

**Economic Impact of Marine Recreational Fishing:
Oregon Pilot Survey**

Oregon Department of Fish and Wildlife
Marine Reserves Program

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A. Introduction

Collection of catch data from private and charter recreational fishermen is crucial to federal and state fish resource management. It is also important to collect socio-cultural and economic information from this stakeholder group for marine reserves monitoring. The Ocean Recreational Boating Survey (ORBS) has developed into an important data collection tool for Oregon's coastal fisheries and was used to assist in collecting needed socioeconomic data from recreational fishermen. In this study, ORBS samplers asked recreational fishermen to fill out postcards with their contact information. This contact information was then used to conduct follow-up interviews in order to gather needed information about spending associated with recreational fishing trips in Oregon.

The data collected both through the ORBS sampler interviews and the follow up interviews provides an understanding of who is recreationally fishing in Oregon marine environments, where they are fishing, what they are fishing for, and their economic impacts to coastal Oregon communities. This information also enables a better assessment of recreational fishing activities in and near marine reserve and protected area sites and to estimate the impacts of restrictions in these areas. The follow-up interviews help us to assess the displacement behavior of these fishers by asking them how they would change their choice in fishing site and time if their chosen area were closed to fishing. Asking in a general way, not associated with any specific marine reserve site, allows this information to be used for a broader scope of management issues.

B. Methods

Port Sampler Program

- ORBS samplers used a method common for surveying catch and effort called a “creel survey,” which included a modified random sampling design during their usual sampling duties. This design helped samplers to randomly select fishermen to interview at various access points along the port during their duties. ORBS maintains a minimum sampling goal of 20% of all ocean trips, and the average coast-wide sampling rate is typically within the range of 35-45% of the angler effort (Schindler 2012).
- This economic study was considered an “add-on” to traditional ORBS duties. Figures 1 and 2 show the sampling plan for the add-on survey in terms of target numbers of interviews to complete by date and port. These targets were eventually revised due to low response and participation rates.
- The add-on portion of the survey began when the port sampler identified the “party leader,” or the boat owner or person responsible for motivating the recreational fishing trip, of the boat they selected to survey and asked them if they would be willing to participate in a follow up interview about their trip.
- The port sampler wrote the ORBS sampler ID number, ORBS interview number, port number, and date on the postcard before distributing it to the fisherman.
- Postcards were collected either on the docks by the ORBS sampler or mailed by the fisher. Each postcard was stamped and self-addressed to the ODFW Marine Reserves Program. The postcards had a dual purpose to provide a list of willing responders, and promote resolve and commitment for agreeing to participate in the follow up interview.

Survey Instrument

- A 27-question survey was designed to ask anglers about their most recent trip to the designated port that they had last visited.
- Information about spending on a typical trip was combined with information on the number of trips taken to the area per year to determine average annual spending per angler at their specific fishing port.
- Participants were then asked questions regarding annual expenditures on fishing gear, equipment, and boats in order to capture information about spending on marine recreational fishing that may be spent outside of a trip. In the future, this information can be used to expand the scope of the study to include the impact of marine recreational fishing expenditures on the entire Oregon economy.
- Anglers were asked what they would do if a new spot closure regulation prevented them from fishing where they had previously fished on their last trip in order to determine how angler behavior and, in association, trip spending may change with the implementation of marine reserves sites.
- Demographic questions were asked to gain a deeper understanding of the characteristics of the survey base.

Survey Administration

- ODFW personnel matched contact information and interview numbers on the postcards with catch information in the online ORBS database and entered this information into a new telephone database.
- Designated interviewers utilized information in the telephone database to call anglers and administer the survey.
- Interviewers cold-called interviewees on the contact list. They often needed to make multiple calls to the interviewee until contact was made.

Tabulation of Results

- The survey was coded numerically for statistical analysis, aside from one question asking for comments. All qualitative questions were multiple choice and quantitative questions were generally open-ended. Completed coded interview information was entered into a database. Detailed economic modeling and analysis was not completed in this study, because the response rate was too low across all ports and at ports in communities of place.

C. Results

Postcards were distributed from October 2011 to October 2012 and phone interviews were conducted simultaneously during distribution. In total, 232 postcards were received and 113 follow-up interviews were conducted. Postcards were distributed at seventeen ports and the majority of the postcards were received from thirteen of these ports.

