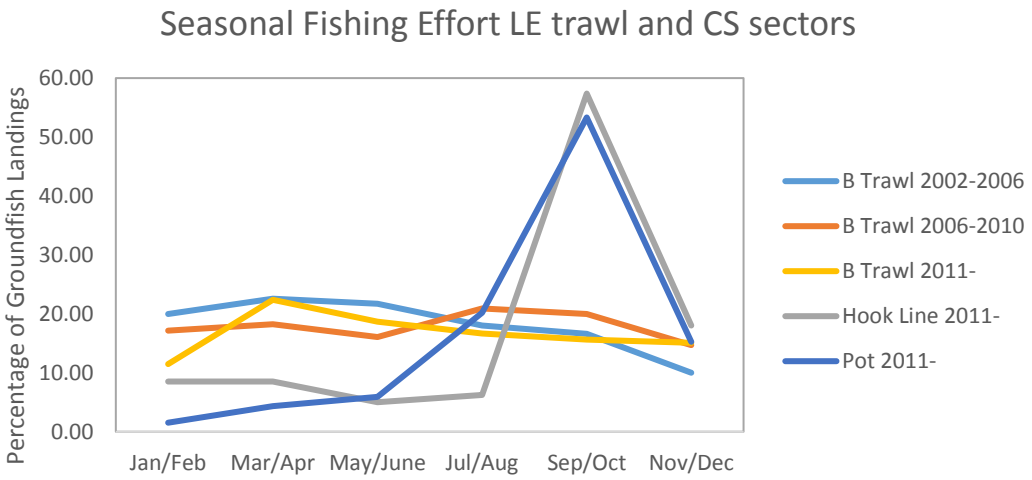
APPENDIX H: CHANGES IN FISHING EFFORT THROUGH TIME

Appendix H. Graphs showing fishing effort changes through time. The first two graphs show how depth fished has changed pre- and post-CS fishery. The third and fourth graphs show changes in latitude and seasons fished through time, respectively.






Mean Latitude of Hauls
47.00
46.00
45.00
44.00
43.00
42.00
41.00
40.00
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
LE Bottom Trawl
CS Bottom Trawl
CS Hook & Line
CS Pot


Seasonal Fishing Effort LE trawl and CS sectors
Percentage of Groundfish Landings
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Jan/Feb Mar/Apr May/June Jul/Aug Sep/Oct Nov/Dec
B Trawl 2002-2006
B Trawl 2006-2010
B Trawl 2011-
Hook Line 2011-
Pot 2011-

APPENDIX I: COMPARISON OF PROFIT LEVELS IN OTHER FISHERIES

This appendix presents publically available indicators of profit levels in other fisheries in order to provide a qualitative comparison to the economic outcomes in the West Coast Groundfish Trawl Catch Share Program. This review was limited by the amount of readily available economic data, especially cost data, for other fisheries. Because of this, three fisheries were selected for direct comparison: The federal Gulf of Mexico shrimp fishery (non-catch share), the West Coast sablefish tier (or permit stacking) fishery (catch share managed since 2001), and the British Columbia trawl groundfish Individual Vessel Quota (IVQ) fishery (catch share managed since 1997).

Gulf of Mexico Shrimp Fishery

The commercial federal shrimp fleet is a managed under a limited access program. There has been a permit moratorium since 2002 and all participants are required to have a federal Gulf of Mexico shrimp (SPGM) permit.

The federal Gulf of Mexico shrimp fishery is surveyed annually by the Social Science Research Group of the Southeast Fisheries Science Center. Data are collected through a two-page survey that is sent to a random sample of about 30 percent of permitted vessels. At the time of this report, published reports from 2006 to 2012 were available, presented in Table I-1. [144]

Data for this fishery are available by state, activity status, vessel age and length, landings volume and ownership structure. However, for this report only gulf-wide, active shrimp vessel outcomes were used to provide a sufficient scope (Table I-2). Information is also available for vessels'-shrimp and non-shrimp activities, as well as for inactive vessels, but only shrimp-related revenue and costs for active vessels is shown here. Government payments are an important consideration for vessel outcomes, particularly after the 2010 Deepwater Horizon oil spill. During and in the years following the spill, vessels have received payments to compensate for damages due to the spill, which are included as part of the net cash flow measure. In addition, in 2010, 28% of vessels participated in the vessels of opportunity program (VOOP), cleaning up oil. As a result, costs reported on the survey represent fishing and VOOP activities. The SEFSC analysts estimated the costs associated with the oil cleanup, and subtracted them from the total reported costs in order to isolate costs associated with shrimping activity alone. While estimates including and excluding VOOP activities are provided in

[144] All reports can be found at https://www.sefsc.noaa.gov/socialscience/shrimp.htm

the 2010 report, only the estimate less VOOP activities is reported here (please see NMFS 2012 for more information).

BC Groundfish Trawl Fishery

The BC groundfish trawl fishery has been managed under the Individual Vessel Quota/Groundfish Development Authority (IVQ/GDA) Program since 1997, and under the Integrated Management Program since 2006, which manages the sablefish, halibut and groundfish trawl catch share programs collectively. Eighty percent of the quota is allocated to vessels based on catch history and vessel length, and the remaining 20 percent is allocated based on "fit" with GDA criteria, including community economic development and industry stability. Only licensed commercial groundfish vessels and fishermen are allowed to hold and fish shares. The fishery also has 100 percent observer and offload monitor coverage.

Information for the BC Groundfish Trawl Catch Share Program was obtained through two reports prepared for the years 2007 and 2009 for vessels operating in the major West Coast commercial fisheries (Nelson Bros Fisheries Ltd 2009, 2011). Data was collected in the 2007 and 2009 calendar years but adjusted to reflect a full fishing season. Landings and permit information was collected from DFO whereas expense information was collected through participants interviews and correspondence, and used to create a financial model. Results between 2007 and 2009 are not directly comparable since in 2007 fishing activities were only classified as groundfish or as hake, with the predominant activity as the basis for classification. In 2009, this changed to three categories, hake only, groundfish only, or groundfish and hake, to reflect different business strategies (Table I-1, Table I-3).

West Coast Sablefish Permit Stacking (or Tier Limit) Program

The 2008 data for the West Coast sablefish permit stacking program used in this report was collected through two voluntary economic surveys of commercial fishing vessel owners by the NWFSC and the Pacific States Marine Fisheries Commission (PSMFC) as part of estimating costs and earnings for the West Coast open access, trawl, and fixed gear fisheries. The survey of the limited entry fixed gear fleet was conducted between July 2009 and February 2010, with data collection through in-person interviews (for more information see Lian 2012, Table 1-4).

West Coast Groundfish Trawl Catch Share Program

West Coast Groundfish Fishery: Information used in this report is from the NWFSC EDC program, as reported in the body of this report. In this comparison, average total cost net revenue for whiting and non-whiting vessel activities, was selected as the metric best suited for comparison to the other cash

flow indicators available for other fisheries, which all include fixed costs. A primary difference across fisheries is the treatment of these fixed costs. In contrast to the other fisheries, the full cost of major investments (i.e., vessels) is included in the year of purchase for total cost net revenue, whereas other indicators may distribute investment costs across time, or do not collect this type of fixed cost expenditure (Tables I-5, I-6).

Cost and Economic Performance Indicator Description:

Values in Table I-1 were extracted from publicly available sources and all were converted to US 2016$ for comparison. All economic measures of profitability differ somewhat in their treatment of sources of revenue and costs, most notably capital costs, but most report a measure of cash flow profitability (Net cash flow, EBITDA, Accounting Net Revue, Economic Net Revenue and Total Cost Net Revenue).

While several economic measures are available for permitted Gulf shrimp vessels, the cash flow indicator is highlighted in Table I-1 for comparison because of its similarity to the measures available for other fisheries. In addition, while several other indicators of economic performance are provided, values from each years' cash flow is provided in Table I-1, since the cost breakouts are most similar to those provided by the BC groundfish trawl fishery, West Coast sablefish, and West Coast groundfish fishery values. However, these values are not identical as several cost items are not available for the other fisheries. Costs that do not align include investments, loan payments, and overhead payments as fixed costs.

The economic metric used to evaluate performance in the BC groundfish fisheries (both groundfish and the hake-only summaries) is termed "Earnings before Interest, Tax, Depreciation, and Amortization (EBITDA)" (Nelson 2009, 2011). While the values generated by these reports are described as representative, they are not presented as precise or definitive. They are described as equivalent to cash flow and ignore many capital costs including: capital costs to acquire the vessel, gear, licenses, and quotas required for the fishing operation; in addition, costs of servicing any debt, including loan payments, depreciation, or interest. BC groundfish and hake revenue information was derived using average price and landings information to calculate gross revenue. In general, cost information presented for the BC fishery is similar to the cost information presented for the U.S. West Coast Groundfish Trawl program, meaning the variable and fixed cost categories are similar. Variable costs collected for the BC fishery include fuel, at sea monitoring, offload monitor, license and co-

management fees, bait, gear maintenance/replacement, crew and captain wages, and gear shares. Fixed costs include insurance, repairs and maintenance, moorage, and some miscellaneous costs.

For the sablefish tier limit fishery, sources of revenue include fishing revenue, government payments (salmon disaster payments), the sale or lease revenue from permits, and any other reported source of revenue. Reported costs through the survey instrument include captain and crew wages, fuel, food, ice bait, insurance, interest, moorage, dues, enforcement, leasing permits, purchasing permits, repair and maintenance, and any other reported costs. These costs were subtracted from all sources of revenue to calculate accounting net revenue, which is reported primarily for comparison. Unlike the other fisheries, information on the contribution of variable and fixed costs to net revenue were not available, so only net accounting revenue and net economic revenue measures are presented. Net economic revenue is incorporates the opportunity cost of operating a commercial fishing vessel by adding landings taxes, adjustments to account for the opportunity cost of owner-operated vessel activity as well as the opportunity cost of capital

Table I-1. Summary profit information for the Federal Gulf Shrimp fishery, BC groundfish trawl fishery, West Coast sablefish permit stacking program, and the Pacific Coast Groundfish Trawl Catch Share Program. Information shown summarizes cash flow profit information using available metrics and information for each fishery. Shaded areas indicate that cost breakout information is not available for the West Coast sablefish permit stacking fishery.

Fishery	**Gulf Shrimp**	**BC Trawl Groundfish**			**West Coast Sablefish**	**Pacific CS Program**			
Data (summed across, statistic)	**Shrimp activities average**	**Non-whiting* average**	**Whiting* average**	**Non-whiting and whiting**	**Single value**	**Non-whiting pre-CS average**	**Non-whiting, post-CS average**	**Whiting pre-CS average**	**Whiting post-CS average**
Years	2006-2012	2007, 2009	2007, 2009	2009	2008	2009-2010	2011-2015	2009-2010	2011-2015
Inflow/Gross Revenue/Revenue	**303,966**	**813,970**	**668,684**	**1,356,927**	**272,368**	**276,288**	**392,079**	**380,670**	**1,106,689**
Costs									
Variable costs - Non-Labor	54%	38%	41%	40%		43%	47%	29%	37%
Variable costs - Labor (hired)	23%	38%	34%	41%		27%	30%	26%	27%
Fixed costs	23%	24%	25%	19%		31%	23%	44%	36%
Total Outflow/Costs	**286,771**	**706,395**	**579,613**	**1,117,407**	**216,427**	**254,110**	**315,392**	**381,649**	**983,673**
Net Cash Flow/EBITDA/Accounting Net Revenue/Total Cost Net Revenue	**17,196**	**107,576**	**89,070**	**239,520**	**55,941**	**22,178**	**76,687**	**-979**	**123,017**

* 2007 includes some whiting and non-whiting related revenue, 2009 data shown in exclusively for non-whiting and whiting activities.

Table I-2. Revenue, cost, and profitability information for the federal Gulf of Mexico shrimp fishery (2016$). *Net revenue from operations includes depreciation and owner vessel time Source: Liese et al. 2009-2014

Gulf of Mexico Shrimp Fishery (active vessels, mean per vessel)								
	2006	2007	2008	2009	*2010	2011	2012	Average
No.vessels	386	388	383	348	332	368	370	
Inflow (revenue, govt payments)	**311,506**	**259,831**	**274,016**	**262,327**	**261,527**	**344,088**	**414,471**	**303,966**
Operating costs								
Variable costs - Non-Labor (fuel, supplies)	53%	54%	59%	53%	51%	54%	56%	54%
Variable costs - Labor (hired)	23%	22%	22%	22%	25%	25%	22%	23%
Fixed costs	24%	24%	20%	24%	24%	21%	22%	23%
Total Outflow	292,040	266,792	269,977	255,555	262,373	315,905	344,756	286,771
Net Cash Flow	**19,466**	**-6,960**	**4,039**	**6,772**	**-845**	**28,183**	**69,715**	**17,196**
Net revenue from operations*	**-8,913**	**-22,901**	**-9,895**	**-3,833**	**-4,926**	**1,497**	**-10,527**	**-8,500**
Non-operating costs								
Interest payments made (on vessel loans)	8,566	8,038	5,208	4,811	3,090	2,779	3,394	5,127
Government payments received (shrimp related)	16,391	9,385	3,646	5,978	2,328	9,229	7,065	7,718
Government payments received (DWH)						10,026	70,957	40,492
Owner's vessel time	10,963	7,920	9,350	8,790	6,608	11,116	11,023	9,396
Depreciation	21,687	18,103	16,048	13,417	13,012	14,006	9,949	15,175
Profit or loss (before taxes, includes financing costs)	**-1,088**	**-21,553**	**-11,457**	**-2,667**	**-5,688**	**17,975**	**64,101**	**5,661**

Table I-3. Revenue, cost, and profitability information for the BC groundfish trawl fishery (2016$). Source: Nelson and Stuart 2009, 2011.

BC Groundfish Trawl Individual Vessels (mean per vessel)							
Activity	**Groundfish**	**Groundfish***	**Groundfish average**	**Hake***	**Hake**	**Hake average**	**Hake and groundfish**
Year	**2007**	**2009**		**2007**	**2009**		**2009**
No. Vessels	48	31		38	8		25
vessel price (per kg)	0.48	1.1		0.16	0.25		0.46
landings (all species)	1,539,103	496,499		4,823,886	2,269,818		2,260,856
Gross revenue	**921,501**	**706,439**	**813,970**	**771,822**	**565,545**	**668,684**	**1,356,927**
Fishery-Specific Costs							
Variable costs- Non-labor	41%	35%	38%	48%	35%	41%	40%
Variable costs- Labor	38%	39%	38%	29%	39%	34%	41%
Fixed Costs	21%	26%	24%	23%	27%	25%	19%
Total Costs	**784,390**	**628,399**	**706,395**	**689,718**	**469,509**	**579,613**	**1,117,407**
Earnings (EBITDA) (cash flow from operations)	**137,112**	**78,040**	**107,576**	**82,104**	**96,037**	**89,070**	**239,520**

Table I-4. Revenue, cost, and profitability information for the West Coast Tier Limit fishery (2016$). Source: Lian (2012). Gray boxes indicate where specific cost information was not available and is not shown.

West Coast Tier Limit Sablefish Fishery (mean per vessel)	
	2008
No.vessels	84
vessel price	2.75
landings	3,285,206
Revenue from All Sources	**272,368**
Costs	
Variable costs- non labor	
Variable costs- labor costs	
Fixed costs	
Total Costs	**216,427**
Accounting Net Revenue	**55,941**
Captain Adjustment	
Opportunity Cost of Capital	
Economic Cost	**230,795**
Economic Net Revenue	**41,573**

Table I-5. Revenue, cost, and profitability information for whiting activities of catcher vessels participating in the West Coast Groundfish Trawl catch share fishery (2016$). Source: EDC data.

Catcher vessels: Whiting Activities (shoreside and at-sea)									
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**pre-CS average**	**post-CS average**
No. Vessels	41	41	31	28	29	30	26		
Revenue	**262,946**	**498,395**	**1,188,200**	**1,138,098**	**1,347,151**	**1,259,308**	**600,690**	**380,670**	**1,106,689**
Costs									
Labor Variable Costs	29%	30%	36%	35%	43%	40%	28%	**29%**	**37%**
Non-Labor Variable Costs	24%	29%	25%	26%	27%	32%	28%	**26%**	**27%**
Fixed Costs	47%	41%	39%	39%	31%	28%	44%	**44%**	**36%**
Total Costs	**287,372**	**475,925**	**959,938**	**1,120,186**	**1,044,909**	**1,089,622**	**703,707**	**381,649**	**983,673**
Total Cost Net Revenue	**-24,427**	**22,469**	**228,263**	**17,913**	**302,242**	**169,684**	**-103,018**	**-979**	**123,017**

Table I-6. Revenue, cost, and profitability information for non-whiting activities of catcher vessels participating in the West Coast Groundfish Trawl catch share fishery (2016$). Source: EDC data.

Catcher Vessels: Non-whiting trawl activities (including fixed gear)									
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**pre-CS average**	**post-CS average**
Vessels	**93**	**88**	**82**	**82**	**80**	**75**	**71**		
Revenue	**288,681**	**263,894**	**367,469**	**370,424**	**387,765**	**398,320**	**436,416**	**276,288**	**392,079**
Costs									
Labor Variable Costs	43%	42%	49%	43%	47%	48%	49%	**43%**	**47%**
Non-Labor Variable Costs	26%	28%	28%	26%	32%	33%	32%	**27%**	**30%**
Fixed Costs	32%	30%	23%	31%	21%	19%	19%	**31%**	**23%**
Total Costs	**265,173**	**243,047**	**290,639**	**335,820**	**304,178**	**316,762**	**329,561**	**254,110**	**315,392**
Total Cost Net Revenue	**23,508**	**20,847**	**76,830**	**34,604**	**83,587**	**81,559**	**106,855**	**22,178**	**76,687**

References:

Lian, C.E. 2012. West Coast limited entry groundfish cost earnings survey: Protocol and results for 2008. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-121, 62 p.

Liese, Christopher, Michael D. Travis, Diana Pina, and James R. Waters. 2009. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders: Report on the Design, Implementation, and Descriptive Results for 2006. NOAA Technical Memorandum NMFS-SEFSC-584, 91 p.

Liese, Christopher, Michael D. Travis, and James R. Waters. 2009. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders: Implementation and Descriptive Results for 2007. NOAA Technical Memorandum NMFS-SEFSC-590, 97 p.

Liese, Christopher, and Michael D. Travis. 2010. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders: Implementation and Descriptive Results for 2008. NOAA Technical Memorandum NMFS-SEFSC-601, 99 p.

Liese, Christopher, and Michael D. Travis. 2011. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders: Implementation and Descriptive Results for 2009. NOAA Technical Memorandum NMFS-SEFSC-601, 99 p.

Liese, Christopher, and Michael D. Travis. 2012. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders: Implementation and Descriptive Results for 2010. NOAA Technical Memorandum NMFS-SEFSC-601, 99 p.

Liese, Christopher, and Michael D. Travis. 2013. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders: Implementation and Descriptive Results for 2011. NOAA Technical Memorandum NMFS-SEFSC-601, 99 p.

Liese, Christopher, and Michael D. Travis. 2014. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders: Implementation and Descriptive Results for 2012. NOAA Technical Memorandum NMFS-SEFSC-601, 99 p.

Nelson, Stuart. 2009. Pacific Commercial Fishing Fleet: Financial Profiles for 2007. Prepared for Fisheries and Oceans Canada, Pacific Region. December, 2008 (Revised April 29, 2009). Pacific Commercial Fishing Fleets Financial Profiles Series, 2009-1. 133 pp.

Nelson, Stuart. 2011. Pacific Commercial Fishing Fleet: Financial Profiles for 2009. Prepared for Fisheries and Oceans Canada, Pacific Region. June. Pacific Commercial Fishing Fleets Financial Profiles Series, 2011-4. 160 pp.

APPENDIX J: PCGFSS ABBREVIATED COMMUNITY SUMMARIES

PCGFSS Abbreviated Community Summaries- Draft In Support of the 5-Year Review of the West Coast Groundfish Trawl Catch Share Program

Authors:

Suzanne M. Russell
Max Van Oostenburg
Ashley Vizek
Brian T. G. Carter

The community summaries in this Appendix provide preliminary community-level information based on data from the Pacific Coast Groundfish Social Survey (PCGFSS). This information should be used to gain a better understanding of the individuals in these communities that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Contents

PCGFSS Community Summary

PUGET SOUND AREA

This summary sheet provides a snapshot of the Puget Sound Area community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Bellingham

Bellingham is the seat of Washington's Whatcom County, and is located about 100 nautical miles east of the mouth of the Strait of Juan de Fuca (nwcruising.net), occupying 25.6 square miles of land and 6.1 square miles of water. Seattle—the nearest major US city—is a 90-mile drive south, while Vancouver, B.C. is a 54-mile drive north (Norman et al., 2007).

The population of Bellingham has grown from 53,458 to an estimated 85,146 since 1990, an increase of 59.28% (US Census Bureau ACS 2015). The median household income[1] is estimated at $43,536 in 2015 US dollars (US Census Bureau ACS 2015). While agriculture, forestry, and fishing are traditional industries in Whatcomb County, the largest industries in the county (as of 2014) are government (17.4% of the workforce), health care (13.5% of the workforce), retail (13.2% of the workforce), and manufacturing (10.8% of workforce) (Bellingham/Whatcom Chamber of Commerce, 2016).

Seattle

Seattle is the seat city of King County, situated on Puget Sound between Lake Washington and Elliot Bay. The city occupies 84 square miles of land and 59 square miles of water, and is a 113-mile drive south of the US-Canada border (Norman et al., 2007). Seattle's early economic pillars were lumber and coal, though fishing, trade, shipping, and shipbuilding also contributed to the city's population growth at the end of the 19th century (Seattle Municipal Archives, 1995).
Seattle's population—estimated at 684,451—has increased by 32.58% since 1990, when the population was 516,262. The median household income in Seattle is an estimated $70,594 in 2015 US dollars (US

[1] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov.

Census Bureau ACS 2015). Farming, fishing, and forestry are minor components of Seattle's economy, accounting for only 0.22% of the workforce. The top five occupational sectors in Seattle are sales/office/administrative support (23.58%), production/transportation/material moving (17.12%), construction/extraction/maintenance (12.24%), management/business/finance (9.92%), and personal care (9.23%) (Sterling's Best Places, 2017).

PCGFSS Participants

The goal of the general community description is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide information about who the participants within each year represent. In Section 3.2 Community Performance, the Puget Sound Area is used to represent a community group composed of the following communities: Anacortes, Bellingham Bay, Blaine, Everett, La Conner, and Seattle. The PCGFSS surveyed participants in Seattle and Bellingham. While these two communities share some characteristics related to their involvement in the groundfish trawl fishery, they differ in many important ways. Due to the small sample size of Bellingham participants in all three rounds of data collection for the PCGFSS—which stems partially from the simple fact that Seattle is home to a much greater number of groundfish fishery participants—the findings presented below are primarily representative of Seattle.

It is important to keep in mind that while there is some overlap in participants across years, not every survey year contains the same sample of individuals. Table PSA-1. summarizes the percentage of respondents in the Puget Sound Area who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table PSA-1. Total number of participants, and percentage of return respondents in the Puget Sound Area.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	38.5	30.4
% Return respondents from 2012	-	-	60.9
Number of participants	16	26	23

Compared to PCGFSS participants in other 5-Year Review community groupings, Puget Sound Area participants are, on average, slightly older, have more experience both in the groundfish fishery and the commercial fishing industry in general, have deeper generational ties to commercial fishing, and derive a relatively high percentage of their income from commercial fishing (see Box PSA-1, below).

The Puget Sound Area PCGFSS participant sample is relatively owner-heavy, compared to other 5-Year Review community aggregates (see Table PSA-2). In terms of catcher-processor and mothership participation, Puget Sound Area ranks first among the few communities with involvement in the at-sea sector.

BOX PSA-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **55.7 years** | Rank 5 out of 13
2010=54.1 (4/13), 2012=56.2 (2/12)

Number of years working in commercial fishing | **34.9 years** | Rank 2 out of 13
2010=31.4 (4/12), 2012=35.0 (2/13)

Number of years working in the PCGTF | **27.6 years** | Rank 3 out of 13
2010=25.7 (5/13), 2012=23.6 (5/12)

Number of generations family has commercially fished | **3 generations** | Rank 2 out of 11
2010=3.1 (5/10), 2012=3.2 (1/12)

Percent income from commercial fishing | **92.3%** | Rank 5 out of 13
2010=91.9% (5/13), 2012=88.7% (5/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table PSA-2. Role of respondents within the Puget Sound Area, presented as a percentage of the total number of participants within the community sample, and rank* from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner**	43.8	3/12	46.2	3/12	52.2	1/11
Absentee owner/co-owner	-	-	34.6	1/8	26.1	2/10
Vessel owner/co-owner	50.0	2/12	30.8	6/8	43.5	2/12
Captain/Crew	25.0	8/12	23.1	9/11	39.1	6/12
Shoreside Processor	0	9/9	23.1	3/10	8.7	7/11
Catcher-Processor/Mothership	37.5	1/2	19.2	1/3	8.7	1/2
Buyer (not processor)	0	5/5	3.9	4/6	0	6/6
Other***	25.0	4/9	19.2	8/12	21.7	10/13
Not applicable	0		4.4		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

** 2010: refers to "permit owner"

*** Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Infrastructure

Seattle is a major hub of shore-side support businesses for the entire West Coast, according to PCGFSS participants. Numerous participants in Washington, Oregon, and California mentioned acquiring nets, gear, and other miscellaneous items related to commercial fishing from Seattle-based businesses. For

some, these suppliers were primary sources of such goods and services, while others turned to Seattle only when the good or service in question was not readily available locally.

Puget Sound Area PCGFSS respondents in all three rounds of data collection shared fewer infrastructure-related concerns than participants in other communities. This may be partially explained by the fact that Seattle is home to the business headquarters of a number of companies involved in the at-sea whiting sector, as these catcher-processor vessels have unique infrastructure needs, and many of the catcher vessels are moored in other ports. Another likely contributing factor is the common involvement of fixed-gear black cod vessels in various Alaska fisheries, as these participants deal less frequently with infrastructure on the West Coast. Participants with ties to these vessels—be it captains, crew, or vessel/permit owners—make up the majority of the non-whiting PCGFSS participants in Seattle who actively participate in the catch shares fishery. The few comments on infrastructure from participants in Bellingham did note a decline in shore-side businesses and infrastructure, but these comments were directed toward the trawl sector in the state of Washington as a whole.

Fishery Participation Levels

This section supplements the general community description by characterizing the community based on respondents' current and planned participation in various fisheries. Fisheries participation data presented here reflects the fisheries that PCGFSS respondents in the Puget Sound Area participate in, and does not account for where these participants may land their catch.

As Table PSA-3 (below) indicates, Puget Sound-based PCGFSS fishermen[2] harvest a variety of groundfish, with Pacific whiting (62.5% in 2012, 54.5% in 2015/2016), shortspine thornyhead (46.2% in 2010, 25% in 2012, 45.5% in 2015/2016), and sablefish (25% in 2012, 63.6% in 2015/2016) being among the most often targeted. It is worth noting here that the percentages presented in the table are representative of fishermen only, and do not include processors. Due to the anomalous (relative to the rest of the West Coast) presence of the at-sea whiting sector in Seattle, the inclusion of processors in this analysis for the Puget Sound Area—some of which are motherships in the at-sea whiting sector—would likely result in an increase in percentages for both Pacific whiting and Alaska Pollock, or at the very least lowered percentages of other groundfish species relative to Pacific whiting.

Table PSA-3. Top five groundfish and other species that Puget Sound Area fishermen reported commercially fishing since catch shares was implemented (2010: commercially fished in the last 5 years).

2010	%	2012	%	2015/2016	%
Shortspine Thorneyhead	46.2	Pacific Whiting	62.5	Sablefish	63.6
Chilipepper	30.8	Lingcod	50.0	Lingcod	54.5
Longspine Thorneyhead	23.1	Dover Sole	50.0	Pacific Whiting	54.5
Yellowtail	23.1	Shortspine Thorneyhead	25.0	Shortspine Thorneyhead	45.5
Splitnose	15.4	Yellowtail	25.0	Longspine Thorneyhead	36.4
		Sablefish	25.0	Yellowtail	36.4
		Arrowtooth Flounder	25.0	Petrale Sole	36.4
		Petrale Sole	25.0		
		Spiny Dogfish	25.0		
		Dungeness Crab	12.5		

[2] The survey item summarized in Table PSA-2 only applies to fishermen, which were defined as captain, crew, and/or other roles directly related to the harvesting of fish.

PCGFSS survey data indicates that Puget Sound Area participants generally do not have plans to decrease activity in the groundfish trawl fishery anytime soon, as Box PSA-2 indicates. Rather, the majority of Puget Sound Area participants plan to continue their current (as of 2015/2016) level of activity in the fishery, and a sizeable minority (31.6%) plan to increase their activity level in the fishery.

BOX PSA-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **31.6%** | Rank 6 out of 11
2012=48% (3/8)

Plan to decrease activity in PCGTF | **0%** | Rank 9 out of 9
2012=0% (3/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Employment Levels

This section summarizes community-level employment based on participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries, Table PSA-4. Participation in the groundfish fisheries has varied across data collection years. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry, Table PSA-5. Ranks across all components for this community vary across all data collection years, not providing clear trends.

Table PSA-4. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	%	Rank	%	Rank	%	Rank
Groundfish	87.5	6/9	96.2	1/11	82.6	4/12
Other fisheries	43.8	12/13	57.7	6/11	43.5	10/10
Non-fishing	6.3	9/11	11.5	10/11	13.1	11/12
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

PCGFSS participants in the Puget Sound Area rank in the top half (relative to other community aggregations included in the 5-year review) of every self-reported job quality measure apart from "method of pay". Though it is difficult to discern what—if any—influence catch shares has had on these favorable job quality measures, the widespread support of the program among Puget Sound Area PCGFSS participants (see Box PSA-3 in the next section) could be reasonably interpreted as a contributing factor.

Interview data offers further insight into the relationship between the catch share program and job quality. Participants in the Puget Sound Area who were in support of the catch shares program tended to emphasize the added security and predictability they felt the catch shares program provided:

> *"I'd say yeah, increase in income…and one thing about catch shares is a lot of jobs get lost because the fishery consolidates, and then the jobs that stay are better jobs."* – QS Permit Owner, Puget Sound Area, 2015/2016

A number of PCGFSS participants in the Puget Sound Area expressed similar sentiments to this quote (i.e., that the catch shares program has decreased the amount of jobs in the fishery, but that the remaining jobs are more stable), but this perspective was not unanimous. Some reported that not only had jobs become more stable, but more numerous as well:

> *"We actually have more jobs, we don't have fewer jobs, we've actually hired a complete crew for another vessel that we didn't have before. Uh, we've essentially entered a new vessel into the fishery by... taking 2 permits and putting them onto a new vessel and hiring all new crew. So we have a completely new operation dedicated to groundfish."* – QS Permit Owner, Puget Sound Area, 2012

Still others reported that catch shares has created less stable jobs—namely for crew and deckhands—making it more difficult to keep good help around long-term:

> *"I mean, I spent 15-20 years where I had the same crew, and it's the same guys all the time, so, you know, nobody left ever, and all of a sudden, I got a different guy every week."* – Fisherman, Puget Sound Area, 2015/2016

Table PSA-5. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		**2012**		**2015/2016**	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.3	5/10	3.5	2/10	3.4	3/10
Compensation	2.8	4/12	3.2	3/11	3.1	6/12
Method of pay	2.7	9/12	3.0	6/9	3.2	7/12
Job stability	3.1	2/13	3.0	3/9	3.2	4/10
Standard of living	3.0	2/8	3.0	5/10	3.2	4/9
Relationships	3.5	3/9	3.6	4/12	3.6	4/11
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	93.8		100		95.2	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While, the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

Puget Sound Area PCGFSS participants reported the highest rate of support for the catch share program of any 5-Year Review community aggregation during all three rounds of data collection. In addition, Puget Sound-based participants consistently ranked high in terms of reporting being positively affected by catch shares, and low in terms of reporting being negatively affected by catch shares. Changing species caught post-catch shares was reported relatively often, and a higher percentage of Puget Sound area participants agreed that safety had improved than any other community sample (Box PSA-3).

