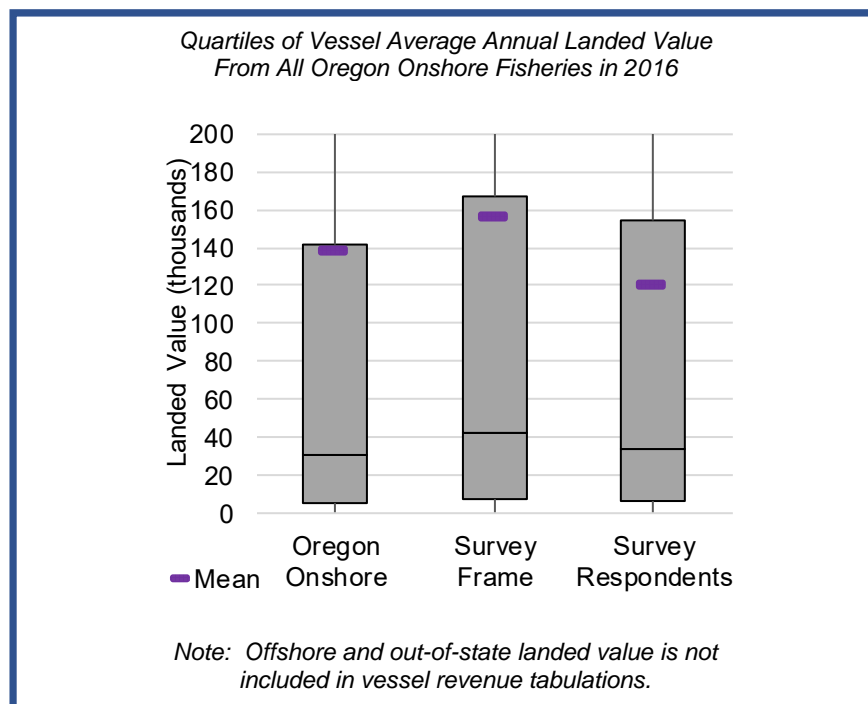


Oregon Nearshore Fisheries Effort Shift Survey Commercial Fisheries Representativeness Report



**Marine Resources Program
Oregon Department of Fish and Wildlife**

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The Research Group, LLC. Oregon Nearshore Fisheries Effort Shift Survey Commercial Fisheries Representativeness Report. Prepared for Marine Resources Program, Oregon Department of Fish and Wildlife. November 2018.

Oregon Nearshore Fisheries Effort Shift Survey Commercial Fisheries Representativeness Report

Version 4.0

prepared by

The Research Group, LLC
Corvallis, Oregon

prepared for

Marine Resources Program
Oregon Department of Fish and Wildlife

November 2018

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Preface

This analysis project was sponsored by the Oregon Department of Fish and Wildlife (ODFW) Marine Resources Program. The analysis was to find the degree of representativeness for respondents to a survey project being undertaken by the Department of Environmental Science and Management, Portland State University (PSU). This analysis project is one of many human dimension investigative studies being used to support ODFW's responsibilities to establish, monitor, and evaluate Oregon's marine reserve (MR) system.

The analysis uses Year 2016 data for the test of representativeness despite the survey administration taking place late in 2017. The reference to 2016 survey project population characteristics probably introduces some analysis distortion since respondents would have been thinking about their situation in 2017. The Pacific States Marine Fisheries Commission was not able to provide Year 2017 data in-time for the analysis.

Two cautions are offered for the report reader. First, the three permit types (Dungeness crab, salmon troll, and nearshore groundfish) chosen for the survey project frame authorize permit owners to utilize fishing grounds beyond *nearshore waters*. Commercial fisheries in nearshore waters are generally described for taking place within the Oregon Territorial Sea and adjacent bays. The report has explanations for the estimated portion of the survey frame permit owner harvests that occur in nearshore waters. Second, the survey project frame's permit type to cover participants in the nearshore groundfish fishery is the Oregon Nearshore Fishery Permit. This permit type allows harvesting for certain groundfish species that are jointly federal and State managed. These permitted vessels also harvest species that are only federal managed. And there are vessels with federal permits that are authorized to harvest the non-State managed nearshore groundfish. The report narrative and notes on tables and figures define which nearshore groundfish species are being included for comparisons and contrasts.

This analysis project was completed by The Research Group, LLC Corvallis, Oregon. Shannon Davis was the lead author and was greatly assisted by Kari Olsen. Hans Radtke, Ph.D. needs to be recognized for his valuable input. Bryn Hudson, Master of Science Candidate, PSU has been outstanding for communicating about all matters dealing with the survey project. Brett Rodomsky, Troy Buell, and Justin Ainsworth from the ODFW Marine Resources Program (MRP) were very helpful for interpreting nearshore fisheries management and providing fisheries data. Ellen Veile-Smuts, ODFW MRP Office Manager, was tireless in first putting together the survey frame list and then assisting with adding vessel identification numbers to the list. Tommy Swearingen, ODFW Human Dimensions MR Project Leader and Cristen Don, ODFW MR Program Leader are thanked for their untiring interest and skilled guidance in getting the survey project underway and shepherding results analysis.

The analysis project authors and not the sponsors were responsible for generating project results. The authors do not make any warranties with respect to the project including fitness for any particular purpose. In no event shall the authors assume any liability for use of the program or derived information and shall not be responsible for any direct, indirect, or consequential damages that might arise from the application.

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Glossary

Acronyms

ACS	U.S. Census Bureau, American Community Survey
CASRO	Council of American Survey Research Organizations
GDP	Gross Domestic Product
MR's	Oregon marine reserve system sites
ODFW	Oregon Department of Fish and Wildlife
OPAC	Oregon Ocean Policy Advisory Council
PacFIN	Pacific Coast Fisheries Information Network
PSU	Portland State University
TRG	The Research Group, LLC
TS	Oregon Territorial Sea
USPS	U.S. Postal Service

Terms

Distant water fisheries	The distant water fisheries are the West Coast offshore fishery, Alaska fisheries, western Pacific highly migratory species fishery, fisheries in Washington and California, and elsewhere. Revenue generated from vessel deliveries in Oregon is referenced in this report as "onshore." Revenue returned to Oregon in the form of wages and salaries or profits and revenue derived from expenditures made in Oregon for repairs, provisioning, or moorage is referenced in this report as distant water fisheries revenue. For example, the revenue generated from the at-sea deliveries for the Pacific whiting fishery is categorized as distant water fishery revenue. Another example is Oregon residents own harvesting permits in Alaska, but keep vessels year around at Alaska ports. Sometimes owners will lease permits for others to harvest the permit quota shares.
Dollar adjustments	Where dollar values are noted to be real, the adjustment index was the GDP implicit price deflator developed by the U.S. Bureau of Economic Analysis.
Economic contribution	<p>An economic contribution metric relates to a short-term perspective for how an industry is represented in the local economy. If there is a change in the economy's industry activity, there may very well be adjustments in the longer term that may cause increased economic contributions. For example, a tourism business start-up may replace a fishing industry business closure.</p> <p>The economic contribution measurement selected for this study is income. It could just as well have been other metrics that would describe the same economic direct and secondary effects, but in a different dimension. Other example metrics are business output (analogous but different than sales), value added, and jobs.</p>

Income	Income accrues to households in the form of net earnings from wages, salaries, proprietorship income, etc. For example, it can include the contract payments based on share of catch value that is paid to a commercial fishing vessel crewman/skipper and the net income after operating and fixed expenses for the vessel owner. Total household personal income would include other sources such as transfer payments (e.g. social security, unemployment insurance, etc.) and investments (e.g. rental income, dividends, interest, etc.).
Marine reserve system	Ocean areas within the Territorial Sea set aside for research and management effectiveness monitoring. Oregon's five legislatively recognized areas have unique management specifications for non-take zones (referred to as marine reserve area) and selective take zones (referred to as marine protected area).
Nearshore area	The part of the continental shelf closest to shoreline and includes an intertidal zone. The intertidal zone extreme is the high tide splash zone and includes lower bay saline dominated estuarine waters. Some nearshore fisheries have management specifications using depth restrictions. Management depth closures can vary during the year.
Nearshore species	The fisheries chosen for the survey population are Dungeness crab, salmon troll, and nearshore groundfish. Nearshore groundfish species include selections of rockfish, roundfish, and flatfish. An estimate of the nearshore harvested portion of lingcod is included. The landings for lingcod were determined using species and gear filter queries to include open access landings with longline, other hook and line, or pot gear; and limited entry landings with longline, other hook and line, or selective FF trawl (small footrope) if it was on the same fish ticket with black or blue rockfish or certain other nearshore species. The criteria used to select species that are nearshore groundfish is discussed in TRG and GMC (2012). The selection is inclusive of State managed nearshore species for which an Oregon Nearshore Fishery Permit is needed. There are other federal managed species in the selection that are typically caught in nearshore areas. The nearshore species are listed by common name in Appendix B. Some report tables only show nearshore species harvests for vessels that have an Oregon Nearshore Fishery Permit. Other tables' content is for all selected nearshore species determined without filtering on vessels associated with permits.
LE and OA groundfish permits	Limited entry and open access refer to federal permit types that allow nearshore groundfish to be harvested either as a directed fishery or incidental in other fisheries. The LE permit types have gear restrictions for being trawl (bottom net, mid-water net, etc.) or fixed gear (longline, pot, etc.). Only a prior qualified vessel can be used to hold a LE permit. Open access is a misnomer in that a permit still needs to be acquired and associated with a vessel. An Oregon Nearshore Fishery Permit is required to harvest certain groundfish species up to maximum bimonthly limits set by ODFW. There

can be small harvests per trip made without the permit. The permit is limited entry. ODFW (2017) has a detailed description about permit requirements and discusses landing histories and fishery management. There are agency and many scholarly reports about the federal limited entry groundfish permits including NOAA Fisheries (2017), Lian et al. (2009), Pfeiffer and Gratz (2016), and Holland et al. (2017).

Oregon Territorial Sea	The ocean that is three nautical miles seaward of shoreline. The seaward extent can be approximated to be the 30 fathom depth contour along the Oregon Coast.
Survey calibration	Procedures to better pattern survey responses for being representative of known indicators of the survey population. Techniques include weighting response types whose numbers are deficient. Weights can be greater than one (under represented) and smaller than one (over-represented). Deville and Särndal (1992) explain the term and offer methods for survey calibration. Gelman and Little (1997) explain post-stratification procedures. Kolenikov (2014) discusses raking techniques.
Survey frame	Commercial fishing permit and charter boat permit registration names. The fisheries permit types are Dungeness crab, salmon troll, and nearshore groundfish.
Survey population	The intended commercial fishermen and recreational charter boat operators to receive a survey questionnaire are those likely to fish in nearshore waters sometime during a calendar year.
Commercial fishing trips	Trips are approximated using fish tickets. A fish ticket represents the landing of fish or shellfish product from one fishing trip. Ticket counts may not reflect fishing trips, because multiple tickets can be issued for a single trip when a vessel delivers to more than one dealer after returning to port, and vessels issue tickets when a sale is made directly to the public. Trip undercounts could occur in the occasion when tendering services are used because more than one vessel's harvest could be combined onto a single fish ticket. Delivery counts are not additive across fisheries because a fish ticket may include more than one species.
Recreational fishing trips	Sometimes the word "trip" is used in this report's narrative, but the unit of measurement for effort is an angler day. The hours actually spent fishing in a calendar day are not a consideration. The amount of money spent for the fishing experience is not appreciably different whether fishing was for a few or many hours. Literature use of the word trip is usually associated with a fishing experience duration that may be more or less than a calendar day. Trip counts in this study have been adjusted to account for multiple days when fishing occurred during a single trip.

Port Group

The following table lists the major ports, acronyms, Census Bureau geographic areas (cities, counties, and zip code areas), and river/streams that are mapped to port groups.

<u>Port Group</u>	<u>Cities and Areas</u>	<u>Major Rivers and Streams</u>
Astoria (AST)	Astoria, Hammond/Warrenton, Gearhart, Seaside, and Cannon Beach. Clatsop County used for Census Bureau data.	Columbia, Klaskanine, Lewis and Clark, Youngs, and Necanicum rivers; Big Creek, Gnat Creek, and Bear Creek
Tillamook (TIL)	Tillamook, Garibaldi, Netarts, and Pacific City. Tillamook County used for Census Bureau data.	Tillamook, Kilchis, Miami, Nehalem, Nestucca, Trask, and Wilson rivers
Newport (NPT)	Newport and Depoe Bay. Lincoln County plus zip code 97439 used for Census Bureau data.	Yaquina, Siletz, Alsea, and Salmon rivers; Big Elk Creek, Drift Creek
Coos Bay (CSB)	Coos Bay, Florence, Winchester Bay, and Charleston. Coos County plus zip code 97467 used for Census Bureau data.	Siuslaw, Umpqua, Smith, Coos, Slough
Port Orford (PRD)	Port Orford. Zip codes 97465, 97476, and 97450 used for Census Bureau data.	Elk and Sixes rivers
Brookings (BRK)	Brookings and Gold Beach. Curry County less Port Orford zip codes used for Census Bureau data.	Chetco and Rogue rivers

Oregon Nearshore Fisheries Effort Shift Survey Commercial Fisheries Representativeness Report

Abstract

The Marine Resource Program, Oregon Department of Fish and Wildlife sponsored a nearshore fisheries effort shift investigation. The potential shift in effort would have been triggered by fishing access closures due to the implementation of Oregon marine reserve system management plans. The Department of Environmental Science and Management, Portland State University was retained to complete the project using primary data collection to find commercial and recreational fisheries participants responses to the management plans. A mail-out survey to commercial nearshore fisheries permit registrants and recreational charter boat permit registrants solicited financial, operational, and social characteristic information as well as attitudinal information about fisheries management and other influences on fishing success. The survey results and derived models are described in a separate report authored by the survey project contractor. This report describes a representativeness analysis of the survey frame and survey respondents for commercial nearshore fisheries permit registrants.