The data described in this section only includes the 58 recreational fishermen who were interviewed from communities of place associated with the Otter Rock and Redfish Rocks sites specifically. The following data is aggregated for Port Orford, Newport, and Depoe Bay. Overall, 12 respondents were sampled from Port Orford, 30 from Depoe Bay and 16 from Newport.

Spending on Recreational Fishing Trips

- For the purposes of this survey, a trip was defined as starting when the angler left home and ending when they returned home, regardless of whether they were gone one day or more than one day. Recreational fishermen sampled took a total of 951 trips to the port they were sampled at per calendar year, with an average of 19 trips per year, a median of 11 trips per year, a minimum of 1 trip, a maximum of 130 trips, and a standard deviation of 25 (see Table 1)
- Recreational fishermen sampled took a total of 2,584 saltwater and freshwater trips to any location per calendar year, with an average of 45 trips per year, a median of 25 trips per year, a minimum of 1 trip, a maximum of 300 trips, and a standard deviation of 54 (see Table 1). Anglers generally spent two nights away from home per trip and spent two days fishing per trip.
- In economic surveys, it is always necessary to ask trip purpose, so that trip spending can be attributed to the specific activity being studied. In this case, all respondents said the main purpose of their trip to the coast was for fishing; 97% said their main purpose was fishing from a boat and 3% said their main purpose was fishing from a dock.
- The greatest percentage of annual angler¹ spending associated with recreational fishing trips to communities of place for Otter Rock and Redfish Rocks was for boat fuel (24% of total spending, \$1,360 mean per angler per year) and travel fuel (20% of total spending, \$1,185 mean per angler per year). Other spending categories included lodging (14%, \$819), buying food at a grocery store (12%, \$650), eating at a restaurant (12%, \$693), charter or guide fees (9%, \$530), and gear, tackle, and bait, (8%, \$441). (see Figure 3/Table 2)
- An important part of determining trip cost is examining income that anglers give up in order to go on a fishing trip. About of 12% of all anglers gave up income to go on their fishing trip, and 9% of anglers used vacation days to go on their trip. The mean amount of income given up per trip was \$599 and the median amount of income given up per trip was \$200 per trip.
- In order to characterize the way that anglers utilized fish resources, questions were asked about the type of angling conducted. The majority (68%) of respondents said they were sometimes catch-and-release anglers, 27% said they were never catch-and-release anglers, 3% were always catch-and-release anglers, and 2% just observed ocean resources (see Figure 4).

¹ Averages are for all anglers interviews, not just participants who spend money in the category

Annual Expenditures on Fishing Gear/Equipment/Boats

- The majority of anglers interviewed (86%) owned a boat. The anglers sampled who owned a boat said an average of 63% of the boat's use was for saltwater fishing in Oregon.
- The greatest percentage of annual spending on boats used for saltwater fishing in Oregon was for replacement of electronics and equipment attached to the boat (\$1,084 mean annual spending per boat owner), maintenance and repair (\$517), storage and slip fees (\$255), insurance (\$183), other (\$142), and license fees (\$33) (see Figure 5/Table 3).
- When anglers were asked hypothetically what they would do if there was a new spot closure regulation that prevented them from fishing the area where they fished most during their trip, the greatest percentage of anglers (36%) said they would choose another port to launch or charter from and fish in an entirely different area, 21% said they would make the trip at another time when the spot closure was over, 17% said they would make the trip and avoid the spot closure, 9% would pick another option, 7% said where they fished was very important so they would not have made the trip, and the remainder said they didn't know or declined to answer (Table 4).

D. Analysis

The number of postcards that were mailed back to ODFW was much smaller than originally targeted. Therefore, this study was considered a pilot project, because the sample size was too small to draw conclusions about a larger population of recreational fishermen in Oregon.

Using ORBS samplers to collect this information was an efficient use of human resources and program budgets. It helped avoid the need to add another layer of enumerators at fishing access sites who would be collecting duplicate information. This method also provided more representative and less biased data than other user survey administration techniques would have. It was also more cost effective than a general angler survey because it avoided having to filter a majority of license holders that did not participate in saltwater (marine) fishing trips.

