Angling for Insight: Examining the Recreational Fishing Community's Knowledge, Perceptions, Practices, and Preferences to Inform Rockfish Recovery Planning in Puget Sound, Washington

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Abstract

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An ever-growing body of literature highlights the importance of understanding user groups and stakeholders in conjunction with biological information to manage and recover threatened or endangered species. Stakeholder support is especially important to manage less charismatic or "rare and little known" species. A representative survey of boat-based anglers (n = 443) was developed to this end with respect to rockfish (*Sebastes* spp.) in Puget Sound, Washington. Survey results discuss anglers' relative knowledge of rockfish life history, regulations, and species familiarity; perceptions about threats to rockfish; fishing practices; and preferences for recovery measures. Findings indicated that support for rockfish recovery was associated with anglers who historically fished for rockfish, yet few anglers took specific fishing trips to target them. Preferences for rockfish recovery measures among anglers varied. Multiple logistic regression analysis demonstrated that knowledge of rockfish life history was a significant explanatory variable for only some recovery preferences, namely for marine protected areas. Additionally, perceptions of rockfish threat type were the most important explanatory variables for recovery preferences – more important than rockfish knowledge, fishing experience, group association, or other demographic variables. Findings can inform managers' planning as they seek methods to: 1) encourage rockfish conservation through targeted education, 2) obtain more accurate records of self-reported released catch, 3) bridge gaps between scientific evidence and commonly-held beliefs, and 4) increase the efficacy of future management actions.

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DEDICATION

To my husband, Ryan -- you are the wind in my sails. 143.

"In the end, we conserve only what we love. We will love only what we understand. We will understand only what we are taught." –Baba Dioum, Senegalese poet and conservationist

Introduction

Conservation and Endangered Species Recovery

Successful conservation requires understanding, support, and participation from stakeholders (Stankey and Shindler 2006). This support is particularly important for the conservation and management of less charismatic or "rare and little known" species (Stankey and Shindler 2006; Kellert 1985), which account for the majority of the world's species (Wilson 1987). This is because user groups typically exhibit knowledge of and value species of economic, utilitarian, or cultural significance (Kellert 1985; Martin-Lopez *et al*. 2007), and information about the value of rare or little known species is not widely available or known (Stankey and Shindler 2006). Additionally, this support is fundamental for management that relies largely upon self-regulation and self-reporting by user groups, such as many recreational fisheries (Haw and Buckley 1968; Reynard and Hilborn 1986).

Effective conservation management is heavily tied to human interactions with species and species habitat, and therefore requires as much of an understanding of people as it does understanding of species and supporting ecosystems (Mascia *et al*. 2003). Differences between sources and breadth of information and background, for example, may inform stakeholder's behavior, perceptions, and support preferences for management measures (Verweij *et al.* 2010). The purpose of this study is to examine the knowledge, perceptions,

practices, and preferences for recovery measures that guide angler behavior related to rockfish (*Sebastes* spp.) in Puget Sound/Georgia Basin (hereafter referred to as Puget Sound) in Washington State.

Rockfish in Puget Sound

In Puget Sound rockfish are a species of conservation concern. Rockfish are a long-lived marine fish (Love *et al*. 2002) that comprise a significant portion (15%) of fish species in the Puget Sound ecosystem (Donnelly *et al*. 1995; Palsson *et al*. 2009).

Three species have been listed for protection under the Endangered Species Act (ESA) (NOAAa 2010) and 13 species have been listed as species of concern (WDFWa 2011). Rockfish face a number of threats (Palsson *et al.* 2009). Despite the commercial rockfish fishery closing in Puget Sound in 1999 (Palsson *et al.* 2009) and a recreational moratorium in 2010 rockfish remain vulnerable to incidental mortality (WDFW 2010). Rockfish live at depth and experience severe barotrauma as they are brought to the surface, resulting in high mortality rates (Schroeder and Love 2002). While there are a number of historic and recent studies that examine their biology and the history of the fishery, fewer studies have examined the underlying knowledge and perceptions that ultimately may drive the action of anglers.

In contrast to various economic incentives fishery managers use for commercial fisheries (Hilborn 2007), recreational fishery managers face complex social motivations involving angler knowledge, perceptions, and behavior (Hickley and Tompkins 1998; Mascia *et al*. 2003; Stankey and Shindler 2006). Though traditionally biological assessments have

been utilized for fisheries management, species such as rockfish and associated ecosystems that are most vulnerable to fisheries may benefit from management also focused on understanding anglers themselves (Kellert 1985; Mascia *et al*. 2003; Beaudreau *et al. 2011*).

Addressing information needs related stakeholder knowledge, perceptions, practices, and recovery preferences has been recognized as particularly important because recent conservation efforts in Puget Sound have failed due to a lack of stakeholder engagement. In 2009, the National Oceanic and Atmospheric Administration (NOAA) – the agency charged with recovery of endangered fish species – proposed creating a seasonal vessel exclusion zone off the west coast of San Juan Island to protect Southern Resident Killer whales. This proposal generated criticism among recreational anglers, kayakers, and commercial whale watching operators (Owens 2009), and was ultimately not implemented. Angler groups such as the Coastal Conservation Association (CCA 2012) and Puget Sound Anglers (PSA 2012) have also increased their engagement within fisheries management issues of the Puget Sound in recent years. Thus, the establishment of future reserves and other recovery measures in Puget Sound, which could be proposed for rockfish conservation, requires a thorough understanding of stakeholders views prior to new initiatives.