The survey design assumed commercial nearshore fisheries participants held one or more of three Oregon permit types (Dungeness crab, salmon troll, and nearshore groundfish). Owner names for three permit types were merged and survey unit duplicate addresses were deleted from the survey list. This resulted in the survey frame containing 1,161 survey units. The survey units were not tagged to vessel identification codes. In order to conduct a representativeness analysis using landed value, it was necessary subsequent to survey administration to find the vessel identifications associated with the pulled permits. The number of permit owner names that match at least one vessel identification is 1,053. The number of respondents for these vessels is 204. After considering refusals and undeliverables, the survey response rate is 21.2 percent. The relatively low response rate is not unusual for a natural resource user voluntary survey that solicits for financial performance information. The review for representativeness is primarily based on landed value. (Vessel revenue from distant water fisheries was not included in tabulations.) The respondent per vessel landed value interquartile range compared to the survey frame is somewhat higher for the salmon troll and nearshore groundfish fisheries and lower for the Dungeness crab fishery. No statistical differences were found between the survey frame and respondents using landed value means. Other measures reviewed for representativeness were vessel physical size, Oregon home port, and permit owner residency. Respondent means and proportions deviations from survey frame are small for these other measures. The fairly close adherence to known survey frame characteristics suggests that calibration schemes to improve representation may not be needed.

Keywords

Survey representativeness analysis, Oregon nearshore fisheries, commercial and recreational fisheries engagement, marine spatial planning, fishing effort shift, survey frame statistical differences, survey calibration schemes

A. Introduction

An Oregon nearshore fisheries effort shift investigation was started in 2017. The investigative project was to find fishers motivation for participation in nearshore fisheries, and in particular, examine whether any effort shift was triggered by fishing access closures due to the implementation of Oregon marine reserve system management plans. The project used primary data collection to find fishers responses to fishing conditions and management plans. The survey project contractor was Department of Environmental Science and Management, Portland State University (PSU). The survey project concluded in August 2018.¹

The survey project was to make progress on ODFW tasking to understand changes within coastal fishing communities affected by marine reserves implementation. The contractor in collaboration with the ODFW Marine Reserves Program staff sent a questionnaire via USPS mailing to nearshore fisheries permit and charter boat permit registrants as of early 2017. There were three commercial fishing permit types and a charter boat permit type selected to cover nearshore fisheries' participants. The commercial fishing permit types are Dungeness crab, salmon troll, and nearshore groundfish.²

The survey project solicited financial, operational, and social characteristic information as well as attitudinal information about fisheries management and other influences on fishing success. There were specific questions about fishing effort and whether the marine reserve program impacted fishing operations. Survey project questions were structured to be both objective and subjective with close-ended and open-ended wording. (Appendix A contains the final survey instrument.) The survey project design has a descriptive and an experimental intent. The survey project contractor will use modeling to find predictive factors for fishing operation choices.

This report contains information about the representativeness of the survey frame and survey respondents. A representative analysis can be useful for developing calibration schemes for adjusting survey results to minimize any

Representative Measures		
Measure	Survey Frame	Respondents
Survey size including charter boats	1,161	229
Commercial fishing vessel count	1,107	212
Landed value of three fisheries in 2016	\$52.0 million in 2016, 85% of onshore	\$11.4 million in 2016, 22% of frame
Mean per vessel landed value of three fisheries in 2016	105% of onshore	93% of frame
Mean per vessel trip counts in 2016	105% of onshore	111% of frame
Vessel length	average 40 feet	average 38 feet
Permit owner residency in 2016	Oregon for 68% of permittees	Oregon for 75% of permittees
Principal delivery port area in 2016	Newport highest number of vessels	Newport highest number of vessels
Note: The three fisheries are D. crab, salmon troll, and nearshore groundfish.		

1. The project's lead author is Bryn Hudson, Master of Science Candidate. Ms. Hudson's master's degree committee members include Elise Granek, Ph.D. (chair), Max Nielsen-Pincus, Ph.D., and Thomas Swearingen, Ph.D.
2. The nearshore groundfish permit type was inclusive of Oregon Nearshore Fishery Permit with and without a Nearshore Endorsement Permit.

discovered non-coverage and non-response bias. Kruskal and Mosteller (1980) in a four-publication series present an extensive overview of representativeness analysis. Methods to overcome representative bias are explained by Särndal and Lundström (2005).

While the survey frame was commercial nearshore fisheries permit registrants and recreational charter boat permit registrants, the representativeness analysis is only for the former. The primary measure to analyze representativeness is harvest landed value. An inset on the previous page of this report shows summaries of the value as well as other indicator comparisons.

The contents of this report starts with an introduction chapter followed by Chapter B that describes survey project funding and justification. Chapter C has a brief description of commercial nearshore fisheries. The chapter also contains some comments about whether fleet response to marine reserve implementation is subsumed by other participation decision factors. Chapter D has a technical description of the survey project scope and administration details. There was an issue in survey administration for not carrying along vessel identification with the chosen fishery permits contact information. It was necessary to use name and address matching routines to find the vessel identifications in permits and landings databases. The matching results are described in Chapter E. The survey frame size, respondent counts, and response rate are explained in Chapter F. The assessment of respondent representativeness is explained in Chapter G. The last chapter (Chapter H) discusses whether there was bias introduced in survey results from the chosen survey frame and non-respondents. Appendices are provided for information too detailed to be contained in end-of-chapter table and figure displays. Displays have notes providing definition and evaluative statements to inform the reader of any relevance and quality issues. A glossary has definitions for technical terms. Survey project response tabulations, modeling results, and inference explanations are presented in a separate document authored by the survey project contractor.

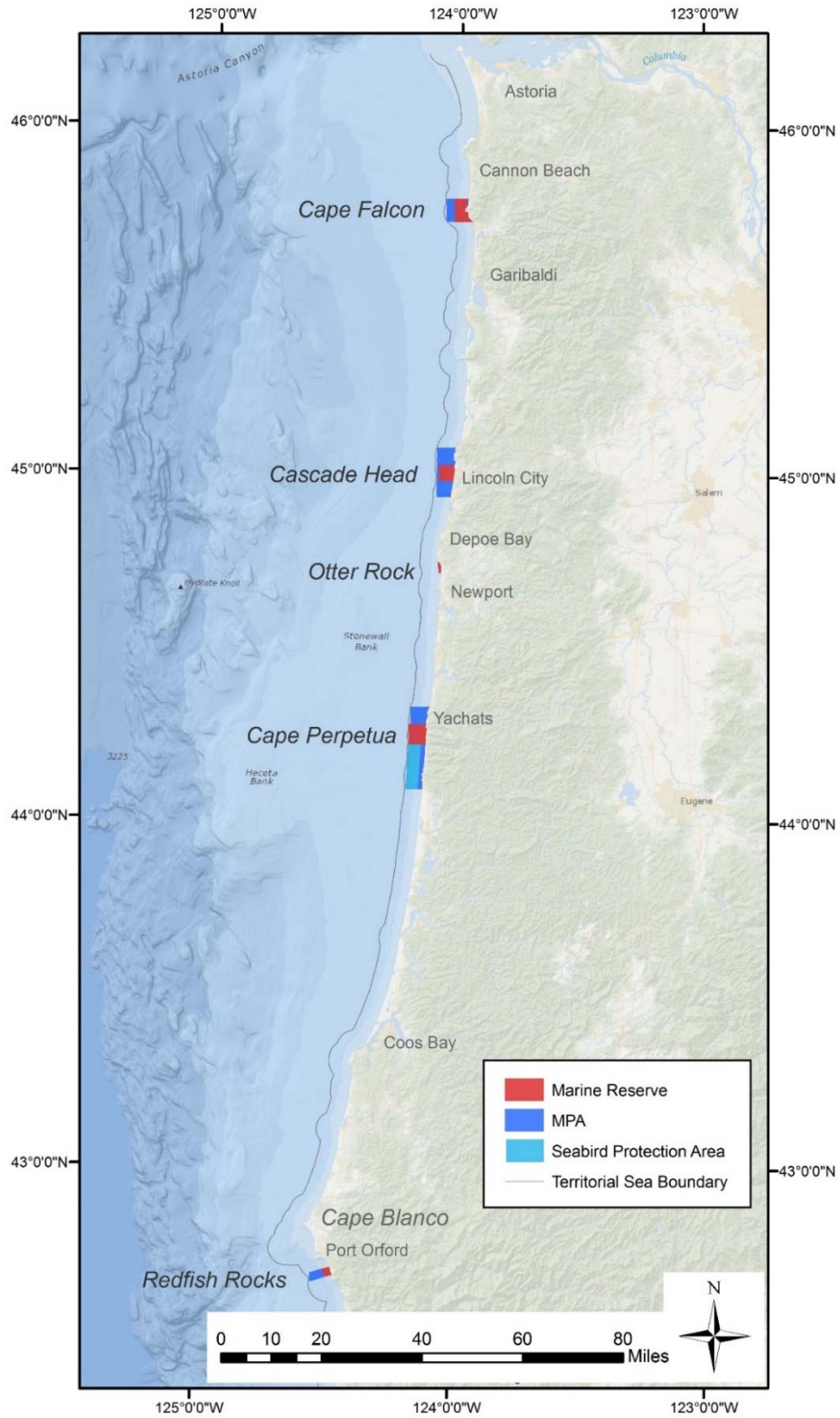
B. Background

Pursuant to the Oregon marine reserve legislative mandate, the survey project and this representativeness analysis project are funded by ODFW to assess Oregon nearshore fishers' perceptions and behavioral changes due to the establishment of marine reserves.¹ There are currently five established marine reserves in the Oregon Territorial Sea (Map B.1). Management plans for the reserves restrict extractive practices and ocean development. The restriction of commercial and recreational fishing may force fishers to forgo or shift their effort to other fishing grounds, which can result in adverse economic and social impacts. Formal research regarding fishers' adaptive behavior and perceptions due to Oregon marine reserves post-implementation is scarce.

Future studies are planned to use survey project results. For example, a survey question solicited whether or not the respondent wanted to participate in a personal interview. Those in the affirmative will be volunteers in a study for gathering additional anthropological and ecological knowledge information. Another study is planned to determine whether or not fisher stated behavioral changes align with real behavior documented with fishing logbook data. (Logbook data is available for some nearshore fisheries, but not all such as the salmon troll fishery.) The alignment analysis results will assist in creating more effective communication pathways with local fishing communities.

1. State mandates and guidelines for Oregon's marine reserves are provided in Executive Order 08-07 in 2008, House Bill 3013 in 2009, Senate Bill 1510 in 2012, administrative rules adopted by state agencies, and in the Oregon Marine Reserve Policy Recommendations adopted by the Oregon Ocean Policy Advisory Council (OPAC) in 2008. The OPAC policy recommendations provide the foundation for ODFW's monitoring of marine reserves. A description of the human dimensions monitoring plans is contained in biennial monitoring reports. The monitoring report and other data collection/investigative project reports can be found in the [Oregon Marine Reserves Internet portal](#).

Map B.1
 Marine Reserve Location and Relative Size Map



C. Oregon Nearshore Fisheries

Coastwide estimates of Oregon nearshore fisheries activity by place were provided by TRG (February 2018) for data year 2014.¹ Nearshore commercial and recreational fisheries activity is substantial (Figure C.1). Total commercial fishing onshore landed value was \$157.7 million in 2014. There were 220.6 thousand ocean recreational trips in 2014 of which 26 percent are estimated to be via charter boat services. The nearshore fisheries proportion of commercial and recreational community economic contribution in 2014 was \$103 million.² This represents 17 percent of Oregon total commercial and recreational fishing industry (includes distant water fisheries) economic contribution which was \$622 million in 2014.

This report focuses on descriptions for the three fisheries selected to represent nearshore fisheries participants: Dungeness crab, salmon troll, and nearshore groundfish. While the three fisheries fishing grounds may be within the nearshore area for some fishers for some of the season, the measurements of fishing activity for the fisheries will include ocean areas westward of the TS.³ Descriptions of the three fisheries activity include trends for the period 2006 to 2017 (Table C.1) and detail characteristics for year 2016 (Table C.2).

- Table C.1 shows landed value and vessel counts for the survey fisheries. The table also shows the average annual landed value per vessel. There are two trend summary statistics: 1) fisheries landed value percent variability, and 2) the Mann-Kendall test statistic that shows the strength (magnitude) and tendency (up/down direction) of a linear trend. The highest variability in landed value per vessel is in the salmon troll fishery at 160 percent over the ten year period. Only the salmon troll fishery showed a downward trend in landed value during the ten-year period.
- Table C.2 shows landed value for the survey fisheries and other major fishery categories at port groups in 2016. (Appendix B shows itemized species revenue for the survey fisheries.) The coastwide total for the survey fisheries was \$61.5 million in 2016 and the coastwide total of all fisheries was \$148.5 million. The table also shows fisheries dependency at port groups. The Tillamook port group has the highest dependency on the survey fisheries. Port Orford had the highest dependency on the nearshore groundfish fishery.

Not all vessels with permits in any of the three survey fisheries will participate in any given year. The average annual year-over-year rate of permittee new or re-entrance in the three survey fisheries is 14.8 percent for Dungeness crab, 33.3 percent for salmon troll, and 25.0 percent for nearshore groundfish during 2006 to 2016 period (TRG November 2018).

-
1. The measurements were participation levels, landed value, and economic contribution based on species/gear definitions and fishing grounds locations.
 2. Economic contribution is expressed as income generated to the State level economy, includes the multiplier effect, and is stated in 2015 dollars.
 3. The nearshore fisheries proportion of the commercial salmon troll fishery was estimated in the TRG (February 2018) project to be 35 percent and the nearshore proportion of the Dungeness crab fishery was estimated to be 54 percent.