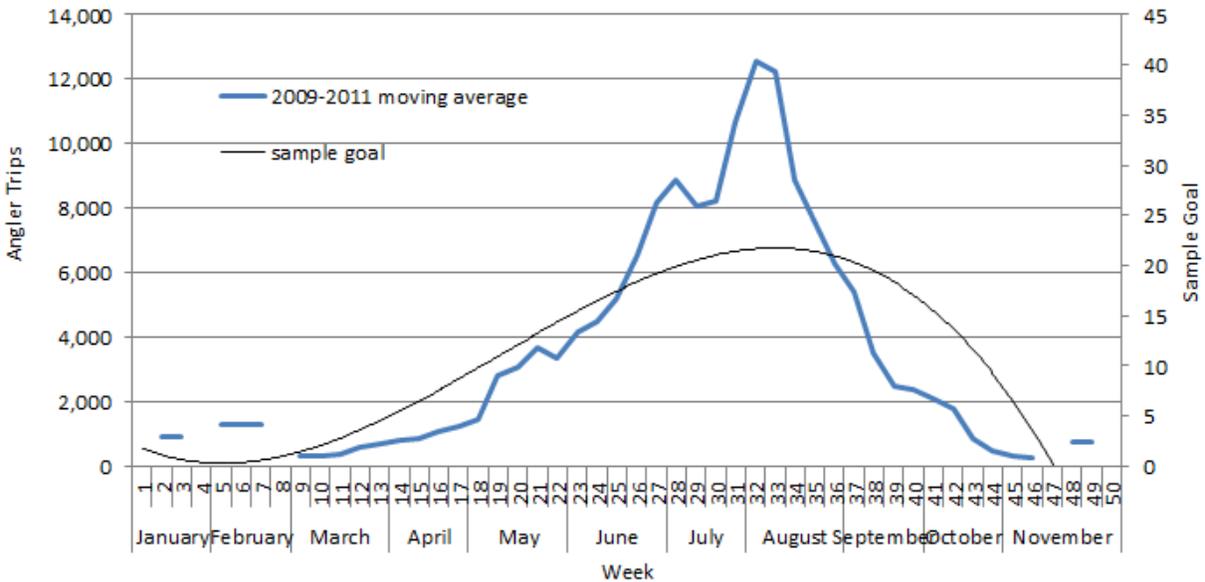
There were some challenges associated with utilizing ORBS samplers. Samplers had varying levels of interest and engagement in the project, so as a result, the number of postcards received from each port was very unbalanced.

To do this survey again in the future, several measures should be taken to ensure higher response rates. This would include planning a more comprehensive training of ORBS samplers and continuing to follow up with these samplers once the survey period started to ensure proper postcard distribution. In addition, a contracted company completed most of the follow-up surveys. In the future, the use of an intern or fellow within ODFW would better be able to ensure that follow-up interviews were being conducted on a timely basis after the postcards were received, which would mean that anglers would be contacted at a time when they could better recall details about their trip.

Responses to the hypothetical scenario question can help predict how the behavior of recreational fishermen may change after spot closures, like marine reserves, are implemented. The responses to this question lead to the prediction that the Oregon coastal economy on the whole is unlikely to see major overall changes in recreational expenditures associated with reserve site implementation, as only 7% of fishermen responded that they would stop making fishing trips completely if a spot closure was implemented at their favorite fishing site.

At the same time, changes in the time periods and locations where these fishermen spend money are expected in association with reserve site implementation. The fact that the greatest percentage of fishermen said they would fish from an entirely different port and location if a spot closure were implemented means that spending which would have originally occurred in communities of place would be displaced to other communities along the coast. In addition, the fact that 21% of anglers said that they would wait until the spot closure was over to fish from their usual spot is another indication that reserve communities in particular could see decreases in spending once reserves go into place.