BOX PSA-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **72.7%** | Rank 1 out of 10
2010=68.8% (1/11), 2012=83.3% (1/11)

Positively affected by catch shares | **56.5%** | Rank 2 out of 12
2010 (expect to be affected)=50% (1/11), 2012=44% (4/12)

Negatively affected by catch shares | **8.7%** | Rank 12 out of 12
2010 (expect to be affected)=18.8% (12/13), 2012=28% (10/12)

Changed species caught post-catch shares | **63.6%** | Rank 2 out of 8
2010 (change in last 5 years)=23.1% (6/8), 2012=37.5% (5/10)

Agree that safety has improved as result of catch shares | **77.8%** | Rank 1 out of 8

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

While support for catch shares was common among PCGFSS participants in the Puget Sound area, interviews were not without commentary on the perceived impacts of fishery management to peoples' own fishing-related businesses, the groundfish fishery, and the industry in general. Two repeated points in this regard were the contention over the gear-switching component of the catch shares program, and gear-switching limitations:

> *"You know, we don't know what's coming next. Right now the trawlers all of a sudden say they don't want gear-switching anymore. Well! Okay, how are you supposed to plan for that? I mean, you know, we made the investments and somebody is taking that seriously. So, we are investing in that pretty…we have money on the line."* – QS Permit Owner, Puget Sound Area, 2015/2016

> *"The problem is I can't own two…I can't have a tier permit and a trawl permit on the boat at the same time. That is the problem. Write that down right there."* – QS Permit Owner, Puget Sound Area, 2015/2016

Some participants in the Puget Sound area also spoke of varying degrees of influence different groundfish-related interests had on fishery management. As the following comment on the trawl sector reflects, the policy arena was not necessarily seen as egalitarian:

> *"Well it's a huge…it's a huge…dollar-wise it's such a huge portion of the fishery. And not only that, it's tremendously consolidated. You know, where, there's still a ton of owner/operators like me in the longline fishery, and we have our organization and our guy to basically protect our*

interests. He's one guy. And you have all these trawl companies—big factory trawlers who are tremendously capitalized—they're the ones that make the political connections, or have high-paid lobbyists and that sort of thing. Very effective lobbyists, and that's how…it's influence, basically. It comes down to dollars, you know? Even though it shouldn't. But it does. So how do you combat that? That's a tough one." – Fisherman, Puget Sound Area, 2015/2016

Additional Themes

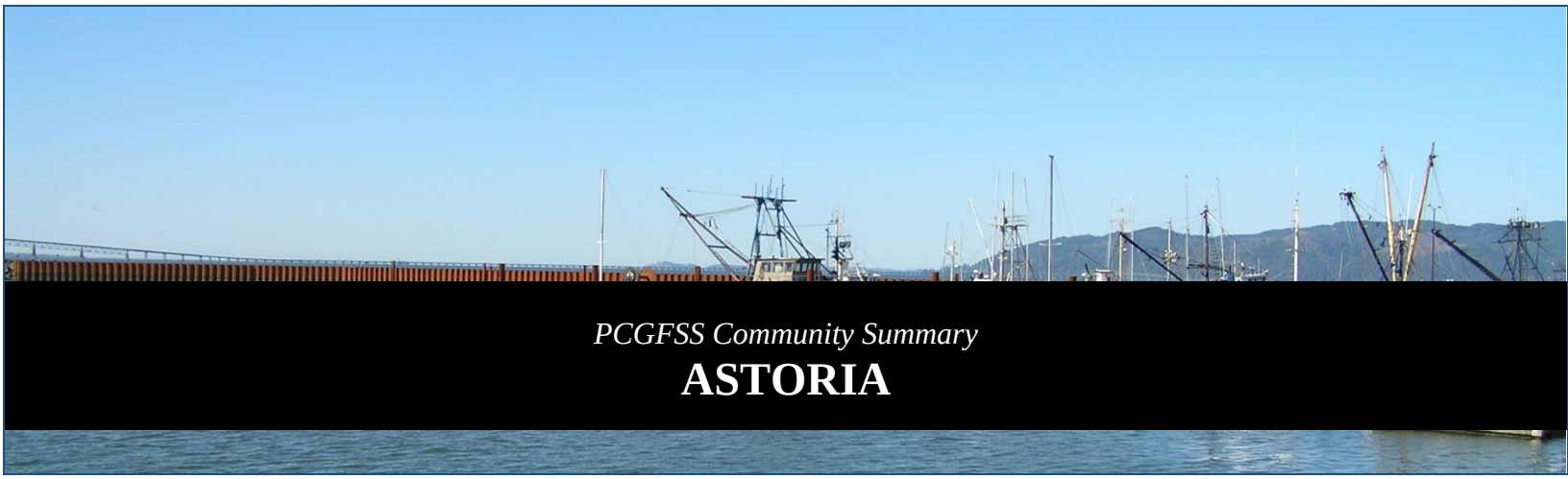
The theme of adaptability was prevalent in interviews with PCGFSS participants in the Puget Sound area. Discussion of adapting to catch shares tended to touch on at least one of the three general themes of a) the importance of having a proactive approach to one's career in the fishery, b) business strategy being dependent upon quota holdings, boat size, and boat capabilities, and c) gear experiments and modifications. The first quote below touches on the first two of these themes, while the second relates to gear modification:

"Well, when I was a kid, my dad always told me, he said, "In the fishing industry, you're either swimming forward, or you're going backwards. You can't tread water." And so my plan has been and continues to be that we will strengthen our position, make sure our boats are buyable, and our boats are maintained well, and we have the ability to catch leased fish. Because we won't be able to afford other fish. We have a big enough base that that will support us but we're going to have to survive off leasing fish." – QS Permit Owner, Puget Sound Area, 2015/2016

"So I make sure I don't catch the stuff I don't have. I mean I have so many holes in my net, I don't even know how I catch fish sometimes." – Fisherman, Puget Sound Area, 2015/2016

Summary

In general, Puget Sound Area participants appear to have adjusted well to the catch share program. Increased stability, increased business flexibility, and benefits to the resource were among the most common positive impacts noted from the catch share program, while decreased stability, decreased flexibility, and decreased employment opportunities were among the most common negative impacts discussed. Major factors that seem to be influencing the high levels of support for the program among Puget Sound Area participants include familiarity with quota-based management in the at-sea whiting and Alaskan IFQ fisheries, the high proportion of quota share owners among those surveyed, and the relatively stable shoreside support sector in the Seattle area.



PCGFSS Community Summary

ASTORIA

This summary sheet provides a snapshot of the Astoria community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Located 91 miles east of Portland in Clatsop County, Astoria is situated near the mouth of the Columbia River in northwestern Oregon. Together with the City of Warrenton, the Astoria area encompasses 22.45 square miles of land, and 8.35 square miles of water (Norman et al., 2007). Named after John Jacob Astor—a prominent New York Merchant during the late 18th and early 19th centuries—the community of Astoria grew out of Fort Astoria, a fur-trading outpost—established in 1811—considered the earliest U.S. settlement on the West Coast (Norman et al., 2007). Chinook, Clatsop, and Tillamook tribes historically occupied the area, harvesting seafood, roots, berries, and other resources to support their societies (Norman et al., 2007).

The US Census Bureau's Population Estimates Program estimates the population of Astoria to be 9,626 in 2015—a 4.5% decrease from 1990. Median household income[3] is estimated at $44,663 in 2015 dollars (US Census Bureau ACS 2015). Though the fishing industry has a fairly strong presence in Astoria, recent estimates indicate that only 1.7% of the population hold an occupation in the farming, fishing, and forestry sector. Sales/office/administrative support (23.6%), production/transportation/material moving (15.2%), and management/business/finance (11.2%) employ the highest percentages of Astoria's population (Sperling's Best Places, 2017).

PCGFSS Participants

The goal of this section is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide information about who the participants within each year represent. In Section 3.2 Community Performance, Astoria is defined as a stand alone community, opposed to an aggregated community. Although some PCGFSS respondents may live outside of the community, all are connected to the fishing community in Astoria. It is important to

[3] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov.

keep in mind that while there is some overlap in participants across years, not every survey year contains the same sample of individuals. Table A-1. summarizes the percentage of respondents in Astoria who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table A-1. Total number of participants and percentage of return respondents in Astoria.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	37.5	23.3
% Return respondents from 2012	-	-	53.3
Number of participants	23	32	30

Compared to participants in other West Coast communities with ties to the trawl groundfish fishery, Astorian PCGFSS participants are—on average—slightly younger, have a comparable level of experience in the groundfish trawl fishery (and commercial fishing in general), have deeper generational ties to fishing, and garner a higher percentage of their overall income from commercial fishing (Box A-1). Roles of study participants in Astoria are identified in Table A-2. Astoria ranks in the mid-range for all roles.

BOX A-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **51.5 years** | Rank 11 out of 13
2010=47.5 (10/13), 2012=49.7 (9/12)

Number of years working in commercial fishing | **29.7 years** | Rank 8 out of 13
2010=29.6 (5/12), 2012=26.8 (9/13)

Number of years working in the PCGTF | **24.6 years** | Rank 6 out of 13
2010=26.6 (4/13), 2012=23.2 (6/12)

Number of generations family has commercially fished | **2.6 generations** | Rank 3 out of 11
2010=2.4 (8/10), 2012=2.0 (8/12)

Percent income from commercial fishing | **94.9%** | Rank 3 out of 13
2010=99.6% (1/13), 2012=91.6% (3/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table A-2. Role of respondents within Astoria, presented as a percentage of the total number of participants within the community sample, and rank[*] from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner[**]	34.8	7/12	31.3	7/12	40.0	3/11
Absentee owner/co-owner	-	-	12.5	5/8	16.7	5/10
Vessel owner/co-owner	43.5	3/12	40.6	3/8	36.7	5/12
Captain/Crew	78.3	1/12	59.4	4/11	43.3	4/12
Shoreside Processor	4.4	8/9	12.5	5/10	20.0	2/11
Catcher-Processor/Mothership	0	2/2	0	3/3	0	2/2
Buyer (not processor)	0	5/5	0	6/6	3.3	4/6
Other[***]	0	9/9	15.6	9/12	23.3	9/13
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

[*]Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

[**]2010: refers to "permit owner"

[***] Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Infrastructure

PCGFSS participants reported declines in shore-side commercial fishing infrastructure that pre-dated the implementation of the catch share program in 2011, though some asserted that fleet consolidation resulting from the program has influenced continued declines. Pacific Coast Seafoods and Bornstein Seafoods are the two primary groundfish processors in town, with Fishhawk Fisheries and Da Yang Seafoods also buying and processing smaller quantities of groundfish.

PCGFSS participants often noted that shore-side service and supply providers had been negatively impacted by the 2003 groundfish buyback program. Trawl vessels were recognized as requiring a higher degree of maintenance than other common gear types, thus the removal of a substantial portion of the drag fleet was seen as a major factor behind infrastructure decline. Consolidation resulting from the buyback and the catch share program was identified as bringing about a reduction in demand for trawl gear and maintenance, which has resulted in those service and supply providers experiencing difficulties maintaining a sufficient volume of products and labor to meet the lessened—but still present—demand.

> *"We are selling a lot less volume of stuff because we have so much fewer customers. So it has slowed the shop down tremendously. With the slowdown, we are not able to bring in volumes of containers of things to give the fishermen the best price."* – Industry Participant, Astoria, 2012

Fishery Participation Levels

This section supplements the section above by characterizing the community based on PCGFSS responses to items about current and planned participation in various fisheries. Fisheries participation data presented here reflects the fisheries that PCGFSS respondents in Astoria participate in, and does not account for where these participants may land their catch.

As presented in Table A-3, PCGFSS fishermen[4] in Astoria report targeting a diversity of groundfish species, with dover sole, sablefish (black cod), and petrale sole being particularly common. In addition to these groundfish species, participants also commonly report targeting pink shrimp, Dungeness crab, and tuna. Some also indicate involvement in Alaska fisheries.

Table A-3. Top five groundfish and other species that Astoria fishermen reported commercially fishing since catch shares was implemented (2010: commercially fished in the last 5 years).

2010	**%**	**2012**	**%**	**2015/2016**	**%**
Dover Sole	100.0	Dover Sole	91.3	Dover Sole	100.0
Sablefish	94.7	Lingcod	87.0	Sablefish	93.8
Petrale Sole	94.7	Sablefish	82.6	Petrale Sole	93.8
Shortspine Thorneyhead	89.5	Petrale Sole	82.6	Shortspine Thorneyhead	87.5
Arrowtooth Flounder	84.2	Shortspine Thorneyhead	73.9	Lingcod	87.5
		Rex Sole	73.9		
Pink Shrimp	42.1	Dungeness Crab	43.5	Dungeness Crab	56.25
Dungeness Crab	26.3	Pink Shrimp	30.4	Pink Shrimp	37.5
Tuna	10.5	Tuna	21.7	Alaska Salmon	18.75
Mackerel	5.3	Pacific Halibut	4.3	Tuna	18.75
Squid	5.3	Alaska Pollock	4.3		
Alaska Tanner Crab	5.3	Alaska Flatfish	4.3		

PCGFSS interview data from Astoria suggests an increase in participation in the shrimp, Dungeness crab, and tuna fisheries since catch share implementation, though participants tended to focus their discussions on increased activity in the shrimp fishery. While favorable ocean and market conditions for shrimp have influenced this trend, participants also linked the phenomenon to the catch share program. Increased participation costs—especially with regards to observer and leasing fees—were frequently identified as driving the shift toward shrimp and other fisheries with lower overhead costs. The following quote illustrates this line of thinking:

> *"But, you know, we don't have an observer so it's not costing me $520 a day. I mean we're looking at over $50,000 a year to have a guy. So anybody that can shrimp is shrimping. And that's the only reason. It's not even, you know if you take that $50,000 away and add it to the trawl fishery I mean, guys are going to shrimp if they can or if they have a market or if they have the gear and everything and they've got a permit to go shrimping. Everybody is shrimping unless their owner won't let them go shrimping for whatever reason, or this or that. But everybody that's shrimping is shrimping. And that's the reason, is the trawl fishery is too [expletive] expensive."* – Fisherman, Astoria, 2015/2016

Leasing out groundfish quota (instead of harvesting it) was another common trend in the post-implementation PCGFSS interview data (2012 and 2015/2016). Bycatch concerns and operating costs were the most commonly mentioned motivating factors behind this strategy:

> *"Why would I want to keep fishing if I could just lease out my quota and not take all those risks?"* – QS Permit Owner, Astoria, 2015/2016

> *"I'm not against the leasing—because it keeps us going—but there's people that are creating a living off owning these IFQs just by leasing them out. And I don't think that was what was*

[4] The survey item summarized in Table A-2 only applies to fishermen, which were defined as captain, crew, and/or other roles directly related to the harvesting of fish.

> *intended, really. This is a working industry, and it's taken these people that were privileged enough to get this fish, to where it's cheaper for them to lease their fish out for 40% because they don't have to own the boat, they don't have to pay for the fuel, they don't have to pay the crew, they don't have to pay for injuries, breakdowns…they just lease their fish out."* – Fisherman, Astoria, 2015/2016

While this strategy enables quota owners to profit off their groundfish quota without as much financial risk as harvesting it would entail, many—including the fisherman quoted below—were concerned about the wider impacts of this strategy on the fishery as a whole:

> *"But I'd even recommend talking to some of the other draggers that have just even leased out their quota. Again, that's taking away from the crew that's on their boat, that's income that now their losing out, and so not only is the crew on that boat losing out on those fish, the quotas being leased out and everyone on the other boat is not getting paid what they normally would have."* – Fisherman, Astoria, 2012

All in all, while participants in Astoria agreed that groundfish activity has decreased under the catch share program, participation in commercial fishing overall was seen as remaining fairly steady. As discussed, this is likely linked to the re-appropriation of harvesting efforts into non-groundfish fisheries, such as shrimp, Dungeness crab, and tuna. Interestingly, these trends were predicted by participants in 2010 (one year prior to catch shares implementation), as the quotes below highlight:

> *"You know, so, I also – the boat can shrimp and I tuna fish. But I've only been tuna fishing for the last four years. And before that, pretty much, I didn't need to deal with anything else because the trawl industry was pretty much the mainstay of everything. Shrimped for a couple of years in between, too, we did shrimp when we first got the boat. I haven't shrimped for two years…But looking at where my quota shares ending up here, I'm going to have to shrimp, I'm going to have to tuna fish. It's probably going to be a mainstay of my fishery."* – Permit Owner, Astoria, 2010

> *"I don't want to shrimp, but I might have to. I really don't know yet. We'll see how this goes."* – Permit Owner, Astoria, 2010

Despite these reported shifts in fishing effort, it is likely that groundfish will continue to remain an important component of the commercial fishing industry in Astoria. About 41% of respondents in 2015/2016 indicate plans to increase their activity in the groundfish fishery (Box A-2).

BOX A-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **41.4%** | Rank 3 out of 11
2012=45.2% (4/8)

Plan to decrease activity in PCGTF | **3.5%** | Rank 8 out of 9
2012=32.3% (1/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Employment Levels

This section summarizes community-level employment based on participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry.

As Table A-4 indicates, the vast majority of PCGFSS participants in all three rounds of data collection reported some level of participation in the groundfish fishery, which is not surprising as groundfish fishery participants were the explicit focus of the survey. Noteably, in comparison to other communities, Astoria ranks in the top two in terms of percentage employed in groundfish. Substantial percentages of respondents also reported some level of involvement in other fisheries. Though comparisons between the three rounds of data collection are complicated by small sample sizes and varying response rates, the apparent increase in non-groundfish fisheries participation between 2010 and 2015/2016 is in line with the qualitative findings presented in the "Fishery Participation Levels" section above.

Table A-4. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		**2012**		**2015/2016**	
	%	Rank	%	Rank	%	Rank
Groundfish	95.5	2/9	93.8	2/11	93.1	1/12
Other fisheries	45.5	11/13	56.3	7/11	79.3	3/10
Non-fishing	4.6	10/11	3.1	11/11	17.2	9/12
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	95.7		100		96.7	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

In 2010—one year prior to catch shares being implemented—PCGFSS participants in Astoria spoke heavily about job losses they felt would result from the catch share program. The following quotes are just a few examples:

> *"You know, right now, some of the numbers being tossed around is 40 to 50 percent fleet reduction. When you talk about a fleet, if you break it down per boat, you're talking anywhere from three to five guys per boat. That's less groceries purchased, that's less work at the hydraulic shop. Englund Marine is scared to death of inventory. You know, they'll order anything you need, but, you know, they don't know what the future's going to hold here either. So, I think as far as economics, some of the coastal communities like Warrenton, they can be hit really hard. I mean, they're already talking about the fish plant having a reduced crew. There's just a lot of things – less fuel purchases, you know, everything that it takes to keep a boat operating. I think all the industries, in that regard, are going to be hit hard. And directly. There is going to be guys on the dock, begging for a job on a boat because they lost their job."* – Fisherman, Astoria, 2010

> *"Just personally, so you know my stand on this, I personally think, and I'm one of the few people who's stood up and spoken about how this is – how we're going to lose jobs over this and how bad this is for the industry and nobody seems to care. But, that's where I fit in, I don't know if it's going to work or not, I don't even give a shit if it's going to works or not, but it's going to take a*

> *lot of jobs, not just fishing jobs, but support people too, and that's what I don't want to see."* – Fisherman, Astoria, 2010

> *"By the time they make this study again, all the people who are hanging on are going to be gone, so they're not going to be getting their jobs back, so I mean. It seems kind of silly to me. I'm glad that they're understanding that this might become a problem, but I think too little too late."* – Fisherman, Astoria, 2010

PCGFSS interviews from Astoria in 2012 and 2015/2016—many of which contain accounts of decreased harvesting and shore-side involvement in the groundfish fishery—suggest that these predictions were at least partially accurate, although a couple of factors seem to be preventing a more pronounced reduction of employment opportunities in Astoria. Based on interview analysis, the main buffering factors according to study participants are the health of the shrimp fishery (a common side—or primary—fishery for participants in the trawl groundfish fishery), and the presence of the "Pacific fleet" (i.e., vessels owned by Pacific Seafood Group that have access to large amounts of quota and the ability to co-ordinate the acquisition and harvesting of groundfish quota). The following quotes offer participant insight into these factors, in turn:

> *"So then when the price of shrimp went up, you know, we went shrimping. But along with the shrimping, as long as the price of shrimp stays I'm probably going to stay like this because the bottom fish fishery costs me way more money to be in than the shrimp. So I don't have to lease any fish. I don't have to worry about this and that and everything else."* – QS Permit Owner, Astoria, 2015/2016

> *"You know, I went to all the council meetings, I spoke against it. I wasn't for it, but when the dust settled I work for a big company that has 10-12 drag permits, and they were able to stack a lot of fish on a coupe boats. It put a lot of other people out of business because they couldn't afford to buy fish and stack the permits. But for me it was positive because I work for Pacific and they have a lot of permits and they got a lot of fish. And that's big business. That put the small mom-and-pop operations, it put those guys out of business."* – Fisherman, Astoria, 2015/2016

In addition to employment levels, PCGFSS survey and interview data also sheds light on reported job quality among participants in the groundfish trawl fishery. One finding presented in Table A-5 (below) stands out in particular: the mean job satisfaction score among PCGFSS participants in Astoria, while high on the Likert-scale from one to four, is consistently ranked lower than the majority of West Coast fishing communities included in this 5-Year Review. Interview data from the most recent round of data collection offers some insight into the impact of fishery management (though not necessarily catch shares) on this apparent trend:

> *"The job is becoming less fun. And, you know, the catch share program, the way it's been carried out, has contributed to it being less fun, so…"* – Industry Participant, Astoria, 2015/2016

> *"Well, you're trying to execute a business based on a scientist's idea of what's in the ocean, and their data is so skewed, so flawed, that it's not fun anymore. It used to be challenging. Now it's, I mean I know where to catch the fish, but it's not fun. You almost have to have a calculator in your hand on a tow-by-tow basis and just pray the wrong fish aren't in the cod end when you haul back."* – QS Permit Owner, Astoria, 2015/2016

Table A-5. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.1	8/10	3.1	6/10	3.3	7/10
Compensation	2.7	6/12	2.9	6/11	3.1	5/12
Method of pay	3.0	7/12	3.0	5/9	3.2	6/12
Job stability	2.5	9/13	3.1	2/9	3.2	3/10
Standard of living	2.9	3/8	3.1	4/10	3.3	2/9
Relationships	3.4	6/9	3.4	6/12	3.5	7/11
Not applicable	0		3.2		0	
Prefer not to answer	5.0		0		0	
Response rate	87.0		100		96.7	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While, the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

In line with overall (coast-wide) findings, support for the catch shares program among Astoria-based PCGFSS participants appears to have increased after implementation (Box A-3). That said, opinions are still decidedly mixed, with 50% being the highest level of support of the three data collection phases. The proportion of Astoria-based participants that reported being positively affected by catch shares increased from 19.1% in 2010 to 48.3% in 2015/2016, while the proportion reporting being negatively affected by catch shares decreased from 42.9% in 2010 to 20.7% in 2015/2016.

The most frequent reasons cited for support of the catch shares program among Astoria-based PCGFSS participants included increased business planning ability and improved sustainability of the resource. The sentiment that "something needed to be done" was repeated by participants in all three rounds of data collection, as some perceived major sustainability issues (in both the biological and economic sense) facing the groundfish fishery prior to the management switch in 2011.

In general, Astoria-based PCGFSS participants regard the catch share program as beneficial to business planning. Relative to the bi-monthly management system that pre-dated catch shares, the catch share program's annually-administered quota was said to allow for more flexibility. Participants spoke of this flexibility being beneficial when budgeting efforts into multiple fisheries.

PCGFSS participants in Astoria also spoke frequently about the importance of incorporating other fisheries into their harvesting operations. While involvement in multiple fisheries is nothing new for fishermen in Astoria or elsewhere on the West Coast, comments like the ones below suggest that the importance of securing income from multiple fisheries may be increased under catch share management.

> *"So the shift to other fisheries is a negative in that it doesn't present an accurate picture. If all we had was bottom fish it would have failed a long time ago, probably a year after it started. It*

> *would have just [inaudible]. But because they have other fisheries that they can shift to, that's a good thing and it keeps them in business. But it has taken the groundfish from a profitable business activity, to a barely break even in most cases, and a loss in a lot of cases. So that's that."* – Processor, Astoria, 2015/2016

For more on issues related to business operations, please see section 3.2.2(h) (Changing Nature of Fishery Businesses and Jobs). For more on the impacts of catch shares on other fisheries, please see section 3.2.2(g) (5) (Interactions Between Trawl Communities and Others).

Astoria-based PCGFSS participants offered a wide range of critiques about the catch share program, though much of their criticism was directed at the management of the fishery more generally. These comments tended to portray the management process as slow, unpredictable, and lacking in fisherman input. The following few quotes reflect repeated management-related sentiments.

> (In response to being asked for his thoughts on why the fishery's attainment rate is so low):
>
> *"Because everybody is scared to death they'll catch a bunch of yellow-eye. Or canary, it might be canaries. They'll do them, they'll model about three or four years from now. I'm sorry but your bosses, they're not getting their [expletive] jobs done. They went to two-year management because they couldn't figure shit about it, and now they still can't. So that mean by the time you go through the council process, and it's, 'Oh, we've gotta wait for another survey.' Well that's three years later. Even still, 'Something's increased? We don't believe that.' If it's [fish stock] farther down, they'll believe it right away and they'll shut it down."* – QS Permit Owner, Astoria, 2015/2016
>
> *"IQs are and were designed primarily by economists as an economic theory. They can have insularly advantages, particularly biological advantages and sometimes safety advantages. Um, so the theory of having an IQ program, um, for the economic benefits attached to it is not a bad one. It's when the practicality of the program, the reality of the program, begins to bite, that you suddenly realize it was not so ideal…There were lots of things that were voted on, that were discussed, that I raised a lot of concerns about. Not the idea of having an IQ program, but the way the program was being slowly structured by varying council actions. And several of those things continue to concern me. Um, hell, for example, the definition of ownership and control, um, was way out of whack from what someone normally considers ownership and control."* – Industry Participant, Astoria, 2015/2016
>
> *"Regulations. Government side of things. The NOAA/NMFS side of things. The council side of things. It's the most unpredictable thing that I deal with. The regulations side of things is the most unsecure part of the whole thing, to me."* – QS Permit Owner, Astoria, 2015/2016
>
> *"But the problem is, we put such faith in those numbers once they get to the TAC. And there's buffer--on every single layer, there's a buffer. And then we get to this number, and now we manage to the absolute, that absolute number like it is 100% science-based."* – QS Permit Owner, Astoria, 2015/2016
>
> *"Unfortunately, they don't put much stock in what we say because we're not educated. We don't have PhDs."* – QS Permit Owner, Astoria, 2015/2016

Cost of Observers: While Astoria-based PCGFSS survey participants were rarely in outright opposition to the catch shares observer program, nearly all recognized the cost of observer coverage as an issue of concern. The cost was seen by some as adding pressure to the harvesting experience. These participants

explained that the margin for error during harvest—already thinned for many by low amounts of bycatch quota—has been further minimized by the observer program.

> *"It used to be you could work harder and scratch around and if fishing wasn't that good you could work harder and spend more time out there, and just work harder and make it work out. You can't do that now. Because the clock is ticking now from when you leave the dock for the observer side of things."* – QS Permit Owner, Astoria, 2015/2016

Small vessels were often seen as bearing an inordinate cost burden with regards to observer coverage, since the flat rate of roughly $500 per day usually accounts for a greater proportion of their revenue on a given trip.

> *"Well, and $500 to a smaller dragger is a whole lot different than $500 to a guy bringing in 70,000 pounds."* – Processor, Astoria, 2015/2016

For more on issues related to observer fees and small vessels please see section 3.2.3.(d) (Small Vessels and Vessels Leaving the Fishery).

BOX A-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **50.0%** | Rank 7 out of 10
2010=23.8% (5/11), 2012=48.4% (6/11)

Positively affected by catch shares | **48.3%** | Rank 3 out of 12
2010 (expect to be affected)=19.1% (5/11), 2012=38.7% (5/12)

Negatively affected by catch shares | **20.7%** | Rank 11 out of 12
2010 (expect to be affected)=42.9% (6/13), 2012=38.7% (7/12)

Changed species caught post-catch shares | **40.0%** | Rank 4 out of 8
2010 (change in last 5 years)=36.8% (2/8), 2012=43.5% (3/10)

Agree that safety has improved as result of catch shares | **37.5%** | Rank 6 out of 8

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Additional Themes

Markets: Comments on the ex-vessel groundfish market in Astoria tended to revolve around the limited number of groundfish processors, as well as the lack of substantial price increases for many species.

> *"We have no markets. We only have two people to buy our fish, which doesn't make it that great."* – QS Permit Owner, Astoria, 2015/2016

> *"Now my lease rates have skyrocketed, and instead of getting $2.00 and $1.85 for petrale, it's down to like, I think it's a buck fifteen ($1.15) right now. Well if you have to lease for 40 cents…That's one of the money fish. If it wasn't for the money fish I couldn't afford to fish. Some*

> *of the prices are at historic lows right now. When I first started fishing, Turbot was 9 cents. It's 10 now."* – QS Permit Owner, Astoria, 2015/2016

As the second quote above alludes to, Astoria-based PCGFSS participants also frequently commented on the groundfish quota leasing market, with many stating that quota leasing has become a necessary component of participation in the trawl groundfish fishery. Lease rates—which a number of participants claimed had increased since implementation—were recognized as an added cost of doing business under catch shares.

Summary

Astoria has undergone changes since the implementation of the catch share program, but many of these changes appear to be continuations of trends that pre-date the program. Opinions on the catch share program have become more favorable since implementation, but they are still solidly mixed. Lease fees and observers costs are major concerns for many Astoria-based PCGFSS participants. Increased efforts in the crab, shrimp, and tuna fisheries were often seen as related to diminished opportunity in the groundfish fishery resulting from catch shares, although the buyback and the conservative approach to management in the last couple of decades were regarded as major factors as well. Despite mixed reviews, Astoria-based participants rank near the bottom among community aggregates in this analysis when it comes to reporting being negatively impacted by the catch share program, as well as with regard to plans to decrease participation in the fishery moving forward.

PCGFSS Community Summary

NEWPORT

This summary sheet provides a snapshot of the Newport community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Newport is located along the central Oregon coast approximately 136 miles southeast of Portland, and encompasses an area of 10.4 square miles (which includes 1.6 square miles of water). Oyster beds in Yaquina Bay attracted settlers to Newport in 1862, which was then incorporated in 1882 (Newport Chamber of Commerce 2016, Norman et al. 2007). Newport's Bayfront soon became an economic hub, supporting wood product industries and a commercial fishing port (Norman et al. 2007). Newport also has a history of tourism—by the 1900s, Nye Beach in Newport was one of the major visitor attractions along the Oregon coast (Norman et al. 2007). In an effort to reduce dependency on natural resource-based fishing and tourism, in the 1980s local businesses and leaders developed a community revitalization plan, which refocused the identity of Newport as a destination resort and research center.

According to the US Census Bureau's Population Estimates Program, the population of Newport in 2015 is estimated to be 10,268—a 20.1% increase from 1990. Median household income[5] (in 2015 dollars) is estimated to be $37,452 (US Census ACS 2015). The Newport Chamber of Commerce (2016) describes the major industries in Newport as tourism, fishing, forestry, and marine science.