It will be difficult to find the degree and outcome of any influence from marine reserve implementation given fishers are also responding to such factors as fish resource conditions and even weather. Further analysis will be necessary to discern any statistical discontinuity in effort (such as measured by vessel counts). The effort shift survey was to illuminate motivations for the survey fisheries participation and possibly tease out whether a contributing factor in motivations was related to marine reserve implementation.

Table C.1
Oregon Onshore Landed Value and Vessel Counts for Survey Fisheries in 2008-2017













Fishery	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2008-2017 Dispersion			
											Trend	Mean	Percent Variability	Mann-Kendall
Landed Value (real, millions)														
All Fisheries	114.7	116.1	115.4	160.8	136.2	188.2	162.7	117.8	151.2	144.0		140.7	52%	1.43
D. Crab	33.7	29.6	50.3	53.8	45.7	51.9	52.3	34.6	52.2	63.1		46.7	72%	1.79
Salmon, troll	0.4	0.4	3.1	2.6	4.6	8.1	15.5	7.6	4.3	2.1		6.0	223%	0.72
Nearshore groundfish	1.2	1.4	1.1	1.3	1.4	1.3	1.2	1.2	1.0	1.0		1.2	30%	-1.61
Participating Vessel Counts														
All Fisheries	1,039	1,140	1,180	1,174	1,140	1,149	1,199	1,129	1,051	1,051		1,125	14%	-0.45
D. Crab	340	346	351	385	354	342	348	336	341	341		348	14%	-0.63
Salmon, troll	163	248	392	327	391	420	515	516	335	335		404	47%	0.63
Nearshore groundfish	116	125	123	118	115	116	105	109	99	99		113	23%	-2.78
Average Landed Value Per Vessel (real, thousands)														
All Fisheries	110.4	101.9	97.8	137.0	119.5	163.8	135.7	104.4	143.9	137.0		125.1	53%	
D. Crab	99.1	85.7	143.4	139.9	129.2	151.8	150.3	102.9	153.2	185.0		134.1	74%	
Salmon, troll	2.7	1.6	8.0	8.1	11.7	19.2	30.0	14.7	12.9	6.4		14.8	160%	
Nearshore groundfish	10.7	11.1	9.0	11.0	11.8	11.4	11.5	11.5	10.5	10.3		10.9	26%	

Table C.1 (cont.)

- Notes:
1. Circled numbers are referenced in report narrative explanations.
 2. Values are real 2017 dollars adjusted using the GDP implicit price deflator developed by U.S. Bureau of Economic Analysis.
 3. The Dungeness crab fisheries landed value are for a season. The season is authorized to open December 1, however some seasons during the tables period have had delayed openings until January. To have consistent landings across the period, any landings in December of the preceding year are compiled to be in the following year.
 4. The salmon fisheries in 2008 and 2009 are outliers because the fishery was essentially closed south of Cape Falcon during those years. The mean and percent variability are calculated for years 2010-2017. The Mann-Kendall statistic is calculated by repeating Year 2010 for those years. Year 2010 harvests were moderate, but representative of decade 2000's averages when salmon disaster years 2006, 2008, and 2009 harvests are omitted.
 5. Oregon onshore values include those fish tickets with no unique vessel identification associated with a delivery.
 6. Year 2017 data is not available for vessel counts, or for nearshore groundfish landings, so 2016 is repeated.
 7. The Mann-Kendall test statistic shows the tendency for an increasing (positive) or decreasing (negative) linear trend with time using a nonparametric method. A value near zero suggests there is no significant upward or downward trend. The magnitude measures the "strength" of the trend.
 8. Marine reserves management restrictions started on January 1, 2012 at Redfish Rocks (RR) and Otter Rocks (OR), January 1, 2014 at Cascade Head (CH) and Cape Perpetua (CP), and January 1, 2016 at Cape Falcon (CF).
 9. Table shows only nearshore groundfish landed by vessels having Oregon Nearshore Fishery Permit with and without a Nearshore Endorsement Permit.

Source: PacFIN annual vessel summary data April 2009, March 2010, July 2011, April 2013, March 2014, April 2015, November 2016, and March 2017 extractions; and PacFIN and ODFW websites accessed April 26, 2018.

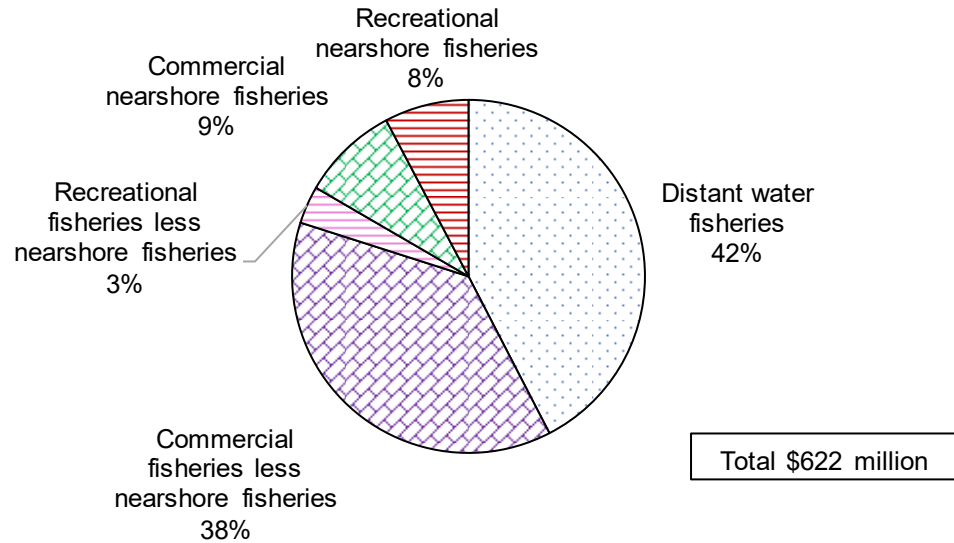
Table C.2
Oregon Onshore Landed Value by Major Fishery at Port Groups in 2016

Port Group	Survey Fisheries				Other Fisheries							Total
	Ocean Salmon	D. Crab	Nearshore Groundfish	Subtotal	Col. R. Salmon	Other Groundfish	P. Shrimp	Tuna	Whiting	Sardine	Other	
Oregon Onshore Landed Value												
Astoria	192,065	15,161,951	281,554	15,635,570	4,053,970	13,965,928	3,756,197	3,704,528	3,938,583	89	1,867,366	46,922,231
Tillamook	142,976	2,411,481	195,605	2,750,062	0	13,365	0	161,212	0	0	487,933	3,412,572
Newport	2,828,968	15,600,124	97,387	18,526,479	0	9,713,738	8,620,048	4,752,673	4,755,090	168	2,035,195	48,403,391
Coos Bay	887,985	11,788,031	97,152	12,773,168	0	3,780,887	8,520,680	3,715,771	0	60	1,507,268	30,297,834
Port Orford	149,879	2,872,524	533,037	3,555,440	0	718,336	0	7,859	7	0	273,630	4,555,272
Brookings	52,032	7,900,763	289,503	8,242,298	0	2,301,401	4,196,328	160,049	2	0	44,280	14,944,358
Coastwide	4,253,905	55,734,874	1,494,238	61,483,017	4,053,970	30,493,655	25,093,253	12,502,092	8,693,682	317	6,215,672	148,535,658
Fishery Dependency												
Astoria	0.4%	32.3%	0.6%	33.3%	8.6%	29.8%	8.0%	7.9%	8.4%	0.0%	4.0%	100.0%
Tillamook	4.2%	70.7%	5.7%	80.6%	0.0%	0.4%	0.0%	4.7%	0.0%	0.0%	14.3%	100.0%
Newport	5.8%	32.2%	0.2%	38.3%	0.0%	20.1%	17.8%	9.8%	9.8%	0.0%	4.2%	100.0%
Coos Bay	2.9%	38.9%	0.3%	42.2%	0.0%	12.5%	28.1%	12.3%	0.0%	0.0%	5.0%	100.0%
Port Orford	3.3%	63.1%	11.7%	78.1%	0.0%	15.8%	0.0%	0.2%	0.0%	0.0%	6.0%	100.0%
Brookings	0.3%	52.9%	1.9%	55.2%	0.0%	15.4%	28.1%	1.1%	0.0%	0.0%	0.3%	100.0%
Coastwide	2.9%	37.5%	1.0%	41.4%	2.7%	20.5%	16.9%	8.4%	5.9%	0.0%	4.2%	100.0%

- Notes: 1. Circled numbers are referenced in report narrative explanations.
2. Oregon onshore landings are from fish tickets that are not filtered for vessel identifications. Columbia River salmon fishery includes both non-Indian and tribal fisheries.
3. Astoria port group includes ports of Astoria and Gearhart-Seaside; Tillamook includes Tillamook/Garibaldi, Pacific City, Nehalem Bay, and Netarts Bay; Newport includes Newport, Depoe Bay, and Waldport; Coos Bay includes Coos Bay, Winchester Bay, Bandon, and Florence; Port Orford includes Port Orford; and Brookings includes Brookings and Gold Beach.
4. Nearshore groundfish includes all Oregon onshore landings, regardless of permit, for selected species of rockfish, roundfish, and flatfish, plus an estimate of the nearshore portion of lingcod. The landings for lingcod used species and gear filter queries to include open access landings with longline, other hook and line, or pot gear; and limited entry landings with longline, other hook and line, or selective FF trawl (small footrope) if it was on the same fish ticket with black or blue rockfish or certain other nearshore species.

Source: PacFIN fish ticket data, March 2017 extraction.

Figure C.1
Oregon Fishing Industry Economic Contribution and Nearshore Fisheries Component in 2014



- Notes:
1. Economic contribution measured by generated income in 2015 dollars at the statewide economy level. The income measurement includes the multiplier effect.
 2. For commercial fishing, effects include primary processing. For recreational fishing, effects are both resident and non-resident angler fishing trip expenditures.
 3. Commercial fishing comprises onshore deliveries from harvesting in the ocean and fishing in bays. It also includes Columbia River salmon fisheries. Recreational fishing includes crab and fish targeting trips in the ocean and bays, and anadromous fish freshwater fishing in Oregon's coastal zone.
 4. A more inclusive definition for Oregon's fishing industry would consist of other associated business sectors, such as new boat building and seafood retail operations related to commercial fishing; and, annualized capital spending related to recreational fishing.

Source: TRG (January 2018).

D. Survey Project Scope

D.1. Objective

The objective is twofold: 1) determine Oregon nearshore fisheries participation characteristics (cost and earnings, fisheries focus, effort levels, etc.), social characteristics (demographics, fishing dependence and tenure, family succession planning, etc.), and perception of marine reserve management; and, 2) determine effects from marine reserve fishing displacement.

D.2. Population

The intended population to be surveyed is participants in Oregon nearshore fisheries. These are the individuals that may have changes in their fishing activities due to establishment of marine reserves. Registrants for three commercial fishing permit types and a charter boat permit type were chosen to represent nearshore fisheries participants. The three commercial fishing permit types are Dungeness crab, salmon troll, and nearshore groundfish. These are the most important (highest landed value) nearshore fisheries. The survey project budget constraints prevented inclusion of other nearshore fisheries participants.

D.3. Sampling

The survey method was to use a 100 percent sampling approach.

D.4. Frame

The survey frame included Dungeness crab, salmon troll, and nearshore groundfish permit registration holders and charter boat permit registration holders in early 2017. A commercial fishing survey unit included in the frame can hold permits for other ocean fisheries (such as halibut) and/or participate in fisheries that are not limited entry (such as albacore tuna). They might also participate in non-ocean fisheries (such as Columbia River gillnet). The survey frame contained both resident and non-resident permit owners. Survey units could be vessel owners that are not active in the fishery as well as those that do make commercial fisheries landings or make charter boat trips. While the survey frame portion related to commercial fishing encompassed most of the important nearshore fisheries, there are other lower landed value nearshore fisheries left out such as sea urchin, hagfish, groundfish trawl, sardine, and other invertebrates.

The recreational fishing survey frame was all charter boat permit owners. The survey frame did not include the private boat, bank, and diving modes for recreational fishing.

The commercial fishing permit owner names from the three permit types were merged and survey unit duplicate addresses were deleted from the survey list. The result of the merging and filtering resulted in the survey frame containing 1,161 survey units.

There are cases where multiple permit owners share an address, so the merging would have precluded some owners receiving a survey instrument. There are cases where multiple vessels

are associated with one owner name (highest number was discovered to be six) and a single vessel being associated with multiple owner names. To minimize respondent burden, the survey instrument contained a question asking for up to two vessel profiles.

D.5. Administration

An early instrument draft was submitted to peer reviewers within PSU and ODFW. A survey proposal was also presented at fishing industry focus group meetings that took place on the Oregon Coast in April 2017. Comments were incorporated into new versions of the instrument. The new version was used during a pretest for one-on-one interviews of a small number of fishers. Comments from the interviews were used to perfect a final questionnaire version.

The dates for survey administration were:

- Prenotification date: 6/20/17
- First mailing packet date: 7/01/17
 - Incentive: NONE
 - Responses received: 121
 - Refusals received: 6
- Second reminder date: 7/14/17
- Second mailing packet date: 8/4/17
 - Incentive: \$2.00 enclosed in survey packet
 - Responses received: 109
 - Refusals received: 10
- Second reminder date: 8/25/17
- Cut-off date for recording responses: 3/1/18
 - Total response number: 229
 - Total refusals: 16
 - Total non-deliverable mailings: 64

E. Associating Vessels With Permit Owners

Commercial fishing vessel identification codes were not included in the original list of permit holders pulled from the survey frame. Therefore, it was necessary subsequent to survey administration to use the ODFW fishery permit database to match the permit owner name and address in order to get the vessel identification. The vessel identification was necessary to compile fish ticket information. Table E.1 shows the results for associating a vessel with the commercial fishing permit owners that received the survey questionnaire. A summary of the matching attempt is as follows.