Challenges to Rockfish Recovery

Federal and state managers face a variety of challenges to rockfish recovery planning, many of which are related to incomplete recreational incidental catch estimates (Palsson *et al*. 2009) and biological information to establish recovery targets (Drake *et al*. 2010), as well as incomplete information about user group knowledge, practices, perceptions, and

preferences regarding socially acceptable management actions related to rockfish (Kellert 1985; Stankey and Shindler 2006).

The three listed rockfish species – yelloweye (*Sebastes ruberrimus*), canary (*Sebastes pinniger*), and bocaccio (*Sebastes paucispinis*) – were probably less abundant historically compared to other rockfish species in Puget Sound (Drake *et al*. 2010). Additionally, the commercial rockfish closure in 1999 (Palsson *et al*. 2009) may have resulted in decreased economic incentives to recover rockfish. These issues bring into question the knowledge and cultural and economic significance of these fishes among user groups (Kellert 1985; Stankey and Shindler 2006; Martin-Lopez *et al*. 2007).

A recent study in Puget Sound found that recreational anglers' ability to recognize rockfish to the common species name species is poor, and that identification abilities are generally limited to salmonids (Beaudreau *et al*. 2011). Anglers' tendency to simply identify all rockfish species as "rockfish" or "rock cod" in general may be misleading, especially in Puget Sound where some species are more abundant than others and some are in decline (Beaudreau *et al*. 2011).

Additionally, related challenges revolve around bycatch and release estimates. An early study (Haw and Buckley 1968) revealed the inability of the majority of anglers surveyed in Washington State to identify a range of marine species, including rockfish. This highlights the implications for management that relies upon anglers to self-report their catch or released catch (Haw and Buckley 1968).

Today the Washington Department of Fish and Wildlife (WDFW) estimates rockfish bycatch through dock-side interviews with 10-20% of anglers (Chang *et al*. 2010). The

WDFW divides state waters into Marine Catch Areas (MCAs) in order to manage recreationally caught fish and shellfish. There are nine MCAs in the Puget Sound region (WDFWb 2011). Monitoring of recreationally caught bottomfish in Puget Sound is part of a larger marine fish catch estimation program administered by the WDFW (Chang *et al*. 2010).

There are two survey components to the sampling design: an estimate of fishing effort (angler trips) and estimates of catch per unit effort ("CPUE," catch-per-angler-trip) (Chang *et al*. 2010). Fishing effort (numbers of licensed angler trips) is estimated through telephone surveys of licensed anglers. Catch-per-angler-trip and the expansion factor for expanding licensed trips to the total number of trips are estimated through intercept (creel) surveys at sites selected throughout Puget Sound. Catch from charter/party, beach/bank, and manmade structures (e.g., piers, docks, etc.) is not included in these estimates; however, effort from these modes is monitored. The WDFW also conducts regular hook-and-line surveys to mimic the behavior of recreational boat-based fisheries (Chang *et al*. 2010). These surveys independently document the encounter rates for various fish species and obtain biological information. Catch is estimated as the product of angler trips and catch per trip (by species and catch area of harvest) within each catch area of intercept, month, fishing season, and day type (Chang *et al*. 2010).

However, Deiwert *et al*. recently compared creel survey reports to actual observer-generated information on recreational fishing boats in the Southern Georgia Strait in Canada. Substantial differences were documented, with the number of released fishes observed significantly higher than those reported by recreational anglers during creel surveys (2005).

This may be particularly problematic for the ESA-listed deep-water species of rockfish in Puget Sound that may not survive their release (Palsson *et al*. 2009).

Managers therefore face the challenge of obtaining accurate rockfish release estimates needed for threat assessment and recovery planning primarily related to barotrauma, in addition to finding ways to make rockfish recovery significant to anglers to gain support for their recovery. This can best be done by gaining understanding of anglers themselves (Haw and Buckley 1968; Stankey and Shindler 2006).

Research Objectives and Scope

The research is designed to address these challenges. I build upon studies of angler species recognition knowledge and extend it to knowledge of rockfish biology and regulations, perceptions of rockfish threats, fishing practices related to rockfish, and preferences for recovery measures. Additionally, I examine differences in these variables among different recreational angling user groups to address specific outreach needs. Finally, I seek to understand relationships between the above-listed variables, as well as among differing angler demographics, such as fishing location (by MCA) and fishing experience.

Recreational Fisheries and Rockfish Management

The impact of recreational fishing on local economies and on fish stocks is significant. Recreational fishing contributed $50 billion to the U.S. economy and an estimated 326,000 jobs in 2010 (NOAA 2011). From 1983-2003, marine recreational fishing effort has also increased by 20% nation-wide (Sutinen and Johnston 2003). In 2006 an

estimated 12,850 jobs were supported by recreational anglers fishing in salt and freshwater in Washington State. They spent approximately $355 million on trip related expenses and $549 million in equipment expenditures. In the same year approximately 850,000 finfish were caught and 652,095 pounds of shellfish were harvested in Washington waters, accounting for nine million angler days (TCW Economics 2008). Therefore sustainability and sound management of recreational fisheries is not only economically significant but it is culturally important to those who spend leisure time pursuing this sport (Larkin 1988; Sutinen and Johnston 2003).