PCGFSS Participants

The goal of this section is to describe the community based on some of the general characteristics that participants reported in the PCGFSS (Box X). These general characteristics provide information about who the participants within each study year represent. In Section 3.2 Community Performance, the community of Newport is defined as a stand alone community, opposed to an aggregated community. PCGFSS respondents within Newport may live outside of Newport (i.e. Toledo), however, all are connected with the groundfish fishery in Newport. When interpreting the results presented in this section

[5] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov.

it is important to keep in mind that while there is some overlap in participants across years, not every survey year contains the same sample of individuals. Table N-1. summarizes the percentage of survey respondents in Newport who were the same between years, and is meant to aid in the interpretation of the results presented in this document.

Table N-1. Total number of participants, and percentage of return respondents in Newport.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	50.0	28.9
% Return respondents from 2012	-	-	50.0
Number of participants	28	34	38

Participants in Newport are generally younger than those in other communities, which may be attributed to the strong presence of the whiting fleet in Newport (Section 3.2.3(c) Fishing Heritage), and in general, commercial fishing accounts for a large percentage of their income (Box N-1). Table N-2 summarizes the roles that Newport participants hold within the industry. In all three study years, Newport ranks in the top five communities for the percentage of PCGFSS respondents that are QS owners/co-owners and vessel owners/co-owners.

BOX N-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **49.9 years** | Rank 13 out of 13
2010=51.3 (8/13), 2012=54.4 (4/12)

Number of years working in commercial fishing | **28.9 years** | Rank 11 out of 13
2010=34.6 (2/12), 2012=34.7 (3/13)

Number of years working in the PCGTF | **22.5 years** | Rank 8 out of 13
2010=24.2 (8/13), 2012=19.5 (7/12)

Number of generations family has commercially fished | **2.2 generations** | Rank 7 out of 11
2010=2.4 (9/10), 2012=2.3 (7/12)

Percent income from commercial fishing | **93.0%** | Rank 4 out of 13
2010=94.0% (4/13), 2012=81.9% (8/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table N-2. Role of respondents within Newport, presented as a percentage of the total number of participants within the community sample, and rank* from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner**	53.6	1/12	47.1	2/12	34.2	4/11
Absentee owner/co-owner	-	-	29.4	3/8	10.5	7/10
Vessel owner/co-owner	57.1	1/12	50.0	1/8	39.5	4/12
Captain/Crew	46.4	6/12	38.2	6/11	60.5	1/12
Shoreside Processor	10.7	5/9	5.9	8/10	2.6	10/11
Catcher-Processor/Mothership	0	2/2	0	3/3	0	2/2
Buyer (not processor)	3.6	4/5	2.9	5/6	2.6	5/6
Other***	14.3	7/9	26.5	6/12	23.7	8/13
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

**2010: refers to "permit owner"

*** Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Fishery Participation Levels

This section supplements the section above by characterizing the community based on PCGFSS responses 3to items about current and planned participation in various fisheries. Fisheries participation data presented here reflects the fisheries that PCGFSS respondents in Newport participate in, and does not account for where these participants may land their catch.

In all three study years, Newport fishermen[6] reported commercially fishing Pacific whiting, sablefish, dover sole, and petrale sole (Table N-3). Additionally, across all years, Newport fishermen reported fishing Alaska Pollock, Dungeness crab, Alaska Pacific cod, pink shrimp, and tuna (Table N-3).

Much of the groundfish fleet in Newport was involved in other fisheries prior to catch shares (Table N-3), which participants recognize as a beneficial characteristic for adaptation. For instance, one non-IFQ fixed gear fisherman stated:

> "*Each fisherman has the job of figuring out where he needs to fit into this puzzle. Because even though your piece of that puzzle has a certain shape, it fits in more than one place. It might be advantageous to be over here one year, and down over here the next year, and maybe over there the year after that. And so if you're reasonably successful at picking the place that you should be, and a little bit lucky, then you do just fine."* – Fisherman (Non-IFQ Fixed Gear), Newport 2015/2016

Adaptability was the most frequently mentioned interview code in Newport, occurring in about 80% of the interviews. Following implementation of catch shares, it was common for participants to switch to shrimping or increase their level of activity in the shrimp fishery. Some reported a heavy reliance on other

[6] The survey item summarized in Table N-2 only applies to fishermen, which were defined as captain, crew, and/or other roles directly related to the harvesting of fish.

fisheries stating that, *"If we didn't have the other fisheries, it wouldn't have been a good thing for us"* (Fisherman, Newport, 2015/2016). However, there are mixed opinions about whether the increase in shrimp activity was directly related to catch shares or the boom in shrimp numbers:

> *"Yeah, boats have gone into shrimping, but the other side of that is the shrimping has been real good the last 3 years. Historically, I mean its way better than its been in the last 20 years."* – QS Permit Owner, Newport 2012

Table N-3. Top five groundfish and other species that Newport fishermen reported commercially fishing since catch shares was implemented (2010: commercially fished in the last 5 years).

2010	**%**	**2012**	**%**	**2015/2016**	**%**
Pacific Whiting	81.0	Pacific Whiting	80.0	Pacific Whiting	100.0
Sablefish	66.7	Sablefish	60.0	Sablefish	85.7
Dover Sole	57.1	Dover Sole	50.0	Dover Sole	85.7
Petrale Sole	52.4	Petrale Sole	50.0	Petrale Sole	71.4
Shortspine Thorneyhead	47.6	Shortspine Thorneyhead	40.0	Arrowtooth Flounder	71.4
Alaska Pollock	66.7	Alaska Pollock	55.0	Alaska Pollock	44.8
Dungeness Crab	52.4	Alaska Pacific Cod	55.0	Dungeness Crab	44.8
Alaska Pacific Cod	52.4	Dungeness Crab	50.0	Alaska Pacific Cod	41.1
Pink Shrimp	38.1	Pink Shrimp	40.0	Pink Shrimp	34.5
Tuna	19.0	Pacific Halibut	5.0	Tuna	17.2
Alaska Flatfish	19.0	Tuna	5.0		
		Alaska King Crab	5.0		
		Alaska Tanner Crab	5.0		

Newport participants discussed that the catch shares program allowed more flexibility to participate in other fisheries, which for some was one of the only benefits of the program:

> *"Its going to give us more flexibility to jump from other fisheries to the other. And the gear types. I like the flexibility of the gear type. Those are the pluses I see. The only two pluses I see. Those two are pretty good ones but the rest that I see are negatives."* – QS Permit Owner, Newport 2010

In addition to a diverse portfolio of fishery involvement, interviewees mentioned quota pound trading as an adaptation strategy. Quota pound trades seem to be more common than sales or paid leasing arrangements, and can be used as a mutualistic strategy to keep costs down. One QS permit owner explained:

> *"Like the hake fleet needs bycatch that we have that we don't need, and so we trade for species that they have that they don't need, like blackcod, petrale sole. We do a lot of that, a LOT of that. We try to keep the cost down. Instead of paying lease rates, trade fish. Because the costs are so high."* – QS Permit Owner, Newport 2015/2016

In terms of Newport respondents' future participation in the PCGTF, in 2015/2016 about 1/3 reported that they plan to increase their activity in the fishery (Box N-2), whereas few plan to decrease their activity.

BOX N-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **33.3%** | Rank 5 out of 11
2012=5.9% (7/8)

Plan to decrease activity in PCGTF | **11.1%** | Rank 2 out of 9
2012=5.9% (2/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Infrastructure

PCGFSS interviewees in Newport reported that there are roughly eight processors in the community along with a new whiting plant in progress. Newport brings in business from other communities and is considered a hub for shoreside support businesses. Unlike other communities that have struggled to maintain capacity, participants found that delivery schedules and shipyards are busier than they used to be. In general, however, participants discussed that they expected catch shares to have a negative cascading effect on shoreside supply/service businesses. Though they also noted that infrastructure has gradually declined over the past decade or so, which they associated with fewer boats in salmon, crab, and dragging, especially after the limited entry permit system started. For instance one participant reports the decline in full service operations, and explains why they work in other locations in addition to Newport:

> *"…Because of the lack of, because of the change in industry- we are like the only full service trawl shop between Seattle and Mexico. For years like Coos Bay had three net shops- they don't have any. Astoria had four- they got kinda one. They just do shrimp nets. There are back yard people doing it on their own but no true businesses specializing in trawl gear."* – Industry Participant, Newport, 2012

Despite these challenges, interviewees found that some service suppliers have adapted to meet the needs of the fleet:

> ***"****We signed a five-year lease getting into this building a month ago. And I'm like, "alrighty". I guess the first five years of the IFQ will be over by then and I don't know if we'll be here by then. We're resourceful and we're the only show in town. We've survived all the other stuff. There were three net shops in Coos Bay and now there's none. There was a huge net shop in Eureka and now there's none. There were at least four net shops in Astoria and now there's like a half of one. And so we survived because of the diversity of the Newport fleet."* – Industry Participant, Newport, 2010

Specifically related to infrastructure impacts in Newport, interviewees discussed the crowded delivery schedule at Newport plants:

> *"I would say, though, as far as us going and fishing – now here's one thing that kinda coming down the line that seems like it's, it seemed like there used to be more processing facilities for groundfish. Where now, like Eureka does takes care of, Pacific in Eureka does their boats but they work Crescent City, Eureka, you know the surrounding areas. Coos Bay all their fish is getting trucked to Newport to be cut. And so if the cannery downsizes at all or does a central location for everything to come to, well if that infrastructure's not big enough to handle the*

boats, that's kind of the predicament that we're in. Right? We have two ports, all the fish is coming to Newport. There's 10 boats. So we're all competing for a piece of that. They can only do 200,000lbs a week of dover. Everybody wants to catch 50,000lbs a week of dover." – QS Permit Owner, Newport 2015/2016

Employment Levels

This section summarizes community-level employment based on survey participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry.

Newport interviewees discussed that there are fewer jobs overall, but that the remaining jobs are more stable (this is also discussed in Section 3.2.2(h) Changing Nature of Fishery Businesses and Jobs). Further, some perceived that job stability may differ depending on the size of the operation—bigger boats offer more stability. More specifically, some mentioned that it is more difficult to find good crew, and that there are fewer deckhands with quality experience in the fishery because there are less full-time groundfish jobs. Some connected this to increased job security for older and more experienced fishermen because their knowledge about fishing grounds (in relation to bycatch) is now more valuable to owners. Participants also highlighted that the whiting fleet may benefit more than non-whiting:

"It's been better for whiting. There's more jobs for whiting but there's less jobs in probably bottom trawl but what was happening in bottom trawl wasn't sustainable long term." – Industry Participant, Newport 2015/2016

In 2015/2016, Newport ranks in the top two in terms of employment levels in the groundfish fishery, and other fisheries (Table N-4). Across all three study years Newport ranks in the top five on all job quality items, except relationships with co-workers (Table N-5). As there is a strong whiting presence in Newport, these results correspond to projections that the whiting fleet may experience positive impacts related to catch shares. In regards to other forms of employment in the fishery, observers expressed concern that the shift to electronic monitoring (a topic that was discussed in many Newport interviews) may result in fewer observer jobs, and issues with observer access.

Table N-4. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	%	Rank	%	Rank	%	Rank
Groundfish	89.3	5/9	64.7	8/11	92.1	2/12
Other fisheries	60.7	9/13	67.7	4/11	81.6	1/10
Non-fishing	17.9	6/11	41.2	4/11	23.7	7/12
Not applicable	0		2.9		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table N-5. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.4	2/10	3.6	1/10	3.5	2/10
Compensation	3.2	2/12	3.2	2/11	3.2	3/12
Method of pay	3.4	1/12	3.2	3/9	3.3	3/12
Job stability	3.2	1/13	2.8	4/9	3.1	5/10
Standard of living	3.4	1/8	3.3	1/10	3.4	1/9
Relationships	3.4	6/9	3.4	7/12	3.5	8/11
Not applicable	0		6.1		2.6	
Prefer not to answer	0		0		2.6	
Response rate	92.9		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While, the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

In 2010, interviewees expressed uncertainty and fear surrounding the forthcoming implementation of catch shares. However, in comparison to potential impacts on other communities, many in Newport thought their community would be able to adapt to the changes:

> *"This is a huge impact to the communities. A huge impact. Newport's not as bad. We have the Alaska fleet, a big hake fleet, we have NOAA coming to the community which couldn't be better timing with this groundfish thing. People are just now waking up and saying, oh what have we done with the groundfish. What have we done. People are just now realizing it. It's pretty sad."* – QS Permit Owner, Newport 2010

Across all three study years, Newport ranks in the top five for percentage supporting catch shares, and percentage positively affected by catch shares (Box N-3). These results may be related to the high levels of whiting participation in Newport as the whiting fleet is thought to benefit more positively from catch shares than non-whiting participants. Additionally, these results may be related to the adaptation capacity of Newport participants. Interviewees discussed five categories of adaptation strategies including 1) proactive management of quota, 2) leaning on other fisheries (as discussed in the "Fishery Participation" section above), 3) changing business operations, 4) switching to fixed gear, and 5) learning from others. Those who spoke about proactive management of quota expressed a need to learn to operate within the management system, actively acquire quota, and track bycatch:

> *"You know, that's why we're trying, basically, we're trying to invest further and get more fish. That way no matter what, we're not having to depend on leases to survive. 'Cause at this point with the 3 boats and without shrimp they wouldn't make it. They wouldn't. So we have to keep investing and try to get some more quota."* – Fisherman, Newport 2015/2016

Participants reported learning from the actions of their peers as well as from management personnel:

> *"… Now I won't go greenie fishing next year because I was greenie fishing up until that point. Now the same guy who owns the boat is like, 'Well, we can't do that again,' because if that happened to us, we'd have nothing to do."* - Fisherman, Newport, 2015/2016

> *"Yeah, the industry, and there's been a lot of guys that have tried things that haven't worked, you know, but but still…that's how we keep learning. That's how we're going to keep learning. And we keep evolving to better and better and better stuff. If you started out where we were, with our first rockfish excluders to where we are now, its been, its like going from a Ferrari to a Volkswagen."* - QS Permit Owner, Newport, 2012

> *"I have seen it starting to happen in Newport but I think they have had a lot of support from some fishermen and I'm sure [omitted name of Sea Grant agent] has been able to help teach them to shift to more of a business model."* - QS Permit Owner, Newport, 2012

BOX N-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **63.2%** | Rank 2 out of 10
2010=38.5% (3/11), 2012=57.1% (4/11)

Positively affected by catch shares | **62.2%** | Rank 1 out of 12
2010 (expect to be affected)=30.4% (3/11), 2012=55.6% (3/12)

Negatively affected by catch shares | **24.3%** | Rank 9 out of 12
2010 (expect to be affected)=39.1% (7/13), 2012=29.6% (8/12)

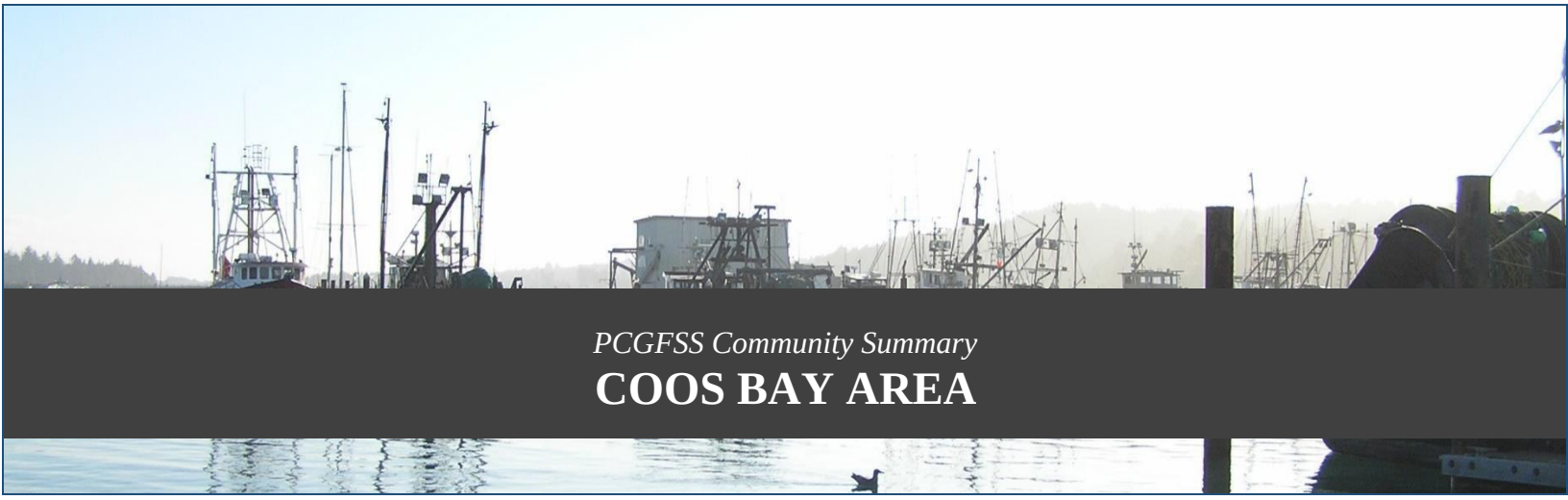
Changed species caught post-catch shares | **33.3%** | Rank 7 out of 8
2010 (change in last 5 years)=28.6% (4/8), 2012=35.0% (6/10)

Agree that safety has improved as result of catch shares | **44.4%** | Rank 5 out of 8

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Summary

In comparison to other communities, Newport appears to have adapted well to catch shares. Newport still faces challenges, but it has adapted more successfully. In all three study years, Newport ranks in the top five for percentage positively affected by catch shares. Interview participants discussed that having a diverse portfolio of fisheries involvement, and quota pound trading may have contributed to their community's adaptability. In particular, the strong presence of the whiting fleet in Newport is a unique characteristic that seems to play an important role in the community's response to catch shares. "Graying of the fleet" or an aging fishing industry is a trend that has been gaining national attention. Fishery participants in Newport, however, do not appear to follow the same aging trajectory, which may also be related to the strong whiting presence.



PCGFSS Community Summary

COOS BAY AREA

This summary sheet provides a snapshot of the Coos Bay Area community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Coos Bay (incorporated in 1874) is located on the southern Oregon coast approximately 220 miles south of Portland, and encompasses an area of 15.9 square miles (which includes 5.3 square miles of water).

The area was originally inhabited by the Coos, Lower Umpqua, Siuslaw, and Coquille Indians (Norman et al. 2007). During the late 1800s, sawmills, shipbuilding, coal mining, and farming activities were the major industries in the area (Norman et al. 2007). While the coal mining industry collapsed in the 1920s and 1930s, the forestry industry in Coos Bay continued to progress—Weyerhauser Timber Company and Menasha Woodenware Company built manufacturing plants in the area around 1945 (Norman et al.

2007).

According to the U.S. Census Population Estimates Program, the population of Coos Bay in 2015 is estimated to be 16,182—a 7.1% percent increase from 1990. Median household income[7] is estimated to be $38,780 (US Census ACS 2015). The Bay Area Chamber of Commerce (2016) describe the major industries in Coos Bay as farming, commercial fishing, forestry, and tourism.

PCGFSS Participants

The goal of this section is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide information about who the participants within each year represent. In Section 3.2 Community Performance, the Coos Bay Area is used to represent a community group composed of the following communities: Coos Bay/Charleston, Florence, and Winchester Bay. PCGFSS respondents are only representative of Coos Bay/North Bend/Charleston. When interpreting the results presented in this section, it is important to keep in mind that while there is some overlap in participants across years, not every survey year contains the same

[7] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov.

sample of individuals. Table CBA-1. summarizes the percentage of respondents in the Coos Bay Area who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table CBA-1. Total number of participants, and percentage of return respondents in the Coos Bay Area.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	57.7	36.0
% Return respondents from 2012	-	-	60.0
Number of participants	26	26	25

In comparison to other communities, Coos Bay participants are generally younger, and derive between 79-92% of their income from commercial fishing (Box CBA-1). Table CBA-2 summarizes the roles that Coos Bay participants hold within the industry. In 2012 and 2015/2016, Coos Bay ranks in the top five in terms of the percentage of PCGFSS respondents that are QS owners/co-owners, and captain/crew members (Table CBA-2).

BOX CBA-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **53.4 years** | Rank 9 out of 13
2010=46.1 (12/13), 2012=52.5 (6/12)

Number of years working in commercial fishing | **31.8 years** | Rank 5 out of 13
2010=23.1 (10/12), 2012=30.9 (6/13)

Number of years working in the PCGTF | **25.6 years** | Rank 5 out of 13
2010=18.5 (11/13), 2012=26.8 (2/12)

Number of generations family has commercially fished | **2.4 generations** | Rank 4 out of 11
2010=7.4 (1/10), 2012=2.9 (2/12)

Percent income from commercial fishing | **78.9%** | Rank 9 out of 13
2010=90.2% (6/13), 2012=91.6% (4/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table CBA-2. Role of respondents within the Coos Bay Area, presented as a percentage of the total number of participants within the community sample, and rank[*] from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner[**]	23.1	9/12	40.7	4/12	40.0	3/11
Absentee owner/co-owner	-	-	14.8	4/8	24.0	4/10
Vessel owner/co-owner	26.9	9/12	40.7	2/8	36.0	6/12
Captain/Crew	73.1	3/12	59.3	5/11	52.0	2/12
Shoreside Processor	7.7	6/9	7.4	7/10	12.0	5/11
Catcher-Processor/Mothership	0	2/2	3.7	2/3	0	2/2
Buyer (not processor)	0	5/5	0	6/6	0	6/6
Other[***]	11.5	8/9	14.8	10/12	16.0	13/13
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

[*]Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

[**] 2010: refers to "permit owner"

[***] Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Fishery Participation Levels

This section supplements the section above by characterizing the community based on PCGFSS responses to items about current and planned participation in various fisheries. Fisheries participation data presented here reflects the fisheries that PCGFSS respondents in Coos Bay participate in, and does not account for where these participants may land their catch.

In all three study years, Coos Bay fishermen[8] reported commercially fishing sablefish and dover sole (Table CBA-3). Coos Bay fishermen also target a diverse selection of species in other fisheries including Dungeness crab, pink shrimp and tuna.

In the Coos Bay, as well as in other communities, participation in the groundfish fishery has declined, primarily due to cost related limitations. Interviewees in 2012 and 2015/2016 also explained that low amounts of black cod and bycatch quota limit participation levels. In order to supplement their income, some fishermen have increased their level of activity in other fisheries. Others have decided to lease out their quota in order to avoid the costs and challenges associated with actually fishing their quota—which also allows more time to fish in other fisheries. For instance, one participant explains the financial benefit of leasing quota (referred to below as selling fish):

> "*He sells his fish. He can make more money selling his fish than he can catching them because he don't have no crew shares or no fuel or nothing. What he gets out of it is money."* – QS Permit Owner, Coos Bay Area, 2015/2016

[8] The survey item summarized in Table CBA-2 only applies to fishermen, which were defined as captain, crew, and/or other roles directly related to the harvesting of fish.

Table CBA-3. Top five groundfish and other species that Coos Bay Area fishermen reported commercially fishing since catch shares was implemented (2010: commercially fished in the last 5 years).

2010	%	2012	%	2015/2016	%
Sablefish	85.0	Sablefish	85.0	Sablefish	66.7
Dover Sole	75.0	Dover Sole	75.0	Dover Sole	66.7
Petrale Sole	60.0	Longnose Skate	75.0	Petrale Sole	66.7
Longspine Thorneyhead	50.0	Rex Sole	70.0	Rex Sole	50.0
Shortspine Thorneyhead	50.0	Arrowtooth Flounder	65.0	English Sole	50.0
Pink Shrimp	70.0	Dungeness Crab	80.0	Dungeness Crab	66.7
Dungeness Crab	45.0	Pink Shrimp	60.0	Pink Shrimp	66.7
Tuna	10.0	Tuna	25.0	Tuna	27.8
Squid	5.0	Pacific Halibut	15.0	Pacific Halibut	16.7
		Pacific Salmon	10.0	Squid	11.1

Interviewees in the Coos Bay Area discussed shrimping and crabbing as a common strategy to adapt to catch shares. While some fishermen participated in crab and shrimp prior to catch shares, there is a noticeable increase in the level of activity. As trawl fishermen move into other fisheries this may impact the environmental and social dynamics of these other fisheries:

> *"Not only that, but now that people have chosen to get out of the groundfish because of these reasons, everybody is jumping into the shrimp, where I used to be able to make a bank load of money. But now there's 50 boats doing it when there used to be 20, and now they can't handle the volume. So I'm making one trip every two weeks, where I used to be able to turn and burn. Turn and burn."* – Fisherman, Coos Bay Area, 2012

> *"I really didn't expect as much overflow in fisheries as we had come down. The shrimp fishery has taken a big hit, and the crab fishery has taken a huge hit with large drag boats that had to do something so they bought crab permits. I don't know if you know about the crab fisheries, but it's a flat-out derby anyway, and now it's really…"* –QS Permit Owner, Coos Bay Area, 2015/2016

For some, especially the smaller boats, an increased level of activity in other fisheries may have negative impacts on safety. A PCGFSS researcher asks, *"Got more people crabbing, bigger boats crabbing?"* The participant responds, *"Which forces a smaller boat to fish harder, in dangerous weather, and we've drowned some people"* (QS Permit Owner, Coos Bay Area, 2015/2016).

BOX CBA-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **28.0%** | Rank 7 out of 11
2012=0% (8/8)

Plan to decrease activity in PCGTF | **8.0%** | Rank 5 out of 9
2012=0% (3/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Furthermore, many perceive catch shares related costs, such as observer coverage, to be a larger issue for small vessels (this topic is discussed in more detail in Section 3.2.3(d) Small Vessels and Vessels Leaving the Fishery):

> "*It just doesn't…the small or mid-sized trawl boat just isn't gonna make it. We've already lost almost…God, there's only a couple of us left in this port. And we just can't afford to fish. Can't afford to trawl."* – QS Permit Owner, Coos Bay Area, 2015/2016

Despite the challenges of catch shares, 28% of Coos Bay participants plan to increase their activity in the groundfish fishery (Box CBA-2), which for some can be attributed to an enjoyment of the job:

> "*It's not really that we're too dumb to quit. Some of us really do enjoy our jobs. The scenery I've seen…I've logged and fished…and the scenery I've seen is awesome, and the challenge of catching being as clean as you can be is a challenge, and to me, it's a worthwhile industry to be involved in. It's kind of hard to explain, but I really do enjoy my job. So it's not that we're too dumb to quit; it's just that we do enjoy doing what we do."* – Fisherman, Coos Bay Area 2015/2016

Infrastructure

Interviewees in Coos Bay reported declines in infrastructure related to catch shares, particularly in regards to buyers and processors. While some of the impacts on infrastructure may pre-date catch shares, infrastructure has not increased with catch shares:

> "*At 15 years ago, there was 1, 2, 3, 4, 5, 6, 7 buyers here in town to buy dragfish. You know how many we got now? Two. And it is not increasing. There is nobody coming in to buy groundfish, especially in this podunk. Unless you can commit to buying the whole thing. You know, it used to be, you know, you would go over here and sell a little bit. And we used to take fish off this dock and sell them around to somebody that's getting started and you know, you need a couple thousand pounds, it's perfect. We always supported that. That's gone. We do that, we don't have a market. We don't have a shrimp market. We don't have a crab market."* – QS Permit Owner, Coos Bay Area, 2012

Participants in Coos Bay provide insight to the cyclical relationship between processor capacity and fish supply. Processors in the area state that there is a lack of a steady supply of fish:

> *"I mean, it's just made our groundfish production less profitable, less easy to manage as far as making money goes. It's just such a lack of product here in this area unless I buy it, truck it, and I can't do that with what it's worth. It's not worth anything."* – Processor, Coos Bay Area, 2015/2016

The lack of fish may in turn result in fewer processor jobs and a loss of overall capacity. A PCGFSS researcher asked a processor if there is an increase in processing capacity, and the processor responded, *"No. For whiting? Yes. For non-whiting? No. In fact we've decreased it because of a loss of filleters. Those are essential for doing bottom-fish"* (Coos Bay, 2015/2016). One QS owner explains that processors are unable to keep up with the amount of fish delivered which then causes a decline in the number of fishing trips:

> *"For me or for…right now I struggle selling enough groundfish because the plant can't keep filleters in there. I mean I go get 50 or 60,000 pounds of fish into [name omitted] and that ties them up for 3 days because they've lost all their filleters. So I think jobs have gone away in that respect. You know, I mean I haven't lost any jobs on my boat, but I've seen infrastructure go*

away that's hurt my business because I can't get the product out as quick as I'd like to. I'm only one boat going, so then if you get 3 or 4 draggers going to that plant, then we're backed up to where we're only making a trip every 10 or 12 days, instead of every time the weather is good. So it's hurt." – QS Permit Owner, Coos Bay Area, 2015/2016

As discussed previously, smaller vessels may be more vulnerable to catch shares related change than larger vessels. Consequently, small-scale processing operations that target fish from small vessels may also encounter challenges:

"Yeah, there's a lot less fish coming into this plant. Our basic plan is to catch quality fish, as far as beach fish. We don't really try to hire the guys that are just big slammers that catch the most fish and charge out there. We try to go for quality fish and always have, so a lot of our boats were smaller boats, and this plan helps the bigger boat, not a smaller boat. So we're losing…I'm losing boats, captains, business, you name it." – Processor, Coos Bay Area, 2015/2016

Employment Levels

This section summarizes community-level employment based on PCGFSS participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry. In 2010 and 2012, Coos Bay ranked in the top three in terms of the percentage of PCGFSS respondents employed in the groundfish fishery, and percentage employed in other fisheries (Table CBA-4).

Table CBA-4. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	%	Rank	%	Rank	%	Rank
Groundfish	92.3	3/9	84.6	3/11	72.0	8/12
Other fisheries	96.2	1/13	73.1	3/11	68.0	5/10
Non-fishing	11.5	7/11	42.3	3/11	16.0	10/12
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		96.3		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

In 2010, participants in Coos Bay anticipated job losses associated with catch shares, and the loss of good crew to more lucrative fisheries:

"*Well, with a reduction in fleet, which is surely to happen other businesses, associated businesses are going to have a decrease, which is you know, already occurring with the buyback and everything else."* –Fisherman, Coos Bay Area, 2010

"I've kept em pretty stable up to the last, I don't know, I've had 2 or 3 them quit in the last week and a half and or two weeks, some of them are going to Alaska, they said, it didn't look good here anymore and some of them said they were going crabbing." –Permit Owner, Coos Bay Area, 2010

Following catch shares implementation, some perceived that while there were still job opportunities, it had become increasingly more difficult to make an income. Participants also continued to discuss the loss of good crew, and attributed this to a decrease in compensation:

> *"It's not necessarily hard to get on a boat. You can get on the same boat during the summer and the tune-up. It's to get on a boat that you can actually make a true living. There are some boats that do the crabbing, the salmon, and tuna, but overall, they probably make $40,000 a year, and that's before taxes, and plus, they work. They're hardly working. They're a smaller boat. They're not going out in the crap."* – Fisherman, Coos Bay Area, 2015/2016

> "*These deck hands anywhere from $50-$80,000 on these boats. Now they're making about $30,000 at the most."* – QS Permit Owner, Coos Bay Area, 2015/2016

> "*Yeah, the good ones said 'hey, there ain't nothing to make here anymore. I'm outta here.' They went and found better jobs, something different to do."* – Fisherman, Coos Bay Area, 2012

Similarly, others discussed that while their income has remained the same they have had to work harder for it:

> *"My income has stayed the same because I've had to break my neck and go to other fisheries. As far as the trawl fishery, it's less income, yes."* – QS Permit Owner, Coos Bay Area, 2015/2016

Despite these challenges, in comparison with other communities, Coos Bay ranked in the top five for average reported job satisfaction, compensation, and job stability in 2015/2016 (Table CBA-5). This corresponds with the general trend of more stable jobs associated with catch shares, which is discussed in more detail in Section 3.2.2(h) Changing Nature of Fishery Businesses and Jobs.