- The columns under the title "Commercial Fishing Owner Names" exclude owners that only have a charter boat permit. There were 70 owners with a charter boat permit, but seven of them also had a commercial fishing permit (1,098=1,161-70+7).
- One of the commercial fishing permit owners was not found to have a vessel match in permit registration information. While some commercial fisheries such as sea urchin are not linked to a vessel, the survey frame permits should have vessels associated with the permit owner name.
- Forty-four (=1,098-1,053-1) were matched to a vessel that was the same as another survey frame owner. The discovered 44 were assumed to be permit transfers. The earliest owner, if it could be determined, was used for the match and the other owners were ignored.
- Commercial fishing permit owner names may be associated with multiple vessels (highest discovered was six vessels). Vessel counting is exclusive of cases when more than one owner name is associated with the same vessel, resulting in 1,107 unique vessel identifications.
- The survey instrument asked for profile information for only two vessels. Therefore, delivering information was compiled for only the top two revenue generating vessels for



Newport Fishermen's Wives Inc.

a survey frame permit owner. One survey frame permit owner had four vessels with salmon permits, but only two had any PacFIN landings in 2016 so the other two are not used. It was the only survey frame permit owner with more than two vessels among the three fisheries that were not assumed to be transfers, and the top two by 2016 Oregon landings are included in the representativeness analysis.

- The columns titled "delivering" are counts of unique vessels discovered in fish ticket information, i.e. the vessel sold a harvested fish resource to a processor or the public in Oregon. Some fish tickets have no unique vessel identification associated with a delivery. For example, Columbia River tribal fisheries are not associated with a vessel identification.
- Six years of Oregon fish tickets were searched for the 1,107 vessels that were matched to the survey frame owner names. There were 869 vessels over that period that were found to have made at least one delivery. However, it could be that during the six-year period the vessel had a different owner. Further, the permit owner included in the survey frame may have owned a different vessel in a previous year. No attempt was made to reconcile the six years of all delivering vessel owner names with the survey frame owner name.
- There were 37 (=212-175) vessels found for survey respondents that had a permit for one of the three fisheries but no Oregon onshore landings for any fishery (i.e. not only the three fisheries included in the survey frame) in 2011-2016.
- There may be additional matches not found due to permit owner name or addresses having slightly different configuration. There are nine survey respondents for the missed matches. Therefore, the number of permit owner names that match at least one vessel identification is 1,053 (=1,098-45). The number of respondents for these vessels is 204.
- There were 473 (=1,107-634) vessels in the survey frame and 74 (=212-138) respondent vessels that did not make Oregon deliveries in 2016. The proportions of permit holders that did not make deliveries in 2016 for any of the three survey fisheries are: survey frame 49 percent and respondents 38 percent.

Table E.1
Survey Frame and Survey Respondents Vessel Counts With Matches to Vessels Having Oregon Onshore Landings in 2011-2016

Year	Onshore Delivering	Survey Frame						Unique Vessels Matching Survey Frame						
		Commercial Fishing Owner Names			Vessel Matches			Permit Files		Delivering				
		Total	Survey Respondents	Survey	Total	Survey Respondents	Survey	Total	Survey	Survey Respondents				
								Vessels	Share	Vessels	Share	Share		
List		1,161	229	1,098	213	1,053	204	1,107	212					
Combined 2011-2016 unique vessel counts:							869		175					
2011	1,174							553	47%	117	10%	21%		
2012	1,140							597	52%	125	11%	21%		
2013	1,149							626	54%	134	12%	21%		
2014	1,199							679	57%	146	12%	22%		
2015	1,129							682	60%	141	12%	21%		
2016	1,051							634	60%	138	13%	22%		

Notes: 1. Circled numbers are referenced in report narrative explanations.
2. See report narrative for column derivation explanations.

Sources: Oregon onshore landings are from PacFIN annual vessel summary data April 2013, March 2014, April 2015, November 2016, and March 2017 extractions. Vessels matched to survey frame using ODFW fishery permit files for 2016 to 2017.

F. Respondents

The survey frame list contained 1,161 permit owner names and the respondents were 229. Commercial fishing owner names were 1,098 and the respondents were 213. When the commercial fishing permit owner name was associated with a vessel identification, there were 1,053 matches with respondents 204. After accounting for multiple vessels per owner name and multiple names associated with one vessel, the 1,107 vessels respondents were 212. Fish tickets were searched in years 2011-2016 for known vessel identifications and 869 were found to have landings; respondents for the vessels were 175. Using the Council of American Survey Research Organizations (CASRO) Ninth Edition of Standard Definitions suggested formula for consideration of refusals and undeliverable instruments, the survey response rate would be 21.2 percent ($= 229 / (1,161 - (16 + 64))$). The relatively low response rate is not unusual for a natural resource user volunteer survey that solicits for financial performance information. A low response rate does not necessarily equate to a non-response bias (Groves 2006).

G. Representativeness

This review for representativeness is primarily based on landed value distribution. Other measures reviewed for representativeness are vessel physical size, Oregon home port, and permit owner residency.

Survey frame permit owners can have vessel revenue from distant water fisheries. The non-Oregon onshore vessel revenue would be highly correlated with non-resident permit status. The non-Oregon onshore revenue was not included in the landed value tabulations. This can mean there are cases where tabulations include vessels that have none or small amounts of Oregon landings, but vessel total revenue can be substantial.

Table E.1 and G.1 and Figure G.1 and G.2 show vessel identification matches that were found to have Oregon landings. The survey frame vessel counts were 60 percent of all onshore vessel counts in 2016. The survey respondents represented about 13 percent (range over years 2011-2016 was 10 percent to 13 percent) of all Oregon vessel counts. The respondents represented about 22 percent of the survey frame vessel counts.



Charleston Marina

Table G.2 and Figure G.3 and G.4 show the survey frame landed value in 2016 was 67 percent of all onshore landed value. The respondents share of all onshore landed value was 11 percent in 2016 and 17 percent of the survey frame landed value in 2016.

Table G.3 shows the coastwide landed value amounts and proportions of survey frame fisheries and other fisheries of the range of years 2011-2016. Table G.4 shows the same by port groups in 2016. The percents of respondent to survey frame fisheries are 21, 29, and 26 respectively in 2016 for Dungeness crab, salmon troll, and nearshore groundfish. This percent varies significantly across the other fisheries. Table G.4 shows the shares by fishery for vessel counts. The shares are about 23 percent for all of the survey frame fisheries.

Figures G.5 and G.6 show comparison of all onshore fisheries, survey frame, and respondents using vessel average annual landed value. The same comparison for vessel trips is shown on Figures G.7 and G.8.

The distribution of respondents per vessel landed value compared to all onshore and survey frame is shown on Table G.5 and Figure G.9. The respondent per vessel landed value interquartile range compared to the survey frame is somewhat higher for the salmon troll and nearshore groundfish fisheries and lower for the Dungeness crab fishery.

Survey respondents are approximately equal for representation in landed value brackets (Table G.6 and Figure G.10). The proportion of vessels in the \$10 to \$50 thousand landed value for 2016 is 24 percent for the survey frame and 25 percent for the respondents. The proportion in the \$150 to \$400 thousand bracket is 18 percent for the survey frame and 19 percent for the respondents.

Table G.5 also shows results for comparing landed value means for the survey frame list to Oregon onshore, and for survey respondents to the survey frame. The comparison used the non-parametric Welch's t-test for two samples with heterogeneous variance between tested categories. No statistical differences (P-value <0.05) in landed values were found for any of the fisheries. A finding of statistical difference suggests investigation is warranted to determine need for survey calibration.

Tables G.7 through G.9 show Oregon onshore, survey frame and respondent representativeness measures for Oregon home port, permit owner residency, and vessel physical size. Using means and proportions, the respondents deviations from survey frame are small for these other measures.

Table G.1
 Survey Frame and Survey Respondents Vessel Counts by Survey Fisheries With Matches to Vessels Having Oregon Onshore Landings in 2016

	Survey Fisheries				All Fisheries
	D. Crab	Salmon Troll	Nearshore Groundfish	All Three	
1. Permit owner tagged with codes "DC", "S", and/or "GF"	374	886	99	1,098	1,098
Respondents	77	166	27	213	213
2. Vessels in survey frame	364	835	76	1,107	1,107
Respondents	77	151	20	212	212
3. Vessels in ODFW fishery permit file for 2016	421	954	114	1,197	1,537
Survey frame	381	878	90	1,069	1,070
Respondents	78	163	27	209	209
4. Vessels with 2016 landings					
Oregon onshore	348	335	253	698	1,051
Survey frame	292	296	175	561	634
Respondents	63	71	42	132	138

- Notes:
1. Circled numbers are referenced in report narrative explanations.
 2. Survey frame permit owners were associated with vessel identifications by exact and inexact matches to permit file registration data without consideration for fishery codes Dungeness crab (DC), salmon troll (S) and nearshore groundfish (GF).
 3. The nearshore groundfish fishery permit types are Oregon Nearshore Fishery Permit with and without a Nearshore Endorsement Permit.
 4. Table E.1 notes and sources apply.

Table G.2
Survey Frame and Survey Respondents With Matches to Oregon Onshore Landings in 2011-2016

Oregon Onshore Landings		Oregon Landings for Unique Vessels Matching Survey Frame										
		Survey Frame					Survey Respondents					
		Pounds		Value			Pounds			Value		
Year	Pounds	Value	Amount	Share	Amount	Share	Amount	Share	Share	Amount	Share	Share
2011	285,820,628	146,485,485	108,212,612	38%	86,437,414	59%	9,085,626	3%	8%	14,269,336	10%	17%
2012	306,715,545	126,369,950	96,429,979	31%	72,999,689	58%	7,458,993	2%	8%	11,502,454	9%	16%
2013	349,390,051	177,395,629	134,363,955	38%	112,086,301	63%	10,497,000	3%	8%	18,198,596	10%	16%
2014	300,362,364	156,126,825	127,789,687	43%	99,949,970	64%	7,214,481	2%	6%	14,983,034	10%	15%
2015	203,885,317	114,274,466	74,554,821	37%	67,713,270	59%	5,034,837	2%	7%	8,657,031	8%	13%
2016	226,918,381	148,535,658	87,013,716	38%	99,208,276	67%	6,600,691	3%	8%	16,576,112	11%	17%

- Notes: 1. Circled numbers are referenced in report narrative explanations.
 2. Values are in nominal dollars.
 3. Oregon onshore landings are from fish tickets that are not filtered for vessel identifications.
 4. Survey frame landings are filtered for the matching vessels showing in Table G.1. The included nearshore groundfish landings are from vessels that have an Oregon Nearshore Fishery Permit with or without a Nearshore Endorsement Permit, as well as incidental fishery landings from vessels that do not have an Oregon Nearshore Fishery Permit.

Sources: Oregon onshore landings are from PacFIN annual vessel summary data April 2013, March 2014, April 2015, November 2016, and March 2017 extractions. Vessels matched to survey frame using ODFW fishery permit files for 2016 to 2017.

Table G.3
Survey Frame and Survey Respondents With Matches to
Oregon Onshore Landed Value by Major Fishery in 2011-2016

Year	Survey Fisheries			Other Fisheries						
	Ocean Salmon	D. Crab	Nearshore Groundfish	Col. R. Salmon	Other Groundfish	P. Shrimp	Tuna	Whiting	Sardine	Other
Oregon Onshore Landed Value by Major Fishery										
2011	2,403,537	44,690,045	1,534,618	4,333,833	26,904,632	24,607,431	18,765,949	16,517,516	3,191,593	3,536,331
2012	4,248,810	29,113,588	1,720,643	2,675,699	22,113,724	24,685,446	15,077,265	14,610,529	8,976,821	3,147,425
2013	7,607,116	71,208,556	1,625,231	4,810,793	20,697,168	24,152,582	16,078,899	20,404,624	6,299,324	4,511,336
2014	14,828,562	47,988,488	1,579,699	5,295,413	20,230,029	29,325,813	11,023,484	18,273,513	3,521,759	4,060,065
2015	7,334,340	11,912,041	1,740,992	4,529,700	27,047,263	40,412,671	9,211,747	7,145,945	812,687	4,127,080
2016	4,253,905	55,734,874	1,494,238	4,053,970	30,493,655	25,093,253	12,502,092	8,693,682	317	6,215,672
Oregon Onshore Landed Value by Major Fishery for Unique Vessels Matching Survey Frame										
2011	2,079,756	35,412,530	811,258	192,540	17,347,318	16,229,219	8,396,320	4,499,793	0	1,468,680
2012	3,580,078	24,465,476	880,663	158,964	13,742,010	16,149,980	8,667,779	3,640,168	538,232	1,176,339
2013	6,520,330	59,533,639	880,742	231,157	12,297,221	16,731,516	7,918,707	5,874,195	939,243	1,159,551
2014	12,849,591	39,444,252	821,961	292,692	11,515,951	19,638,839	7,010,889	6,170,362	733,763	1,471,670
2015	6,500,007	10,031,697	1,054,512	196,176	16,435,325	25,229,662	5,513,137	964,072	497,663	1,291,019
2016	3,919,288	47,159,023	926,306	217,546	20,242,802	15,693,805	7,823,917	1,920,131	66	1,305,392
Oregon Onshore Landed Value by Major Fishery for Unique Vessels Matching Survey Respondents										
2011	479,318	7,060,329	300,670	13,543	3,465,850	1,574,991	1,215,506	0	0	159,129
2012	887,568	5,159,397	286,178	9,199	2,331,786	1,532,167	1,198,682	0	0	97,477
2013	1,538,474	11,393,340	292,061	17,059	1,539,609	1,894,117	1,383,996	1	0	139,939
2014	2,968,615	7,459,684	264,197	16,119	1,552,607	1,410,160	1,142,054	0	842	168,756
2015	1,435,981	2,229,060	329,428	14,131	2,119,256	1,364,607	929,465	23	63,525	171,555
2016	1,148,304	10,049,362	237,631	12,012	2,628,813	936,131	1,337,051	7	0	226,801
Share of Oregon Onshore Landed Value by Major Fishery for Unique Vessels Matching Survey Frame										
2011	87%	79%	53%	4%	64%	66%	45%	27%	0%	42%
2012	84%	84%	51%	6%	62%	65%	57%	25%	6%	37%
2013	86%	84%	54%	5%	59%	69%	49%	29%	15%	26%
2014	87%	82%	52%	6%	57%	67%	64%	34%	21%	36%
2015	89%	84%	61%	4%	61%	62%	60%	13%	61%	31%
2016	92%	85%	62%	5%	66%	63%	63%	22%	21%	21%
Share of Oregon Onshore Landed Value by Major Fishery for Unique Vessels Matching Survey Respondents										
2011	20%	16%	20%	0%	13%	6%	6%	0%	0%	4%
2012	21%	18%	17%	0%	11%	6%	8%	0%	0%	3%
2013	20%	16%	18%	0%	7%	8%	9%	0%	0%	3%
2014	20%	16%	17%	0%	8%	5%	10%	0%	0%	4%
2015	20%	19%	19%	0%	8%	3%	10%	0%	8%	4%
2016	27%	18%	16%	0%	9%	4%	11%	0%	0%	4%
Share of Survey Frame Landed Value From Survey Respondents Landed Value										
2011	23%	20%	37%	7%	20%	10%	14%	0%		11%
2012	25%	21%	32%	6%	17%	9%	14%	0%	0%	8%
2013	24%	19%	33%	7%	13%	11%	17%	0%	0%	12%
2014	23%	19%	32%	6%	13%	7%	16%	0%	0%	11%
2015	22%	22%	31%	7%	13%	5%	17%	0%	13%	13%
2016	29%	21%	26%	6%	13%	6%	17%	0%	0%	17%