However, like many areas in the U.S., the record of recreational fisheries is incomplete in Puget Sound. Existing data for bottomfish – especially rockfish – in Puget Sound have showed a downward trend since at least the 1980s (Palsson *et al*. 2009). From the 1940s to 1970 commercial rockfish harvest was between approximately 50,000 and almost 400,000 pounds per year, with little recreational harvest. Beginning in the 1970s after legal and management changes, recreational rockfish harvest was estimated to be significantly higher than the commercial harvest, or between approximately 150,000 and 900,000 pounds per year (equivalent to ~279,000 fish). The estimated average recreational harvest was 261,000 pounds per year between 1970 and 1993. From 2004-2007, recreational harvest of all rockfish averaged 37,000 pounds per year, and as of 2007 WDFW began a new system to better capture harvest estimates by individual species (Palsson *et al*. 2009).

Since 1970, rockfish harvest rates for anglers who target salmon or other fish species have been higher than anglers targeting bottomfish, most likely due to the high effort placed on salmon. Additionally, released recreational catch is not counted as harvest and therefore

the actual impact of the recreational fishery on rockfish is greater than harvest numbers reported indicate (Palsson *et al*. 2009).

Rockfish Management and Use Over Time

Fisheries Puget Sound are co-managed with tribes as required by treaty rights under *U.S. v Washington,* otherwise known as the Boldt decision (1974) (NOAA 2011).

Historically, rockfish catch by indigenous people was opportunistic and likely sustainable. Beginning in the early 1900s the commercial rockfish fishery in Washington began in earnest (Williams *et al*. 2010).

The Boldt decision (1974) brought additional exploitation of rockfish by recreational anglers (Williams *et al*. 2010). To assuage public opposition to the decision by non-tribal fishers, federal and state managers began to promote rockfish as an alternative fishery to the reduced salmon fishery. Thereafter, the estimated recreational rockfish harvest in Puget Sound usually exceeded commercial rockfish catch in each region. Regular recreational landing estimations for rockfish species as a whole began in the 1970s (Williams *et al*. 2010).

The first management plans to include rockfish began in the 1980s. Following soon after bottom trawlers were banned in most, but not all, of Puget Sound and recreational bag reductions began. In 1999 the commercial rockfish fishery was closed, followed by a one recreational rockfish bag limit in 2000. In 2003 recreational restrictions required no retention of yelloweye and canary rockfish, and in 2004 the limit was amended to the first legal rockfish and no spearfishing (Palsson *et al*. 2009).

Today the retention of any rockfish is prohibited in Puget Sound and the San Juan Islands east of Port Angeles, or in MCAs 6-13. Angling for bottomfish (halibut are not considered bottomfish) at depths of 120 feet and greater is also prohibited (WDFW 2010). This is due to the July 27, 2010, ESA listing of three species. Yelloweye rockfish (*Sebastes ruberrimus*) and canary rockfish (*Sebastes pinniger*) were listed as "threatened" and bocaccio (*Sebastes paucispinis*) was listed as "endangered" under the ESA within Puget Sound/Georgia Basin (NOAAa 2010). Additionally 13 rockfish have been listed as species of concern (WDFWa 2011).

However, because of the long life span of rockfishes, current populations are affected by fishing practices of the past (Palsson *et al*. 2009). Likewise, today's fishing practices will affect populations long into the future.

Currently less than 5% of rockfish habitat has been designated as a marine protected area in Puget Sound (Van Cleve *et al*. 2010). These protected areas currently areas have varying degrees of protection, different goals, and are managed by a number of agencies. User groups also exhibit a lack of knowledge about this patchwork of protected areas, which may weaken the efficacy of the marine protected areas (Van Cleve *et al*. 2010).

Comparatively, in neighboring British Columbia 30% of rockfish habitat in inland waters (20% on the coast) have been set aside as rockfish conservation areas, but they still have recreational and commercial fishing for rockfish (Yamanaka and Logan 2010).

Rockfish Biology

Diversity

Worldwide there are over 100 species of rockfish (*Sebastes),* 40 of which may be found off the Washington coast (Love *et al*. 2002). Rockfish make up a significant portion of the marine fish ecosystem within Puget Sound waters, comprising 28 of an estimated 211 (15%) fish species (Palsson *et al*. 2009; Donnelly *et al*. 1995).

Rockfish of various species occupy most of the habitats of the Puget Sound, ranging from the pelagic environment and the nearshore to deepwater habitats. Sub-adult and adult yelloweye rockfish, canary rockfish, and bocaccio typically utilize habitats with moderate to extreme steepness, complex bathymetry, and rock and boulder-cobble complexes (Love *et al*. 2002). Within Puget Sound, each species has been documented in areas of high relief rocky and non-rocky substrates such as sand, mud, and other unconsolidated sediments (Miller and Borton 1980; Buckley 1997). Yelloweye rockfish remain near the bottom and have small home ranges, while some canary rockfish and bocaccio have larger home ranges, move long distances, and spend time suspended in the water column (Love *et al*. 2002). ESA-listed adult species are most commonly found between about 130 to 820 feet (Love *et al*. 2002; Orr *et al*. 2000). The most commonly found species within Puget Sound – copper, quillback, black, and brown rockfish – are considered primarily sedentary species typically found in depths 130 feet or less (Gunderson and Vetter 2006). The ESA-listed species are distinct population segments (DPS) (NOAA 2011).

Life History

Rockfish maximum life spans vary from approximately 10 years to approximately 200 years of age depending on the species, making them some of the longest-living vertebrates on earth (Mangel *et al*. 2007). The maximum documented age of yelloweye rockfish is nearly 120 years of age, and they do not reach sexual maturity until they are about 20 years of age (Andrews *et al*. 2002; Gunderson and Vetter 2006). Canary rockfish may live to more than 84 years of age and are mature at around seven to nine years of age (Andrews *et al*. 2007; Gunderson & Vetter 2006). Bocaccio rockfish may live to be around 50 years of age and mature at about four to seven years of age (Andrews *et al*. 2005; Gunderson & Vetter 2006).