Table CBA-5. Respondents' ratings of the following items related to their role in the commercial fishing industry on a Likert-scale from Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		**2012**		**2015/2016**	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.4	4/10	3.2	5/10	3.4	5/10
Compensation	2.7	6/12	2.6	8/11	3.2	4/12
Method of pay	3.0	6/12	3.0	6/9	3.2	6/12
Job stability	2.9	3/13	2.4	6/9	3.2	1/10
Standard of living	2.8	4/8	2.6	9/10	3.0	7/9
Relationships	3.4	6/9	3.4	8/12	3.1	11/11
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	88.5		100		92.0	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While, the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares

impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

In 2010 there were mixed opinions about catch shares—21% of Coos Bay respondents supported the program (Box CBA-3). In 2012, interviewees expressed primarily negative opinions about catch shares, which corresponds to few reporting that they had been positively affected by catch shares, and 68% reporting that they had been negatively affected (Box CBA-3). In particular, many were frustrated about increasing management, allocation amounts and process, and observer cost. Despite this, over half of respondents support the catch shares program.

Interviewees expressed a frustration with the nature of relationships between the commercial fishing industry and government agencies. For instance, one participant perceived a lack of communication between fishermen and scientists:

> *"I would say fair. My problem with that is I went to a lot of them damn meetings for no good, and I listened to all their PhDs and all their stuff, and when I get my little one-minute explanation, they wouldn't listen. So I just figured I got 40 years in the ocean, I'm equal to goddamn PhD…"* –QS Permit Owner, Coos Bay Area, 2015/2016

More specifically in regards to catch shares, some were not satisfied with the allocation process, and thought that non-vessel owning participants had been overlooked:

> *"I lease this vessel from a man that I deeply respect and have been very good to me, but if I lease his boat and I go out and catch those fish in the ocean, I give him 50% of the value… I don't know if these questions are coming up, but I feel before they changed this, they should have looked at tenure captains and crews on these vessels. Because we're the ones that got these guys their permits, I'm sure you've heard that before and I think we got neglected and overlooked. I don't think the fish plant should have ever got a 20% share of the quota. I believe that guys like me, you talk to half of these boats here, I bet you 1/3 of them are run by owners. Most of them are hired out. I think we really got kicked to the curb."* – Fisherman, Coos Bay Area, 2015/2016

BOX CBA-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **54.2%** | Rank 4 out of 10
2010=21.1% (6/11), 2012=52.0% (5/11)

Positively affected by catch shares | **43.5%** | Rank 4 out of 12
2010 (expect to be affected)=10.5% (7/11), 2012=8.0% (11/12)

Negatively affected by catch shares | **52.2%** | Rank 5 out of 12
2010 (expect to be affected)=52.6% (4/13), 2012=68% (2/12)

Changed species caught post-catch shares | **12.5%** | Rank 7 out of 8
2010 (change in last 5 years)=20.0% (7/8), 2012=40.0% (4/10)

Agree that safety has improved as result of catch shares | **61.1%** | Rank 2 out of 8

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

One of the most frequently mentioned codes in the Coos Bay Area interviews was "observers" which occurred in 84% of interviews. Participants primarily discussed observers in association with cost, working experience and small vessels. Many thought that the midnight-to-midnight schedule was problematic, both financially and in terms of overall working experience:

> "*That's another thing, is the observers. I did come in a little bit after midnight—we're charged for midnight to midnight—I came in at 1 o-clock in the morning because of the current, fighting the current, and I was trying to get in before midnight, and then I was charged for another day. I was a little bit late, and $400. Next year it'll be $500. So it's kind of hard to...you know? Heck, when I started doing this in the '80s, $500 was the profit. I was hoping to make that much money to make ends meet."* – QS Permit Owner, Coos Bay Area, 2015/2016

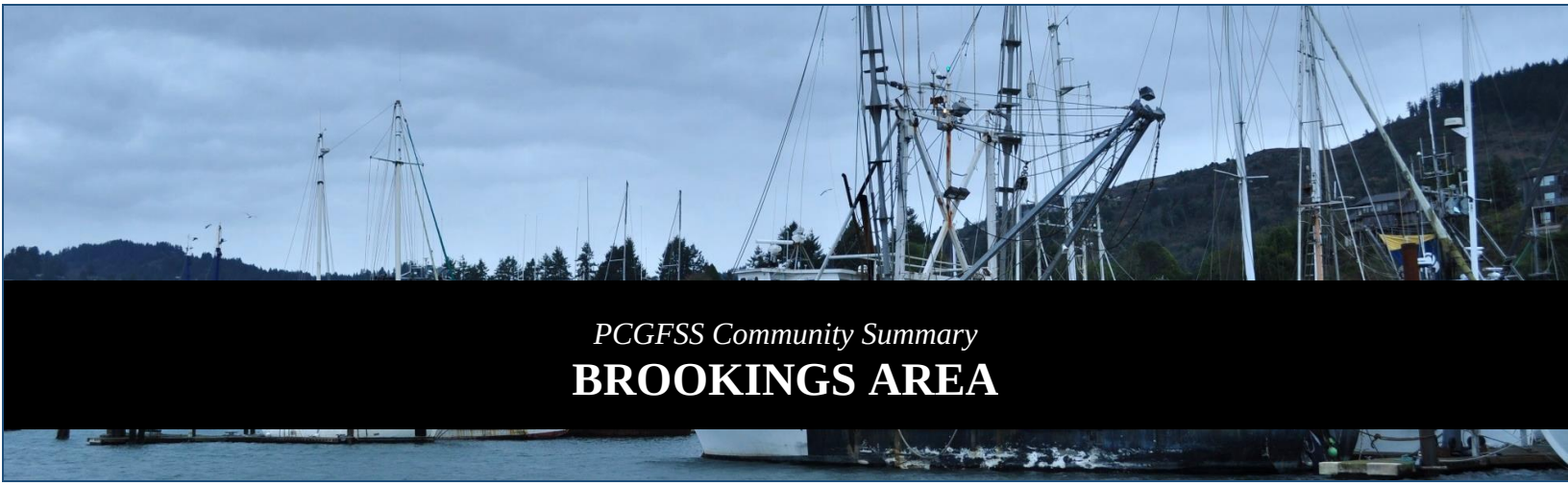
> "*Well, then I used to fish until midnight, run home, and get in…the crew gets a couple hours of sleep before we start offloading at 8 AM. Now we're forced to quit in the middle of the afternoon, so we can be in by midnight because if we run over by 12:30, that's another day. That's another $500."* – Fisherman, Coos Bay Area, 2015/2016

Summary

The decline in processing capacity, decreasing compensation, and loss of good crew to more lucrative fisheries appear to be important themes in Coos Bay. In comparison with other communities, Coos Bay ranks in the top five across all study years in terms of the percentage negatively affected by catch shares (Box CBA-3). Although many in Coos Bay have encountered hardships related to the catch shares program, many have found ways to adapt. In the "Fisheries Participation" section above, respondents reported increasing their level of activity in other fisheries and/or leasing out their quota as strategies to supplement their income or remain profitable. There were also multiple reports of net design/excluder experimentation in Coos Bay:

> "*We have even, as individuals, have taken it upon ourselves. I've changed my designs of my nets. We've put square mesh panels in them to relieve the small black cod and the juvenile fish."* – Fisherman, Coos Bay Area, 2015/2016

Similar to other communities, Coos Bay appears to have been noticeably impacted by catch shares directly following implementation in 2012. In the 2015/2016 data collection efforts, while there are still issues and frustrations, there is evidence that some Coos Bay participants are utilizing strategies such as quota leasing, diversifying fishery participation, and gear experimentation to adapt to catch shares. Whereas none of the 2012 participants in Coos Bay planned to increase their level of activity in the groundfish fishery, about 28% reported plans to increase their activity in 2015/2016. This may be an indication of the community's continued commitment to the fishery, and ability to adapt despite hardships and challenges.



PCGFSS Community Summary

BROOKINGS AREA

This summary sheet provides a snapshot of the Brookings Area community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Brookings (incorporated in 1951) is the southernmost coastal city in Oregon. It is located approximately 345 miles southeast of Portland and encompasses a 3.94 square mile area of land and 0.03 square miles of water (Brookings 2017, Norman et.al. 2007). The area was originally inhabited by the Chetco Indians (Normal et. al. 2007). Explorers discovered gold and precious metals in the region in the mid-1800's (Norman et. al. 2007) In the late 1800's/early 1900's lumber operations including a sawmill and shipping operations were established, the port also supported commercial and sport fishing activities. In the 1920's, lily bulb farming was established. The lumber, fishing, and bulb farming industries continue to support the local economy to date (Brookings 2017).

According to the U.S. Census Popluation Estimates Program, the population of Coos Bay in 2015 is estimated to be 6,376 – 17.1% percent increase from 1990. Median household income[9] is estimated to be $40,228 (US Census ACS 2015).

PCGFSS Participants

The goal of this section is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide information about who the participants within each year represent. In Section 3.2 Community Performance, Brookings Area is used to represent a community group composed of the following communities: Brookings and Port Orford. PCGFSS respondents are only representative of Brookings for this effort. When interpreting results presented in this section, it is important to keep in mind that while there is some overlap in participants across years, not every survey year contains the same sample of individuals. Table BA-1. summarizes the

[9] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov.

percentage of respondents in the Brookings Area who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table BA-1. Total number of participants, and percentage of return respondents in the Brookings Area.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	66.7	16.7
% Return respondents from 2012	-	-	50.0
Number of participants	8	6	6

In comparison to other communities, Brookings participants are generally younger, and derive between 92.0% to 97.5% of their income from commercial fishing (Box BA-1). Table BA-2 summarizes the roles that Brookings Area participants hold within the industry. Brookings ranks in the top five across all years in terms of the percentage of captain and crew, and post-catch shares ranks in the top five for absentee owners.

BOX BA-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

Age | **50.4 years** | Rank 12 out of 13
2010=41.9 (13/13), 2012=49.7 (10/12)

Number of years working in commercial fishing | **29.5 years** | Rank 9 out of 13
2010=22.9 (11/12), 2012=36.5 (1/13)

Number of years working in the PCGTF | **22.2 years** | Rank 9 out of 13
2010=17.3 (12/13), 2012=25.8 (3/12)

Number of generations family has commercially fished | **1.6 generations** | Rank 10 out of 11
2010=2.0 (10/10), 2012=2.3 (6/12)

Percent income from commercial fishing | **97.5%** | Rank 1 out of 13
2010=94.4% (3/13), 2012=92.0% (2/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table BA-2. Role of respondents within the Brookings Area, presented as a percentage of the total number of participants within the community sample, and rank* from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner**	25.0	8/12	50.0	1/12	33.3	5/11
Absentee owner/co-owner	-	-	33.3	2/8	33.3	1/10
Vessel owner/co-owner	25.0	10/12	50.0	1/8	33.3	7/12
Captain/Crew	75.0	2/12	66.7	1/11	50.0	3/12
Shoreside Processor	0	9/9	0	10/10	0	11/11
Catcher-Processor/Mothership	0	2/2	0	3/3	0	2/2
Buyer (not processor)	0	5/5	0	6/6	0	6/6
Other***	0	9/9	0	12/12	16.7	12/13
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

** 2010: refers to "permit owner"

*** Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Fishery Participation Levels

This section supplements the section above by characterizing the community based on PCGFSS responses to items about current and planned participation in various fisheries. Fisheries participation data presented here reflects the fisheries that PCGFSS respondents in Brookings participate in, and does not account for where these participants may land their catch.

The species of groundfish that most Brookings Area fishermen[10] reported fishing include longspine thorneyhead (50-100% of participants), shortspine thorneyhead (50-100%), sablefish (67-100%), dover sole (67-100%), and petrale sole (50-100%) (Table BA-3). The other species that participants reported fishing include Dungeness crab (83-100%), and pink shrimp (83-100%). In 2012, 20% of participants also fished Alaska Pollock and Alaska Pacific cod. In 2015/2016, 17% of participants also fished Pacific salmon and tuna.

Participation in the groundfish fishery has declined in Brookings, and their participation in shrimp and crab has declined as well. For the groundfish fishery, issues of bycatch are a concern and some owners may lease out quota to avoid bycatch and reduce costs. Regarding bycatch a fisherman describes it as follows:

> *"…we can't catch blackcod anymore, because of dover fishing…we catch our blackcod up and it's mixed with the dover, well we can't dover fish anymore. We have like 800,000 pounds of dover to catch, but it's impossible to catch because we're going to catch something else before we catch a dover up and those fish are left on the table…"* Fisherman, Brookings Area, 2015/2016

[10] The survey item summarized in Table BA-2 only applies to fishermen, which were defined as captain, crew, and/or other roles directly related to the harvesting of fish.

Table BA-3. Top five groundfish and other species that Brookings Area fishermen commercially fished since catch shares was implemented (2010: commercially fished in the last 5 years).

2010	**%**	**2012**	**%**	**2015/2016**	**%**
Longspine Thorneyhead	100.0	Sablefish	100.0	Sablefish	66.7
Shortspine Thorneyhead	100.0	Dover Sole	100.0	Dover Sole	66.7
Sablefish	100.0	Petrale Sole	100.0	Longnose Skate	66.7
Dover Sole	100.0	Longspine Thornyhead	80.0	Longspine Thornyhead	50.0
Petrale Sole	100.0	Shortspine Thornyhead	80.0	Shortspine Thornyhead	50.0
		Rex Sole	80.0	Petrale Sole	50.0
		Longnose Skate	80.0		
Dungeness Crab	100.0	Dungeness Crab	100.0	Dungeness Crab	83.3
Pink Shrimp	100.0	Pink Shrimp	100.0	Pink Shrimp	83.3
		Alaska Pollock	20.0	Pacific Salmon	16.7
		Alaska Pacific Cod	20.0	Tuna	16.7

A QS owner discussed selling quota as either related to bycatch issues or cost, as indicated below:

> *"So it's easier to sell it, so that way you don't get your blood pressure up… I just sell it because I don't think it's feasible to even groundfish anymore. If you want to take the overall cost…there's no reason to participate because my feeling is all you have to do is pull up one wrong fish, and you're out of business. It doesn't add up to me. "* QS Permit Owner, Brookings Area, 2015/2016

This decline in groundfish is further supported in Box BA-2, where participants ranked low in their intention to increase activity in the groundfish fishery, and ranked the highest of all communities in their intention to decrease participation in groundfish. Reasons for why participation in non-groundfish fisheries has decreased are not clear in Brookings and more research into this area is needed to understand this trend. However, one participant provides some insight suggesting that high levels of participation in shrimp may be reducing deliveries:

> *"…more boats are starting to come back into the shrimpin industry. That's going to cut out deliveries…"* Fisherman, Brookings Area, 2015/2016

BOX BA-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **16.7%** | Rank 10 out of 11
2012=0% (8/8)

Plan to decrease activity in PCGTF | **16.7%** | Rank 1 out of 9
2012=0% (3/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Infrastructure

Brookings Area participants discuss infrastructure loss, but don't necessarily tie it directly to catch shares. Rather, respondents commonly reference the buyback and discuss long-term trends of decline exasperated by the catch shares program. One response describes the buyback as follows:

> *"…the big problem that I've watched and seen here was the buyback program. That's hurt us worse than anything…"* QS Permit Owner, Brookings Area, 2015/2016

When asked about loss of community infrastructure, one participant describes it as follows:

> *"…not measureable. But there's been a steady erosion."* Fisherman, Brookings Area, 2015/2016

One participant further explains the resources that are lacking in Brookings:

> "*No, we don't have any local here in fishing gear. We don't have much here. We have to call our fuel in from out of town or get to get it at a decent price...(any shipyards?) nothing that will haul my boats. All we have is a Blacksmith in Crescent City."* QS Permit Owner, Brookings Area, 2015/2016

One participant further discusses processing related to groundfish:

> *"…We lost processors because there's no groundfish."* QS Permit Owner, Brookings Area, 2015/2016

While another speaks to the future in non-groundfish:

> *"I…realized that they have almost finished a brand new shrimp processing plant."* Industry Participant, Brookings Area, 2015/2016

Employment Levels

This section summarizes community-level employment based on participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry.

One major takeaway from the Brooking Area PCGFSS employment level measures is that the percentage of Brookings respondents employed in the groundfish fishery has remained relatively constant, whereas in comparison with other communities, Brookings ranks higher post-catch shares than in 2010 (Table BA-4). Small sample sizes limit the power of any conclusions from this data, but this dynamic is potentially a reflection of the overall decrease in groundfish fishing effort at the coast-wide level. Similar to other communities, high levels of employment in other fisheries and non-fishing jobs in 2012 may suggest a period of adjustment following catch shares in which participants utilized other fisheries and/or non-fishing jobs to supplement their income from groundfish (3.2.2(f) Changes in Employment).

Table BA-4. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	%	Rank	%	Rank	%	Rank
Groundfish	87.5	6/9	83.3	4/11	83.3	3/12
Other fisheries	62.5	8/13	83.3	2/11	50.0	7/10
Non-fishing	0	11/11	16.7	8/11	0	12/12
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

For all three rounds of data collection, Brookings Area participants' average overall job satisfaction score ranks last among community aggregates included in this analysis (Table BA-5). Other items related to job satisfaction—compensation, method of pay, and standard of living—appear more fluid. Again, small sample sizes hinder the ability to attribute strong trends to these measures. The following quotes help qualify these rankings:

> *"They gotta, you know deal with the consequences of where they stick that net. And yeah, it's scary for them, especially the beach fishermen that, they never know when they're gonna put that net down there. It's like playin' Russian roulette."* – Industry Participant, Brookings Area, 2015/2016

> *"…the uncertainty in there really is a deal killer with stuff. It wears you down as an individual; it stops you from making decisions for planning things. It just takes the air out of the room."* – QS Permit Owner, Brookings Area, 2015/2016

Table BA-5. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	2.5	10/10	2.7	10/10	3.0	10/10
Compensation	2.1	9/12	3.3	1/11	3.2	4/12
Method of pay	2.6	10/12	3.3	2/9	3.3	2/12
Job stability	2.8	6/13	3.0	3/9	3.2	3/10
Standard of living	2.6	7/8	3.2	3/10	3.3	3/9
Relationships	3.3	8/9	3.0	12/12	3.5	6/11
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While, the previous sections provide information related to how

the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

As Box BA-3 indicates, in all three study years Brookings Area participants ranked high in comparison with other communities when it comes to support for the catch shares program. Additionally, the proportion of Brookings Area participants reporting being negatively impacted by the catch shares program has remained consistently low relative to other communities included in the study. The apparently positive attitude toward the program among Brookings Area participants suggests that the relatively low levels of job satisfaction reported in Table BA-5, may stem from issues other than catch share management. The following general statement on job satisfaction sheds light on the subject:

> *"You're satisfied at the time until you're strapped in to when you get the bad years. You have to survive through those. You get sucked in, that's your life. We're here every single day. When do you have time to do anything else, to go do anything else?"* – Fisherman, Brookings Area, 2015/2016

BOX BA-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **60.0%** | Rank 3 out of 10
2010=37.5% (4/11), 2012=83.3% (1/11)

Positively affected by catch shares | **33.3%** | Rank 6 out of 12
2010 (expect to be affected)=25.0% (4/11), 2012=66.7% (2/12)

Negatively affected by catch shares | **16.7%** | Rank 11 out of 12
2010 (expect to be affected)=25.0% (11/13), 2012=16.7% (12/12)

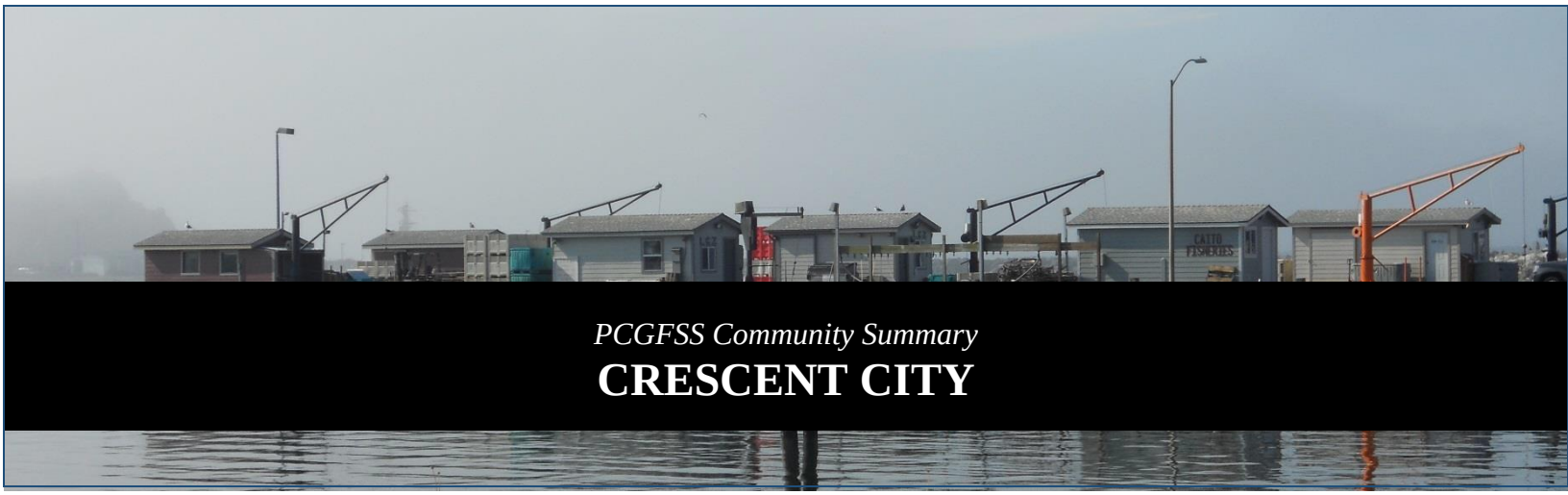
Changed species caught post-catch shares | **0%** | Rank 8 out of 8
2010 (change in last 5 years)=25.0% (5/8), 2012=0% (10/10)

Agree that safety has improved as result of catch shares | **60.0%** | Rank 3 out of 8

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Summary

In comparison with other communities, support for catch shares in the Brookings Area is high and few participants expected to be or reported being negatively affected by catch shares. This may be related to groundfish participation levels in Brookings. In 2012 and 2015/2016, Brookings Area ranks in the bottom two in terms of the percentage of respondents that plan to increase their level of activity in the groundfish fishery. Additional research aimed at increasing the Brookings Area sample size may provide additional insight to these trends.



PCGFSS Community Summary

CRESCENT CITY

This summary sheet provides a snapshot of the Crescent City community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Crescent City is located in northern California, about 25 miles south of the Oregon border and approximately 330 miles south of Portland. Situated along the north coast, the community encompasses 1.8 square miles of land and 0.3 square mile of water (Norman, 2007). According to the US Census Bureau Population Estimates Program, the population of Crescent City in 2015 is estimated to be 6,774—a 10.96% increase from 1990. The median household income[11] (adjusted to 2015 dollars) is estimated to be $27,622 (US Census Bureau ACS 2015).

The Tolowa people occupied the area that would become Crescent City, utilizing the resources of the redwood coast for constructing their dwellings and sources of food, including elk, fish, berries and nuts (Norman, 2007). The discovery of gold during the 1850s in northern California brought miners and homesteaders to the region resulting in the removal of the native peoples. Crescent City, named for its crescent shaped beach, was established during the same time period and became the main entry point and supply center for Oregon miners and growing California settlements (Norman, 2007). Timber and logging became the dominate industry for Crescent City until its decline in the mid-1900s and commercial fishing took its place. The harbor and community sustained significant tsunami damage in 1964 and again in 2011. The community rebuilt and today serves a state and national park centered tourist industry.

PCGFSS Participants

The goal of the PCGFSS Participants section is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide information about who the participants within each year represent. In Section 3.2 Community Performance, Crescent City is defined as a stand alone community, opposed to an aggregated community. Although some PCGFSS respondents may live outside of the community, all are connected to the fishing

[11] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov .

community in Crescent City. When interpreting the results presented in this section, it is important to keep in mind that while there is some overlap in participants across years, not every survey year contains the same sample of individuals. Table CC-1. summarizes the percentage of respondents in Crescent City who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table CC-1. Total number of participants, and percentage of return respondents in Crescent City.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	33.3	66.7
% Return respondents from 2012	-	-	50.0
Number of participants	5	6	6

In comparison to other communities, Crescent City participants are older, have worked fewer years in the PCGTF, and derive somewhat less of their income from commercial fishing (Box CC-1). Table CC-2 summarizes the roles that Crescent City participants hold within the industry. In comparison with other communities, Crescent City has ranked in the middle in terms of the percentage of PCGFSS respondents that are QS owners/co-owners, while vessel owners/co-owners have fluctuated between the bottom three and bottom five since 2012, a decrease from 2010.

BOX CC-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **56.0 years** | Rank 4 out of 13
2010=51.8 (7/13), 2012=49.5 (12/12)

Number of years working in commercial fishing | **30.8 years** | Rank 7 out of 13
2010=28.0 (7/12), 2012=20.6 (13/13)

Number of years working in the PCGTF | **18.8 years** | Rank 12 out of 13
2010=19.0 (10/13), 2012=16.8 (10/12)

Number of generations family has commercially fished | **2.2 generations** | Rank 6 out of 11
2010=2.0 (10/10), 2012=1.8 (9/12)

Percent income from commercial fishing | **79.2%** | Rank 8 out of 13
2010=68.0% (13/13), 2012=85.0% (7/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table CC-2. Role of respondents within the Coos Bay Area, presented as a percentage of the total number of participants within the community sample, and rank[*] from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner[**]	40.0	4/12	33.3	6/12	33.3	5/11
Absentee owner/co-owner	-	-	33.3	2/8	16.7	5/10
Vessel owner/co-owner	40.0	4/12	33.3	5/8	33.3	7/12
Captain/Crew	40.0	7/12	16.7	11/11	33.3	8/12
Shoreside Processor	0	9/9	33.3	2/10	0	11/11
Catcher-Processor/Mothership	0	2/2	0	3/3	0	2/2
Buyer (not processor)	0	5/5	0	6/6	0	6/6
Other[***]	40.0	2/9	33.3	4/12	50.0	2/13
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

[*]Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

[**] 2010: refers to "permit owner"

[***] Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Fishery Participation Levels

This section supplements the general community description by characterizing the community based on respondents' current and planned participation in various fisheries. Fisheries participation data presented here reflects the fisheries that PCGFSS respondents in Crescent City participate in, and does not account for where these participants may land their catch.

Crescent City vessels have not participated in the groundfish trawl fishery since catch shares' implementation, their owners opting to lease out their quota pounds in favor of Dungeness crab and profitable pink shrimp fisheries. Participants indicated in both 2012 and 2015/2016 that if shrimp stocks cycled down, they would consider a return to groundfish fishing. Crescent City ranks in the middle among other communities planning to increase PCGTF activity, and indicated that they have no plans to decrease any participation levels, however low, in the Groundfish fishery (Box CC-2).

> "Researcher: *And you don't do any more groundfish either?*
> Participant 1: *Not the last 5 years.*
> Participant 2*: We might start up this year. I mean, we still got our permits and stuff.*" –
> Fishermen, Crescent City, 2015/2016

One industry participant's comment from 2015/2016 illustrates the effects a poor Dungeness crab season may have on fishers, potentially motivating them to return to groundfish trawl:

> "*There's one guy in the harbor here that every year just sits down with the buyer and says, 'Alright, what's my quota worth this year?' And then he doesn't even fish it. He just, you know, leases it out to 'em. Although since the crab season was so poor, you know, there was a vessel that said, well we got this quota and we can't crab fish, let's go drag even though they had never participated in catch shares, they'd always sold their quota. So now this boat, I went down to the harbor and I see them putting their net on and I was like, 'Wow, that boat hasn't had a net on it*

in four years.' Yeah, it was pretty easy to figure out. It's like, 'Well we gotta do somethin', no crab season.' " – Other Industry Participant, Crescent City, 2015/2016

BOX CC-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **33.3%** | Rank 5 out of 11
2012=0% (8/8)

Plan to decrease activity in PCGTF | **0%** | Rank 9 out of 9
2012=0% (3/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Infrastructure

As with a number of California's ports, Crescent City's infrastructure was impacted by the loss of 15 vessels during the 2003 federal buyback (Section 3.2.2(c) Changes in Infrastructure).

"*I think the buyback was extremely significant. […] I mean, you take 15 boats away from my business, the repair business that I have here and, it was a very large hit to us. You know, 15 boats with the maintenance and services that they need really impacted this business.*" - Fisherman, Crescent City, 2015/2016

The city's harbor was recently rebuilt after damage incurred by the 2011 tsunami, yet according to one participant, "*…we got a beautiful, brand new harbor down there and it's maybe 25% full.*" (Fisherman, Crescent City, 2015/2016).

There is one, primary marine supplier for remaining trawl vessels, but the company "*…has survived on the crabbing and the shrimping is why they're still here*" (Fisherman, Crescent City, 2015/2016) as well as recreational fisheries and markets. This focus on recreational users is evident in the local store's expansion into a larger, more retail-friendly facility.

One industry supplier, based in Crescent City performing a range of vessel services for clients all along the Pacific Coast, in response to a survey question in 2015/2016 about improving job satisfaction stated, "*We are a slave to seasons. We have worked booked out for 3 years. One job overlaps the next.*" Despite the level of industry demand for these services, this participant does not have anyone lined up to take over the business nor do they foresee another business in the area filling the gap when they retire.

This lack of local, new entrants into the industry supplier side of the industry forces fishers to seek those services farther afield.

"*Yeah. We used to have our own net shop here that we don't have any more but we do have that in Oregon, You know, Portland. […] Yeah and to build doors we got to go to Newport. It might be further away. But that was not because of the industry. That guy retired because he was too old.*" – Fisherman, Crescent City, 2015/2016

There is groundfish processing located in Crescent City, trucking fish in from out of town, and another which offloads out-of-town vessels but trucks those catches to Eureka for processing. The latter operates the local ice plant, as well.

Employment Levels

This section summarizes community-level employment based on participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry.

Crescent City's groundfish fishing employment levels have ranked within the bottom two all three years when compared to other communities. Employment in other fisheries declined slightly since 2010 but levels have been higher than groundfish since 2012 (Table CC-3), accounting for the level of groundfish fishing activity reported by participants in interviews.

> "Participant 1: *But neither one of us have been draggin' since this started.*
> Participant 2:*: Right, 5 years or whatever. I haven't drug in about 5 years."*

In comparison to other communities, non-fishing employment levels ranked in the top two in 2010 and 2015/2016 (with a drop in 2012). Crescent City participants' ratings for job satisfaction remained relatively consistent across all three years while compensation, job stability and standard of living increased slightly, ranking in the top 3 by 2015/2016 when compared to other communities (Table CC-4).