Notes: 1. Notes and sources of Table G.2 apply. Circled numbers are referenced in report narrative explanations.
2. Columbia River salmon fishery includes both non-Indian and tribal fisheries.

Table G.4
Survey Frame and Survey Respondents With Matches to
Oregon Onshore Landing Vessels by Major Fishery in 2011-2016

Year	Survey Fisheries			Other Fisheries						
	Ocean Salmon	Nearshore D. Crab	Groundfish	Col. R. Salmon	Other Groundfish	P. Shrimp	Tuna	Whiting	Sardine	Other
Oregon Onshore Landing Vessels by Major Fishery										
2011	327	395	231	218	179	62	442	54	26	379
2012	391	357	245	187	196	64	447	51	35	372
2013	420	363	246	168	187	60	397	45	25	328
2014	515	371	224	183	174	60	379	40	32	285
2015	516	321	267	174	177	78	348	47	13	256
2016	335	348	253	175	182	75	367	57	17	253
Oregon Onshore Landing Vessels by Major Fishery for Unique Vessels Matching Survey Frame										
2011	240	284	134	12	112	42	248	23	3	141
2012	305	269	149	13	126	42	280	21	7	149
2013	333	284	158	9	125	40	237	19	5	129
2014	423	288	140	9	113	40	237	14	6	188
2015	438	262	174	11	116	48	239	19	6	178
2016	296	292	175	9	124	50	254	27	4	171
Oregon Onshore Landing Vessels by Major Fishery for Unique Vessels Matching Survey Respondents										
2011	58	66	32	2	27	4	47	2	1	25
2012	66	61	37	3	31	5	54	2	0	31
2013	78	65	43	1	33	5	42	2	0	24
2014	91	66	35	1	25	3	45	1	1	39
2015	91	58	38	1	26	4	38	1	1	39
2016	71	63	42	1	26	5	51	2	0	38
Share of Oregon Onshore Landing Vessels by Major Fishery for Unique Vessels Matching Survey Frame										
2011	73%	72%	58%	6%	63%	68%	56%	43%	12%	37%
2012	78%	75%	61%	7%	64%	66%	63%	41%	20%	40%
2013	79%	78%	64%	5%	67%	67%	60%	42%	20%	39%
2014	82%	78%	63%	5%	65%	67%	63%	35%	19%	66%
2015	85%	82%	65%	6%	66%	62%	69%	40%	46%	70%
2016	88%	84%	69%	5%	68%	67%	69%	47%	24%	68%
Share of Oregon Onshore Landing Vessels by Major Fishery for Unique Vessels Matching Survey Respondents										
2011	18%	17%	14%	1%	15%	6%	11%	4%	4%	7%
2012	17%	17%	15%	2%	16%	8%	12%	4%	0%	8%
2013	19%	18%	17%	1%	18%	8%	11%	4%	0%	7%
2014	18%	18%	16%	1%	14%	5%	12%	3%	3%	14%
2015	18%	18%	14%	1%	15%	5%	11%	2%	8%	15%
2016	21%	18%	17%	1%	14%	7%	14%	4%	0%	15%
Share of Survey Frame Unique Vessels That Match Survey Respondents Unique Vessels										
2011	24%	23%	24%	17%	24%	10%	19%	9%		18%
2012	22%	23%	25%	23%	25%	12%	19%	10%	0%	21%
2013	23%	23%	27%	11%	26%	13%	18%	11%	0%	19%
2014	22%	23%	25%	11%	22%	8%	19%	7%	17%	21%
2015	21%	22%	22%	9%	22%	8%	16%	5%	17%	22%
2016	24%	22%	24%	11%	21%	10%	20%	7%	0%	22%

Notes: 1. Notes and sources of Table G.1 apply. Circled numbers are referenced in report narrative explanations.
2. Columbia River salmon fishery excludes tribal fisheries because fish tickets do not reveal vessel identification.

Table G.5
Frequency Distribution of Oregon Onshore, Survey Frame, and
Survey Respondent Average Annual Landed Value in 2016

	Oregon Onshore	Survey Frame	Survey Respondents
<u>All Fisheries</u>			
Vessels	1,051	634	138
Minimum value	32	58	149
1st quartile	6,035	7,855	6,106
2nd quartile (median)	30,650	41,947	33,853
3rd quartile	141,557	166,482	154,316
Maximum value	1,807,386	1,734,913	1,714,885
Interquartile range (IQR)	135,522	158,628	148,210
Mean	138,357	156,480	120,117
Two sample t-test P-value		0.186	0.086
<u>D. Crab</u>			
Vessels	348	292	63
Minimum value	0	0	1,154
1st quartile	42,074	59,151	70,055
2nd quartile (median)	120,360	123,445	103,153
3rd quartile	234,132	233,673	225,012
Maximum value	818,458	805,282	805,282
Interquartile range (IQR)	192,058	174,523	154,957
Mean	160,046	161,504	159,514
Two sample t-test P-value		0.902	0.928
<u>Salmon, troll</u>			
Vessels	335	296	71
Minimum value	0	0	63
1st quartile	745	1,068	1,271
2nd quartile (median)	4,832	5,687	6,433
3rd quartile	16,888	18,482	24,558
Maximum value	149,071	149,071	94,507
Interquartile range (IQR)	16,143	17,414	23,287
Mean	12,664	13,241	16,173
Two sample t-test P-value		0.708	0.281
<u>Nearshore groundfish</u>			
Vessels	253	175	42
Minimum value	0	0	0
1st quartile	188	232	357
2nd quartile (median)	1,522	1,915	2,297
3rd quartile	7,602	6,911	9,276
Maximum value	71,335	40,976	40,890
Interquartile range (IQR)	7,414	6,679	8,919
Mean	5,887	5,293	5,658
Two sample t-test P-value		0.498	0.789

- Notes:
1. Circled numbers are referenced in report narrative explanations.
 2. Oregon onshore excludes landings with no identifiable vessel. Distant water fisheries revenue is not included in vessel revenue tabulations.
 3. Survey frame and respondents only include vessels with Oregon deliveries in 2016.
 4. The Welch Two Sample t-test is a parametric method to test the hypothesis that two sub-populations have equal means. Survey frame is compared to Oregon onshore, and survey respondents are compared to survey frame.
 5. The included nearshore groundfish landings are from vessels that have an Oregon Nearshore Fishery Permit with or without a Nearshore Endorsement Permit, as well as incidental fishery landings from vessels that do not have an Oregon Nearshore Fishery Permit.

Table G.6
 Frequency Distribution of Oregon Onshore, Survey Frame, and Survey
 Respondent Delivering Vessel Average Annual Landed Value in 2016

	\$0-500	\$500-10k	\$10k-50k	\$50k-150k	\$150k-400k	\$400k+	Total
<u>Vessels</u>							
Oregon onshore	60	286	271	180	151	103	1,051
Survey frame	35	142	155	122	111	69	634
Survey respondents	10	32	35	26	26	9	138
<u>Share</u>							
Oregon onshore	6%	27%	26%	17%	14%	10%	100%
Survey frame	6%	22%	24%	19%	18%	11%	100%
Survey respondents	7%	23%	25%	19%	19%	7%	100%

Notes: 1. Table G.5 notes apply.

Table G.7
 Residency of Oregon Permitted, Survey Frame, and Survey Respondent Permit Owners in 2016

	Count of Permittees				Oregon Share
	All	Oregon	Other	Both	
<u>All Fisheries</u>					
All Oregon permitted	1,442	1,012	467	37	68%
Survey frame	1,098	750	348	0	68%
Survey respondents	213	160	53	0	75%
<u>D. Crab</u>					
All Oregon permitted	381	284	105	8	72%
Survey frame	363	271	92	0	75%
Survey respondents	77	60	17	0	78%
<u>Salmon, troll</u>					
All Oregon permitted	897	627	292	22	67%
Survey frame	879	605	274	0	69%
Survey respondents	165	126	39	0	76%
<u>Nearshore groundfish</u>					
All Oregon permitted	101	99	4	2	96%
Survey frame	76	72	4	0	95%
Survey respondents	20	18	2	0	90%

- Notes: 1. Circled numbers are referenced in report narrative explanations.
2. Table values for all Oregon permitted include all 2016 fishery permit registrants whether or not the permit was associated with a vessel that made deliveries in 2016. Names with addresses in more than one state are counted as non-Oregon for share.
3. Survey frame includes only commercial fishing permit owners, and assignments to fishery use 2016 and 2017 fishery permit files and assumptions to exclude transfers.
4. Nearshore groundfish permit types are Oregon Nearshore Fishery Permit with and without a Nearshore Endorsement Permit.

Table G.8
Vessels by Principal Oregon Delivery Port Area in 2016

<u>All Fisheries</u>	<u>Astoria</u>	<u>Tillamook</u>	<u>Newport</u>	<u>Coos Bay</u>	<u>Port Orford</u>	<u>Brookings</u>	<u>Total</u>
Oregon onshore	325	85	272	223	54	92	1,051
Survey frame	97	63	197	165	40	72	634
Survey respondents	24	20	40	24	11	19	138
<u>Share</u>							
Oregon onshore	31%	8%	26%	21%	5%	9%	100%
Survey frame	15%	10%	31%	26%	6%	11%	100%
Survey respondents	17%	14%	29%	17%	8%	14%	100%

- Notes: 1. Circled numbers are referenced in report narrative explanations.
 2. Principal Oregon delivery port area is the port group where a vessel had the most Oregon onshore landings in 2016 (not necessarily a majority).

Table G.9
 Frequency Distribution of Oregon Onshore, Survey Frame, and Survey
 Respondent Landing Vessel Lengths by Survey Fisheries During 2011 to 2016

	<u>Oregon Onshore</u>	<u>Survey Frame</u>	<u>Survey Respondents</u>	<u>Share Oregon Onshore</u>	<u>Share Survey Frame</u>	<u>Share Survey Respondents</u>
<u>All Fisheries</u>						
Zero	76	0	0	4.0%	0.0%	0.0%
1 to 9 ft.	0	0	0	0.0%	0.0%	0.0%
10 to 30 ft.	675	229	59	35.5%	26.4%	33.7%
31 to 40 ft.	340	238	44	17.9%	27.4%	25.1%
41 to 50 ft.	390	242	51	20.5%	27.8%	29.1%
51 to 100 ft.	411	160	21	21.6%	18.4%	12.0%
over 100 ft.	10	0	0	0.5%	0.0%	0.0%
Total	1,902	869	175	100.0%	100.0%	100.0%
Mean length	39.6	40.4	37.9			
<u>D. Crab</u>						
Zero	0	0	0	0.0%	0.0%	0.0%
1 to 9 ft.	0	0	0	0.0%	0.0%	0.0%
10 to 30 ft.	113	61	19	19.7%	15.3%	22.1%
31 to 40 ft.	118	96	23	20.6%	24.0%	26.7%
41 to 50 ft.	152	122	25	26.5%	30.5%	29.1%
51 to 100 ft.	189	121	19	33.0%	30.3%	22.1%
over 100 ft.	1	0	0	0.2%	0.0%	0.0%
Total	573	400	86	100.0%	100.0%	100.0%
Mean length	45.6	45.7	42.3			
<u>Salmon, troll</u>						
Zero	0	0	0	0.0%	0.0%	0.0%
1 to 9 ft.	0	0	0	0.0%	0.0%	0.0%
10 to 30 ft.	224	160	42	28.8%	26.7%	35.0%
31 to 40 ft.	252	205	37	32.3%	34.2%	30.8%
41 to 50 ft.	223	186	38	28.6%	31.0%	31.7%
51 to 100 ft.	77	49	3	9.9%	8.2%	2.5%
over 100 ft.	3	0	0	0.4%	0.0%	0.0%
Total	779	600	120	100.0%	100.0%	100.0%
Mean length	38.4	37.8	35.1			
<u>Nearshore groundfish</u>						
Zero	0	0	0	0.0%	0.0%	0.0%
1 to 9 ft.	0	0	0	0.0%	0.0%	0.0%
10 to 30 ft.	243	130	39	49.1%	43.9%	56.5%
31 to 40 ft.	100	78	19	20.2%	26.4%	27.5%
41 to 50 ft.	55	41	6	11.1%	13.9%	8.7%
51 to 100 ft.	96	47	5	19.4%	15.9%	7.2%
over 100 ft.	1	0	0	0.2%	0.0%	0.0%
Total	495	296	69	100.0%	100.0%	100.0%
Mean length	37.1	36.7	31.6			

- Notes: 1. Circled numbers are referenced in report narrative explanations.
 2. Excludes vessels with no valid vessel identification.
 3. Includes vessels with Oregon deliveries in any year from 2011 to 2016.