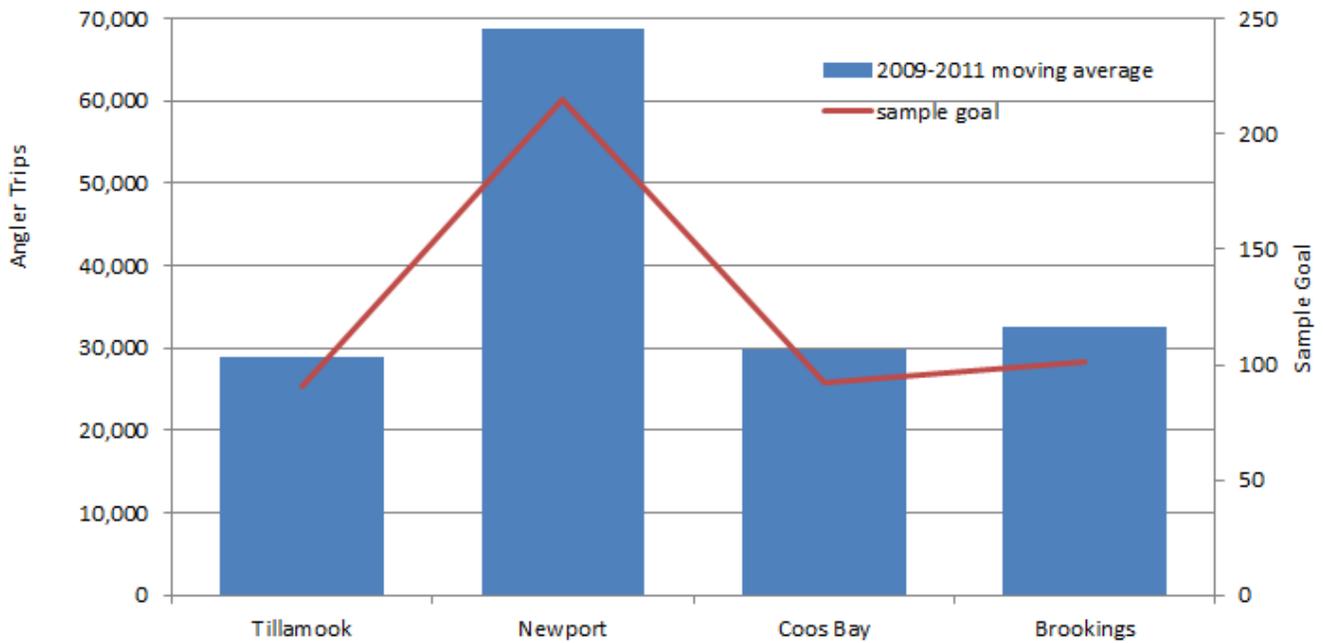
Figure 1. Weekly Recreational Angler Trips and Sample Goal



- Notes:
1. Proportional distribution of sampling goal based on moving average of 2009 to 2011 of Oregon ocean weekly fishing pressure south of Cape Falcon. Pressure measured by sum of all recreational angler days for any trip purpose.
 2. A moving average is commonly used with time series data to smooth out short-term fluctuations and highlight longer-term trends or cycles. A moving average is necessary because recreational fishing seasons are generally the same, but can have different opening and closing dates depending on stock abundance. Also, the number of trips anglers are willing to make is related to perceived CPUE, weather, and other factors for a particular year.
 3. Sample goals are useable results from completed interviews. Sample goal time distribution based on assigning sample size allowed by budget proportional to trips during a month. The distribution was smoothed using a third order polynomial equation.
 4. Angler trips include charter and private trips for salmon, bottomfish, combination, tuna, halibut, dive, and non-fishing.

Source: Schindler, Eric, ODFW, Personal communication, March 2012.

Figure 2. Recreational Angler Trips and Sample Goal by Port Groups



Notes: 1. South of Falcon includes Tillamook area (Garibaldi and Pacific City), Newport area (Depoe Bay and Newport), Coos Bay area (Florence, Winchester Bay, Charleston, and Bandon), and Brookings area (Port Orford, Gold Beach, and Brookings).

Source: Schindler, Eric, ODFW, Personal communication, March 2012.