Despite job stability's fairly high ranking, participants discussed the challenges maintaining a processing workforce and vessel crew, also discussed in Section 3.1.3(a)(1) Utilization of Non-whiting Species Allocations;

> "*It's hard, it's hard 'cause I can't always promise 'em 40 hours a week so they go get other jobs. I mean they got to. And then I have to find as many people as I can when it does bust loose. So we ran into this problem a couple weeks ago. I mean went… the wind down in Fort Bragg forever and that boat could not get out so everybody I had on standby went to the lily fields up in Smith River and Oregon. Went a got other jobs and then when finally did get a load in I started callin' people up, you know, "Sorry I got job now." But I also get probably 2 people a day comin' in wantin' an application so I just… It's a lot of new hires, getting' em into the system. Gettin' their info and then I can't work 'em for 2 weeks cause I don't have any work and then well, their gone. They gotta live too and pay rent.*" – Processor, CA, 2012

> "*The fish ain't coming in steady here,* [name omitted] *they got one drag boat working for them, now out of the whole coast. The stability for the dock workers and the plant workers and the crews is not there like it was.*" – Fisherman, Crescent City, 2015/2016

> "*In order to keep a crew, I mean we try to fish year round in something. Whether that's shrimp or crab or, you know, at this point it's gonna be the trawl fishery, I think. So in order to keep your crew and so they can, that can have a good income and want to hang around, we have to keep that boat goin' year round.*" – Fisherman, Crescent City, 2015/2016

Table CC-3. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	%	Rank	%	Rank	%	Rank
Groundfish	80.0	7/9	50.0	9/11	50.0	12/12
Other fisheries	80.0	4/13	66.7	5/11	66.7	6/10
Non-fishing	40.0	2/11	33.3	5/11	50.0	2/12
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table CC-4. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.2	6/10	3.0	9/10	3.3	6/10
Compensation	2.6	7/12	2.8	7/11	3.3	1/12
Method of pay	2.8	8/12	3.2	4/9	3.5	1/12
Job stability	2.8	5/13	3.2	1/9	3.2	3/10
Standard of living	2.8	5/8	3.0	6/10	3.3	3/9
Relationships	3.4	4/9	3.2	11/12	3.5	6/11
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While, the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

Support for catch shares in Crescent City has decreased since 2010, with a significant drop since 2012 (60% in 2012 to 33.3% in 2015/2016) leaving the community ranked in the bottom two, compared to other communities (Box CC-3).

BOX CC-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **33.3%** | Rank 8 out of 10
2010=40.0% (2/11), 2012=60.0% (3/11)

Positively affected by catch shares | **16.7%** | Rank 10 out of 12
2010 (expect to be affected)=40.0% (2/11), 2012=20.0% (7/12)

Negatively affected by catch shares | **66.7%** | Rank 3 out of 12
2010 (expect to be affected)=0% (13/13), 2012=40.0% (6/12)

Changed species caught post-catch shares | ***Cannot present due to confidentiality***

Agree that safety has improved as result of catch shares | ***Cannot present due to confidentiality***

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Participant interviews echoed several themes identified in other communities along the coast, including cost of observers [Section 3.2 Community Performance (3.2.2(f); 3.2.2(g)(4)(c); 3.2.2(g)(6); 3.2.2(h)(1) & 3.2.3(d))] and increased price of leasing QP, driven by fixed gear market competition (Section 3.2.2(g)(3)(a) Participating in Multiple Fisheries) specifically high-risk or choke species, due to low allocations of petrale, yellow-eye and black cod. Black cod was associated with targeting Dover sole and observations of Washington and Oregon vessels fishing off Crescent City.

> "*The big part of the problem here is, is times of a lot of black cod and the drag boats from up north – even Washington, Westport boats - come all the way down here to fish dover because it's mixed with black cod. So then when we were allocated the fish, we don't have enough black cod to fish all this big pile of dover we got.*" – Fishermen, Crescent City, 2015/2016

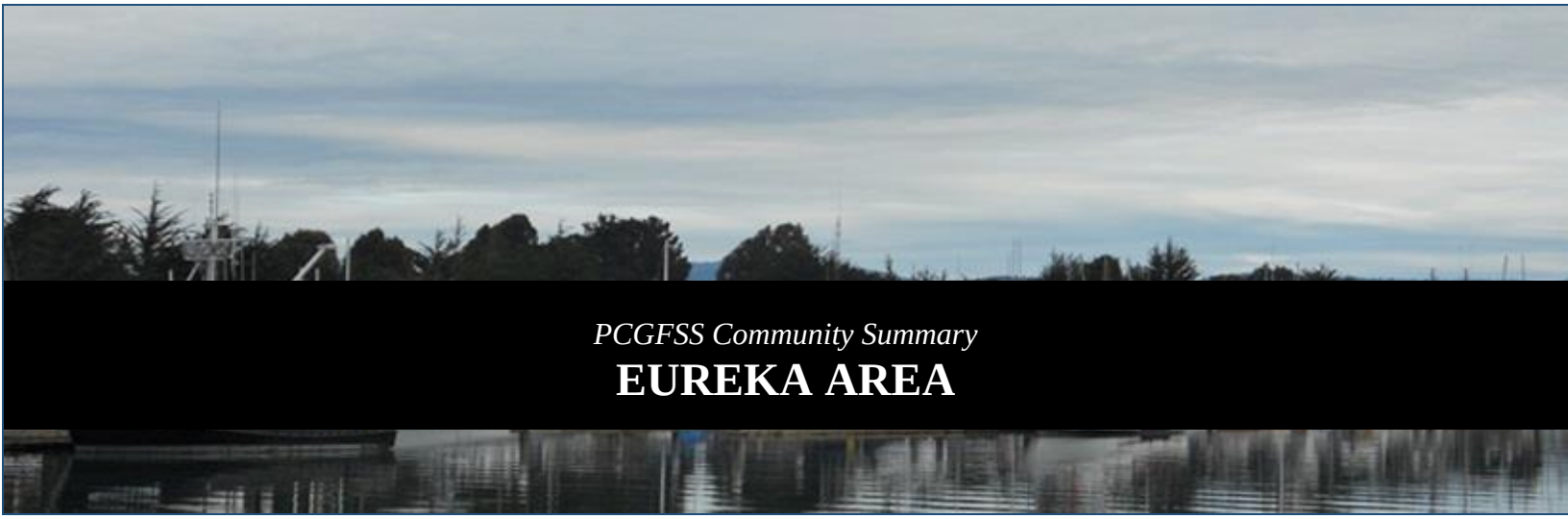
Discussed as one impact of the IFQ (Section 3.3.3(c)(d) Effect of IFQ Program and other Factors on Attainment) anxiety or stress associated with these low bycatch allocations was the reason Crescent City participants provided for concentrating their fishing efforts on other fisheries and away from groundfish;

> "*…I listen to people and kind of paid attention to the industry a little bit and I'm afraid to even put a drag net on. We're gonna try to this year. Because crabbing is so bad I gotta fill-in that, I gotta fill it in, now. So we're gonna go dragging this year and I just don't know if I can go to the beach or go deep. And with 9,000lbs of petrale, shit, I've had 20,000lbs trips. You know 4 days, 20,000.* " – Fisherman, Crescent City, 2015/2016
>
> "*Really hurt us is what it did. The guys that's got more quota and can go get it off their other boats, 'cause not everybody's gonna – You can go through there and accidently hit yellow eye and you're done until that quota's caught up. I mean, you repay it. And for me and* [name omitted]*, if I caught 400lbs I'd probably be dead for 10 years, probably even more."*
> – Fishermen, Crescent City, 2015/2016

Summary

Crescent City participants have forgone groundfish trawl fishing since the implementation of catch shares in favor of Dungeness crab and pink shrimp, which were reportedly more profitable compared to the cost

of operating under the IFQ program. However, with a poor crab season and anticipation that shrimp stocks will begin cycling down, these fishers may return to groundfish but not without concerns over low bycatch allocations and cost of leasing QP and observers. Should Crescent City participants refocus their efforts on groundfish then this increased activity may provide a more consistent supply of fish and in turn more opportunities for the local processing workforce and fishing crews.



PCGFSS Community Summary

EUREKA AREA

This summary sheet provides a snapshot of the Eureka Area community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Eureka, located on Humboldt Bay along the north coast of California about 100 miles south of the Oregon border, serves as the county seat of Humboldt County encompassing 9.5 square miles of land and 5 square miles of water (Norman, 2007). According to the US Census Bureau Population Estimates Program, the population of Eureka in 2015 is estimated to be 27,017—a 4.7% increase from 1990. The median household income[12] (adjusted to 2015 dollars) is estimated to be $37,094 (US Census Bureau ACS 2015).

The area in which Eureka is situated was once occupied by the Wyot tribe, among several others in the surrounding region of Humboldt County, who "utilized the natural resources for food, medicine and basketry" (Norman, 2007). Today, the Wyot tribe is located on the Table Bluff Reservation, 16 miles south of Eureka. The early 19th Century saw first traders arrive in Humboldt Bay, followed by gold prospectors in the 1850s and the town's founding in 1856. The economy shifted to timber, salmon and agriculture as the gold rush subsided. Humboldt Bay - one of the largest on the West Coast - with its complex habitats supporting a multitude of fish and invertebrates species, clams, mussels and oysters, remains integral to the economic health of Eureka (Norman, 2007).

PCGFSS Participants

The goal of the PCGFSS Participants section is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide information about who the participants within each year represent. In Section 3.2 Community Performance, the Eureka Area is defined as an aggregation of communities including Eureka, Fields Landing, Humboldt and Loleta. While all PCGFSS respondents in the Eureka Area are connected to the

[12] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov.

groundfish fishery in Eureka, they may reside in locations near but outside of Eureka. When interpreting the results presented in this section, it is important to keep in mind that while there is some overlap in participants across years, not every survey year contains the same sample of individuals. Table E-1. summarizes the percentage of respondents in the Eureka Area who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table E-1. Total number of participants, and percentage of return respondents in the Eureka Area.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	72.2	50.0
% Return respondents from 2012	-	-	60.0
Number of participants	22	18	20

In comparison to other communities, Eureka Area participants are older, have worked longer in the PCGTF, and derive between 79-88% of their income from commercial fishing (Box E-1). Table E-2 summarizes the roles that Eureka participants hold within the industry. In comparison with other communities, the Eureka area has ranked in the bottom three in terms of the percentage of 2012 PCGFSS participants that are QS owners/co-owners, vessel owners/co-owners and captain/crew members, suggesting a decline each study year since 2010.

BOX E-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **56.9 years** | Rank 3 out of 13
2010=47.0 (11/13), 2012=53.6 (5/12)

Number of years working in commercial fishing | **32.7 years** | Rank 4 out of 13
2010=25.3 (9/12), 2012=30.4 (7/13)

Number of years working in the PCGTF | **28.9 years** | Rank 2 out of 13
2010=22.1 (9/13), 2012=27.6 (1/12)

Number of generations family has commercially fished | **2.1 generations** | Rank 9 out of 11
2010=3.4 (4/10), 2012=2.5 (5/12)

Percent income from commercial fishing | **81.1%** | Rank 6 out of 13
2010=88.1% (7/13), 2012=78.9% (9/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table E-2. Role of respondents within the Coos Bay Area, presented as a percentage of the total number of participants within the community sample, and rank* from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner**	36.4	6/12	22.2	9/12	10.0	10/11
Absentee owner/co-owner	-	-	11.1	6/8	5.0	9/10
Vessel owner/co-owner	36.4	6/12	33.3	5/8	10.0	12/12
Captain/Crew	50.0	5/12	33.3	8/11	30.0	10/12
Shoreside Processor	4.6	7/9	5.6	9/10	5.0	8/11
Catcher-Processor/Mothership	0	2/2	0	3/3	0	2/2
Buyer (not processor)	0	5/5	0	6/6	0	6/6
Other***	31.8	3/9	44.4	2/12	60.0	1/13
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.
** 2010: refers to "permit owner"
*** Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Fishery Participation Levels

This section supplements the general community description by characterizing the community based on respondents' current and planned participation in various fisheries. Fisheries participation data presented here reflects the fisheries that PCGFSS respondents in Eureka participate in, and does not account for where these participants may land their catch.

Eureka fishermen[13] consistently targeted sablefish, dover and petrale sole and longspine and shortspine thornyheads all three years (Table E-3). During the same time period, Dungeness crab and pink shrimp were the top two, non-IFQ fisheries for Eureka community fishermen. Of those who participated in 2015/2016, only 15.8% planned to increase their groundfish trawl participation while 10.5% reported plans to decrease their activity (Box E-2). This small percentage of fishers anticipating altering the amount of groundfish fishing activity may suggest their levels of activity have reached an operational stability. This could be interpreted as some fishers may have reached an optimal level of groundfish trawl activity for their business while others may have been constrained by costs or allocations and are unable to increase their activity levels.

Participants noted changes in fishing practices and effort, particularly among Eureka's smaller vessels. Due to issues catching black cod, a choke species, while targeting dover sole or fishing nearshore trying to avoid petrale, small vessels are deciding to lease quota rather than fish it. The cost of leasing additional quota pounds and observers were reasons participants provided for such decisions. This has employment consequences as well, discussed further in the Employment Levels section.

[13] The survey item summarized in Table E-2 only applies to fishermen, which were defined as captain, crew, and/or other roles directly related to the harvesting of fish.

Table E-3. Top five groundfish and other species that Eureka respondents commercially fished since catch shares was implemented (2010: commercially fished in the last 5 years).

2010	**%**	**2012**	**%**	**2015/2016**	**%**
Longspine Thorneyhead	92.3	Sablefish	87.5	Petrale Sole	87.5
Shortspine Thorneyhead	92.3	Dover Sole	87.5	Dover Sole	87.5
Sablefish	92.3	Shortspine Thornyhead	75.0	Sablefish	62.5
Dover Sole	92.3	Petrale Sole	75.0	Longspine Thornyhead	62.5
Petrale Sole	92.3	Longspine Thornyhead	62.5	Big Skate	50.0
		Rex Sole	62.5	Longnose Skate	50.0
		Longnose Skate	62.5	Shortspine Thornyhead	50.0
Dungeness Crab	76.9	Dungeness Crab	75.0	Dungeness Crab	75.0
Pink Shrimp	53.8	Pink Shrimp	62.5	Pink Shrimp	75.0
Tuna	15.4	Pacific Halibut	12.5		
		Pacific Salmon	12.5		
		Tuna	12.5		

BOX E-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **15.8%** | Rank 11 out of 11

2012=17.7% (5/8)

Plan to decrease activity in PCGTF | **10.5%** | Rank 3 out of 9

2012=0% (3/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

While the majority of groundfish trawlers in this community have traditionally participated in other fisheries, they appear to have increased their level of activity in Dungeness crab and pink shrimp.

> *"…just shrimp and crab. We just do more of that. I already wrote that. Fished crab for 2 to 3 weeks in December and then boom be right back to dragging. Now we gotta milk it out. Travel outta town to early crab seasons. Fish 'til February*. " – Fisherman, Eureka, 2012

One reason, at least in part, for the reported increase is attributed to low groundfish allocations;

> "*There's an increase. In shrimpin'. Everybody's tryin' to… a lot of guys don't very big bottom fish limit. A lot of guys, they don't have very big limit and so they want to do somethin' else to fill in their summer. So tuna fish or shrimp.* " Fisherman, Eureka, 2015/2016

But, as with many aspects of the marine system, most everything is cyclical. One participant speculated, "*And when the shrimp cycles go away and they can't go shrimpin' we'll see how long their drag fish quota lasts*" (QS Owner, Eureka, 2015/2016). This presents an interesting situation, which may come about once shrimp cycles down,

> *"I mean these guys in the past, like I said, they could lease their quota, get some bucks for that, not have any cost of going out and catching it and then go shrimping and go crabbing and have a pretty good life. The reality's gonna hit this year when more guys are gonna go, 'I need to go groundfish fishin' and we're gonna find out that… well you never know what could happen."* - Processor, CA, 2015/2016

The reality this participant speaks to also involves the availability of quota pounds once those who previously leased out their quota begin fishing it once more, removing it from the QP leasing market. Demand for those quota pounds will persist in the face of reduced supply which would likely increase the price for what remains on the QP marketplaces.

Infrastructure

Infrastructure in the Eureka Area, as with other California communities, has experienced losses due to vessel reductions and an aging industry as discussed in Section 3.2.2(c) Changes in Infrastructure. While Eureka has fared better than others, participants foresee further reductions because of a lack of new entrants to take the place of those who have retired or plan to in the near future, which will require participants to search farther afield for services.

> "*The Port of Humboldt Bay is lacking in services. I mean, besides me, us here, we don't have a marine electrician anymore. The mechanics are down to nothin'. Electronics is down to nothin'. That's sad. That's a reason for nobody to come here anymore. But it's also, it's hard to survive.*" – Other Industry Participant, Eureka, 2015/2016

> *"We can get whatever we need. Well, we are, you know if hydraulic leak, I guess. I don't know what'll happen when FabCast goes out of business. But it will be somebody. Be more of a pain in the butt. There's a lot of big companies up north. Yeah, well I have my winches right now up in Coos Bay bein' worked on. And then there was, I don't know about Eureka, but there'll always be somebody. You know, we have problems gettin' our radar equipment worked on or electronics. He retired. No one took it over. Couple guys tried but, there's just not enough money, there's not as much money in it. Like I say, when there was 30-40 drag boats in the harbor you'd sell quite a bit of stuff. Now, what is there six? Five? Four?*" - Fisherman, Eureka, 2015/2016

Employment Levels

This section summarizes community-level employment based on participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry.

Eureka's groundfish fishing employment levels have fluctuated widely from 100% in 2010 to a low of 44.4% in 2012 then rebounding to 70% in 2015/2016. Employment in other fisheries followed a similar trend but did not fluctuate nearly as much. Compared to other communities, Eureka has ranked in the bottom three in these two areas of employment since 2012 (Table E-4). Eureka participants' ratings of the well-being categories listed in Table E-5 remained relatively stable across all three study years. However, when compared to other communities, Eureka's rankings for job satisfaction, job stability and standard of living all declined from their 2010 ranks with the exception of compensation which remained in the top four all three years.

Table E-4. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	%	Rank	%	Rank	%	Rank
Groundfish	100.0	1/9	44.4	11/11	70.0	9/12
Other fisheries	68.2	7/13	38.9	9/11	50.0	7/10
Non-fishing	9.1	8/11	44.4	2/11	20.0	8/12
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table E-5. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.6	1/10	3.5	3/10	3.3	8/10
Compensation	3.2	1/12	3.1	4/11	3.3	2/12
Method of pay	3.4	2/12	3.4	1/9	3.1	8/12
Job stability	2.7	7/13	2.7	5/9	3.1	6/10
Standard of living	3.0	2/8	2.9	8/10	3.2	5/9
Relationships	3.4	5/9	3.7	2/12	3.3	10/11
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

The challenges for small vessels discussed previously also present employment issues. When these vessel choose to lease their quota rather than fishing, it reduces jobs for crew. This situation is discussed in detail in Section 3.2.4, Small Vessels, and Section 3.2.2(g)(3)(c)), Consolidation Impacts. In addition, since small vessels tended to fish nearshore, making day trips – as opposed to multi-day trips on larger vessels – they created the traditional, entry level jobs which are diminished as small vessels reduced their fishing activity.

> "*Where, like a lot of guys would start off on smaller boats, where they're maybe day boats. Go out and fish for the day and come in, unload. You know, do that for a while.*" – Fisherman, Eureka, 2015/2016

For both fishers and processors, groundfish is no longer a year-round job as it once was (3.2.2(f) Changes in Employment). This results in an inconsistent supply of fish, which translates into inconsistent work for processors' workforce (3.2.2(c) Changes in Infrastructure).

> "*We are having a tough time keeping the crew. Their income levels have been hit like I said, and it's hard for them to get the hours to qualify for insurance. And it's just tough, it's difficult, it's difficult to look people in the eye that need more work…*" – Processor, CA, 2012

From another perspective one Eureka fisher stated income was more stable with fewer boats and people in the fishery.

> "*Well, I mean, the income's more stable because I get to go fishin' more because there's less people fishin'.[…] Income's better but days on the ocean's less.*" – Fisherman, Eureka, 2015/2016

Another participant offered a summation of the income potential for someone in the fishing industry, today;

> "*…quite frankly even now today, fishing is one of the more profitable endeavors you could go into. It's not all doom and gloom. You talk about back deck workers, where can somebody with no educational background, they graduated high school… where you're maybe running a boat for somebody and it's a good producing vessel, a trawler dragger, a shrimper, a crabber where you can make $120,000 a year and you're gonna maybe spend 150 days a year on the ocean. Back deck guys making $60,000 a year.*" – Other Industry Participant, Eureka, 2015/2016

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While, the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

Support for catch shares has steadily increased since 2010, from 18.2% to 52.6% in 2015/2016 ranking Eureka in the middle compared to other communities. This increase in support may be related to a significant decrease in reports by those being negatively affected by catch shares, but the community remained in the bottom four for those who reported being positively affected. Given the reporting in Box X-2, participant views of catch shares appears mixed.

Eureka participants reported issues related directly the catch shares, identifying the cost of observers and leasing quota pounds and low allocations of choke species as the most challenging aspects of the management program.

Cost was a frequent theme across interviews in the Eureka Area. Observer costs were particularly frequent, occurring in half of the community's interviews. The significance of observer costs is discussed further in Section 3.2 Community Performance (3.2.2(f); 3.2.2(g)(4)(c); 3.2.2(g)(6); 3.2.2(h)(1) & 3.2.3(d)). The participants speak to the impacts of the broader program-related fees;

> "*So we got 3%, adaptive management, 5% buyback and then our observer costs. That's before the, so that's 10, 11%. That used to be our full, that used to our operating expense, 10%; fuel, ice bait, oil. That's what it used to be.*" – Fisherman, Eureka, 2015/2016

> "*The cost of the program is consuming a huge amount of that revenue. And it's the costs in the program that's resulted in fewer people participating.*" – Other Industry Participant, 2015/2016

BOX E-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **52.6%** | Rank 6 out of 10
2010=18.2% (7/11), 2012=31.3% (9/11)

Positively affected by catch shares | **21.1%** | Rank 8 out of 12
2010 (expect to be affected)=4.8% (10/11), 2012=18.8% (8/12)

Negatively affected by catch shares | **26.3%** | Rank 7 out of 12
2010 (expect to be affected)=61.9% (1/13), 2012=56.3% (5/12)

Changed species caught post-catch shares | **37.5%** | Rank 5 out of 8
2010 (change in last 5 years)=7.7% (8/8), 2012=25.0% (7/10)

Agree that safety has improved as result of catch shares | **37.5%** | Rank 6 out of 8

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Low allocations of bycatch or choke species, discussed previously as a factor for increasing effort in other fisheries, create problems for catching the full allotment of target species, which is discussed in Section 3.1.3(a)(1) Utilization of Non-whiting Species Allocations, Section 3.3.3 Effects of IFQ Program and other Factors on Attainment and related by the follow participants;

> "*I mean we had boats that were done fishin' in September this year. Didn't have any more quota to fish. Didn't have the right species to fish. Ran out of arrowtooth or black cod or whatever it is so they could necessarily execute a dover fishery…*" – Processor, Eureka, 2015/2016

> *"…no one knew what was going on with this catch shares program. And then we found out that we really didn't have enough fish to catch. [after a pause] And if I didn't belong to a company with a group of boat, I don't, I wouldn't of, I don't think I would've survived.*" - Fisherman, Eureka, 2015/2016

The low allocations, along with the ability for fishers to catch their groundfish quota when they choose, has created an inconsistent supply according to processors, in terms of a lack of fish as discussed previously. But the other side of that issue is dealing with gluts of fish coming in all at one time.

> "*Yeah. It's lack of participation. It's fishing, we fish ourselves into gluts, now. So you have a fishery in some ports, because shrimp is from April to October. So the guys will go fishing in November, December, January, February and get all their quota caught. So you get this rush of fish at one time and then they don't fish again until next November, except for the small, a few boats that are year-round draggers and trawlers. And so, you get these market gluts. You put way too much fish of the same species on the market at one time and then you don't have enough to supply the customers and you start losin' shelf space. When you asked about market competition… it's all from imported fish that are takin' over our space. It's not market competition among ourselves with groundfish species on the West Coast. It's losing our space on the shelves because we're inconsistent. We either have too much at one time or not enough for the rest of the year.*" – Processor, Eureka, 2015/2016

Despite the catch shares-associated challenges participants reported, some saw benefits emerge from the management program;

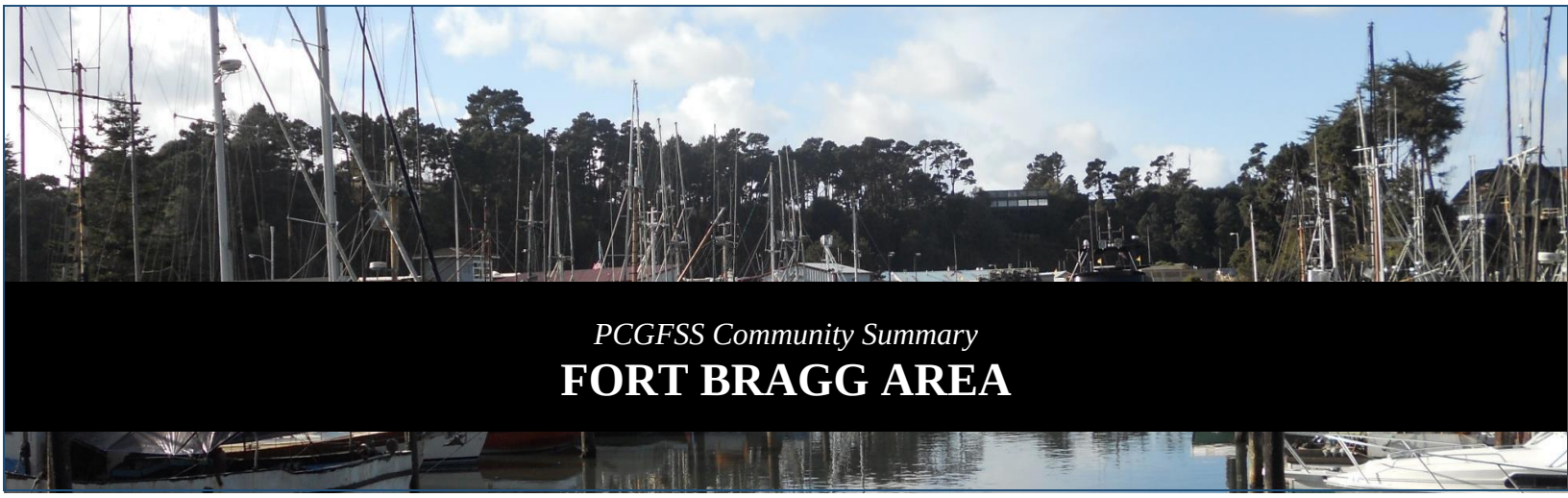
> "*I mean before the, I wouldn't've been able to lease my pounds before the quota share thing came in. So there's more, there's more advantages.*" – QS Owner, Eureka, 2015/2016

When asked about safety under the catch shares program, 37.5% of participants agreed safety has improved, ranking Eureka in the middle compared to other communities (Box X-2). Participants attributed improvements in safety to fewer fishing trips but also credited observers and the safety inspections they performed before each trip.

> "*Because we have observers. Because we have observers we go through our safety stuff more often. So that would be a direct result.*" – Fisherman, Eureka, 2015/2016

Summary

Eureka participants reported changes in fishing practices spurred by increased activity in Dungeness crab and pink shrimp. Program associated costs and low bycatch allocations created challenges for small vessels resulting in some to lease out their quota, foregoing groundfish fishing altogether. This may result in reduced employment opportunities for crew. Processors reported workforce retention issues due to inconsistent supplies of groundfish. Overall, Eureka participants faced operational challenges from program fees, observer costs and low allocations of bycatch or choke species. Despite this, some participants noted benefits from catch shares in the form of more stable income, flexibility to lease QP and focus on other fisheries and improved safety, reflecting the community's mixed levels of support for the management program.



PCGFSS Community Summary

FORT BRAGG AREA

This summary sheet provides a snapshot of the Fort Bragg Area community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Fort Bragg is located about 170 miles north of San Francisco, along California's Medocino coast. According to the US Census Bureau Population Estimates Program, the population of Fort Bragg in 2015 is estimated to be 7,289—a 17.38% increase from 1990. The median household income[14] (adjusted to 2015 dollars) is estimated to be $33,867 (US Census Bureau ACS 2015).

Pomo Indians originally inhabited the region of northern California where Fort Bragg is situated, relying on coastal and marine life including salmon, shellfish and marine mammals. The fur trade brought Russian traders and later Spanish missionaries established the first European settlements in the early 1800s (Norman, 2007), which eventually led to the relocation of tribes to smaller reservations. Fort Bragg was founded in 1857 as a military outpost to guard the Mendocino Indian Reservation. The timber industry boomed in the late 1800s, followed later by a fishing industry built on salmon, based on the Noyo River (Norman, 2007). Commercial harvest expanded into other fisheries, surviving fish stock collapses of the mid-1990s and on through to their ongoing recovery in 2010s. Commercial and recreational fishing remains an important part of Fort Bragg's economy today.

PCGFSS Participants

The goal of the PCGFSS Participants section is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide information about who the participants within each year represent. In Section 3.2 Community Performance, the Fort Bragg Area is defined as an aggregated community including Fort Bragg, Albion, Casper, Elk, Little River and Point Arena. The majority of PCGFSS participants in this area are associated with Fort Bragg. When interpreting the results presented in this section, it is important to keep in mind that while there is some overlap in participants across years, not every survey year contains the

[14] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov .

same sample of individuals. Table FBA-1. summarizes the percentage of respondents in the Fort Bragg Area who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table FBA-1. Total number of participants, and percentage of return respondents in the Fort Bragg Area.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	66.7	68.8
% Return respondents from 2012	-	-	87.5
Number of participants	20	21	16

In comparison to other communities, the Fort Bragg Area participants are older, and able to trace their commercial fishing heritage back three generations. They've been working longer in the PCGTF compared to other communities yet derive less of their income from commercial fishing (Box FBA-1).

Table FBA-2 summarizes the roles that Fort Bragg participants hold within the industry. In comparison with other communities, Fort Brag ranked in the top 3 in terms of the percentage of 2015/2016 PCGFSS that are QS owners/co-owners and vessel owners/co-owners, a significant increase from 2010 and 2012. This may reflect a shift in ownership along the West Coast, due in part to divestiture and QS acquisition by community quota funds (Section 3.2.2(d)(3) Redistribution of QS to Comply with Divestiture) and discussed in the Additional Themes section of the community summary.

BOX FBA-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **59.3 years** | Rank 2 out of 13
2010=56.4 (2/13), 2012=56.6 (1/12)

Number of years working in commercial fishing | **35.8 years** | Rank 1 out of 13
2010=37.0 (1/12), 2012=32.9 (4/13)

Number of years working in the PCGTF | **28.9 years** | Rank 1 out of 13
2010=31.0 (2/13), 2012=23.9 (4/12)

Number of generations family has commercially fished | **3.0 generations** | Rank 2 out of 11
2010=5.0 (2/10), 2012=2.7 (3/12)

Percent income from commercial fishing | **77.9%** | Rank 10 out of 13
2010=77.8% (10/13), 2012=71.8% (11/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table FBA-2. Role of respondents within the Fort Bragg Area, presented as a percentage of the total number of participants within the community sample, and rank* from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner**	25.0	8/12	28.6	8/12	43.8	2/11
Absentee owner/co-owner	-	-	9.5	7/8	25.0	3/10
Vessel owner/co-owner	35.0	7/12	33.3	5/8	43.8	1/12
Captain/Crew	15.0	11/12	38.1	7/11	31.3	9/12
Shoreside Processor	15.0	4/9	9.5	6/10	12.5	6/11
Catcher-Processor/Mothership	0	2/2	0	3/3	0	2/2
Buyer (not processor)	0	5/5	0	6/6	0	6/6
Other***	45.0	1/9	42.9	3/12	25.0	7/13
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

** 2010: refers to "permit owner"

*** Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Fishery Participation Levels

This section supplements the general community description by characterizing the community based on respondents' current and planned participation in various fisheries. Fisheries participation data presented here reflects the fisheries that PCGFSS respondents in Fort Bragg participate in, and does not account for where these participants may land their catch.

Fort Bragg fishermen[15] consistently targeted sablefish, dover and petrale sole and longspine thornyheads all three years, while lingcod – previously fished by most participants - has not been targeted since 2010 (Table FBA-3). Fishermen also reported targeting Dungeness crab and tuna during the same time periods. Of those who participated in 2015/2016, 46.7% planned to increase their groundfish fishing activity, a significant increase from 2012 when no participant planned to increase their activity (Box FBA-2). One participant expressed uncertainty when asked about their plans for groundfish fishing,

> "*Well, prefer to increase it. Just don't know if the opportunity's there.*" – QS Owner, Fort Bragg Area, 2015/2016

The uncertainty expressed in this comment may suggest that plans to increase groundfish fishing are dependent on the right conditions to create opportunities for expansion rather than definite plans.