Figure G.1
Delivering Vessel Counts in 2016

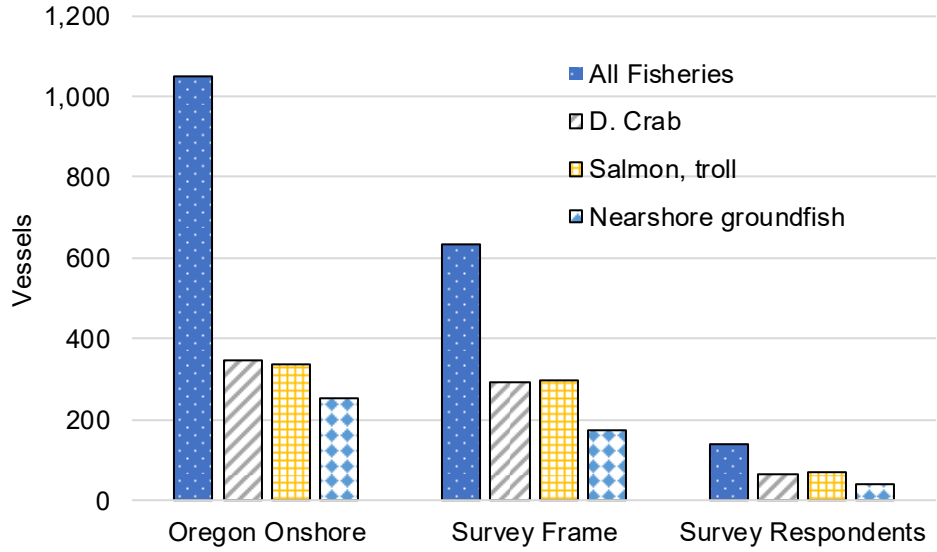
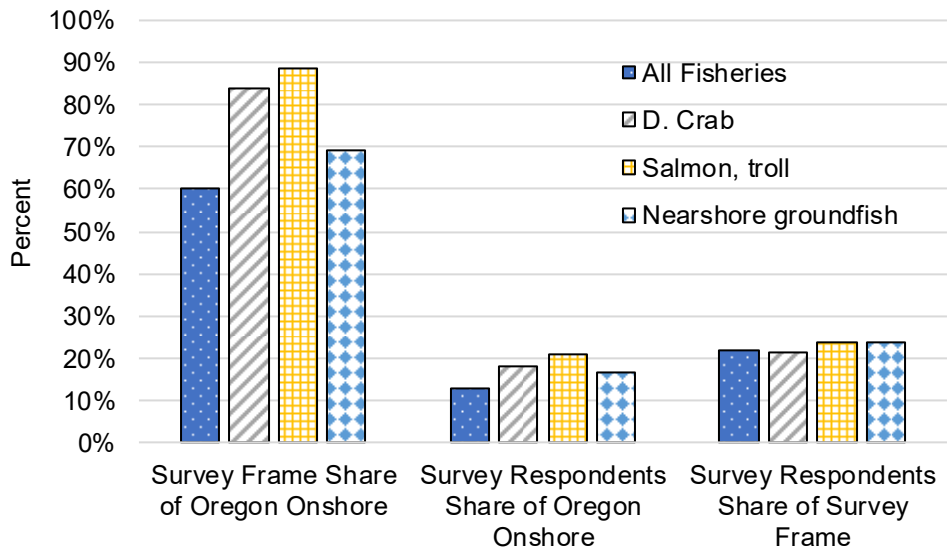


Figure G.2
Delivering Vessel Count Shares of
Oregon Onshore and Survey Frame in 2016



Notes: 1. Table G.5 notes apply.

Figure G.3
Delivering Vessel Landed Value in 2016

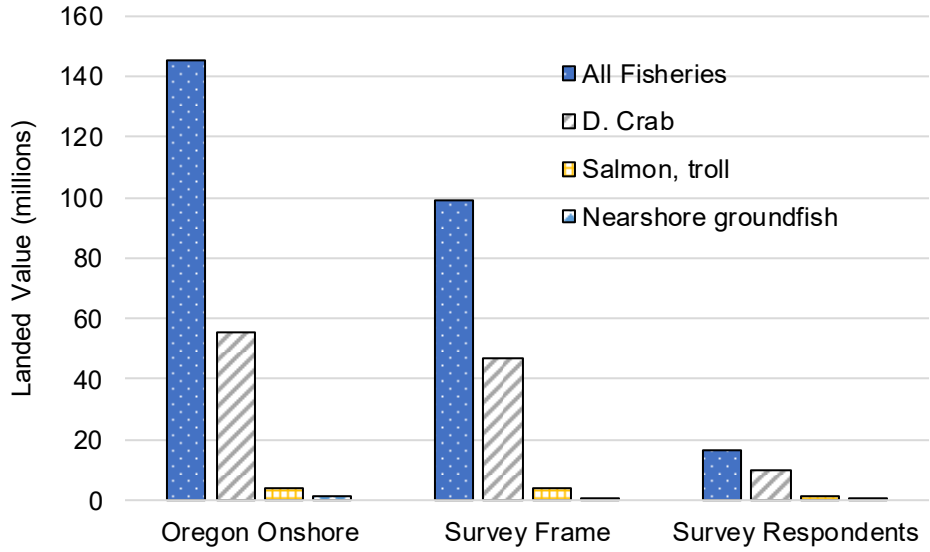
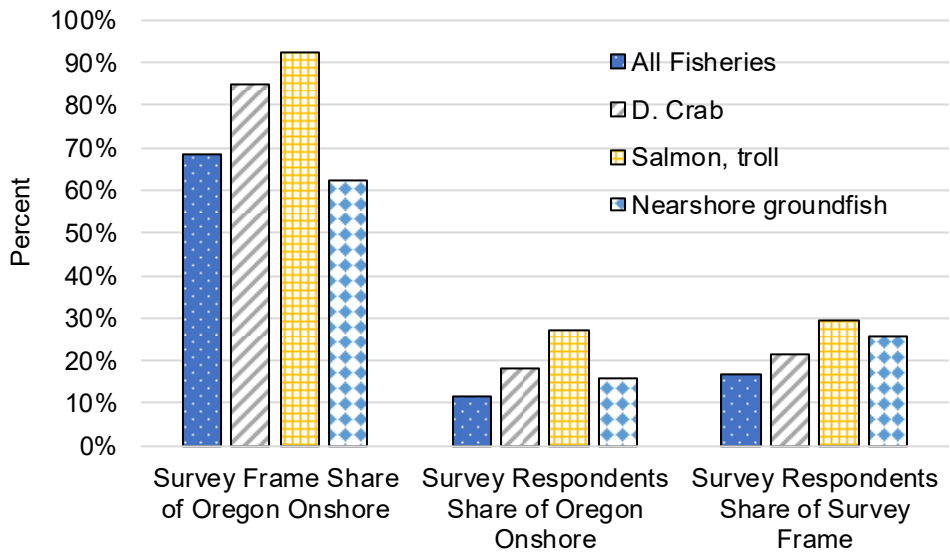


Figure G.4
Delivering Vessel Landed Value Shares of Oregon Onshore and Survey Frame in 2016



Notes: 1. Table G.5 notes apply.

Figure G.5
Delivering Vessel Average Annual Landed Value in 2016

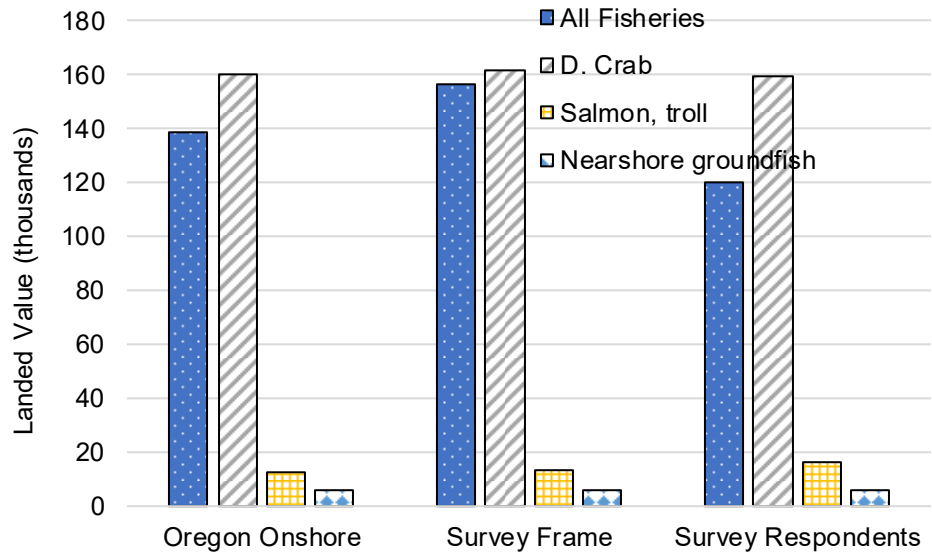
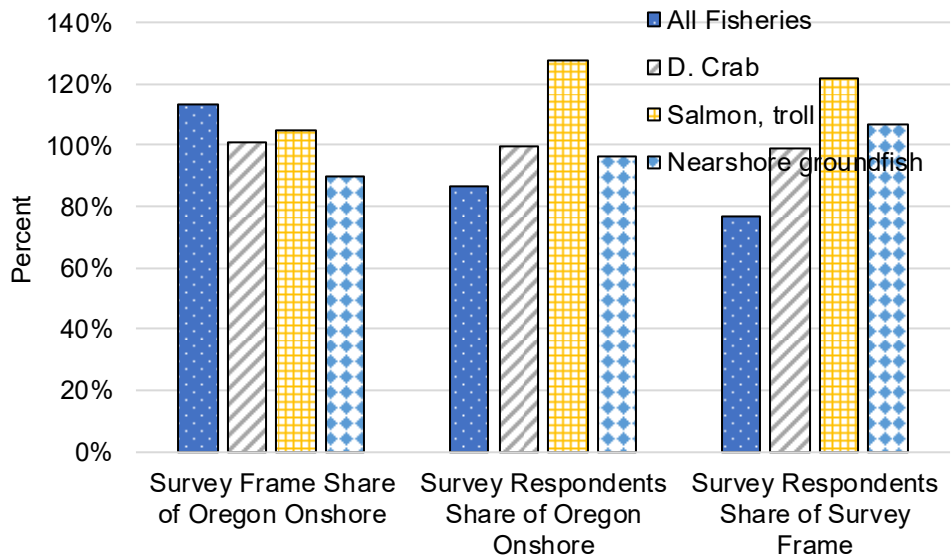


Figure G.6
Delivering Vessel Average Annual Landed Value
Shares of Oregon Onshore and Survey Frame in 2016



Notes: 1. Table G.5 notes apply.