Adults of most species of rockfish produce tens of thousands to millions of offspring each year, but offspring have a low rate of survival in their first year of life and recruitment is erratic. Larvae of older female rockfish have significantly greater growth rates and starvation tolerance compared to larvae of younger females (Berkeley *et al*. 2004), making conservation of older females of the utmost importance. Due to these life history characteristics most rockfish species are unable to recover quickly, if at all, from the intensive overfishing to which they have been subject, making recovery planning even more challenging (Berkeley 2006; Williams *et al*. 2010).

Table 1: Summary of Rockfish Characteristics of ESA-listed Species Compared to Commonly Harvested Species

Common Name	Mean Maximum Age (yrs.)	Mean Age at Maturity (yrs.)	Mean Natural Mortality Rate (%)	Commonly Found Depth (ft.) (Adults)	Status
Yelloweye rockfish	118+	19-22	3	130-820	Threatened
Canary rockfish	84+	7-9	5	130-820	Threatened
Bocaccio	50	4	8	130-820	Endangered
Copper rockfish	50	6	8	0-130	--
Quillback rockfish	95	7-11	4	0-130	--
Brown rockfish	34+	4-5	12	0-130	--
Black rockfish	50	6-8	8	0-130	--

Adapted from Palsson *et al*. 2009; Gunderson and Vetter 2006.

Threats

The WDFW identified the top three risks to rockfish and their environments as derelict fishing gear (WDFW 2011), hypoxia/nutrient addition (Palsson *et al.* 2008; Newton *et al*. 2007), and fishery removal (Palsson *et al*. 2009). Other stressors' relative risk is considered secondary or unknown. These include habitat loss (Gunderson and Vetter 2006), pollution, and the bioaccumulation of toxins (Meador *et al*. 2002) and climate change (Mantua *et al*. 2007) and food web interactions, respectively (Buckley 1999; Wiles 2004; Beaudreau and Essington 2007; Lance and Jeffries 2007; Palsson *et al*. 2009).

I focus on reducing the known stress resulting from fishery removal, primarily from incidental catch and associated barotrauma.

Rockfish have swim bladders that are used to regulate neutral buoyancy (Jarvis and Lowe 2008). Most rockfish caught from depths below approximately 60-90 feet are likely to

die as a result of barotrauma-related injuries when released (Palsson *et al*. 2009). Barotrauma can cause erratic behaviors and injury, such as tissue trauma, bacterial infection, thermal shock, or increased predation vulnerability, contributing to the overall mortality rate of rockfish (Schroeder and Love 2002). Therefore catch avoidance is highly preferred over catch and release (Schroeder and Love 2002).

Many catch release options to reduce barotrauma are of mixed result, and symptoms observed at the surface are not necessarily indicative of a fish's ability to recover at depth (Schroeder & Love 2002). Reducing time spent at the surface is one of the most important factors in reducing the effects of barotrauma. Other factors include position and hook type, bait type, handling time, and angler experience (Schroeder & Love 2002). While venting does release pressure on organs, studies have shown that it is harmful to fishes caught at deeper depths and only slightly beneficial to fishes caught shallow. Ultimately there is little difference in survival between unvented and vented rockfishes (Wilde 2009).

Because an important predictor of rockfish survival is short surface holding time, angler knowledge of rockfish handling techniques are vital for conservation (Jarvis and Lowe 2008). Additionally, recent studies have found that the average survival of released yelloweye rockfish can be significantly improved by using a device to release the fish at depth (Hochhalter and Reed 2011), making understanding anglers' fishing habits and willingness to use these devices important.

Methods

The scope of this research is limited to recreational angling user groups. It includes boat-based recreational anglers, pier anglers, shoreline anglers, divers (including spearfishing divers and non-spearfishing alike), members of local angler's associations, and charter guides. However, data show that the highest fishing effort is from boat-based anglers (Palsson *et al*. 2009); therefore, I primarily focus on obtaining and analyzing survey results from a representative sample of boat-based anglers in MCAs 6-13.

Neither tribal nor commercial fisheries are included within this study. Impact of tribal fisheries since 1991 has been approximately 1% of total Puget Sound rockfish harvest, most of which has been incidental catch and is considered negligible compared to recreational incidental catch (Palsson *et al*. 2009). Commercial incidental catch is also considered to be comparably small (Palsson *et al*. 2009), and is it being addressed through other studies. Additionally, there are several ongoing efforts in Puget Sound to remove derelict commercial fishing gear that is a source of incidental mortality (NSF 2011).

Research Questions

A review of literature and discussions with staff from NOAA and WDFW, recreational angling community members, University of Washington faculty, and conservation nonprofit community members involved in rockfish research or recovery informed the survey research questions and objectives.

Each research question seeks to explain different aspects of angler demographics or differences between user groups (Beaudreau *et al.* 2011), knowledge (Haw and Buckley

1968; Stankey and Shindler 2006; Beaudreau *et al.* 2011), perceptions (Kellert 1985; Hickley and Tompkins 1998; Stankey and Shindler 2006; Verweij *et al.* 2010; Beaudreau *et al.* 2011), fishing practices (Renyard and Hilborn 1986), preferences for rockfish recovery (Renyard and Hilborn 1986; Martin *et al*. 2006), or interactions between these different variables to inform conservation management (Martin-Lopez 2006; Verweij *et al.* 2010). The questions:

Angler Knowledge

Research Question 1: To what extent do anglers understand rockfish life history?