[15] The survey item summarized in Table FBA-2 only applies to fishermen, which were defined as captain, crew, and/or other roles directly related to the harvesting of fish.

Table FBA-3. Top five groundfish and other species that Fort Bragg Area respondents commercially fished since catch shares was implemented (2010: commercially fished in the last 5 years).

2010	**%**	**2012**	**%**	**2015/2016**	**%**
Lingcod	100.0	Sablefish	88.9	Sablefish	100.0
Sablefish	100.0	Chilipepper	77.8	Longspine Thorneyhead	85.7
Chilipepper	85.7	Longspine Thorneyhead	77.8	Dover Sole	85.7
Longspine Thorneyhead	85.7	Dover Sole	77.8	Shortspine Thorneyhead	71.4
Shortspine Thorneyhead	85.7	Petrale Sole	77.8	Petrale Sole	71.4
Dover Sole	85.7			Longnose Skate	71.4
Petrale Sole	85.7				
Dungeness Crab	57.1	Dungeness Crab	66.7	Dungeness Crab	42.9
Tuna	57.1	Pacific Salmon	22.2	Tuna	14.3
		Tuna	11.1	Pink Shrimp	14.3
		Alaska King Crab	11.1		

BOX FBA-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **46.7%** | Rank 2 out of 11

2012=0% (8/8)

Plan to decrease activity in PCGTF | **0%** | Rank 9 out of 9

2012=0% (3/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Participants discussed making fewer fishing trips - an issue in both 2012 and 2015/2016 - and struggling to stretch their groundfish allocations out as long as possible. While conversely, fewer groundfish trips allows those who fish multiple fisheries the flexibility do so;

> "*Like the* [vessel name omitted]*, for example, used to fish maybe 6 or 7 months out of the year and, it's luck now to fish four. And that's stretching and that's when he stretches his quota out.*" QS Owner, Fort Bragg, 2015/2016

> "*They fish until their quota's caught. Some of them can make it stretch out all year long and others will catch it, if they've go multiple fisheries and you can catch it all in the summer months… like if you're a crab boat and you can catch all your trawl fish before crab season or after crab season…*" – Other Industry Participant, Fort Bragg, 2015/2016

Participants indicated a shift to other fisheries by augmenting reliance on groundfish with tuna, Dungeness crab, salmon and shrimp. This is discussed further in the Employment Levels section as the theme pertains to income dependence.

Infrastructure

As reported by other California ports and detailed in Section 3.2.2(c) Changes in Infrastructure, Fort Bragg has lost vessels and portions of its infrastructure over time with more anticipated in the near future.

> "*But you know what built the town and the infrastructure in this town was commercial fishing and logging. You know we lost the logging, pretty much, you know. And the fishing, we're losing it too losin' a lot of the infrastructure.*" - Fisherman, Fort Bragg, 2012

The loss of the port's fuel dock and potential loss of its ice house were frequently discussed all three study years. While Fort Bragg does have a locally-based net builder, there is no electrical repair provider and the remaining mechanical repair provider reports a thirty day wait period for service. This provider is also phasing out their marine work, which will require fishers to search further afield for their mechanical repair needs.

> "*So many of our local businesses, some of them have quit or not working anymore or whatever, retirin'. I've had to go out and find outside suppliers, you know*." –Other Industry Participant, Fort Bragg, 2015/2016

While there are no formal haul-out facilities, crew are able to utilize the harbor's parking lot for net repairs and to perform other vessel-related maintenance.

Employment Levels

This section summarizes community-level employment based on participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry.

According to participant reporting, Fort Bragg's fishing employment levels (groundfish and other fisheries) have rebounded to their 2010 levels. Despite this, Fort Bragg still ranked in the bottom three compared to other communities, with the exception of groundfish in 2015/2016 (Table FBA-4).

In Table FBA-5 participants' ratings for job satisfaction, compensation, job stability and standard of living remained fairly stable across all three study years. Interestingly, standard of living and compensation shifted from ranking in the top three in 2010 - compared to other communities - to the bottom two and three, respectively, since 2012. This could indicate that these categories have improved for other communities since catch shares' implementation while income and standard of living stagnated locally. Job stability in Fort Bragg has consistently ranked in the bottom two compared to other communities while job satisfaction ranked in the top four, except for an apparent temporary drop in 2012.

Participants indicated that while groundfish was once their primary source of income dependence has reportedly, shifted, to other fisheries such as Dungeness crab, salmon and shrimp. This dependence on other fisheries is also discussed in Section 3.1.2(d) (1) Participation, and Section 3.1.3(c) Interdependencies with Other Fisheries

> "*And before we used to… groundfish was our mainstay. That kept us, we could survive on groundfish. Now if we didn't have crabs or salmon we would be, we wouldn't be here to do groundfish. 'Cause it's just, it has not become a viable fishery anymore.*" – Processor, CA, 2015/2016

> "*So, I wouldn't necessarily say it's supplement the groundfish fisheries. It's workin' that way now, though. In fact it's kind of carryin' my business, to be on honest with ya, the crab fish is. In the past it was a nice little shot. You maybe go crab fishin' for a month and half, two months out*

of the year and the rest of the year you do your groundfish. You know, in a lot of years we would make as much money crab fishin' in that 2-month period that we would make the rest of the year groundfishin'. Yeah, now we're make a lot more, a lot more money crab fishin'. A lot less money in groundfish 'cause we're not fishin' very much." – Fisherman, Fort Bragg, 2015/2016

Table FBA-4. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	%	Rank	%	Rank	%	Rank
Groundfish	80.0	7/9	47.6	10/11	81.3	5/12
Other fisheries	50.0	10/13	38.1	10/11	50.0	7/10
Non-fishing	35.0	3/11	52.4	1/11	31.3	6/12
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table FBA-5. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.4	3/10	3.1	7/10	3.4	4/10
Compensation	2.9	3/12	2.6	8/11	2.7	9/12
Method of pay	3.1	5/12	3.0	6/9	2.9	11/12
Job stability	2.2	11/13	2.3	7/9	2.6	9/10
Standard of living	3.0	2/8	2.9	7/10	3.0	7/9
Relationships	3.5	2/9	3.5	5/12	3.3	10/11
Not applicable	12.5		0		0	
Prefer not to answer	0		0		0	
Response rate	80.0		100		93.8	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

In 2010, some participants felt secure that their diversification in salmon, Dungeness crab and tuna would carry them through the changes brought by catch shares. Reported shifts to other fisheries or reliance on diversification continued through 2012 and into 2015/2016. But, with recent issues in the other fisheries participants rely upon – domoic acid closing or truncating Dungeness crab season and multiple, poor salmon seasons – the situation may increase income uncertainty.

Participants continued to identify a reduction in income as it related to fewer fishing trips, referenced previously in the Fishery Participation Levels section. Resulting from a reduced number of trips, with months in between, crew find themselves seeking second jobs;

"*But mostly, the last few years I've just been doin' the drag boat. But if we don't go out for months at a time, I have to go find a job. I did firewood for a few years, crab fishin', urchin divin', black cod fishin'. It sucks to have to go down there and find a job for just a minute. 'I'll*

> *work for ya for a month and then I gotta go back to my other job.' That's kinda hard to do.*" – Fisherman, Fort Bragg, 2015/2016
>
> "*Before I was able to fully employ them all year long and with the IFQ program we're not workin' all year long. So they're actually workin' second jobs. I haven't been but my crew has been workin' second jobs to kind of make ends meet*." ." – Fisherman, Fort Bragg, 2015/2016
>
> "*It's kinda sad, though. 'Cause you know who really gets screwed is the crews. They're the ones that are makin' the least amount of money.*" QS Owner, Fort Bragg, 2015/2016

Another participant reflected on the number of vessels built in Fort Bragg, that have remained in the port and whose owners will eventually exit the fishery;

> "*You take a look at the fleet here in Fort Bragg like my boat was built here in Fort Bragg before the trawl fisheries. Boat was launched in 1980 as a trawler.It's been here in this port ever since the [names omitted], these boats were all built here . And they've remained in the trawl fisheries the whole time. And these guys are little by little, like [name omitted], I think he's gonna call it quits. I think* [name omitted]*'s already, one of his boats isn't even fishin', you know. Little by little they're just gonna fall by the wayside.*" - Fisherman, Fort Bragg, 2012

This introduces an additional factor for employment in the local fishery, related to the graying of the fleet identified by Russell et al. (2014) and discussed in Section 3.2.3(c) (2) Aging of the Fishing Workforce. If these vessels remain active in the community then there will be continued opportunities for crew but if they are sold to other areas those jobs may well be lost.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While, the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

Fort Bragg's support for catch shares increased only a small amount since 2010, while consistently ranking in the bottom two compared to other communities (Box FBA-3). This may be reflected in the steady increase of those who reported being "negatively affected" and, possibly, in the large increase of those who changed the species caught since catch shares' implementation as discussed previously in Fisheries Participation Levels and Employment Levels.

Frequent catch shares-related themes that emerged in Fort Bragg involved cost of observers, cost of leasing quota pounds and allocations of high-risk or choke species, which pose challenges for catching the full allocation of target species.

The cost and availability of observers is a frequent theme in southern California ports but also for this small, isolated community located away from more centralized fishing centers and main thoroughfares. As discussed in Section 3.2 Community Performance (3.2.2(f); 3.2.2(g)(4)(c); 3.2.2(g)(6); 3.2.2(h)(1) & 3.2.3(d)), the cost of observers and their travel to the area presented significant financial challenges for small vessels like those operating out of Fort Bragg. Low observer availability during times of optimal weather and sea conditions resulted in lost trips for this port's vessels in some years.

"*Oh yeah, that observer is $15-$20,000 a year. That's a wage for a person. That comes out of my check. So I'm payin' directly to that.*" – Fisherman, Fort Bragg, 2015/2016

"*Probably the scheduling was the biggest. You know watching the weather and trying to, 2 days ahead of time get a hold of one and still be in the weather window for the trip, was probably the hardest challenge.*" – Fisherman, Fort Bragg, 2015/2016

BOX FBA-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **18.8%** | Rank 9 out of 10
2010=10.0% (9/11), 2012=17.7% (10/11)

Positively affected by catch shares | **12.5%** | Rank 11 out of 12
2010 (expect to be affected)=15.0% (6/11), 2012=17.7% (9/12)

Negatively affected by catch shares | **68.8%** | Rank 2 out of 12
2010 (expect to be affected)=55.0% (3/13), 2012=64.7% (4/12)

Changed species caught post-catch shares | **85.7%** | Rank 1 out of 8
2010 (change in last 5 years)=33.3% (3/8), 2012=70.0% (2/10)

Agree that safety has improved as result of catch shares | **28.6%** | Rank 7 out of 8

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

In an effort to alleviate some of the expenses, two vessels have turned to video monitoring (VM) with others anticipating similar changes in the near future.

"*Yeah, I put the cameras on last year. That's going save a little on the observer costs, yeah. […] So I did 3 years with observers. And I would say the observers….there was times when I couldn't get one.*" Fisherman, Fort Bragg, 2015/2016

But switching to VM requires a catch monitor when delivering catches. This shifts the same observer cost burden to the processors.

"*Catch monitors… for the boats that have cameras. And, well and the observers. I mean, we gotta pay observer costs for a guy to be here in the plant to watch us weigh the fish. […] if they're using a camera the catch monitor, we call 'em, they come here and we get billed for it. The boat doesn't.*" – Processor, CA, 2015/2016

Participants spoke of the need to lease quota pounds over and above their own allocation of choke species

– low allocated species that is often caught along with target species - in order to continue fishing. These comments discuss how the additional cost of leasing quota pounds affect profits;

"*We used to catch a lot more fish before the catch shares. Or we catch approximately the same but it costs us an extra $100,000 a year to do it. We had to buy it from you or somebody else otherwise, we're done.*" – QS Owner, Fort Bragg, 2015/2016

> "*Because once I have my fish caught and I have to start leasing, I have to start leasing fish, it's really not profitable. If I have to lease a bunch of fish it's not even worth going for me so I just don't go.*" – Fisherman, Fort Bragg, 2015/2016

The issue with low choke species allocations translates into an inability to catch one's full quota allocation, which tends to result in an inconsistent supply of fish for the processors and other businesses that depend on regular landings of groundfish (Section 3.1.3(a)(1) Utilization of Non-whiting Species Allocations).

> *"…three of our boats went out of the IFQ; the Terra Dawn, the Blue Pacific and the Verna Jean. They left the fishery in September, I wanna say, because there was no more, they couldn't find any black cod or any petrale. They needed those two species in order to prosecute their other holdings. They couldn't find them. So they left the fishery.*[16]" QS Owner, Fort Bragg, 2015/2016

> "*Because of the inconsistency and of the, the products, the species we used to get where we don't anymore. I mean we get, right now we get dover, thorny-head, sablefish, petrale once in a while and chili peppers once in a while. That's it.*" – Processor, CA, 2012

When asked if safety had improved since catch shares few credited the management program, as observed by the level of agreement and low ranking compared to other communities (Box X-2). Instead participants felt safety declined, in part, due to reduced income resulting in delayed vessel maintenance (Section 3.1.3(d) Safety: Alternative measures of risk-taking and safety).

> "*…I hauled my boat out, every year for 30 years. Now, I'm 3 years without a haul out. I just don't have the money to do it. [...] And that's gonna be what winds up happening, you're gonna start seein' some guys basically, they'll go broke, you know they blow-up a main engine or defer maintenance and they wind up sinking or something like that. You're gonna start seeing some of it. I guarantee I'm not the only one that's deferin' some maintenance because they don't have any money*." – Fisherman, Fort Bragg, 2015/2016

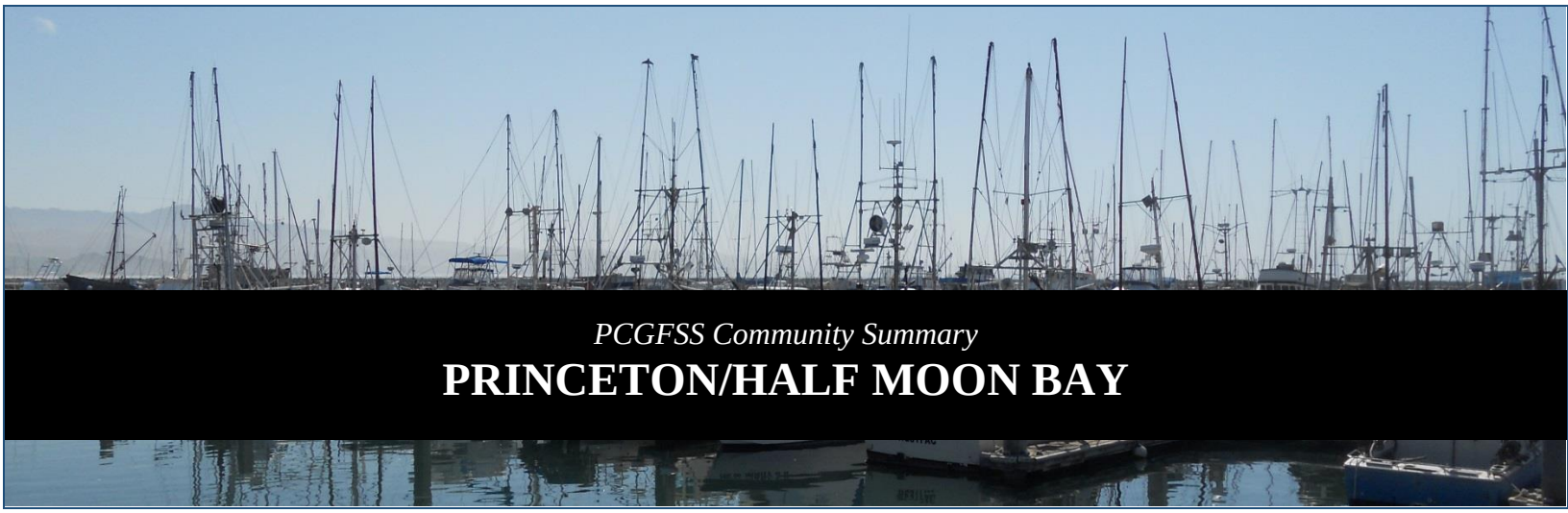
Additional Themes

Fort Bragg has formed a risk pool or community trust, the Fort Bragg Groundfish Conservation Trust, which has recently, "*…acquired a really nice portfolio of quota which will help tremendously. We can keep it local. Our boats will know that they have access, affordable, reliable access to quota,*" (Other Industry Participant, Fort Bragg, 2015/2016). Working closely with other community trusts in Morro Bay and Half Moon Bay, these efforts have served to reduce some of the uncertainty for its members.

Summary

Fort Bragg with its long history of commercial fishing still holds on despite ongoing challenges. While groundfish remains a significant fishery for the community's fishers, financial necessity has elevated the importance of other fisheries such as Dungeness crab, salmon and tuna. Yet, with the vessel losses of the past and participants taking fewer fishing trips, the future of the remaining infrastructure and potential for job opportunities are called into question. Catch shares related costs and allocations of high-risk species continue to challenge fishing operations. Yet, through the formation of the community trust, its acquisition of community quota shares and partnering with other communities, Fort Bragg has seen progress toward meeting and overcoming some of those challenges.

[16] "*…left the fishery*", in this instance, refers to vessels that stopped groundfish trawling for the remainder of the year.



PCGFSS Community Summary

PRINCETON/HALF MOON BAY

This summary sheet provides a snapshot of the Princeton/Half Moon Bay community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Half Moon Bay, encompassing an area of 6.5 square miles, and Princeton (just north of Half Moon Bay) are located along the California coast 30 miles south of San Francisco. Prior to the arrival of Spaniards in the late 1700s, the area between San Francisco and Big Sur was inhabited by approximately 40 tribal groups (Norman et al. 2007). Half Moon Bay was established in 1840, but not incorporated until 1959, whereas Princeton was established between 1906 and 1909, but never incorporated (Norman et al. 2007). In the early 1900s, the railroad brought tourists to the area from San Francisco (Norman et al. 2007). Though tourism declined after the railroad failed, the area came alive again in the 1920s as a haven for rumrunners (Norman et al. 2007).

According to the US Census Bureau's Population Estimates Program, the population of Half Moon Bay in 2015 is estimated to be 12,657—a 42.7% increase from 1990. Median household income [17] (in 2015 dollars) is estimated to be $103,255 (US Census Bureau ACS 2015). The Half Moon Bay Area Chamber of Commerce (2016) describes the major industries in the area as tourism, agriculture (specifically floriculture), and commercial fishing.

PCGFSS Participants

The goal of this section is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide information about who the participants within each year represent. In Section 3.2 Community Performance, Princeton/Half Moon Bay is included in the San Francisco Area. However, the PCGFSS has sufficient data to report on the community. PCGFSS participants in this analysis represent similar participation from both Half Moon Bay and El Granada. When interpreting the results presented in this section, it is important to keep in

[17] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov.

mind that while there is some overlap in participants across years, not every survey year contains the same sample of individuals. Table HMB-1. summarizes the percentage of respondents in Princeton/Half Moon Bay who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table HMB-1. Total number of participants, and percentage of return respondents in Princeton/Half Moon Bay.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	50.0	42.9
% Return respondents from 2012	-	-	42.9
Number of participants	13	8	14

In comparison to other communities, Half Moon Bay participants are somewhat younger, have been working in the PCGTF for a comparable number of years, and derive between 80-95% of their income from commercial fishing (Box HMB-1). Table HMB-2 summarizes the roles that Half Moon Bay participants hold within the industry. In comparison with other communities, Half Moon Bay ranks comparably in terms of the percentage of PCGFSS respondents that are QS owners/co-owners, and relatively high in vessel owners/co-owners and captain/crew members.

BOX HMB-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **55.0 years** | Rank 8 out of 13
2010=56.7 (1/13), 2012=49.6 (11/12)

Number of years working in commercial fishing | **28.9 years** | Rank 10 out of 13
2010=28.8 (6/12), 2012=24.6 (6/13)

Number of years working in the PCGTF | **18.0 years** | Rank 13 out of 13
2010=25.5 (6/13), 2012=16.2 (11/12)

Number of generations family has commercially fished | **3.1 generations** | Rank 1 out of 11
2010=2.6 (7/10), 2012=2.6 (4/12)

Percent income from commercial fishing | **79.6%** | Rank 7 out of 13
2010=84.2% (8/13), 2012=95.0% (1/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table HMB-2. Role of respondents within Half Moon Bay, presented as a percentage of the total number of participants within the community sample, and rank[*] from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner[**]	38.5	5/12	37.5	5/12	21.4	7/11
Absentee owner/co-owner	-	-	0	8/8	14.3	6/10
Vessel owner/co-owner	38.5	5/12	37.5	4/8	42.9	3/12
Captain/Crew	61.5	4/12	62.5	2/11	50.0	3/12
Shoreside Processor	7.7	6/9	12.5	5/10	14.3	4/11
Catcher-Processor/Mothership	0	2/2	0	3/3	0	2/2
Buyer (not processor)	7.7	3/5	25.0	1/6	21.4	3/6
Other[***]	15.4	6/9	12.5	11/12	21.4	11/13
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

[*]Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.
[**] 2010: refers to "permit owner"
[***] Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Fishery Participation Levels

This section supplements the section above by characterizing the community based on PCGFSS responses to items about current and planned participation in various fisheries. Fisheries participation data presented here reflects the fisheries that PCGFSS respondents in Half Moon Bay participate in, and does not account for where these participants may land their catch.

Based on participant interviews, the number of active groundfish vessels has declined in 2015/2016[18] from five reported in 2012. The Nature Conservancy leases permits and quota to some groundfish participants – acquired by the nonprofit during the TNC sponsored 2006 buyback - while two others have chosen to lease out their quota due to program costs, a community concern for smaller vessel operations since 2010.

In all three study years, fishermen[19] in Half Moon Bay reported fishing Chilipepper in addition to a suite of other groundfish species (Table HMB-3). Participants also reported fishing for a variety of non-groundfish species including Dungeness crab, halibut, and Pacific salmon (Table HMB-3).

Despite a decrease in groundfish fishing activity, a small percentage of respondents plan to increase their participation in the fishery (Box HMB-2). This may be related to local membership in a regional risk pool which also includes the communities of Morro Bay and Fort Bragg.

In the Half Moon Bay interviews, there was a fair amount of praise for catch shares, particularly in regards to the gear and business planning flexibility the program offered. Participants noted that this flexibility allowed for a shift to other fisheries or to utilize more than one gear type

[18] In order to ensure confidentiality the number of vessels has been withheld.
[19] The survey item summarized in Table HMB-2 only applies to fishermen, which were defined as captain, crew, and/or other roles directly related to the harvesting of fish.

> *"I guess, cause now I can do two, two…I can trap and trawl where before I had to, I couldn't trap, I had to just trawl. Now we are able to do both."* – Fisherman, Half Moon Bay, 2015/2016

Table HMB-3. Top five groundfish and other species that Princeton/Half Moon Bay Area respondents commercially fished since catch shares was implemented (2010: commercially fished in the last 5 years).

2010	**%**	**2012**	**%**	**2015/2016**	**%**
Chilipepper	100.0	Chilipepper	60.0	Chilipepper	50.0
Petrale Sole	100.0	Sablefish	60.0	Sablefish	50.0
English Sole	77.8	English Sole	40.0	Petrale Sole	50.0
Starry Flounder	77.8	Petrale Sole	40.0	Dover Sole	25.0
Lingcod	55.6	Starry Flounder	40.0	Sanddabs	25.0
		Sanddabs	40.0	Longnose Skate	25.0
		Longnose Skate	40.0		
		Big Skate	40.0		
Dungeness Crab	77.8	Dungeness Crab	100.0	Dungeness Crab	87.5
Pacific Halibut	44.4	California Halibut	60.0	California Halibut	50.0
		Pacific Salmon	60.0	Pacific Salmon	50.0
				Alaska Pollock	12.5
				Alaska Pacific Cod	12.5

Those fishers who did make shifts to or increased activity in other fisheries it was towards California halibut, salmon and Dungeness crab. Others reported little change in their fishing activity since catch shares' implementation because their portfolios were already sufficiently diverse.

Conversely, others did not perceive there to be, or could not take advantage of flexibility in the program. Some were unable to shift to other fisheries because groundfish was the staple of their business as was the case for this participant;

> *"Oh, shift to other fisheries, well, there's really no other fisheries that we, we can shift to the same type of fishery, but um, still the same type of staples that we need to have for our businesses, you know, like…groundfish. Petrale, rex soles, all of that stuff. And we couldn't shift to other fisheries 'cause it's like a staple.*" – Buyer/Processor, CA, 2015/2016

For these buyers/processors, there was a reported inconsistent supply of groundfish [similarly reported in 3.2.2(g) (1). Community Variability] from the one local trawler, so much so they have turned to Oregon and Washington to supplement product.

As with other communities, small vessels were negatively impacted by program related costs. According to 2012 and 2015/2016 participants, this resulted in some getting priced out of the fishery and/or having to lease out their quota rather than fishing it [3.2.2(f) (1) Employment Opportunities, Income, and Stability]. This topic is also discussed in Section 3.2.2(g)(4)(b) Absentee Quota Holders, and in Section 3.2.3(d) Small Vessels as these reasons and trends pertain specifically to small vessels in other ports along the west coast.

BOX HMB-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **16.7%** | Rank 10 out of 11
2012=0% (8/8)

Plan to decrease activity in PCGTF | **0%** | Rank 9 out of 9
2012=0% (3/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Infrastructure

There are two groundfish buyers, one in Half Moon Bay and one in Princeton. Although participants discussed decreases in processors and infrastructure over time, these changes were not attributed to catch shares—which is consistent with the status of California's infrastructure reported in section 3.2.2(c) Changes in Infrastructure, typically linked to the number of active vessels and the demand they create.

> *"So we need fuel, and we, we struggled a lot this year with ice with our infrastructure being so messed up, with the salmon seasons being weak, and everything being outdated, And the fleet being low enough that they're not, it's not like a priority, right? Because like you said there's two guys fishing groundfish*." – Fisherman, Half Moon Bay, 2015/2016

A 2012 participant succinctly identified the issue many California port communities face;

> *"More biz/infrastructure…let's face it, this is suffering at all ports and catch shares hasn't changed that."* – Fisherman, Half Moon Bay, 2012

This statement, concise as it is, seems to express a broader sentiment that while catch shares may not have been the cause of infrastructure problems, it has not improved the situation either.

Employment Levels

This section summarizes community-level employment based on participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry.

In comparison to other communities, Half Moon Bay ranks low in terms of the percentage of participants employed in the groundfish fishery (Table HMB-4). In 2012 and 2015/2016, however, Half Moon Bay ranks highly in terms of the percentage employed in other fisheries.

Table HMB-4. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	%	Rank	%	Rank	%	Rank
Groundfish	76.9	8/9	75.0	7/11	57.1	11/12
Other fisheries	69.2	6/13	87.5	1/11	71.4	4/10
Non-fishing	0	11/11	12.5	9/11	35.7	4/12
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

One participant discusses the challenge of sufficient employment:

> *"To see…to have to put crew members through this, to have them go like "hey, believe in me, we're gonna make some money fishing", and then be demoralized because we couldn't make that money fishing, and then to have to help them find other jobs…*" -Fisherman, Half Moon Bay, 2015/2016

Participants in Half Moon Bay had varied perspectives about job quality aspects (Table HMB-5). In comparison with other communities, in 2015/2016 Half Moon Bay ranked in the bottom four in terms of compensation, job stability, method of pay, standard of living, and relationships with co-workers. This does not mean that all participants ranked job quality items low. For instance, some reported that fishing jobs had stabilized;

> *"What it did is it gave stability, which stability made me happier, made my crew happier, made everybody happier, the stability it, and being able to, in the end, not only stability, they made more money, so yeah, the catch shares made a big difference."* – QS Permit Owner, Half Moon Bay, 2015/2016

Table HMB-5. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.0	9/10	3.1	6/10	3.6	1/10
Compensation	2.1	10/12	3.0	5/11	2.8	8/12
Method of pay	3.1	4/12	2.9	7/9	3.1	9/12
Job stability	2.2	10/13	2.7	5/9	2.6	8/10
Standard of living	2.5	8/8	3.0	6/10	3.1	6/9
Relationships	3.6	1/9	3.6	3/12	3.5	9/11
Not applicable	7.7		0		7.7	
Prefer not to answer	0		0		0	
Response rate	100		87.5		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

As noted in the Fishing Participation Levels section above, the ability to switch gear types to fixed gear may also be associated with increases and stability in income:

> *"I was affected positively due to increased income and income stability. That was important for me. When I started, I was making ok money, but was always worried about what's gonna happen next year. Now you feel more secure."* – Fisherman (IFQ Fixed Gear), Half Moon Bay, 2012

Other aspects of the catch shares program, such as observers, cost recovery, buyback repayment costs in addition to regular operating expenditures became a hindrance to income and business stability for other participants;

> *"August rolled around […] and all of a sudden I could not catch fish. Anywhere I went, I tried, you know, north, up front, down south, nothing was around. Fish were gone. Well, you know what that means? I was going backwards severely to the tune of about $2,000 bucks a day. In the old days, you could, a guy could go look around and scratch fish and maybe eventually find something, you know, […] I still remember all that, and that's how we used to have a lot of success, but you know, I started going backwards, I probably lost like $15,000 looking for fish, and that's not stable, that's…that's just a disaster, you know? Um, you got $600 to the observer and then I pay for, you know, offloads within my own business because I'm my own first receiver, you know, fuel was still pretty high then and then you got the everything else…cost recovery, groundfish buyback And so, if you don't catch fish up here, you're in trouble […] 'cause in the old days when it wasn't just so expensive to conduct your business you could go scratching and eventually maybe you find something to work on. So the stability doesn't feel great sometimes, especially after that experience."* - Fisherman, Half Moon Bay, 2015/2016

Another participant, citing these costs, exited and leased out his quota and ended up working as a deckhand on a fixed gear vessel.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While, the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

Support for catch shares in Half Moon Bay is mixed—53.9% supported the program in 2015/2016 (Box X-2). In the 2010 interviews, participants were not positively anticipating catch shares' implementation, but were optimistic about flexibility and business planning. In 2012, interviewees expressed a relatively high level of support, which aligns with the 71.4% who reported being positively affected by the program (Box HMB-3).

As discussed in the previous sections, flexibility and business planning were major themes across all three study years for Half Moon Bay, and may explain the levels of support for catch shares in the community:

> *"The flexibility it allows a guy to plan his business, there's no way to grow your business, we couldn't grow as much or at the rate that we're growing now, without a program like this that we could depend on, because it's road mapped more than anything in an uncertain fishery, right?"* – Fisherman/QS Owner, Half Moon Bay, 2015/2016

> *"From a business plan point of view, now it costs less because now, with quotas you're able to go to a bank and go – I have a vessel and I have this much quota, this is how many days it can fish,*

this is how much revenue can be generated, this is my (perform?) on maintenance and repair. Here's my business plan. I know what it's going to cost me, what I can make and all things…if the boat breaks down tomorrow, I still have my quota, if the boat sinks, I still have my quota, I still…you know, I still have something the bank can have, I still have a way to pay my bills if I lose a whole season and have to lease the quota to someone else, I have a way to get out of this." – QS Permit Owner, Half Moon Bay, 2015/2016

BOX HMB-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **53.9%** | Rank 5 out of 10
2010=8.3% (11/11), 2012=71.4% (2/11)

Positively affected by catch shares | **41.7%** | Rank 5 out of 12
2010 (expect to be affected)=8.3% (9/11), 2012=71.4% (1/12)

Negatively affected by catch shares | **25.0%** | Rank 8 out of 12
2010 (expect to be affected)=50% (5/13), 2012=28.6% (9/12)

Changed species caught post-catch shares | **62.5%** | Rank 3 out of 8
2010 (change in last 5 years)=33.3% (3/8), 2012=80.0% (1/10)

Agree that safety has improved as result of catch shares | **50.0%** | Rank 4 out of 8

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

While the flexibility for business planning offered by catch shares was viewed favorably, flexibility as it pertained to observer availability was viewed less so;

"…we have to watch the weather, so for us to watch the weather sometimes you get up in the morning, [what's?] good weather, I'll go fishing. Can't do that with the observer program, got to them 24 hrs. notice and everything, so, that, I just quit groundfish at that time. […] I've got a quota share that I can lease out…" - Fisherman, Half Moon Bay, 2015/2016

Observer costs and related challenges were a significant issue coast wide and is reported in more detail in section 3.2 [3.2.2(f); 3.2.2(g) (4) (c); 3.2.2(g) (6); 3.2.2(h) (1) & 3.2.3(d)].