Figure G.7
Delivering Vessel Trips in 2016

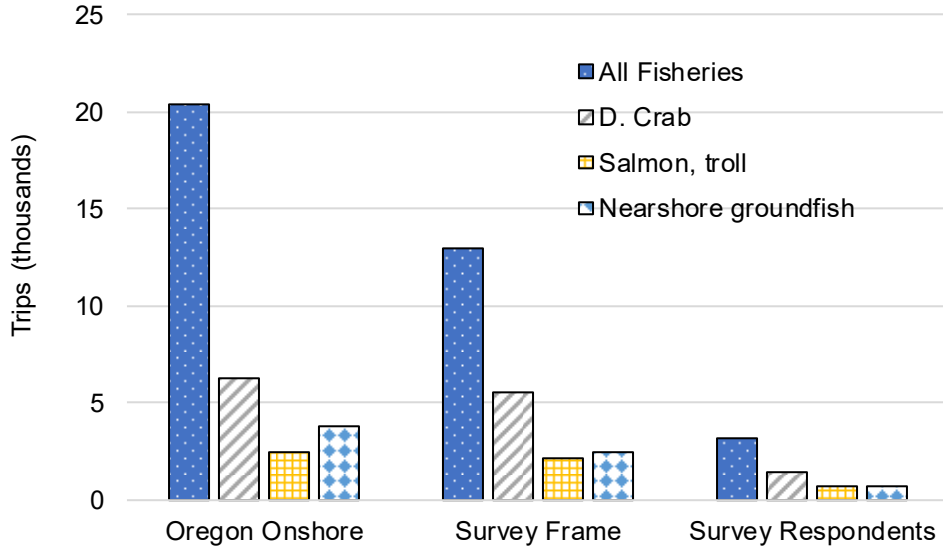
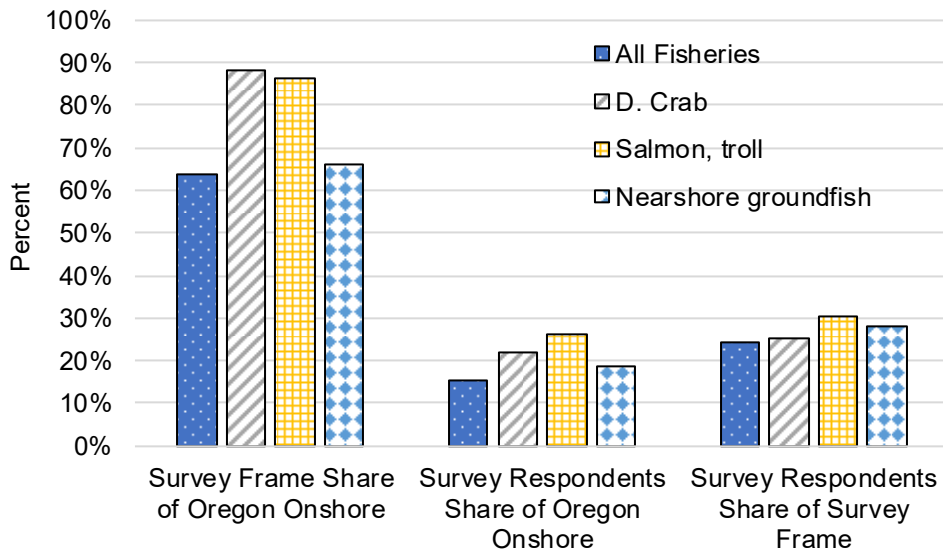
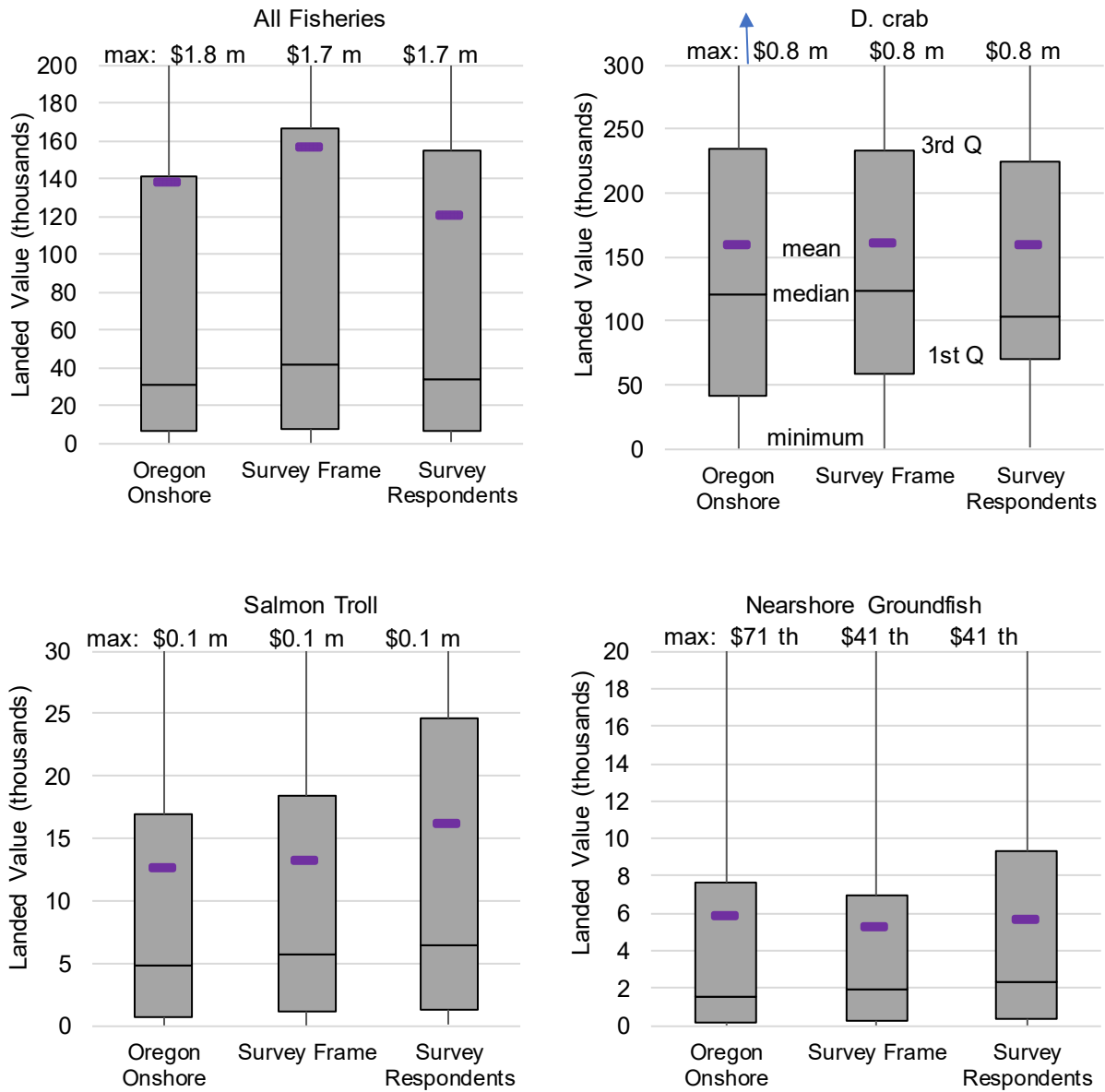


Figure G.8
Delivering Vessel Trips Shares of
Oregon Onshore and Survey Frame in 2016



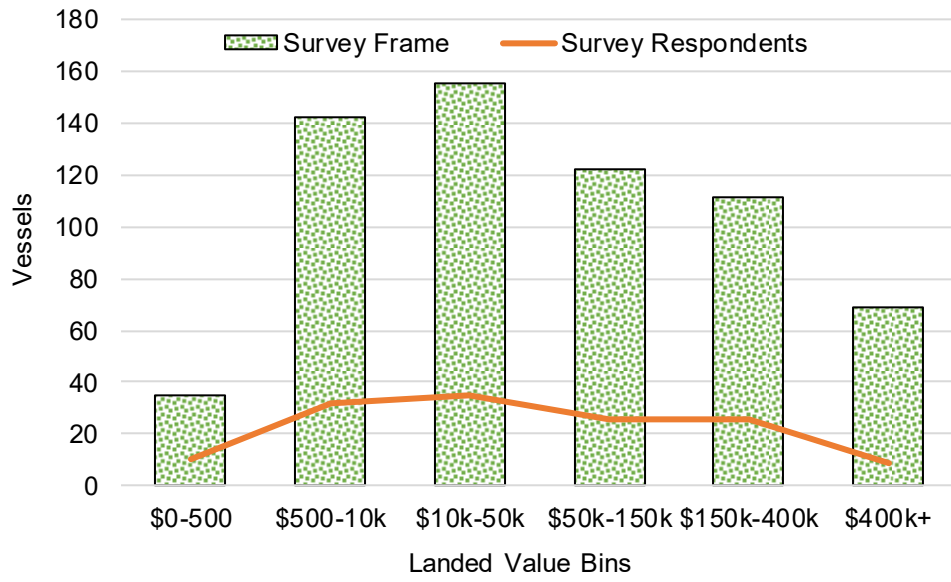
- Notes: 1. Table G.5 notes apply.
2. Trips are approximated using fish tickets. A fish ticket represents the landing of fish or shellfish product from one fishing trip. Ticket counts may not reflect fishing trips, because multiple tickets can be issued for a single trip when a vessel delivers to more than one dealer after returning to port, and vessels issue tickets when a sale is made directly to the public. Trip undercounts could occur in the occasion when tendering services are used because more than one vessel's harvest could be combined onto a single fish ticket. Delivery counts are not additive across fisheries because a fish ticket may include more than one species.

Figure G.9
 Quartiles of Delivering Vessel Average Annual Landed Value in 2016



Notes: 1. Table G.5 notes apply.

Figure G.10
Histogram of Delivering Vessel Average Annual Landed Value in 2016



Notes: 1. Table G.5 notes apply.

H. Discussion

The representativeness analysis purpose is to determine bias of the chosen survey frame for being inclusive of the intended survey population and investigate bias of non-response. The survey population included commercial fishing permit holders and recreational fishing charter boat permit holders. The representativeness analysis was only for the commercial fishing stratum.

The known indicators of the survey frame are from fisheries permit registrations and harvest delivery information recorded on fish tickets. There were no overt survey procedures used to track down non-respondents to determine potential bias. Therefore, and only if necessary due to a finding of misrepresentation, the known indicators could be used for creating post-survey calibration schemes to ameliorate any non-response bias.

Major findings from the representativeness analysis are:

1. If the survey population is commercial fishing participants in a traditional definition for Oregon nearshore fisheries, then survey coverage bias is introduced with the choice for the survey frame. The choice opened the survey frame list to participants whose fishing grounds are outside nearshore fisheries and there are other fishery permits that could have been included in the survey frame to be more inclusive of nearshore fisheries, such as the sea urchin fishery. The chosen survey frame does contain the most important (highest landed value generating) nearshore fisheries.
2. Concatenating survey frame list addresses and limiting respondents to providing information for only two vessels caused some loss in survey frame integrity. There were cases where multiple permit owners are associated with one address and other cases where many vessels were owned by a single registrant.
3. Not preloading the instrument with vessel and harvest history nor asking for the vessel identification number on the survey caused difficulties in verifying respondents stated behavior and supplying fish ticket delivery information to the survey results database.
4. Survey respondents were diverse and proportionally aligned with known characteristics about the survey frame universe. Known characteristic measures include vessel landed value, vessel physical length, Oregon principal port (port group where a plurality of Oregon landings are made), and permit registration in-state residency. Based on means and proportions, the respondents' deviations from survey frame are small for the characteristics.
5. The proportions of permit holders active in 2016 for any of the three survey fisheries are: survey frame 51 percent and respondents 62 percent. It makes sense that a permit owner that is active in an Oregon fishery would be more likely to invest the time to complete a survey that is about the fisheries in which they participate.
6. Using only Oregon landed value and effort in modeling will misrepresent total vessel harvesting activity because some of the survey frame three fisheries permit holders also participate in distant water fisheries.

7. Response rate is low but not unexpected and unusual of other similar voluntary commercial fishing cost-earnings and preference survey studies. There were no non-response follow-up interviews that could be used to test similarity to respondent characteristics, behavior, and attitudes. At 229 respondents for a 1,161 survey list, an expected parametric margin of error at 95 percent confidence level for a question with a cardinal number answer that had no refusals would be plus or minus six percent.
8. More work in assessing representativeness such as comparing survey cost-earning results to mandatory reporting and other survey studies is possible.
9. Any signal of effort shift away from marine reserve due to fishing restrictions is probably lost in the noise of annual landing variability. The maximum potential loss of landing value is 3.6 percent of Oregon Territorial Sea using average landings 2013-2015 (TRG February 2018). The landing value variability between 2008 and 2017 has a range of 72 percent for Dungeness crab, 223 percent for salmon troll, and 30 percent for nearshore groundfish (Table C.1). A more spatial and temporal refined investigation would be necessary to discern a discontinuity in effort related to area fishing restrictions.

This representative analysis shows fairly close adherence to known survey frame characteristics. Therefore it is suggested that calibration schemes to improve representation may not be needed. There are no analytical standards to determine whether responses should be calibrated to reduce bias. It would be up to the project author to judge its necessity.

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APPENDIX A

Survey Instrument

Post Office Box 751
Portland, Oregon 97207-0751
www.pdx.edu/esm

Hello! We are contacting you to ask for your help in a study on changes in Oregon fisheries over time. We are conducting this study as part of my graduate research at Portland State University with Drs. Elise Granek and Max Nielsen-Pincus, and in partnership with the Oregon Department of Fish and Wildlife.

As part of this study, we request that you complete the enclosed questionnaire about your experiences with Oregon fisheries. We will be evaluating shifting conditions in Oregon's nearshore commercial ground fish, Dungeness crab, nearshore salmon troll, urchin, charter and nearshore trawl fisheries. Participation in this study is an opportunity for you to voice your perspective and experience in Oregon's fisheries, which will contribute to a growing body of work regarding marine resource policy and management. Your responses will help develop more effective communication between management agencies and fishers.

Participation in this study will take 20-40 minutes and there is no more than minimal risk associated in your participation. Your personal information will only be used to mail and return your survey. **Your responses are completely confidential, and your name will never be connected to your answers or included in any reporting.** A final report will be published by Portland State University; a copy will be provided to the Oregon Department of Fish and Wildlife. If requested, we will send you a copy as well.

There is a separate postcard enclosed in this packet. On that postcard, you can enter into a raffle to win one of five \$50 gift cards and you may also opt to sign up for an in-depth interview for a related study. This interview is an opportunity to speak with another researcher about any additional information you feel is critical in understanding changes in fisheries or fisheries management over time. You will be compensated with a \$25 gift card if you choose to participate in the interview. Please include the postcard with your return mailing.

Your decision to participate in this study is completely voluntary, you may skip any questions you do not want to answer, and you have the right to end your participation at any time. When you complete and return the attached questionnaire, it means that you have read and understood this information, you agree to take part in this study, and you are over 18 years old. Thank you very much for your time and support of this study.

Sincerely,



Bryn Hudson (Graduate Student)
503-686-5407
bryn@pdx.edu

PS. The Portland State University Institutional Review Board overseeing human research has reviewed and approved this study. If you have any questions before or after the survey, you can contact me, or my advisor Elise Granek at graneke@pdx.edu. If you have questions regarding your rights as a research participant, you may call the Portland State University Office for Research Integrity at (503) 725-2227 or 1(877) 480-4400. The Office for Research Integrity is the office that supports the PSU Institutional Review Board. For more information, you may also access the Institutional Review Board website at <https://sites.google.com/a/pdx.edu/research/integrity>

2017 Oregon Fishing Effort Survey

Please answer the following questions to the best of your ability. Feel free to write your thoughts and comments anywhere on the survey.