Figure 3. Annual Trip Spending per Angler by Type

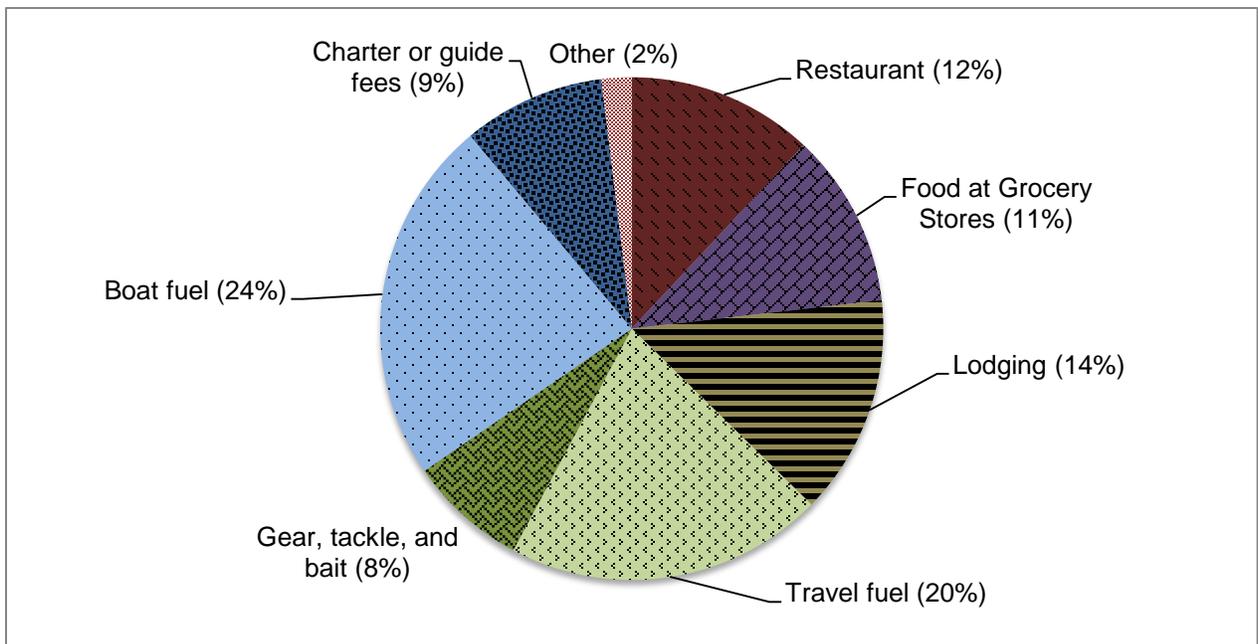


Figure 4. Types of Angling Engaged in by Respondents

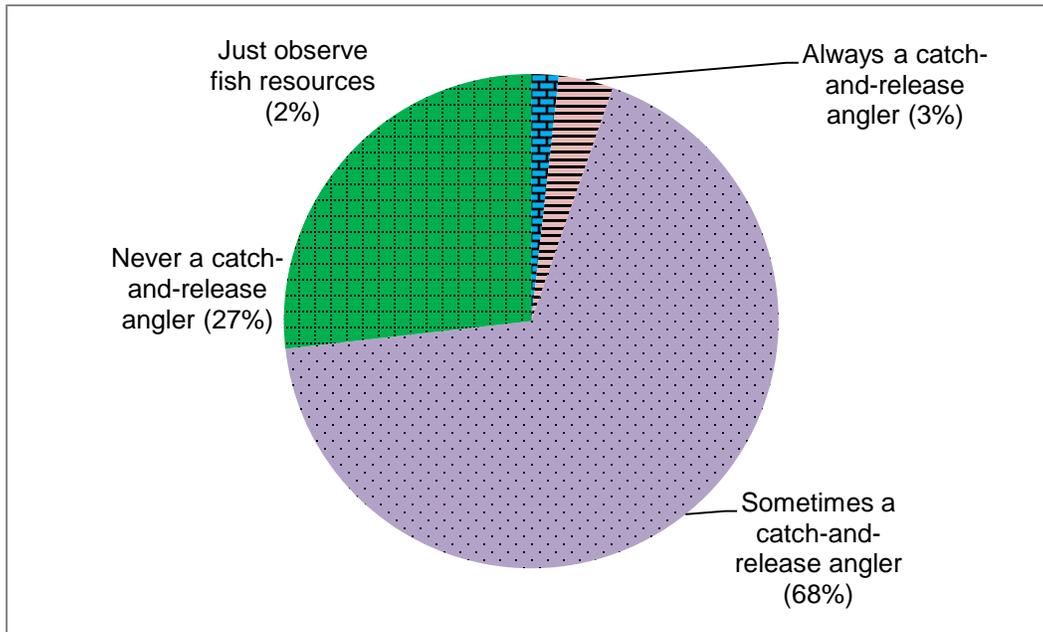


Figure 5. Annual Spending for Boats Related to Saltwater Fishing in Oregon

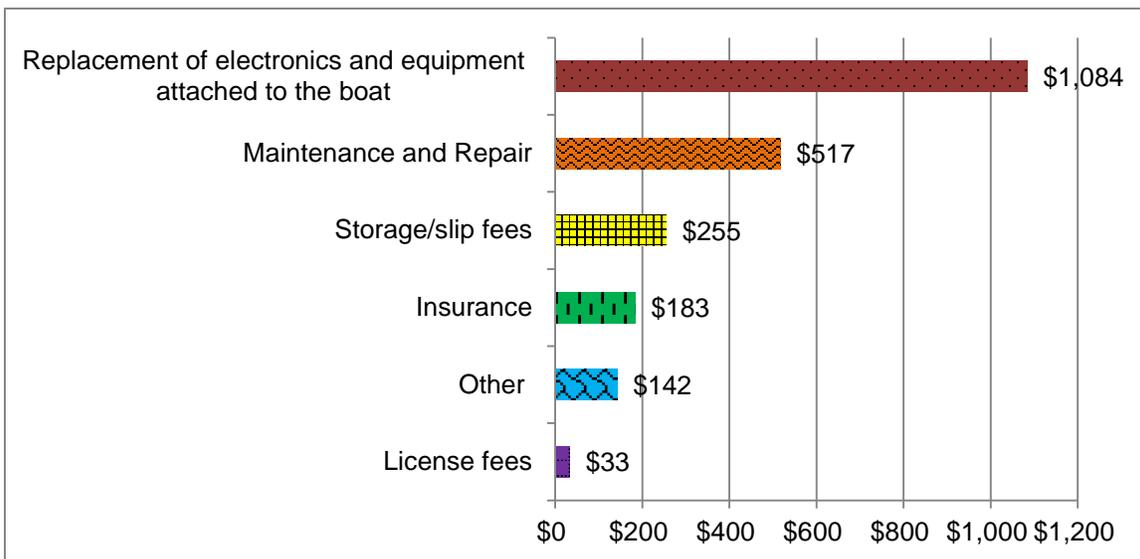


Table 1. Annual Recreational Fishing Trips to Communities of Place

	Total	Average number for those that answered	Average of all Respondents	Maximum	Minimum	Median	Standard Deviation
Trips to Designated Port	951	19	16	130	1	11	25
Saltwater and Freshwater trips taken to any location	2584	45	45	300	1	25	54
Nights spent away from home per trip	-	2	2	13	0	1	3
Size of group	-	4	4	17	0	3	3
Number of days spent fishing per trip	-	2	2	32	1	5	1

Source: Economic Impact of Marine Recreational Fishing in Oregon Pilot Survey

Table 2. Annual Spending on Recreational Fishing Trips to Communities of Place

	Average per person	Average per actual spender	Avg. per trip	Avg. per actual spender per trip	Median	Max	Min	Standard Deviation
Restaurant	\$693	\$1,1148	\$58	\$95	\$138	\$8,000	\$0	1,500
Food at Grocery Stores	\$650	\$897	\$45	\$63	\$115	\$4,000	\$0	972