Research Question 1a: Can anglers reliably identify rockfish to the common species name?

Research Question 1b: Do anglers know rockfish regulations?

Research Question 1c: Does angler knowledge of rockfish vary by demographics (i.e. years fishing, fishing preference, MCA, etc.)?

Angler Perceptions

Research Question 2: What do anglers view as threats to rockfish?

Research Question 2a: How do anglers view rockfish abundance?

Research Question 2b: Do angler perceptions about threats and abundance vary by demographics?

Angler Practices

Research Question 3: How do anglers currently release rockfish?

Research Question 3a: How many anglers have historically fished for rockfish?

Research Question 3b: Are anglers willing to try different measures that may result in decreased incidental catch or mortality after catch?

Angler Preferences

Research Question 4: Do anglers prefer artificial reefs, marine reserves, hatchery supplementation, and other potential measures to recover rockfish?

Research Question 4a: What variables contribute most to these preferences for recovery measures?

Research Question 4b: Do anglers' preferred target species associate with their attitudes toward rockfish and rockfish threats?

Research Question 4c: Do angler attitudes about recovery preferences vary by demographics?

Research Question 4d: Is the way anglers obtain angling-related information similar to the way they prefer to obtain information?

Differences between User Groups

Research Question 5: Does knowledge, perceptions, practices, and preferences vary by user group?

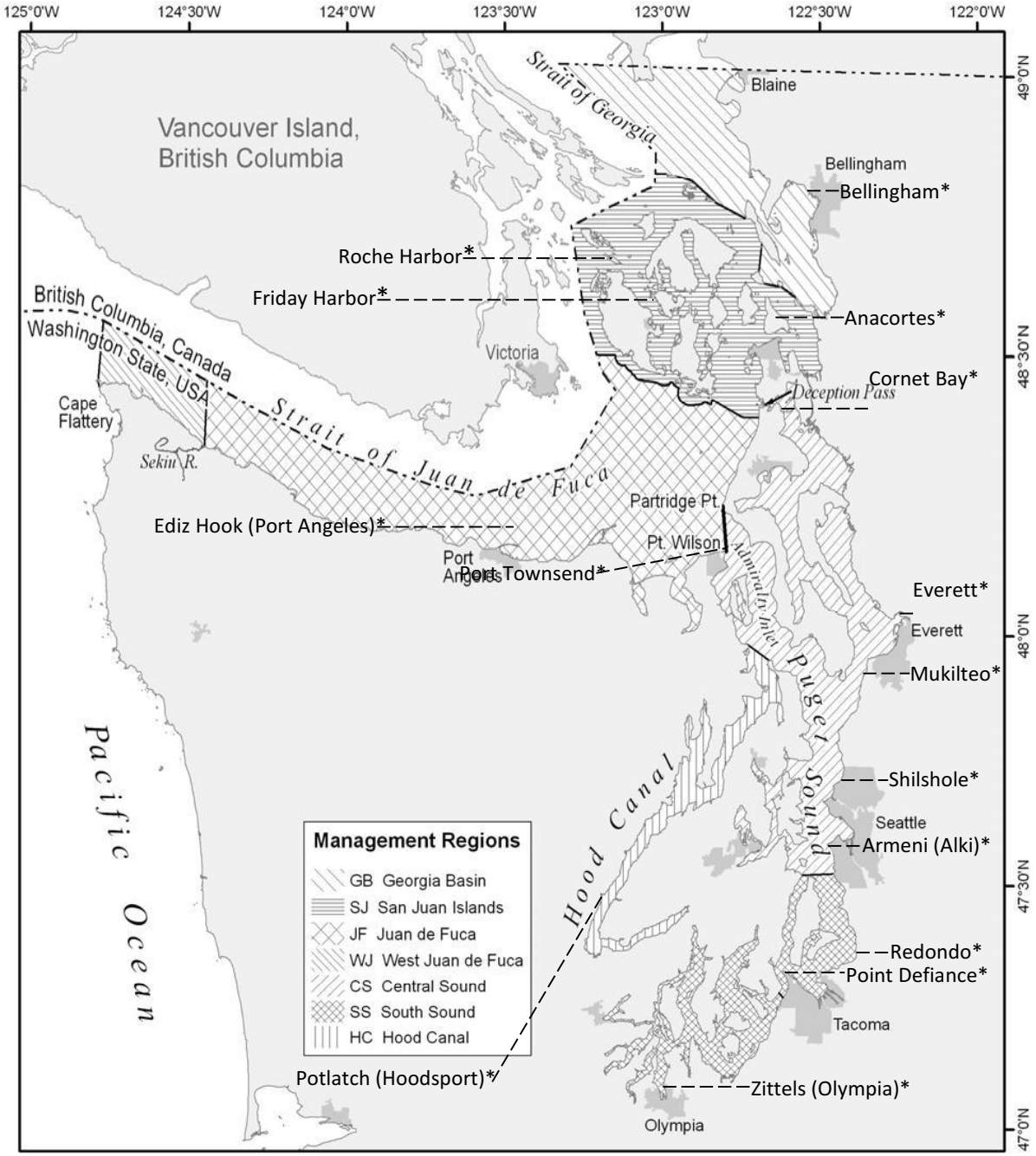
Research Question 5a: If so, can specific outreach/education be designed for different user groups?

The full survey written to answer these questions is included in Appendix A.