Others in both 2012 and 2015 study efforts identified the same issue of availability along with cost, and also linked the problem to a decrease in safety;

"…I have to tell an observer to be on the boat and they made the trip, they live in Monterrey, 2 hours away, which they always seem to live an hour or two away, so they have to get to the boat, and I've already been saddled with expense for travel and partial-day or whatever, even if we don't go and they're on the boat, I wake up at 2 in the morning and I look at the weather and they went from 15 - 25 to 20 - 30 in the forecast, well, I've already started spending money on this day, so, I might just say "screw it", I gotta go and I'll go out in 30 knots of wind, ugly weather, because I've already paid to have an observer on my boat, so…to me that's just disgraceful that we have to operate under that type of…you know. But, to me that is a decrease in safety…" - Fisherman, Half Moon Bay, 2015/2016

Reduced income was also linked to safety in that it forced regular maintenance delays. An overall statement about the current state of safety in the fishery attributed improvements in safety, not necessarily to catch shares, but to a variety of reasons including Coast Guard requirements and to the experience of the remaining fishers;

> *"I think the coast guard is a little bit stricter on things, and I think the Federal government is a little stricter on stuff too, you know what I mean?[…] I think there's more safety. There's less guys fishing and you got the best of the best now. The guys that are fishing now are like the elite group. You know what I mean? So, they're really safety orientated."* – Buyer/Processor, CA, 2015/2016

This also has implications for any new entrants who enter the fishery after this "elite group" exits. Safety may suffer without passing along that knowledge to the next generation. This passage of knowledge, though not specifically linked to safety, was discussed in terms of knowledge of fishing methods and fishing grounds in Sections 3.2.3(b)(1) Perception of New Entrants and 3.2.3(c)(2) Aging of the Fishing Workforce. For further information on safety, see Section 3.1.3(d) Safety.

Another theme that emerged in Half Moon Bay pertained to the challenges of a one-size fits all management system, and the impacts of catch shares on the smaller ports and small, one-vessel operations:

> "*…it's a, um…conundrum this catch share. It's under the guise of protecting the fish and the resource, it's uh…it's destroying the very thing they claim to be helping because it's catering to the big boats, it's not catering to the little boats."* – Buyer, Half Moon Bay, 2015/2016

In response to these challenges, participants in Half Moon Bay expressed a need for a community-level approach, and more collaboration with management;

> *"Yeah, we need a sort of collaborative approach between NOAA and the observers program and the industry to be more fine-tuned to accommodate each port. 'Cause each port has so many different problems. So that's what we need, we need some sort of system that says, Ok, this isn't an observer program for the West Coast, or if it is, it has to be specific to Half Moon Bay, has this set of problems, Monterey has this set of problems, Morro Bay has this set of problems."* –
>
> Fisherman/QS Owner, Half Moon Bay, 2015/2016

> *"And there's just a handful of guys holding on in small port California and um…you know, that's what the people that screamed against catch shares – that was their rallying cry, right? Was that it's going to…catch shares is going to put out the small California guys and I don't think that's come to pass, but the guys that are remaining are committed and want this to work, but if everything, you know…if decisions made continue to focus around the larger ports and not take into consideration maybe some mitigating circumstances down here, no matter how hard they try, they're not going to be able to survive it."* – Other Industry Participant, Half Moon Bay, 2015/2016

Similar issues were discussed in sections 3.2.2(g) (1). Community Variability and 3.2.3(d) Small Vessels.

Additional Themes

An additional theme identified in Half Moon Bay was the formation of risk pools and trusts. Participants explained that risk pools and trusts were a way to spread the risk of bycatch among members, but also to

anchor quota shares to the communities, which may forestall consolidation and reduce the risk of losing those resources to out of the state interests [Sections 3.2.2(g), and 3.2.2(g)(2)];

> *"So, in the last 2 years, we developed, …founded HMBGMA and we're in the process now of anchoring quota in this community, for good. With the use of a trust. Fisheries Trust. Community, you know, quota fund. Same thing that Monterey and Morro Bay have done, at this point, so we're actually almost very close to sealing the deal on that…"* - Fisherman, Half Moon Bay, 2015/2016

Summary

Half Moon Bay's groundfish trawl activity has diminished since the implementation of catch shares in 2011—having seen its number of active vessels fall from five. During the same period the community's other fisheries, Dungeness crab and salmon, have experienced slight increases. Despite this, catch shares support has increased, borne primarily by the benefits of business planning and gear flexibility. Other participants, however, have experienced challenges related to program costs, which for some has resulted in exiting the fishery or leasing out their quota. Despite the challenges, the community is working to remain viable by joining a regional risk pool and creating trusts in an effort ensure local fishing is preserved by anchoring quota shares to the community.

PCGFSS Community Summary

SAN FRANCISCO AREA

This summary sheet provides a snapshot of the San Francisco Area community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

The San Francisco Area is located along the California coast, encompassing 46.7 square miles of land and 185.2 square miles of surface water (Norma et al. 2007). Prior to the arrival of the Spaniards, the area between San Francisco and Big Sur was inhabited by 40 tribal groups. In the late 1700s Spain established numerous mission settlements throughout California, which would later become pueblos (Norman et al. 2007). San Francisco grew rapidly following the discovery of gold, and the fishing industry began to the develop when the Gold Rush subsided (Norman et al. 2007). The Chinese and Italians were influential to the development of the fishing industry in San Francisco. The Chinese shrimp fishery, along with the Bay Area's oyster business, were the most productive fisheries in California during the late 1800s (Norman et al. 2007). Throughout the late 1800s and early 1900s the fishing industry oscillated with declines in stocks related to pollution and exploitation, while in other areas there was progress due to technology advances (Norman et al. 2007).

According to the US Census Bureau Population Estimates Program, the population of the City of San Francisco in 2015 is estimated to be 864,816—a 19.5% increase from 1990. The median household income[20] (adjusted to 2015 dollars) is estimated to be $81,294 (US Census Bureau ACS 2015). Fishermen's Wharf, the traditional home of San Francisco's fishing fleet, still serves several fishermen, though the wharf is primarily visited by tourists (Norman et al. 2007).

PCGFSS Participants

The goal of this section is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide information about who the

[20] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov.

participants within each year represent. In Section 3.2 Community Performance, the San Francisco Area is used to represent a community group composed of the following communities: San Francisco, Alameda, Oakland, Alviso, China Camp, Berkeley, Pacifica, Pinhole, Richmond, Rodeo, Vallejo, and Princeton/Half Moon Bay. PCGFSS participants are primarily representative of San Francisco. Additionally, the PCGFSS has sufficient participation in Princeton/Half Moon Bay to represent the community as a standalone community. Therefore, data for Princeton/Half Moon Bay is not included in this analysis. See the Princeton/Half Moon Bay Community write-up for more specific information on this community. It is important to keep in mind that while there is some overlap in participants across years, not every survey year contains the same sample of individuals. The analysis presented in this section represents all participants for each study year within this community. Table SFA-1. summarizes the percentage of respondents in the San Francisco Area who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table SFA-1. Total number of participants, and percentage of return respondents in the San Francisco Area.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	55.6	46.2
% Return respondents from 2012	-	-	69.2
Number of participants	10	9	13

In comparison to other communities, San Francisco Area participants are older, have been working in the PCGTF for fewer years, and derive less of their income from commercial fishing (Box SFA-1). Table SFA-2 summarizes the roles that San Francisco Area participants hold within the industry. In all three years, the San Francisco Area ranks in the bottom three in terms of the percentage of QS owners/co-owners and/or vessel owners/co-owners.

BOX SFA-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **64.4 years** | Rank 1 out of 13
2010=55.0 (3/13), 2012=55.4 (3/12)

Age started work in commercial fishing | **24.6 years** | Rank 2 out of 12
2010=28.6 (1/13), 2012=23.0 (3/12)

Number of years working in the PCGTF | **18.8 years** | Rank 11 out of 13
2010=24.6 (7/13), 2012=14.1 (12/12)

Number of generations family has commercially fished | **3.0 generations** | Rank 2 out of 11
2010=2.0 (10/10), 2012=1.2 (12/12)

Percent income from commercial fishing | **74.2%** | Rank 11 out of 13
2010=77.6% (11/13), 2012=85.6% (6/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table SFA-2. Role of respondents within the San Francisco Area, presented as a percentage of the total number of participants within the community sample, and rank* from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner**	20.0	10/12	11.1	11/12	16.7	9/11
Absentee owner/co-owner	-	-	0	8/8	0	10/10
Vessel owner/co-owner	30.0	8/12	22.2	8/8	25.0	9/12
Captain/Crew	20.0	9/12	22.2	10/11	16.7	12/12
Shoreside Processor	30.0	3/9	44.4	1/10	16.7	3/11
Catcher-Processor/Mothership	0	2/2	0	3/3	0	2/2
Buyer (not processor)	0	5/5	11.1	2/6	25.0	2/6
Other***	40.0	2/9	22.2	7/12	33.3	6/13
Not applicable	0		8.3		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.
** 2010: refers to "permit owner"
*** Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Fishery Participation Levels

The San Francisco Area's groundfish trawl participation is minimal[21]. Participants attributed program cost-related reasons to the low level of activity. Based on reporting in Section 3.2.2(c). Changes in Infrastructure it is probable earlier resident vessels exited the fishery during the 2003 buyback. Other fixed gear types are more active, focusing primarily on black cod and other non-groundfish fisheries (Table SFA-3), like Dungeness crab. Most vessels in the area are small (< 50ft), independently owned, which, according to participants, have experienced significant challenges under the Catch Shares program.

Fishery participation in San Francisco has shifted away from groundfish—with the exception of black cod—into other fisheries, particularly into Dungeness crab and shrimp. It is unclear whether previously active trawlers abandoned groundfish for other fisheries or they exited the industry entirely. Originally predicted by participants in the 2010 baseline data collection, the 'shift to other fisheries' theme continued through 2012 and into the 2015/2016 study years. For one participant, the cost and availability of observers was the reason for the shift, "*That's why I just go for halibut right now and I freeze my catch-shares permit*," leading this fisherman to decide to lease out his quota;

> *So I write to rent my quota and fish just halibut and that's the only way I survive. Very, very little. And at the end of the year whatever I make I spend into the boat.* - Fisherman, San Francisco, 2015/2016

Another participant decided against entering the groundfish fishery because of the same issues with cost, a sentiment shared by other central California communities [section 3.2.2(g) (6) Fixed Gear Fisheries];

[21] PCGFSS survey data is removed from this section to protect confidentiality.

> *At one point I was considering renting catch shares, but decided not to after finding out the costs of observer coverage.* – Fisherman (Non-IFQ Fixed Gear), San Francisco, 2015/2016

According to participants, cumulative program costs and observer availability, determine participation in the groundfish Fishery—issues which often limit access to fishing and result in lost trips. In turn, this has led some to lease out their quota rather than fishing it [3.2.2(f)(1) Employment Opportunities, Income, and Stability]. This topic is also discussed in Section 3.2.2(g)(4)(b) Absentee Quota Holders, and in Section 3.2.3(d) Small Vessels as these reasons and trends pertain specifically to small vessels in other ports along the West Coast. All told, these challenges appear to disproportionately impact the smaller vessel operations that make up this central California fishing community. Despite these challenges, some San Francisco Area participants (though fewer than in other communities) still plan to increase their activity in the PCGTF (Box SFA-2).

BOX SFA-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **20.0%** | Rank 9 out of 11
2012=12.5% (6/8)

Plan to decrease activity in PCGTF | **10%** | Rank 4 out of 9
2012=0% (3/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Infrastructure

Trawl sector related infrastructure is minimal in the San Francisco Area due to limited demand for the one remaining, resident trawl vessel. Overall, infrastructure was not a frequent theme in this community. However, when the topic was discussed, it focused on maintaining processor workforces, an issue also reported in Section 3.2.2(c) Changes in Infrastructure of the Community Performance section.

Employment Levels

This section summarizes community-level employment based on participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry.

In comparison with other communities, the San Francisco Area ranked in the top five for groundfish employment in 2010, and in the bottom two in both 2012 and 2015/2016 (Table SFA-3). Participants reported variable levels of job quality (Table SFA-4). Notably, in 2015/2016, San Francisco Area ranked in the top three for job satisfaction, job stability, and relationships with co-workers.

Table SFA-3. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	%	Rank	%	Rank	%	Rank
Groundfish	90.0	4/9	44.4	11/11	58.3	10/12
Other fisheries	70.0	5/13	55.6	8/11	66.7	6/10
Non-fishing	30.0	5/11	22.2	6/11	33.3	5/12
Not applicable	0		11.1		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table SFA-4. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.3	5/10	3.0	9/10	3.6	1/10
Compensation	2.7	5/12	2.5	9/11	2.9	7/12
Method of pay	3.1	3/12	3.0	6/9	3.2	5/12
Job stability	2.9	4/13	3.0	3/9	3.2	2/10
Standard of living	2.8	6/8	3.3	2/10	2.9	8/9
Relationships	3.3	7/9	3.3	10/12	3.6	3/11
Not applicable	0		11.1		0	
Prefer not to answer	0		0		8.3	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

The 2010 baseline participants discussed concerns about opportunities for the next generation and felt their reduced quota would lead to decreased income. Through 2012 and into 2015/2016 participants reported fewer jobs and reduced income within this community, yet high levels of job stability were also reported (Table SFA-4). An inconsistent supply of groundfish translated to inconsistent work for processors' workforce creating retention challenges. From the fishing perspective, a 2012 participant related the experiences on one vessel:

> *So this CS came in, the guy sold all the quota, and then the boat became derelict. The owner got out, the captain and crew lost their jobs. He's now on the back deck of another boat working for someone else. The crew just melted into San Fran.* - QS Owner, San Francisco, 2012

This reporting of fewer jobs or reduced employment opportunities in the groundfish fishery and concern for the next generation of entrants is echoed along the West Coast, in other ports. Similar trends were reported in section 3.2.2(f) Changes in Employment section 3.2.3 New Entry identified fiscal barriers to ownership impeding previous opportunities for crew to work their way up from the deck.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

BOX SFA-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **33.3%** | Rank 8 out of 10
2010=10.0% (9/11), 2012=0% (11/11)

Positively affected by catch shares | **25.0%** | Rank 7 out of 12
2010 (expect to be affected)=0% (11/11), 2012=0% (12/12)

Negatively affected by catch shares | **66.7%** | Rank 3 out of 12
2010 (expect to be affected)=60.0% (2/13), 2012=100% (1/12)

Changed species caught post-catch shares | ***Cannot present due to confidentiality***

Agree that safety has improved as result of catch shares | ***Cannot present due to confidentiality***

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Across all three years, San Francisco Area participants reported low levels of support for catch shares (Box SFA-3). Reasons associated with this lack of support are evident in the themes identified through analysis of San Francisco Area interviews. Top code intersections (unique codes used in context with one another) for the San Francisco Area included observers and cost and, allocations of bycatch/choke species and loss of business and job opportunities.

The challenges of observer costs was a dominant theme discussed widely throughout the Community Performance, section 3.2 [3.2.2(f); 3.2.2(g) (4) (c); 3.2.2(g) (6); 3.2.2(h) (1) & 3.2.3(d)]. In the San Francisco Area, the intersection of these two themes occurred in eight of the nine interviews conducted in the 2015/2016 data collection. Local perceptions echoed the challenges others along the West Coast reported struggling with:

> *I know in our program here, we pay 100% of it, so it's, it's hard when the observer costs are more than your fuel costs are for the entire trip, I mean, uh…it's ridiculous and my guys are all small boats…* – Fisherman, San Francisco, 2015/2016

> *…having these people on the boat, they're expensive, one, making…costs me $500/day and that's more than the crew in some cases per day…* – QS Permit Owner, San Francisco, 2015/2016

This 2012 participant spoke about the gradual elimination of government subsidies used to offset the observer costs:

> *Some captains will complain about future costs. Right now it's just the cost of doing business, and if the observer does something, they don't seem to mind. But the eventual cost – we'll be costing them over $400 a day. Some deckhands don't get paid that much. That will eventually be a solid financial burden.* – Other Industry Participant, San Francisco, 2012

Allocations of bycatch or choke species changed the experience of groundfish fishing [section 3.2.2(h) Changes in Relationships]. Locally, the risk of catching these high-risk species have also contributed to heightened stress or anxiety, leaving some participants to wonder if it's worth the effort.

> *I don't have no problem to respect the limit, when I finish my limit that's fine. But if I got to go fishing, and you jeopardize, you're scared, when you put the net into the water, it's not worth the fishing. That's the only problem we got.* - Fisherman, San Francisco, 2015/2016

From both the shoreside buyer/processor and fishermen perspective, participants specifically attributed a general loss of business and loss of opportunity to catch shares:

> *…we're not really, really happy with the catch shares program. For us, it's been a pretty big reduction in particular local-caught rockfish and groundfish, and it's been a lot of money to a lot of people, and I think it's cost a lot of jobs on the coast for a lot of fishermen, and a lot of…and it's really hurting the people that are in our position as well.* - Buyer, San Francisco, 2015/2016

> *As a crew, I was on a good boat. It was a good year round boat. Stable job and it just wasn't for me after that. Like I was actually aspiring to take over that boat and run it. […] But once this came into effect – there's not a lot of young guys getting into fishing. That was a dream for me – to have a big boat that I could run year round. In this economy/job market, it was a big deal for someone my age to have that opportunity. And it just went out the window. […] I feel like I wasted that time in my life because it was something I was going for, and now it's just something I'm not interested in. Too many headaches, too many hassles, and really the payoff just isn't worth it.* - Fisherman, San Francisco, 2012

An interesting point of safety, identified by one participant, was a link between income, maintenance and safety of the vessel.

> *Every time I go in the shipyard you are looking about $75,000, $100,000, painting, uh, changing, working a little bit on the propeller, or doing a little bit of work on the engine. Tomorrow, I got a mechanic that's going to come, because of the propeller. They are going to charge me one arm and leg just to look at it, if there's nothing wrong. So that's part of the main things on the boat do you go fishing. Because every time I want to go fishing I want to be safe out there. My first priority on this boat is safety, for me and my crew. […] So to maintain safety, it cost a lot money. So when I go over there fishing if I don't catch, if don't bring fish in, I lose money, I go broke.*" Fisherman, San Francisco, 2015/2016

The participant attributes reduced income from groundfish fishing led to delaying regular maintenance, which in turn, placed the safety of the crew and the vessel at risk, also discussed in Section 3.1.3(d) Safety: Alternative measures of risk-taking and safety.

Additional Themes

There were two additional themes that were consistent across data collection efforts. In 2010, participants foresaw a potential for out of state vessels utilizing the adjacent fishing grounds – also discussed in

Section 3.2.2(g)(5) Interactions Between Trawl Communities and Others. By 2015/2016, participants reported Oregon vessels competing for black cod fishing grounds, stating:

> *…they flood the market, and it's just a bad thing all the way around, and it just consolidates all that effort into the hands of a few people instead of being spread out into the community.*" – Fisherman, San Francisco, 2015/2016

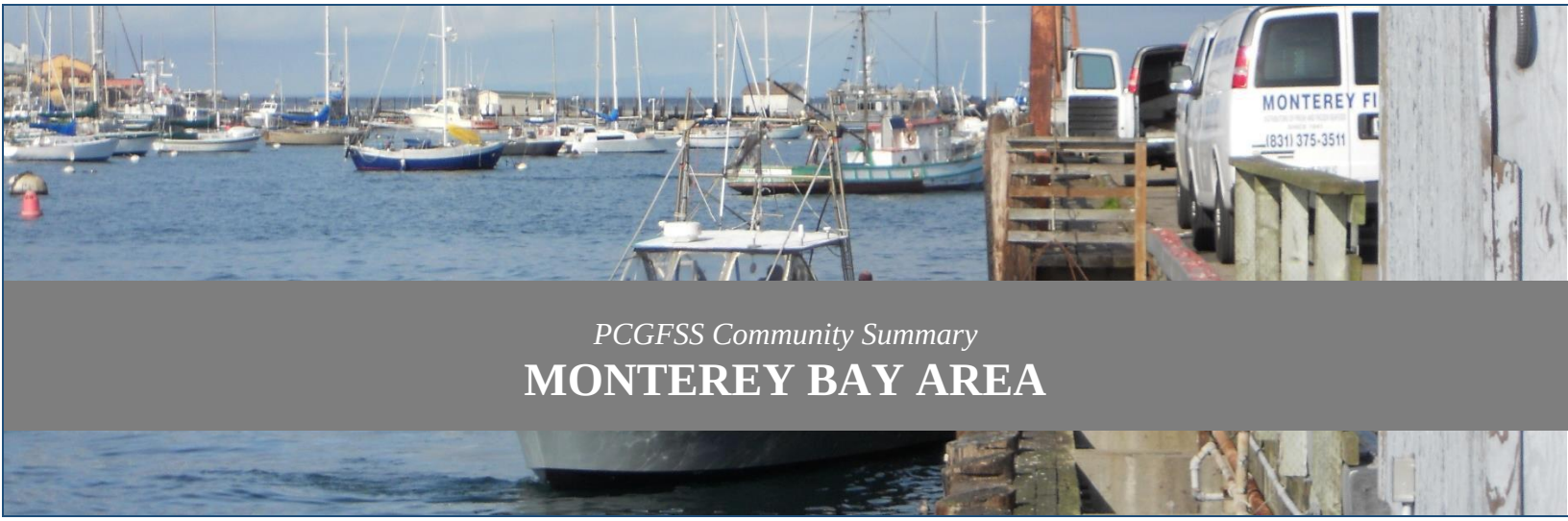
Related to reduced amounts of local trawl caught-groundfish, buyers and processors reported a need to supplement market demand with Canadian fish.

> *Canada's my partner in business. I don't want to show disrespect to Canada. But I sure wish we were augmenting what we do with some fish from CA trawlers. And I haven't bought one pound!* – Buyer, San Francisco, 2012

> *In terms of rockfish? Let's pass on that only because we're not purchasing anything locally. It's all Canada* – Buyer, San Francisco, 2015/2016

Summary

The San Francisco Area's groundfish participation is minimal. One trawl vessel remains in the area but no longer actively participates in the fishery. Other fixed gear types are more active, focusing primarily on black cod and other non-groundfish fisheries, like Dungeness crab. Most of San Francisco' vessels are small (< 50ft), independently owned vessels, which participants report have been disproportionately impacted by catch shares. Most San Francisco participants reported being negatively affected by the program, which included similar reasons identified by other communities; observer costs, bycatch allocations and general loss of business. Yet despite these challenges, some still plan to increase in groundfish fishing.



PCGFSS Community Summary

MONTEREY BAY AREA

This summary sheet provides a snapshot of the Monterey Bay Area community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Located along the central coast of California, approximately 345 miles north of Los Angeles and 113 miles south of San Francisco, the community of Monterey rests nestled in the southernmost crook of Monterey Bay. Monterey and the nearby community of Moss Landing - 18 miles to the north - encompass approximately 9 square miles of land and 3.5 square miles of water (Norman et al. 2007). According to the US Census Bureau Population Estimates Program, the population of Monterey Bay in 2015 is estimated to be 28,338—an almost 12% decrease from 1990. The median household income[22] (adjusted to 2015 dollars) is estimated to be $66,166 (US Census Bureau ACS 2015).

Originally home to the Ohlone/Costanoan Esselen tribe, Monterey served as the capitol of Alta (upper) California during Mexican rule and was the location of the signing of the California state constitution in 1849 (Norman et al. 2007). Monterey evolved into a successful fishing port, thanks in large part to the efforts of Chinese fishermen. The canning industry began in 1902 and expanded throughout World War I, driven by wartime demand for canned fish. During World War II, Monterey earned the moniker, "Sardine Capital of the World", because of the community's Cannery Row - where canneries were historically located - made even more famous by John Steinbeck's novel of the same name. Today, Monterey is home to the Monterey Bay Aquarium and a successful tourism industry centered around the area's commercial fishing heritage (Norman et al. 2007).

PCGFSS Participants

The goal of the PCGFSS Participants is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide information about who the participants within each year represent. In Section 3.2 Community

[22] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov.

Performance, the Monterey Area is defined as an aggregated community including Monterey, Moss Landing, Santa Cruz, and Watsonville. The majority of PCGFSS respondents in this area are associated with Monterey, while a small minority is associated with Moss Landing. When interpreting the results presented in this section, it is important to keep in mind that while there is some overlap in participants across years, not every survey year contains the same sample of individuals. Table MONT.BA-1. summarizes the percentage of respondents in the Monterey Bay Area who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table MONT.BA-1. Total number of participants, and percentage of return respondents in the Monterey Bay Area.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	36.4	47.1
% Return respondents from 2012	-	-	29.4
Number of participants	12	11	17

In comparison to other communities, the Monterey Bay area participants have been working longer in the PCGTF (except for 2012), derive less of their income from commercial fishing, and are somewhat younger, with just two generations involved in commercial fisheries (Box MONT.BA-1). One participant shared a memory of his first fishing trip;

> "*I had to wait until I was 7 to go fishing with my dad. Remember that day perfectly. He finally let me go and I grabbed my gear and it felt like it took forever to get to Point Sur. I started captaining at 16.*" - QS Permit Owner, Monterey Bay Area, 2012

BOX MONT.BA-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **52.9 years** | Rank 10 out of 13
2010=54.0 (5/13), 2012=52.3 (7/12)

Number of years working in commercial fishing | **31.3 years** | Rank 6 out of 13
2010=32.6 (3/12), 2012=24.5 (11/13)

Number of years working in the PCGTF | **27.3 years** | Rank 4 out of 13
2010=30.0 (3/13), 2012=19.4 (8/12)

Number of generations family has commercially fished | **2.2 generations** | Rank 8 out of 11
2010=3.5 (3/10), 2012=1.7 (10/12)

Percent income from commercial fishing | **60.4%** | Rank 12 out of 13
2010=80.9% (9/13), 2012=75.7% (10/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table MONT.BA-2 summarizes the roles that Monterey Bay participants hold within the industry. In comparison with other communities, Monterey Bay ranks in the bottom four in terms of the percentage of QS owners/co-owners and vessel owners/co-owners since 2012, a significant drop from 2010. Shoreside processing saw a similar reduction, yet buyers remained in the top three all three years

Table MONT.BA-2. Role of respondents within the Monterey Bay Area, presented as a percentage of the total number of participants within the community sample, and rank* from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner**	50.0	2/12	20.0	10/12	17.7	8/11
Absentee owner/co-owner	-	-	0	8/8	5.9	8/10
Vessel owner/co-owner	50.0	2/12	30.0	7/8	29.4	8/12
Captain/Crew	25.0	8/12	60.0	3/11	35.3	7/12
Shoreside Processor	41.7	2/9	0	10/10	5.9	8/11
Catcher-Processor/Mothership	0	2/2	0	3/3	0	2/2
Buyer (not processor)	8.3	2/5	10.0	3/6	29.4	1/6
Other***	16.7	5/9	30.0	5/12	35.3	5/13
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.
** 2010: refers to "permit owner"
*** Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Fishery Participation Levels

This section supplements the general community description by characterizing the community based on respondents' current and planned participation in various fisheries. Fisheries participation data presented here reflects the fisheries that PCGFSS respondents in Monterey Bay participate in, and does not account for where these participants may land their catch.

In all three study years fishermen[23] in the Monterey Bay area reported targeting sablefish (black cod) in addition to various other groundfish including Dover sole, chilipepper and thornyhead rockfish (Table MONT.BA-3). Fishermen also targeted non-groundfish and non-IFQ species such as California halibut, Dungeness crab and Pacific salmon. Only 35% of participants planned to increase groundfish activity in 2015/2016, a significant drop from the nearly 67% who planned an increase in 2012 (Box MONT. BA-2). Possibly, reflecting the reported 2015/2016 increase in absentee ownership from zero in 2012 to 5.9% (Table MONT.BA-2), some participants reluctantly decided to lease out their whole quota;

> "*Early on in the catch shares program, I leased some black cod in, but now I'm leasing it all out, and not fishing it.* […] *I do get some profit from leasing quota shares which I could not have done before, but that then means I'm not fishing, and fishing is what I want to be doing.*" – Fisherman, Monterey Bay Area, 2015/2016

There is some indication groundfish was relied upon to a higher degree than it may be now. A 2012 participant explained, "*Groundfish acts as a stabilizer – while salmon and sardines go up and down,*

[23] The survey item summarized in Table MONT.BA-2 only applies to fishermen, which were defined as captain, crew, and/or other roles directly related to the harvesting of fish.

groundfish has always been the bread and butter in this harbor." Yet by 2015/2016, groundfish fishing has changed somewhat, at least for one participant.

> "*I'm having such trouble making ends meet in groundfish that I've been leaving the wife and kids at home and going to up Astoria crabbing, up to San Francisco catching California halibut." –* Fisherman, Monterey Bay Area, 2015/2016

In terms of this, another participant describes what it takes to adapt to the challenges brought by policy and regulatory changes;

> "*Diversification is the key to success. I have to be flexible so that I can go wherever fish are and catch whatever is plentiful at any given time. But it's not a simple matter – in order to do that, I need to spend a lot of money on permits and gear and a lot of time, fishing in every season. This means I sacrifice a lot and spend a lot to even make a living.*" – Fisherman, Monterey Bay Area, 2012

Table MONT.BA-3. Top five groundfish and other species that Monterey Area fishermen commercially fished since catch shares was implemented (2010: commercially fished in the last 5 years).

2010	**%**	**2012**	**%**	**2015/2016**	**%**
Chilipepper	83.3	Sablefish	83.3	Sablefish	100.0
Sablefish	83.3	Dover Sole	83.3	Longspine Thorneyhead	83.3
Dover Sole	83.3	Chilipepper	66.7	Shortspine Thorneyhead	83.3
Petrale Sole	83.3	Longspine Thorneyhead	66.7	Dover Sole	66.7
Longspine Thorneyhead	66.7	Shortspine Thorneyhead	66.7	Longnose Skate	50.0
Shortspine Thorneyhead	66.7	English Sole	66.7		
Lingcod	66.7	Petrale Sole	66.7		
Dungeness Crab	16.7	Dungeness Crab	16.7	California Halibut	50.0
		Pacific Halibut	16.7	Dungeness Crab	33.3
		California Halibut	16.7	Pacific Salmon	33.3
		Pacific Salmon	16.7	Squid	16.7
		Herring	16.7		
		Mackerel	16.7		
		Tuna	16.7		
		Ridgeback Prawn	16.7		
		Squid	16.7		

BOX MONT.BA-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **35.3%** | Rank 4 out of 11
2012=66.7% (1/8)

Plan to decrease activity in PCGTF | **5.9%** | Rank 7 out of 9
2012=0% (3/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Infrastructure

The City of Monterey owns and maintains the wharf, hoist and warehouse building yet given the current level of trawl activity, they are unsure as to the direction of future waterfront investment

> *"Well the transition to catch shares has me and the city thinking very hard about what mix of tenants we should have in the wharf and harbor buildings, with groundfish being a big question mark. We have a catch 22 here, because the city wants to support the economy, and that means supporting the fishermen and the infrastructure they need to keep working, but the fishermen have to be landing enough so that there is demand for the infrastructure."* – Other Industry Participant, Monterey Bay Area, 2015/2016

Other discussion about infrastructure assessed the status of local, processing capacity stating, "*We don't have the infrastructure here to do processing, due to the gentrification of the harbor area – it has happened here and at lots of other harbors too*" (Buyer, CA, 2015/2016) similarly reported in Section 3.2.2(c) Changes in Infrastructure. However, the same participant reasoned better access to the fishery for smaller vessels could increase the demand for associated infrastructure,

> "*With smaller boats, we could support a strong infrastructure, including fuel dock, local markets and local restaurants. One boat bringing in big volume infrequently, or even frequently, does not work in Moss Landing.*" - Buyer, CA, 2015/2016

Employment Levels

This section summarizes community-level employment based on participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the community rated different components of job quality related to their role in the commercial fishing industry.