Lodging	\$819	\$2,793	\$74	\$254	0	\$19,000	\$0	2,654
Travel fuel	\$1,185	\$1,347	\$95	\$108	\$800	\$8,000	\$0	1,359
Gear, tackle, and bait	\$441	\$692	\$29	\$46	\$120	\$5,600	\$0	947
Boat fuel	\$1,360	\$1,923	\$87	\$123	\$500	\$8,450	\$0	1,987
Charter or guide fees	\$530	\$2,561	\$55	\$266	0	\$19,000	\$0	2,563
Other	\$112	\$929	\$8	\$65	\$0	\$2,400	\$0	399
Total	\$5,790	-	\$451					

Source: Economic Impact of Marine Recreational Fishing in Oregon Pilot Survey

Table 3. Annual Spending on Boats for Saltwater Fishing in Oregon

Category of Spending	Average per Boat Owner	Average per Actual Spender	Median	Max	Min	Standard Deviation
Replacement of electronics and equipment attached to the boat	\$1084	\$1,748	\$30	\$20,000	0	3,066
Maintenance and Repair	\$517	\$834	\$10	\$6,000	0	1,142
Storage/slip fees	\$255	\$796	\$0	\$4,800	0	701
License fees	\$33	\$63	\$0	\$240	0	47
Insurance	\$183	\$285	\$40	\$1,140	0	245
Other	\$142	\$1,774	\$0	\$4,000	0	662

Notes: 1. Annual spending for saltwater fishing in Oregon was calculated by multiplying annual spending for boats, by the percentage of time the boat was actually used for saltwater fishing in Oregon.