Research Site and Respondent Selection

Fifteen sites were selected for this study using the following criteria: (1) sites that represented each of Puget Sound's five basins or regions included in the ESA rockfish listing area: North Puget Sound, the Main Basin, Whidbey Basin, South Puget Sound, and Hood Canal (i.e., all MCAs east of Port Angeles, 6-13; NOAAa 2010, NOAAc 2012); (2) public boat launch and marina sites representative of heaviest boat-based angler traffic data provided by WDFW (WDFW 2012); and (3) inclusion of different user groups (Figure 1). This includes boat-based anglers, pier and shoreline anglers, both spearfishing and non-spearfishing divers, members of local angling groups such as Puget Sound Anglers and the Coastal Conservation Association (both groups are active in fisheries management (PSA 2012; CCA 2012), and charter guides licensed to operate within the ESA listing area.

Figure 1: Boat Launch and Marina Locations Surveyed and Management Regions



*Survey sites indicated with a star.
Map adapted from map of major basins and Groundfish Management regions of Puget Sound (Palsson *et al.* 2009).

The WDFW provided data to identify the most heavily-used boat launches and marinas, and I further utilized that data to determine representative sample sizes by location in addition to survey locations. According to WDFW survey data, licensed recreational anglers who fished or planned to fish within Puget Sound/Georgia Basin numbered 141,405 during the license year 2010-2011. However, this number was slightly lower than previous years (Kraig 2011). Therefore, I calculated a target sample size using the five year average of 182,114 (2006-2011) (Kraig 2011) with a target confidence level of 95% and a margin of error of 4%. The total sample I attained (N = 544) was short of obtaining a margin of error of 4%; however, I reached a close margin of error of 4.25% with 95% confidence (Table 2). For the boat-based angling population (n = 443) I reached a margin of error of 4.75% with 95% confidence (Table 2).

Table 2: Sample Size Target and Sample Size Achieved

State License Year	Puget Sound Anglers	Sample Size Target: Confidence Level of 95% Margin of Error of 4**	Sample Size Achieved (Total Sample N=538): Confidence Level of 95% & Margin of Error of 4.25**	Sample Size Achieved (Boat Anglers n=443): Confidence Level of 95% & Margin of Error of 4.75**
2006-2011	182,114[1] (5 yr. avg.)	598*	544*	443*

[1] Kraig 2011

*Sample size (n) = N x/((N-1)E2 + x) (De Veaux *et al*. 2008)

**Margin of Error (E) = Sqrt[(N - n)x/n(N-1)] (De Veaux *et al*. 2008)

Survey Design

I designed the survey to answer the research questions outlined above. Fisheries managers, university faculty, and angler leaders also reviewed the survey questions.

My survey framework was also informed by the World Health Organization's Knowledge, Attitudes, and Practices (KAP) survey methodology (WHO 2008). This framework is commonly utilized in the public health field to first obtain a baseline of knowledge, attitudes, and practices about a particular health issue, which is then used to design appropriate public outreach and education.

I field tested the survey at one of the selected sites. I approached twelve anglers at random, one at a time, half of whom were asked fill out the survey themselves and encouraged to ask clarifying questions if needed. The remaining half was also encouraged to ask questions, but I administered the survey to them. This field testing revealed that respondents completed the survey when I administered it, but left many questions incomplete when it was self-administered. During field testing I also solicited feedback about the survey questions, which resulted in one of the questions being re-worded for clarity.

The 41-question survey included 18 open-ended questions, 11 of which asked fish identification questions. It also included 21 multiple choice questions and two five-level Likert items (de Vaus 1991) (Appendix A). This survey was designed for all anglers I would administer the survey to (boat-based anglers at boat launches and marinas (n = 443), shoreline and pier anglers (n = 30), and divers (n = 30).

I designed a survey with five fewer fish identification questions for respondents who would be self-administering the survey (Appendix B). I did this anticipating they would fill it out completely if it was shorter. These surveys were designed for distribution during local angling association meetings (n = 55) and for distribution via postal mail to licensed charter guides who operate in Puget Sound (n = 6). I also designed a one page explanation of the study to give to all interested respondents I administered the survey to and for all respondents who self-administered the survey (Appendix C).

I asked several questions measuring angler knowledge of rockfish. Two general rockfish life history questions (knowledge of long life spans and knowledge that older female rockfish produced more and healthier young) were asked in addition to three rockfish regulation questions (knowledge of the no rockfish retention rule, no bottomfishing below 120 feet rule in MCAs 6-13, and knowledge of which rockfish were ESA-listed). Species knowledge identification questions included the three ESA-listed rockfish. Seven other species of fish were also tested (black rockfish (*Sebastes melanops),* copper rockfish (*Sebastes caurinus),* quillback rockfish (*Sebastes maliger),* brown rockfish (*Sebastes auriculatus*), china rockfish (*Sebastes nebulosus*), vermilion rockfish (*Sebastes miniatus),* and yellowtail rockfish (*Sebastes flavidus*), and one picture of a lingcod (*Ophiodon elongates),* which commonly inhabits similar habitat as rockfish.

Survey Administration Approach

Surveys were administered from July – September, 2011 in Puget Sound primarily during the salmon and crabbing season (WDFWb 2011). The majority of respondents (all boat-based anglers) were approached at random at boat launches. Respondents were asked if they would participate in providing feedback for rockfish recovery planning. After agreeing the respondents were then given a longer explanation and asked the survey questions after they had pulled their boat out of the water. Non-responses, reasons for non-response, and other variables that could affect response or bias were recorded for each user group and location (Appendices D-I).

The majority of pier anglers were approached at random at Point Defiance, Redondo, Shilshole piers. Shoreline anglers were primarily approached at Hoodsport. Divers were targeted primarily at Alki and Shilshole.