In the Monterey Bay Area, employment levels in the groundfish fishery have remained stable since 2010 while employment in other fisheries has increased (Table MONT.BA-4), possibly echoing the increase in non-groundfish fishing activity reported in the previous section. Participants also reported increased employment in non-fishing employment. This may be related to issues with job stability reported in Table X-4 and identified in participant interviews;

> "*I think I need to take a job this summer instead of fishing, just to get some bills paid.*" – Fisherman, Monterey Bay Area, 2015/2016

While job satisfaction remained somewhat high all three years of the study despite consistently ranking among the bottom three compared to other communities (Table MONT.BA-5), some participants' experiences ran contrary to the community trend.

> *"Stress kills the love of my job. My job satisfaction would be excellent if I did not have to work so hard to stay within the law."* – Fisherman, Monterey Bay Area, 2015/2016

Monterey Bay Area participants have reported issues with large, infrequent landings by large out-of-state vessels fishing offshore (discussed further in the Additional Themes section) challenging local buying or processing capacity. In that context one participant noted, "*We need a low volume steady stream, which could also be an economic opportunity for new entrants*" (Buyer, CA, 2015/2016). Based on this reasoning, a steady stream of low volume landings would provide sufficient stability to create more

employment opportunities for both fishing crew and the processing/buying workforce.

Table MONT.BA-4. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	%	Rank	%	Rank	%	Rank
Groundfish	75.0	9/9	80.0	5/11	76.5	7/12
Other fisheries	33.3	13/13	20.0	11/11	47.1	8/10
Non-fishing	33.3	4/11	20.0	7/11	52.9	1/12
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table MONT.BA-5. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.1	7/10	3.1	8/10	3.2	9/10
Compensation	2.1	11/12	2.0	11/11	2.1	12/12
Method of pay	2.6	11/12	2.4	9/9	2.8	12/12
Job stability	2.1	12/13	2.2	9/9	2.4	10/10
Standard of living	2.5	8/8	2.3	10/10	2.7	9/9
Relationships	3.3	7/9	3.7	1/12	3.7	2/11
Not applicable	0		0		13.3	
Prefer not to answer	0		0		0	
Response rate	100		100		93.8	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares. While, the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

Support for catch shares is extremely low among Monterey Bay Area participants, ranking consistently within the bottom two all three years compared to other communities. This level of support is possibly reflected by the 60.0% who reported being negatively affected by the program in 2012 and 2015/2016, respectively (Box MONT.BA-3).

As reported on extensively in Section 3.2 Community Performance [3.2.2(f); 3.2.2(g) (4) (c); 3.2.2(g) (6); 3.2.2(h) (1) & 3.2.3(d)], program-related costs, observer costs especially, and their availability have become a significant financial challenge for many participants along the West Coast. For Monterey Bay

Area participants these costs have affected the ability to go fishing, to respond to local market demands and for some expenditures have become unsustainable.

> *"We absolutely want to get along with the department, but it is not easy, with mounting costs and lack of availability. All we want to do is be able to go fishing"* – Fisherman, Monterey Bay Area, 2015/2016

> *"There have been times when the market says: bring us x amount of fish on Monday. They tend to like landing on a Monday. However, I can't get an observer until Sunday. So, 12 hours out plus 12 hours back, I can only fish 1 day. I can't even fill a semi with that, and what I do catch is definitely not enough to pay expenses, as they are now. You end up stuck in the hole. I can't afford the observer fees, and I don't want to be the guy everyone points at and says, 'he doesn't pay his bill!'"* – Fisherman, Monterey Bay Area, 2015/2016

> *"I just ran my first trip in groundfish under catch shares, and I got taken to the cleaners on my quota bill, and I'm not happy about that. This seems to me to be an unfair application of the rules. Between observer costs, fuel, bait, and buyback, my guys are not getting a paycheck on this trip. That is what I call not sustainable."* – Fisherman, Monterey Bay Area, 2015/2016

BOX MONT.BA-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **6.7%** | Rank 10 out of 10
2010=9.1% (10/11), 2012=33.3% (8/11)

Positively affected by catch shares | **0%** | Rank 12 out of 12
2010 (expect to be affected)=9.1% (8/11), 2012=11.1% (10/12)

Negatively affected by catch shares | **60.0%** | Rank 4 out of 11
2010 (expect to be affected)=36.4% (8/13), 2012=66.7% (3/12)

Changed species caught post-catch shares | **33.3%** | Rank 6 out of 8
2010 (change in last 5 years)=42.9% (1/8), 2012=16.7% (8/10)

Agree that safety has improved as result of catch shares | **0%** | Rank 8 out of 8

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Issues of safety and how it has changed since the implementation of catch shares is detailed in Section 3.1.3(d) Safety. Locally, Monterey Bay Area participants did not attribute any improvements in safety to the IFQ program (Box X-2). Participants felt safety was hindered by sparse observer availability during good weather giving them little choice but to fish marginal weather. Also identified in Section 3.1.3 Safety, other participants linked income, deferred vessel maintenance and safety;

> *"If a guy can't afford to take a boat to the shipyard, he's going to defer maintenance, and that increases the danger to the crew and to everybody. All those little things you would find if you had the boat in the shipyard for regular maintenance don't get found if you defer the maintenance."* – Fisherman, Monterey Bay Area, 2015/2016

Additional Themes

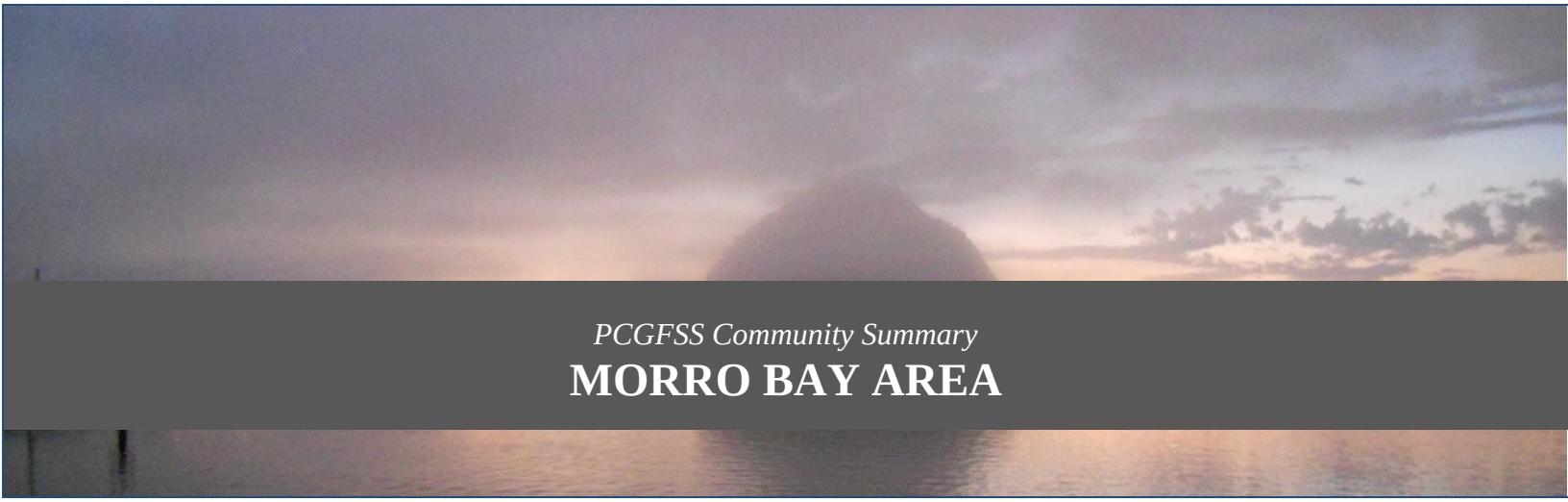
An additional theme was prevalent in this area concerning the impacts large, out-of-state vessels have on the fleet of the smaller resident boats, a topic also discussed in Section 3.2.2(g) (5) Interactions between Trawl Communities and Others. As briefly noted earlier, the volume caught by these large vessels is beyond the community's processing or buying capacity.

> *"We really need to give the small guys more access. What is happening in the larger trawl fleet – the bigger boats – overshadows the needs of our small boats. We need more opportunities to fish the resource sustainable and more connection to the resource for the consumer. We need volumes that match our supply and our demand. For example, if a trawler catches 30,000 pounds of fish, our community can't take it, so it goes elsewhere."* – Buyer, CA, 2015/2016

This "overshadowing" of the small vessels and related discussion about the opportunities a well-supported small boat fleet could bring speaks to how this community and its fishery developed over time. Because of a traditional reliance on smaller vessels and the catch volumes they provided, they are not set up for the larger catches of today.

Summary

The Monterey Bay Area exhibits similar challenges as other central California fishing communities including issues related to observer availability and cost, shifts in employment trends and the burdens of small vessels. However, addressing the issues identified both locally and reported on in Section 3.2.3(d)) Small Vessels it may be possible for these small vessel fishing communities to achieve stability and become more sustainable.



PCGFSS Community Summary

MORRO BAY AREA

This summary sheet provides a snapshot of the Morro Bay Area community based on data from the PCGFSS. This information should be used to gain a better understanding of the individuals in this community that participated in the PCGFSS (primarily individuals involved in the groundfish trawl fishery in some capacity), and how these individuals may have been impacted by the implementation of catch shares. Where applicable a "rank" (highest to lowest for a given year and survey item) is presented to allow for easy comparison across communities.

Located along the California coast in San Luis Obispo County, the community of Morro Bay is situated equidistance between Los Angeles and San Francisco. Morro Bay encompasses 5.2 square miles of land and 5 square miles of water (Norman et al. 2007). Coastal Chumash Indians originally settled in the area and utilized marine, coastal and river resources for subsistence. Taking its name from the extinct volcano, Morro Rock – dubbed the Gibraltar of the Pacific -Morro Bay was utilized as a safe harbor by 18th century Spanish galleons. The town of Morro Bay was founded in 1870 where the main wharf was built and is still known today as the "Embarcadero". By the 1930's the wharf became a bustling area of commerce for commercial fishermen landing albacore, tuna and cod (Norman et al. 2007). In the 1940s Morro Bay's wharf became an operations site for the U.S. Naval during World War II, falling into disrepair soon after the end of the war. Despite a rise and fall of various fisheries, Morro Bay remains a significant fishing port for halibut, rockfish, sole, and other species. The community now combines commercial fishing with a growing coastal tourism industry (Norman et al. 2007).

According to the US Census Bureau Population Estimates Program, the population of Morro Bay in 2015 is estimated to be 10,639—a 10% increase from 1990. The median household income[24] (adjusted to 2015 dollars) is estimated to be $51,338 (US Census Bureau ACS 2015). Home to 4 of California's 127 marine protection areas, Morro Bay is known for its locally caught seafood (Morro Bay Chamber of Commerce, 2017).

PCGFSS Participants

The goal of the PCGFSS Participants section is to describe the community based on some of the general characteristics that participants reported in the PCGFSS. These general characteristics provide

[24] US. Census data reported for median income is supported by the American Community Survey (ACS) and available on the U.S. Census website www.census.gov.

information about who the participants within each year represent. In Section 3.2 Community Performance, the Morro Bay Area is defined as an aggregation of communities including Morro Bay, Avila, and San Luis Obispo. While all PCGFSS respondents in the Morro Bay Area are connected to the groundfish fishery in Morro Bay, they may reside in locations near but outside of Morro Bay. When interpreting the results presented in this section, it is important to keep in mind that while there is some overlap in participants across years, not every survey year contains the same sample of individuals. Table MOR.BA-1. summarizes the percentage of respondents in the Morro Bay Area who were the same between years, and is meant to aid in the interpretation of the results presented here.

Table MOR.BA-1. Total number of participants, and percentage of return respondents in the Morro Bay Area.

	2010	**2012**	**2015/2016**
% Return respondents from 2010	-	38.9	38.9
% Return respondents from 2012	-	-	66.7
Number of participants	10	18	18

In comparison to other communities, Morro Bay Area participants are of a comparable age, have worked in the PCGTF for fewer years, and derive less of their income from commercial fishing (Box MOR.BA-1). Table MOR.BA-2 summarizes the roles that Morro Bay participants hold within the industry. In comparison with other communities, the Morro Bay Area ranks lower in terms of the percentage of QS owners/co-owners (except in 2015/2016), vessel owners/co-owners (except in 2012) and captain/crew members represented. In all three years, Morro Bay ranks in the top four in terms of the percentage of shoreside processors represented.

BOX MOR.BA-1. The following demographics and family history characteristics are presented as averages, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2010 and 2012 below).

2015/2016

Age | **55.2 years** | Rank 7 out of 13
2010=51.9 (6/13), 2012=50.2 (8/12)

Number of years working in commercial fishing | **28.5 years** | Rank 12 out of 13
2010=18.6 (12/12), 2012=23.8 (12/13)

Number of years working in the PCGTF | **23.2 years** | Rank 7 out of 13
2010=15.7 (13/13), 2012=16.9 (9/12)

Number of generations family has commercially fished | **1.3 generations** | Rank 11 out of 11
2010=2.0 (10/10), 2012=1.4 (11/12)

Percent income from commercial fishing | **54.4%** | Rank 13 out of 13
2010=68.2% (12/13), 2012=57.8% (12/12)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table MOR.BA-2. Role of respondents within the Morro Bay Area, presented as a percentage of the total number of participants within the community sample, and rank* from highest to lowest in comparison with other communities. Multiple response item: respondents could fall in more than one role category.

	2010		2012		2015/2016	
Role Category	%	Rank	%	Rank	%	Rank
QS owner/co-owner**	10.0	11/12	0	12/12	27.8	6/11
Absentee owner/co-owner	-	-	0	8/8	16.7	5/10
Vessel owner/co-owner	10.0	11/12	33.3	5/8	16.7	11/12
Captain/Crew	10.0	12/12	33.3	8/11	27.8	11/12
Shoreside Processor	50.0	1/9	16.7	4/10	22.2	1/11
Catcher-Processor/Mothership	0	2/2	0	3/3	0	2/2
Buyer (not processor)	0	5/5	11.1	2/6	0	6/6
Other***	40.0	2/9	50.0	1/12	44.4	3/13
Not applicable	0		5.6		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

** 2010: refers to "permit owner"

*** Other represents the percentage of respondents that do not fall in any of the other role categories, and encompasses: Risk pool manager, QS/QP manager, Observer, Industry supplier, Fisherman's wife.

Fishery Participation Levels

Black cod is the focus of Morro Bay's groundfish fishery. Fixed gear and longlining are the preferred gear types among the area's IFQ, open access and Limit-A permitted vessels. With the significant reduction of trawl vessels after The Nature Conservancy (TNC) sponsored 2006 buyback, trawl plays a minimal role in the community[25]. According to participants, soon after the buyback, fixed gear filled the space left by the trawlers, which essentially, created a one species groundfish fishery.

> *"There are lots of people fishing black cod here, but leaving everything else behind. We need to examine what is NOT getting caught.*" Processor, CA, 2015/2016

Despite the potential, unintended impacts from a narrowly focused fishery, 2010 participants felt black cod had saved Morro Bay.

> *"Since TNC bought the permits, Morro Bay is like a ghost town. There might be 1 boat coming in every 2 to 3 days. Black Cod has been saving Morro Bay this last 2 years, because of its abundance. If that gets knocked [disappears], Morro Bay is dead."* – Fisherman, Morro Bay Area, 2010

While the black cod fishery may have provided enough support for its participants, one processor laments about the limited range of groundfish caught locally;

> *"I wish I had access to more groundfish. With the dearth of landings in Morro Bay, I'm rekindling relationships with Oregon suppliers to get groundfish. It's sad to see that less local product goes to the local consumer.*" – Processor, CA, 2015/2016

[25] Due to confidentiality concerns, the exact number of trawlers is withheld.

A more detailed reporting and discussion of fixed gear under catch shares can be found in Section 3.2.2(g)(4)(a) Gear Switching.

Overall, only a small percentage of 2015/2016 participants plan to increase their groundfish-related activity, whereas nearly 60% of participants in 2012 planned to increase their activity (Box MOR.BA-2).

BOX MOR.BA-2. The following fishery participation characteristics are presented as percentages of the total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for the **2015/2016** survey (2012 below).

2015/2016

Plan to increase activity in PCGTF | **25.0%** | Rank 8 out of 11
2012=58.8% (2/8)

Plan to decrease activity in PCGTF | **6.3%** | Rank 6 out of 9
2012=5.9% (2/3)

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Infrastructure

Infrastructure was not a frequently discussed theme in the Morro Bay Area. A 2015/2016 participant, however, did note the cumulative effects of fisheries management and conservation efforts on the community's infrastructure;

> *"We had a federal buyback here, and then we had the Nature Conservancy buyback, so we're down to exactly 1 trawler in this harbor. Lines and pots don't wear out the gear the way trawling does, so trawl used most of the fuel, most of the services, and brought most of the fish into this harbor. We used to have 4 or 5 processing plants here – no more. This used to be a big dragger town. Along with the buybacks, the Rockfish Conservation Area and rebuilding programs affected us – the boats started dropping out then. There's no full time diesel mechanic in this town anymore, now that I'm retired. There is one guy who works on party boats, and he can do a bit. There is another guy who works on yachts, he does a bit. But there is nobody supporting the fishing boats. It's sad but it's true."* – Other Industry Participant, Morro Bay, 2015/2016

The link between the federal and TNC buybacks, and a loss of infrastructure was a reoccurring theme identified across California fishing communities.. This is discussed in detail in Section 3.2.2(c) Changes in Infrastructure. Despite regional losses of infrastructure, locally, there are potential infrastructure improvements in the works;

> *"We sure could use a boat yard here. It's estimated it would cost about $6 million to set up a boatyard. The windmill people who are trying to set up a wind farm out here, that's one of the possible deals – they can put up windmills if they give the harbor $6 million for a boatyard."* – Fisherman, Morro Bay, 2015/2016

Employment Levels

This section summarizes community-level employment based on participants' reported employment (including any combination of full-time, part-time, seasonal, and/or self-employment) in the groundfish fishery, other fisheries, or non-fishing industries. Additionally, we summarize how respondents within the

community rated different components of job quality related to their role in the commercial fishing industry.

In 2012 a participant reflected on catch shares and the role of fisheries as an employer in the community;

> *"So far Morro Bay has not been hurt by catch shares; it possibly has helped the harbor. […] However, catch shares are generally nice for the guys who get a large quota allocation, but not for anyone else. The whole program is geared to put the small guy under. Even in a small community, fisheries are a big employer, and in some cases the backbone of the community. That means the damage is done not to the fishing industry but to the community as a whole."* – Fisherman, Morro Bay, 2012

One area where catch shares has possibly helped the harbor is job stability, which participants reported steady increases in since 2010 (Table MOR.BA-4), yet Morro Bay still ranks in the bottom three compared to other communities. Additionally, Morro Bay ranks higher in 2012 and 2015/2016 than in 2010 for job satisfaction and standard of living. However, in comparison with other communities, Morro Bay consistently ranks in the bottom two in terms of compensation. Participants report that small operations are disproportionately affected by catch shares. As Morro Bay is primarily composed of small businesses, this may correspond to an apparent decline in groundfish and other fisheries employment (Table MOR.BA-3). Possibly reflecting general decreases in employment, one fixed gear fisherman discussed the challenges of keeping a regular crew;

> *"We might be able to give a guy 24 to 30 hours of work in one outing, and none of the crew want to do baiting, which would probably double their income. So, work is sporadic, and each guy probably stays 6 to 9 months before they need to move on. If I had more permits, it would be easier to keep a guy full time. As it is, a guy could make $20,000 for 24 hours a week landscaping, so why would he want to be out here doing the hard work?"* – Fisherman (Non-IFQ Fixed Gear), Morro Bay, 2015/2016

Table MOR-BA-3. Community-level employment (includes any combination of full-time, part-time, seasonal and/or self-employment), in percentages of total respondents within community sample, and rank* from highest to lowest in comparison with other communities.

	2010		**2012**		**2015/2016**	
	%	Rank	%	Rank	%	Rank
Groundfish	80.0	7/9	77.8	6/11	50.0	12/12
Other fisheries	90.0	2/13	55.6	8/11	44.4	9/10
Non-fishing	50.0	1/11	44.4	2/11	38.9	3/12
Not applicable	0		0		0	
Prefer not to answer	0		0		0	
Response rate	100		100		100	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Table MOR.BA-4. Respondents' rated the following items related to their role in the commercial fishing industry on a Likert-scale Poor (1)-Excellent (4). Presented as community-level mean, and rank* from highest to lowest in comparison with other communities.

	2010		2012		2015/2016	
	Mean	Rank	Mean	Rank	Mean	Rank
Job satisfaction	3.0	9/10	3.3	4/10	3.4	3/10
Compensation	2.0	12/12	2.2	10/11	2.6	11/12
Method of pay	2.6	10/12	2.8	8/9	3.1	10/12
Job stability	1.9	13/13	2.3	8/9	2.8	7/10
Standard of living	2.6	7/8	3.0	6/10	3.2	5/9
Relationships	3.3	8/9	3.3	9/12	3.6	5/11
Not applicable	0		5.9		7.7	
Prefer not to answer	0		0		0	
Response rate	80.0		100		72.2	

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Catch Shares Characteristics

The goal of the catch shares characteristics section is to describe the community based on participants' reported perspectives about catch shares (Box MOR.BA-3). While, the previous sections provide information related to how the community may have been impacted by catch shares, this section responds directly to catch shares impacts by summarizing participants' perspectives on how they have been personally affected by catch shares.

Support for catch shares among the Morro Bay Area participants is mixed, evident from their rating of the program and how it has affected them (Box MOR.BA-3). In 2010, participants did not discuss catch shares in-depth because people felt that after the buybacks there was little left to affect the community. However, those who did speak about the program expressed concerns about the costs and consolidation, and feared regulations would put people out of business.

BOX MOR.BA-3. The following characteristics related to catch shares impacts are presented as percentages of total respondents within the community sample, followed by the community rank* from highest to lowest in comparison with other communities for **2015/2016** survey (2010 and 2012 below).

2015/2016

Support for the catch shares program | **50.0%** | Rank 7 out of 10
2010=12.5% (8/11), 2012=47.1% (7/11)

Positively affected by catch shares | **25.0%** | Rank 7 out of 12
2010 (expect to be affected)=0% (11/11), 2012=23.5% (6/12)

Negatively affected by catch shares | **31.3%** | Rank 6 out of 12
2010 (expect to be affected)=30.0% (10/13), 2012=23.5% (11/12)

Changed species caught post-catch shares | ***Cannot present due to confidentiality***

Agree that safety has improved as result of catch shares | ***Cannot present due to confidentiality***

*Communities with equal values are given the same rank. Communities where n<5 are removed for confidentiality.

Participants spoke directly to local experiences associated with the cost of observers, views similar to those issues identified coast wide that were reported on extensively throughout Section 3.2 Community Performance (3.2.2(f); 3.2.2(g)(4)(c); 3.2.2(g)(6); 3.2.2(h)(1) & 3.2.3(d)). These reported observer costs had become a significant challenge that extended beyond the direct effects on individual vessel operations.

> *"I have quota I wanted my son to be able to fish, but he can't afford the observer costs any more than I can. So what did he have to do? He had to lease out the quota, which just compounds the problem – now you've got boats stacking quota on, going from Oregon down to Morro Bay, and sweeping up all the fish, putting the little boats that still exist at an even greater disadvantage*." – Fisherman, Morro Bay, 2015/2016

> *"…observer costs make it impossible for local guys to get into the fishery, so the community quota fund has to lease to someone else, so they lease to northern boats, who come down here with truckloads of pots and compete with our local longline fishermen."* – Fisherman, Morro Bay, 2015/2016

> *"The big problem for the Community Quota Fund in Morro Bay is that people can't get observers, and observers cost so much. If we could solve that, we could probably get guys to lease that quota, and have it landed here."* – Other Industry Participant, Morro Bay, 2015/2016

As with other aspects of catch shares, observations of safety in the fishery are mixed. Participants reported both reductions associated with derelict gear and improvements in safety attributed to Coast Guard requirements. For instance, two fixed gear fishermen describe these safety concerns as follows:

> *"So now we have a 35' boat, which could sensibly go 15 miles offshore, going out 40 or 50 miles to avoid the ghost gear, and one of the effects of catch shares here has been to make the job more dangerous than it was – to impact fishermen's safety negatively.*" – Fisherman (Non-IFQ Fixed Gear), Morro Bay, 2015/2016

> "*Safety is always improving, but it's not due to catch shares, it's because the Coast Guard are religious about inspections, and they'll call you when you are due.*" – Fisherman (Non-IFQ Fixed Gear), Morro Bay, 2015/2016

A full reporting on the topic of safety under since catch shares implementation is located in Section 3.1.3(d) Safety.

Additional Themes

In 2012, participants reported that the city of Morro Bay and The Nature Conservancy were working to form a quota pool. By 2015, the Morro Bay Quota Fund and Central Coast Groundfish Project Association were in place. The quota fund has bought quota shares from TNC, anchoring quota to the community; however, due to quota ownership caps the community has reached its limit.

Participants felt the Rockfish Conservation Areas (RCAs) should be opened for small vessels, partly for safety reasons, not having to travel farther into rougher water to fish. The RCAs encompass many of the traditional fishing grounds where small vessels used to fish.

Another prevalent theme for this community was the conflict between local California boats and the larger, Oregon-based vessels fishing black cod (Section 3.2.2(g)(5). Interactions Between Trawl Communities and Others). The issues ranged from the local economy to safety problems from discarded gear to perceived overuse of local resources.

> *"There are some big boats from Oregon that are coming down here and catching lots of black cod, but of course the revenue all goes back to Oregon – it's not helping the economy in Morro Bay at all."* – Processor, CA, 2015/2016

> *"We have these big boats coming down from Oregon or Washington state, picking up all the black cod because they bought the quota to do that, and other than the dock that unloads their product, the money all leaves the area.*" – Buyer, Morro Bay, 2015/2016

> *"When we find a big spot of black cod and start to fish them (we use horizontal benthic long line), the big boats from Oregon and Washington come and put hundreds of traps all over, then we can't fish there at all. The longline gear and trap gear confound each other, and also if they lose traps, that screws up our gear, so it costs us thousands to fix our gear, we lose that trip, and additional cost to go find other grounds"*– Fisherman (Fixed Gear), Morro Bay, 2015/2016

> *"I did support catch shares when they first came in, because of the TNC system and what we were trying to do – to make a small central coast fishery. But then the big pot boats come down and catch 150,000 pounds of black cod in a couple months and they're gone. That seriously affects the A permit guys, so it's not working for a lot of guys the way things are now."* – Fisherman (Fixed Gear), Morro Bay, 2015/2016

> *"And their gear is different. They use 1" – 1.5" line or maybe even 1.75" groundline to the pots. They've got bigger escape rings on the pots than the local guys have, so they get bigger fish. When I was in that fishery, I would set 4 tubs with 300 hooks each. These guys are setting 30 tubs with 300 hooks each, so the black cod is getting fished much too heavily.*" – Fisherman, Morro Bay, 2015/2016

Additionally, participants discussed the large vessels' impact on local supplies and influence with

observer availability;

> *"It's also made a difference because the big Oregon boats come here and use up resources. If a big boat takes 5,000 gallons of fuel, a little guy can't get 100 gallons and has to wait for a truck. Big Oregon boats used to take all the bait – but now they're bringing their own."* – Fisherman, Morro Bay, 2015/2016

> *"I had a Morro Bay guy as observer on my vessel, and Alaskan Observers took him off my boat and put him on to an Oregon boat that was landing in Morro Bay. That did not seem fair. From the observer company's point of view, the observer was probably getting more work, so he got more money and Alaskan Observers got more money, but that meant that the Morro Bay boats were hindered.*" – Fisherman (Fixed Gear), Morro Bay, 2015/2016

Summary

The Morro Bay Area is unique for its reliance on black cod, a fishery that participants feel has kept the community alive and productive despite local changes that came after two vessel buybacks, the formation of RCAs, and implementation of the catch shares IFQ. The abundance of local black cod and the flexibility offered by gear switching, however, has also attracted out-of-state vessels that compete for resources with the smaller boats of resident fleet. These issues, along with those associated with observercosts, will continue to present challenges going forward. Efforts by the Morro Bay Quota Fund to obtain and anchor quota shares locally may bring more opportunity to the community.

References

Bay Area Chamber of Commerce. 2016. Bay Area Info: Economy. Retrieved from: http://coosbaynorthbendcharlestonchamber.com/bay-area-info/business-info/economy/. Accessed 02 May 2017.

Bellingham/Whatcom Chamber of Commerce, 2016. Business & Industry. Retrieved from: https://bellingham.com/business-industry/. Accessed 10 May 2017.

City of Brookings History & Demographics 2017. http://www.brookings.or.us/index.aspx?nid=89, Accessed 10 July 2017.

Half Moon Bay Coastside Chamber of Commerce and Visitors' Bureau. 2016. About the Coast. Retrieved from: http://www.halfmoonbaychamber.org/living-coast/about-coast. Accessed 25 April 2017.

Morro Bay Chamber of Commerce. 2017. About the Area. Retrieved from: http://morrochamber.org/page/about_the_area

Newport Chamber of Commerce. 2016. Newport: A City Rich in History. Retrieved from: http://newportchamber.org/area-info. Accessed 24 April 2017.

Norman, K., J. Sepez, H. Lazrus, N. Milne, C. Package, S. Russell, K. Grant, R.P. Lewis, J. Primo, E. Springer, M. Styles, B. Tilt, and I. Vaccaro. 2007. Community Profiles for West Coast and North Pacific Fisheries: Washington, Oregon, California, and other US States. US Dept. of Commerce, NOAA Technical Memorandum NMFS-NWFSC-85. 602 p.

nwcruising.net, year unknown. Cruising Distances in the Pacific Northwest From/To Bellingham, WA, NOAA Chart 18424. Retrieved from: http://nwcruising.net/nm_folders/bellingham.html.

Russell, S., K. Sparks, A. Arias-Arthur, and A. Varney. 2014. The Pacific Groundfish Fishery Social Study: An Initial Theme Report. NOAA Fisheries, Northwest Fisheries Science Center, and Pacific States Marine Fisheries Commission.

Seattle Municipal Archives, 1995. Brief History of Seattle. Retrieved from: https://www.seattle.gov/cityarchives/seattle-facts/brief-history-of-seattle. Accessed 10 May 2017.

Sterling's Best Places. 2017. Astoria, Oregon. Retrieved from: http://www.bestplaces.net/economy/city/oregon/astoria. Accessed 3 May 2017.

US Census Bureau. 2015. American Community Survey 5-Year Estimates (2011-2015). Retrieved from:https://www.census.gov/quickfacts. Accessed 10 May 2017.

US Census Bureau. 2015. Population Estimates Program. Retrieved from: https://www.census.gov/quickfacts. Accessed 10 May 2017.

US Census Bureau. 1990. Population Estimates Program. Retrieved from: https://www2.census.gov/programs-surveys/popest/tables/1990-2000/2000-subcounties-evaluation-estimates/sc2000f_wa.txt. Accessed 10 May 2017.

Photo Credit: PCGFSS