Source: Economic Impact of Marine Recreational Fishing in Oregon Pilot Survey

Table 4. Behavioral Changes Associated with Spot Closure Regulations

Response	Share of Answers
I would choose another port to launch or charter from and fish in an entirely different area	36%
I would make the trip at another time when the spot closure was over	21%
I would have made the trip and avoided the spot closure	17%
Other	9%
Where I fished was very important, so I would have not made the trip	7%
Don't know	5%
Refused	5%

Notes: 1. Answers shown are responses to the question, "Hypothetically, what would you do if there was a new spot closure regulation that prevented you from fishing where you fished on this trip?"

Source: Economic Impact of Marine Recreational Fishing in Oregon Pilot Survey

Appendix 1: Recreational Survey and Recruitment Instrument

RECREATIONAL FISHING QUESTIONNAIRE

Calling Log

ORBS ID #: _____ ORBS PORT #: _____ ORBS INT # _____

ORBS Interview Date: _____

Interviewee Name: _____

Interviewee telephone number: _____

Telephone Interviewer _____ Phone Interview Date: _____

Telephone interview event:

G	B	N	F	R
Gave up after 10 rings	Business number	No English spoken	Fax machine or computer	Refused immediately
D	A	L	S	
Disconnected number	Answering machine	Spoke and agreed to call later	Spoke and completed interview	

Enter event code and date:

First try: _____, Second try: _____, Third try: _____

More tries: _____

Interview results: Complete ____, Partially Complete ____, Incomplete ____, Refusal ____

Completed interview duration (minutes): _____

Confidentiality Statement Delivered:

Promised that ODFW will maintain confidentiality of personal and trade secret information provided in response to this survey to the extent permitted by law.

Introduction

A1. Hello. My name is _____ and I am working with the Oregon Department of Fish and Wildlife conducting a survey of people recreationally fishing or diving in the ocean. You recently filled out a postcard indicating that you might be willing to take part in a survey about your recent trip to (*Designated Port*). The survey will take about 10 minutes and all the information you provide will be kept strictly confidential. Is now a good time to talk? [If NO SAY: *May I call you later? When would work best?*]

- 1 Talk now. [SKIP TO A2]
- 2 Call later. Telephone number _____ [RECORD IN LOG AND END]
- 8 Don't know [THANK AND END]
- 9 Refused [THANK AND END]

Section A. Questions About Trip Purpose

ODFW is interested in determining how changes in ocean management might affect trip behavior and the economic value of the trip. To do that, they need information on trip characteristics and how much money was spent on your trip.

A2. For purposes of this survey, a trip starts when you leave home and ends when you return home, regardless of whether you were gone one day or more than one day. Given that a trip may be more than one day, how many trips to (Designated Port) will you probably take this calendar year?

- 1 ___ trips
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

A3. How many saltwater and freshwater fishing trips will you probably take anywhere this calendar year [AVERAGE NUMBER IF GIVEN RANGE]?

- 1 ___ trips
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

A4. Thinking about those saltwater and freshwater trips, would you say you generally: [READ CHOICES]

- 1 Just observe fish resources.
- 2 Always a catch-and-release angler.
- 3 Sometimes a catch-and-release angler.
- 4 Never a catch-and-release angler. [DO NOT ASK B5]
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

Section B. Questions Regarding Recent Trip

Now I'd like to ask you to think about your recent (*Designated Port*) trip. Remember we already have information about any fish you might have caught from our port sampler, so we'll just be asking questions about your overall trip.

B1. What was the main purpose of your recent trip to (*Designated Port*)? Please answer yes or no as I read the choices. [READ CHOICES]

- 1 Fishing from boat. Yes___
- 2 Fishing from beach. Yes___
- 3 Diving from boat. Yes___
- 4 Diving from beach. Yes___
- 5 Boating without fishing or diving. Yes___
- 6 Observing the ocean from shore. Yes___
- 7 Business. Yes___
- 8 Other - Specify: _____. Yes___
- 88 Don't know [DO NOT READ]
- 99 Refused [DO NOT READ]

B2. How many nights were you away from home on your trip to (*Designated Port*)?

- 1 ___ nights [IF 0, SKIP TO B3]
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

B3. Including yourself, how many people were with you on your recent (*Designated Port*) trip?

- 1 ___ people
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

C3. Do you own a boat?