1. Currently, what is your primary operating port? *(Circle one or write one in)*

- | | |
|--|---|
| a. Astoria, Warrenton, Hammond area | e. Port Orford, Gold Beach area |
| b. Garibaldi, Pacific City area | f. Brookings |
| c. Newport, Depoe Bay, Florence area | g. Other port in Oregon: _____ |
| d. Coos Bay, Bandon, Charleston, Winchester Bay area | h. Port not in the State of Oregon: _____ |

2. For each commercial fishery in Oregon that you participated in since at least 2011, fill in the table below.

Fishery <i>(Circle all that apply)</i>	Years Fished <i>(From-to)</i>	Fulltime fishery participant <i>(Write in yes or no)</i>	Percentage of household income derived from fishery <i>(Column must add to 100% fishing income)</i>
Nearshore ground fish			
Dungeness crab			
Salmon troll			
Sea Urchin			
Charter			
Nearshore trawl (Beach dragging)			
Other: _____			

If you have discontinued your activity in any of the above fisheries since 2011, please state the name of the fishery(ies) and the reason for your discontinuation in the box below.

3. How many generations has your family participated in Oregon's fisheries? *(Circle one)*

- a. 1 (I am a first generation fisher)
- b. 2
- c. 3
- d. 4 or more

4. Do you anticipate that your children will participate in your family's fishing operation? *(Circle one)*

Yes No Maybe I Don't Have Children

5. To what degree do you agree/disagree with each statement below? *(Check one box for each statement)*

Statement	Strongly disagree	Moderately disagree	Neutral	Moderately agree	Strongly agree
Public agencies have done a good job advocating for my personal interests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public agencies have done a good job advocating for the interests of the fisheries in which I participate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public agencies adequately communicate issues regarding Oregon fishery management to my local fishing community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the amount of contact I have with agency representatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel comfortable voicing my opinions about Oregon ocean management and policy to public agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I know where to obtain information about policy changes regarding Oregon ocean issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I know where to obtain information about scientific research regarding Oregon ocean issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. What do you see as the main factors influencing the trends of your fishery related profits? (Circle up to 3 factors that influence profits and rank them 1-3, with 1 being the largest influence)

Fishery: _____

Fishery: _____

RANK

- a. ___ Operating expenses
- b. ___ Catch limits
- c. ___ Catch per unit efforts
- d. ___ Ocean conditions
- e. ___ Weather conditions
- f. ___ Market prices
- g. ___ Regulations (specify):

- h. ___ Regulations (specify):

- i. ___ Other: _____

RANK

- a. ___ Operating expenses
- b. ___ Catch limits
- c. ___ Catch per unit efforts
- d. ___ Ocean conditions
- e. ___ Weather conditions
- f. ___ Market prices
- g. ___ Regulations (specify):

- h. ___ Regulations (specify):

- i. ___ Other: _____

10. Since 2011, what are the main factors that explain the variability in your fishing effort? (Circle up to 3 factors that influence fishing effort and rank them 1-3, with 1 being the largest influence)

Fishery: _____

Fishery: _____

RANK

- a. ___ Operating expenses
- b. ___ Catch limits
- c. ___ Catch per unit efforts
- d. ___ Ocean conditions
- e. ___ Weather conditions
- f. ___ Market prices
- g. ___ Regulations (specify):

- h. ___ Regulations (specify):

- i. ___ Other: _____

RANK

- a. ___ Operating expenses
- b. ___ Catch limits
- c. ___ Catch per unit efforts
- d. ___ Ocean conditions
- e. ___ Weather conditions
- f. ___ Market prices
- g. ___ Regulations (specify):

- h. ___ Regulations (specify):

- i. ___ Other: _____

11. Please fill the table in below explaining how the percentage of each cost has contributed to your total operating costs in the years 2011, 2014 and 2017. (Ensure each box adds to 100% for each year)

Fishery	2011	2014	2017
_____	___% fuel ___% crew ___% other	___% fuel ___% crew ___% other	___% fuel ___% crew ___% other
_____	___% fuel ___% crew ___% other	___% fuel ___% crew ___% other	___% fuel ___% crew ___% other

12. To the best of your memory, fill in the table below that describes your fishing effort of each fishery in which you participate over the last seven years (2011-2017). We acknowledge that the 2017 season is not over for some fisheries, answer for that year to the best of your ability. Please note that 3 nautical miles falls within state territorial waters and is typically less than 40 fathoms deep.

Fishery: _____	Year	2011	2014	2017
Define your fishing season (Circle the months fished)		Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
What percentage of your net household income was derived from this fishery? (0-100%)				
About how many days did you fish during the season, total ? (0-365)				
About how many days did you fish during the season, within 3 nautical miles ? (0-365)				
About how many hours was your fishing gear deployed each day during the season? (0-24)				
About how many hours was your fishing gear deployed each day during the season, within 3 nautical miles ? (0-24)				
About how many miles did you travel before deploying fishing gear?				
About how many days did you fish within what is now marine reserve limits? (0-365)				
What percentage of your annual revenue was caught within what is now marine reserve limits? (0-100%)				
Fishery: _____	Year	2011	2014	2017
Define your fishing season (Circle the months fished)		Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
What percentage of your net household income was derived from this fishery? (0-100%)				
About how many days did you fish during the season, total ? (0-365)				
About how many days did you fish during the season, within 3 nautical miles ? (0-365)				
About how many hours was your fishing gear deployed each day during the season? (0-24)				
About how many hours was your fishing gear deployed each day during the season, within 3 nautical miles ? (0-24)				
About how many miles did you travel before launching fishing gear?				
About how many days did you fish within what is now marine reserve limits? (0-365)				
What percentage of your annual revenue was caught within what is now marine reserve limits? (0-100%)				

13. Which best describes the type of impact that the establishment of no-take marine reserves has had on your ability to partake in at least one Oregon fishery in which you participate? If reserves have had NO CLEAR IMPACT on your fishing efforts, skip to the end of the survey. (*Check one box for each statement*)

Fishery	Largely negative	Moderately negative	No clear impact	Moderately positive	Largely positive
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. How has marine reserve establishment impacted your ability to partake in any of the Oregon fisheries in which you participate? (**Circle up to 3 outcomes and rank them 1-3, with 1 being the greatest impact**)

Fishery: _____

Fishery: _____

RANK

- a. ___ Fishing ground displacement
 b. ___ Increased spatial competition
 c. ___ Longer travel distances
 d. ___ Other: _____
 e. ___ Other: _____
 f. ___ Other: _____

RANK

- a. ___ Fishing ground displacement
 b. ___ Increased spatial competition
 c. ___ Longer travel distances
 d. ___ Other: _____
 e. ___ Other: _____
 f. ___ Other: _____

15. Identify which marine reserve (if any) has had the greatest impact on your fishing operations. (*Circle one*)

GREATEST IMPACT

- a. Marine reserve implementation has not impacted my fishing operation
 b. Cape Falcon
 c. Cascade Head
 d. Otter Rock
 e. Cape Perpetua
 f. Redfish Rocks

SECOND GREATEST IMPACT

- a. Marine reserve implementation has not impacted my fishing operation
 b. Cape Falcon
 c. Cascade Head
 d. Otter Rock
 e. Cape Perpetua
 f. Redfish Rocks

-This is the end of the survey-

Thank you for your time. We greatly value your answers and opinions. Please return your survey and the raffle ticket in the self-addressed stamped envelop within two weeks.

Please remove and keep the cover letter for your records. If you have any questions or concerns, please contact the number given on the cover letter. If you would like to be entered in a raffle to win one of five \$50 gift cards, please fill out and send back the enclosed postcard in your return envelope.

Feel free to write any other thoughts you have about Oregon Fisheries in the space below or on the next page:

APPENDIX B

Survey Commercial Fisheries Landed Value by Species at Port Groups in 2016

Appendix B
Survey Commercial Fisheries Landed Value by Species at Port Groups in 2016

Species Group	Species	Management	Landings by Vessels With Oregon Nearshore Fishery Permit								Delivery Port Groups						
			Total	Permit	No Permit	Hook&Line	Net	Pot	Trawl	Troll	Other	Astoria	Tillamook	Newport	Coos Bay	Port Orford	Brookings
Crab	Dungeness crab	s	55,734,874	54,734,492	1,000,382		855	55,587,237	0		146,782	15,161,951	2,411,481	15,600,124	11,788,031	2,872,524	7,900,763
<u>Salmon, troll</u>																	
Salmon	Chinook	O,f,s	4,253,521	4,161,150	92,371		0		0	4,253,521	191,681	142,976	2,828,968	887,985	149,879	52,032	
Salmon	Coho	O,f,s	384				384		0		384		0				
Salmon	Chum	O,f,s	0						0		0						
	subtotal		4,253,905	4,161,150	92,371	0	384	0	0	4,253,521	0	192,065	142,976	2,828,968	887,985	149,879	52,032
<u>Nearshore groundfish</u>																	
Flatfish	English sole	G	153,271	0	153,271	0	0	0	153,271	0	126,146	0	9,382	11,476	0	6,267	
Flatfish	Pacific sanddab	G	58,350	0	58,350	0	0	0	58,350	0	46,663	0	981	10,705	0	1	
Flatfish	Sand sole	G	55,851	5	55,846	5	0	0	55,846	0	55,655	0	191	0	5	0	
Flatfish	Starry flounder	G	9,012	9	9,003	9	0	0	9,003	0	9,001	0	2	0	9	0	
Rockfish	Black rockfish	G,f,s	503,786	498,045	5,741	502,848	0	38	720	180	718	94,702	22,628	19,335	224,813	141,590	
Rockfish	Black-and-yellow rockfish	G,f,s	32	32	0	32	0	0	0	0	0	0	4	0	28	0	
Rockfish	Blue rockfish	G,f,s	6,574	6,490	84	6,571	0	0	3	0	3	795	828	38	3,935	975	
Rockfish	Brown rockfish	G,f,s	31	31	0	31	0	0	0	0	0	0	28	0	3	0	
Rockfish	China rockfish	G,f,s	46,339	46,335	4	46,339	0	0	0	0	0	0	0	611	38,271	7,457	
Rockfish	Copper rockfish	G,f,s	7,500	7,474	26	7,473	0	22	5	0	0	69	26	1,122	5,466	817	
Rockfish	Gopher rockfish	G,f,s	438	438	0	438	0	0	0	0	0	0	0	5	237	196	
Rockfish	Grass rockfish	G,f,s	559	559	0	559	0	0	0	0	0	0	0	0	60	499	
Rockfish	Quillback rockfish	G,f,s	7,773	7,661	112	7,658	0	28	87	0	87	140	37	1,016	5,859	634	
Rockfish	Unsp. sculpin		114	114	0	0	0	114	0	0	0	114	0	0	0	0	
Rockfish	Wolf eel		1,033	836	197	530	0	476	27	0	27	306	150	289	261	0	
Roundfish	Lingcod, nearshore	G	441,398	269,745	171,653	392,852		7,435	41,112		43,130	81,382	62,355	47,357	129,894	77,280	
Roundfish	Cabezon	G,f,s	119,752	119,507	245	102,774	0	16,854	124	0	124	17,426	698	4,282	77,059	20,163	
Roundfish	Kelp greenling	G,f,s	82,425	82,399	26	81,850	0	575	0	0	0	671	77	916	47,137	33,624	
	subtotal		1,494,238	1,039,680	454,558	1,149,969	0	25,542	318,548	180	0	281,554	195,605	97,387	97,152	533,037	289,503
Total			61,483,017	59,935,322	1,547,311	1,149,969	1,239	55,612,779	318,548	4,253,701	146,782	15,635,570	2,750,062	18,526,479	12,773,168	3,555,440	8,242,298

- Notes: 1. Landed value is in nominal dollars. Landed value reflects the mix of prices for deliveries that include live and dead fish.
2. The permit for nearshore groundfish is a state issued limited entry Oregon nearshore fishery permit with and without a nearshore endorsement permit for harvesting other rockfish. Federal and state regulations allow nearshore groundfish to be harvested without a permit as a trip limited incidental fishery. State regulations apply inside three nautical miles and are accompanied with depth restrictions.
3. Hook and line gears include "longline or setline" and "other hook and line gear"; net gears include "dip net" and "other net gear"; pot gears include "fish pot" and "crab pot"; trawl gears include "flatfish trawl", "selective FF trawl, small footrope", "groundfish trawl (otter)", "midwater trawl", and "roller trawl"; troll gear is "troll"; and other gear is "other known gear".
4. Astoria port group includes ports of Astoria and Gearhart-Seaside; Tillamook includes Tillamook/Garibaldi, Pacific City, Nehalem Bay, and Netarts Bay; Newport includes Newport, Depoe Bay, and Waldport; Coos Bay includes Coos Bay, Winchester Bay, Bandon, and Florence; Port Orford includes Port Orford; and Brookings includes Brookings and Gold Beach.
5. Management: G = Groundfish FMP, O = Pacific Coast Salmon FMP, f = federal managed complex, s = state managed (overlapping federal and state management shown as "f,s"). Some species have federal and state individual annual harvest guidelines and others are managed as complexes with harvest guidelines. Generally species that have declining stock assessments are managed individually and others with healthy abundance are in complexes.
6. The estimate of the nearshore portion of lingcod landings used species and gear filter queries to include open access landings with longline, other hook and line, or pot gear; and limited entry landings with longline, other hook and line, or selective FF trawl (small footrope) if it was on the same fish ticket with black or blue rockfish or certain other nearshore species.
7. The nearshore fisheries portion of the commercial salmon troll fishery is assumed 35 percent and the nearshore portion of the Dungeness crab fishery is assumed to be 54 percent (TRG 2018).

Source: PacFIN annual vessel summary and fish ticket data, March 2017 extraction. Permits from ODFW fishery permit file for 2016.