On average administered face-to-face surveys (boat based anglers, pier and shoreline anglers, and divers) took approximately 20 minutes to complete. Respondents often provided additional information or insight into why the answered the survey questions the way they did, and this information was recorded separately. However, some anglers did not have time or chose not to provide this additional qualitative interview data. Therefore, the majority of this study will rely on the uniformly completed surveys for quantitative analysis.

Surveys were administered 5-6 days per week (Tuesday or Wednesday through Sunday), including weekends, between 8:30 am and 5 pm to achieve the highest number of respondents possible.

Surveys for members of anglers associations were self-administered after an introduction and explanation of the survey during regularly scheduled PSA meetings (in Edmunds and Renton) and CCA meetings (in Everett). Surveys were mailed to charter guides registered in Washington who operate within Puget Sound, along with a self-addressed stamped envelope.

In compliance with social science standards, only subjects 18 years and older were asked to participate in the survey. All surveys were conducted in compliance with University of Washington Human Subjects standards.

Survey Analysis Approach

I designed my analysis to answer my research questions. I first utilized descriptive statistics to quantify differences between the different user groups (boat-based anglers, divers, pier and shoreline anglers, members of angler associations, and charter guides) in terms of their relative knowledge about rockfish, perceptions, fishing practices, preferences for rockfish recovery measures, and general demographics.

I utilized descriptive statistics also to quantify angler knowledge about rockfish life history, regulation, and species identification. I then calculated Spearman's rho to determine the magnitude and direction of the association between these knowledge variables at the 95% confidence level (De Veaux *et al*. 2008). I also used Spearman's rho to determine if knowledge variables were associated to any demographic variables.

I also utilized descriptive statistics to quantify anglers' perceptions of rockfish abundance and their perceptions of threats to rockfish. I again calculated Spearman's rho to

determine the magnitude and direction of the association between these perception variables at the 95% confidence level (De Veaux *et al*. 2008). I also used Spearman's rho to determine if perception variables were associated to any demographic or knowledge variables.

I calculated descriptive statistics to quantify anglers' fishing practices, from target species and gear utilization to their willingness to use gear that may decrease rockfish mortality. Again, I calculated Spearman's rho to determine the magnitude and direction of the association between these perception variables at the 95% confidence level (De Veaux *et al*. 2008). I also used Spearman's rho to determine if fishing practices variables were associated to any demographic, knowledge, or perception variables.

I again calculated descriptive statistics to quantify anglers' preferences for rockfish recovery measures and communication. I calculated Spearman's rho to determine the magnitude and direction of the association between these perception variables at the 95% confidence level (De Veaux *et al*. 2008). I also used Spearman's rho to determine if recovery preference measures were associated to any demographic, knowledge, perception, or practices variables.

Additionally, I used multiple logistic regression to determine the extent to which variables describing respondents' knowledge, fishing practices, and perceptions predicted their preferences for particular rockfish management measures. I was particularly interested in two primary recovery management measures often chosen by anglers as well as resource managers: marine protected areas and artificial reefs.

The regression models are as follows:

1) Logit $(Y) = ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$

where *Y*, the response variable, is equal to prefer marine reserves for rockfish recovery; α is equal to the intercept; π is the probability of interested outcome; β is a regression coefficient; and *X* is a predictor (De Veaux *et al*. 2008). The six predictor variables are listed in Table 13 of the Results, *Boat-Based Anglers* section.

2) Logit $(Y) = ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$

where *Y*, the response variable, is equal to prefer artificial reefs for rockfish recovery; α is equal to the intercept; π is the probability of interested outcome; β is a regression coefficient; and *X* is a predictor (De Veaux *et al*. 2008). The six predictor variables are listed in Table 14 of the Results, *Boat-Based Anglers* section.

The models were also tested with the interaction between variables (De Veaux *et al*. 2008), but these interactions were not significant. Thus they are not included in the models or the results.

Descriptive statistics were calculated in MS Excel 2010 and displayed in frequency tables for each of the separate user groups and the population as a whole. Sigmaplot 12.2 and R ver. 2.15 (R Development Core Team 2012) was then used to further analyze the boat-based angling population (n=443) through Spearman's rho and multiple logistic regression.

Results: Overall

Detailed results are reported by user group in the Appendices (boat-based anglers, Appendix D; pier and shoreline anglers, Appendix E; angler association members, Appendix F; divers, Appendix G; guides, Appendix H; all respondents, Appendix I).

For the purposes of this study, I will briefly discuss the entire surveyed population (N = 544) to analyze key differences between user groups. This group includes 443 boat-based anglers, 30 pier and shoreline anglers, 55 members of anglers associations, 34 divers, and six charter guides. The representative boat-based angling group includes people who are also divers or members or angling associations. They are accounted for in the boat-based angling population calculations. Divers appear in both categories, and members of angling associations are represented where I surveyed them (on boats or at meetings). I will then go into depth of results from boat-based anglers (n = 443) that compose the majority of the licensed angling population.

Table 3: User Groups Surveyed

User Group	Frequency
Representative boat-based anglers*	443
Pier and shoreline anglers	30
Angler association members	55
Divers**	34
Charter Guides	6
All responses***	544

*Includes some divers who are also anglers and angler association members who were surveyed on the water instead of at meetings.
** This represents total divers, including those who are also anglers.
***No duplicate surveys.

Results: Key Differences Between User Groups

An examination of the primary differences between user groups surveyed follows, and it is intended to help managers to better tailor outreach, education, and management. Note that due to a small sample size, responses from surveyed charter guides may not be representative of the population of charter guides operating in Puget Sound.