- 1 Yes [SKIP TO C4]
- 2 No [SKIP TO D1]
- 8 Don't Know [SKIP TO D1]
- 9 Refused [SKIP TO D1]

C4. How much did you spend on the boat over the past 12 months for:

- 1 Replacement of equipment & electronics attached to the boat? \$_____
- 2 Maintenance and repair? \$_____
- 3 Storage/slip fees? \$_____
- 4 License fees? \$_____
- 5 Insurance? \$_____
- 6 Other - Specify: _____ \$_____
- 8 Don't Know
- 9 Refused

C5. Thinking of all the days that the boat was used over the past 12 months, what percent of the boat's use was for saltwater fishing in Oregon?

- 1 ____%
- 8 Don't know
- 9 Refused

Section D – Substitution Question

Think of the area (on the ocean) you spent the most time fishing during your trip.
Hypothetically, what would you do if there was a new spot closure regulation that prevented you from fishing this area?

[READ ITEMS]

- 1 Where I fished was very important, so I would have not have made the trip.
- 2 Made the trip and avoided the spot closure.
- 3 Make the trip at another time when the spot closure was over.
- 4 Choose another port to launch or charter from and fish entirely different area.
- 5 Other - specify: _____
- 8 Don't Know [DO NOT READ]
- 9 Refused [DO NOT READ]

Section E - Questions Regarding Demographics

Now I'd like to end by asking you some general questions.

E1. What is your residence zip code?

- 1 _____
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

E2. How many years of saltwater fishing experience do you have?

- 1 ___ years
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

E3. In what year were you born?

- 1 _____
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

E4. What is your ethnic background? Do you consider yourself . . . ? [READ CHOICES; MULTIPLE ANSWERS OKAY]

- 1 Non-Hispanic White
- 2 Hispanic White
- 3 Black
- 4 Asian
- 5 Native American
- 6 Other - Specify: _____
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

E5. What is the highest level of education that you've attained?

- 1 Some high school
- 2 High school graduate or GED
- 3 Some college or technical/trade school
- 4 Two-year college degree
- 5 Four-year college degree
- 6 Postgraduate degree
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

E6. Which of the following best describes your employment status? Would you say:

- 1 Employed by someone else full time
- 2 Employed by someone else part time
- 3 Self employed full time
- 4 Self employed part time
- 5 Retired
- 6 Full time homemaker
- 7 Student
- 8 Other - Specify: _____
- 88 Don't know [DO NOT READ]
- 99 Refused [DO NOT READ]

E7. [RECORD GENDER. VOICE RECOGNITION ONLY ... DO NOT ASK.]

- 1 Male
- 2 Female
- 8 Don't know [DO NOT READ]
- 9 Refused [DO NOT READ]

Section F – Future Interviews

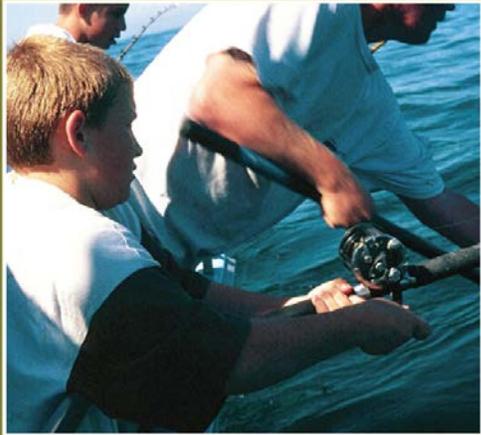
F1. Thank you for being so patient and for participating. Would you be willing to take part in future interviews or focus groups on specific issues such as Marine Reserves, Wave Energy, or Fisheries Management?

- 1 Yes
- 2 No
- 8 Don't Know
- 9 Refused

Section G: Comments

G1. Would you like to share any other comments with us about this survey?

Thank you for your participation in this survey. Have a good day and if you have any further questions please don't hesitate to contact us. [Give my number 541 867 7701 x 229]



Tell Us About Your Trip...



We want to know about your trip!

The Oregon Department of Fish & Wildlife is collecting social and economic information from recreational fishers to better understand the importance of ocean recreational fishing to Oregon's coastal communities.

If you agree to participate please take a moment to fill out the information below and either **mail** it back to us or **hand** it to your Port Sampler and we'll contact you to find out a little more about your fishing trip today.

THANK YOU!!

First & Last Name: _____

Email Address: _____

Phone Number: (_____) _____ - _____

For more information contact: melissa.murphy@state.or.us (541)867-7701 x 229

ODFW Staff Use Only

ID _____ DATE ____/____/____ PORT _____ INT.# _____

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