Differences in Demographics

Years of fishing experience across all user groups was similar (approximately 30 years), yet surveyed pier and shoreline anglers reporting fishing more frequently than all other user groups with the exception of charter guides. Pier and shoreline anglers reported an average of about 41 trips/year (*SD* = 31.04; *Range* = 98). Boat-based anglers reported an average of 26 trips/yr. (*SD* = 22.01; *Range* = 199); members of angler associations reported an average of 24 trips/yr. (*SD* = 19.73; *Range* = 99); and divers reported an average of 23 trips/yr. (SD = 16.71; *Range* = 58). Surveyed charter guides were the outlier group and reported taking an average 196 trips/year (*SD* = 219.86; *Range* = 590), reflecting their reliance on the fishing for their livelihoods.

Members of angler associations were on average the oldest of the surveyed user groups (58 yrs. old), and piers and shoreline anglers were the most ethnically diverse.

Differences in Angler Knowledge

Knowledge about rockfish life history and rockfish regulations was variable by user group. Surveyed guides (100%), members of angler associations (75%), and divers (74%) were most likely to know that rockfish were long-lived. However, understanding that older

female rockfish produce more and healthier young was limited among all groups, though members of angler associations were most likely to know this (29%) (Table 3).

Across all user groups a majority of surveyed anglers knew that no retention of rockfish is allowed in Puget Sound(64-83%). Members of angler associations were the exception to this rule, though, and only about 42% of them knew this regulation. Knowledge of the depth regulation while bottomfishing was limited (between 7%-50%) (Table 3).

Table 3: Knowledge of Rockfish Life History and Rockfish Regulations by User Group

User Group	Know rockfish are long-lived	Know rockfish reproduction	Know no retention rule	Know depth restriction
Boat-based anglers (*n* = 443)	58%	13%	64%	20%
Pier/shoreline anglers (*n* = 30)	43%	10%	70%	7%
Angler assn members (*n* = 55)	75%	29%	42%	37%
Divers (may also be anglers) (*n* = 34)	74%	27%	79%	38%
Charter guides (*n* = 6)	100%	17%	83%	50%

All user groups had difficulty correctly identifying rockfish species to the common name. Divers performed the best of the user groups: about half of the surveyed divers could identify yelloweye, a third canary, and about 10% were able to name bocaccio to the common species name (Table 4). Respondents who were not administered the survey (self-administered) received a fewer rockfish pictures to identify in hopes of achieving complete surveys. Thus, yelloweye was not tested with members of anglers association and charter guides.

Table 4: Ability to Identify ESA-listed Species to Common Names by User Group

User Group	Know yelloweye	Know canary	Know bocaccio
Boat-based anglers (*n* = 443)	31%	11%	5%
Pier/shoreline anglers (*n* = 30)	10%	7%	0%
Members of associations (*n* = 55)	Not tested	10%	6%
Divers (may also be anglers) (*n* = 34)	53%	32%	12%
Charter guides (*n* = 6)	Not tested	0%	17%

Differences in Angler Perceptions

Angler user groups reported having diverse perceptions about threats to rockfish. For example, the majority of surveyed pier and shoreline anglers (73%) viewed pollution most frequently as a threat, while divers, boat-based anglers, and angler association members viewed commercial fisheries to be a threat. Across all groups less than 33% of surveyed anglers perceived recreational fisheries to be a threat. This perception was the lowest among surveyed members of angler associations, with only 4% of respondents indicating they thought recreational fisheries were a threat to rockfish (Table 5).

Table 5: Perceptions of Greatest Threats to Rockfish in Puget Sound by User Group

User Group	Commercial fisheries	Derelict gear	Pollution	Habitat loss	Recreational fisheries
Boat-based anglers (*n* = 443)	49%	26%	34%	30%	17%
Pier/shoreline anglers (*n* = 30)	30%	7%	73%	33%	20%
Members of associations (*n* = 55)	51%	53%	20%	24%	4%
Divers (may also be anglers) (*n* = 34)	62%	47%	47%	47%	32%
Charter guides (*n* = 6)	33%	100%	50%	17%	33%

Totals may not add up to 100% as respondents were able to choose more than one answer.

Most user groups perceived rockfish populations to be of low or very low abundance. However, about 40% of surveyed angler association members perceived populations to be average or abundant (Table 6).

Table 6: Perceptions of Rockfish Abundance in Puget Sound by User Group

User Group	Abundant	Average	Low/ Very Low	Do not know	Other: See juveniles but adults scarce
Boat-based anglers (*n* = 443)	1%	5%	67%	24%	4%
Pier/shoreline anglers (*n* = 30)	0%	3%	73%	23%	7%
Members of associations (*n* = 55)	10%	31%	37%	8%	0%
Divers (may also be anglers) (*n* = 34)	0%	9%	59%	9%	18%
Charter guides (*n* = 6)	17%	17%	33%	17%	17%

Totals may not add up to 100% as anglers were also able to choose "Other" as a response. "Other" responses less than 5% are not listed in the table.

Differences in Fishing Practices

Pier and shoreline anglers rely on recreational angling for food more than any other user group, with 100% of those anglers reporting that they fish for both for purposes of food and sport. All other user groups responded that they also recreate for purposes of consumption but to a lesser degree and more often for sport or work (Table 7).

Table 7: Reasons for Fishing by User Group

User Group	Sport	Food	Other
Boat-based anglers (*n* = 443)	100%	91%	1%
Pier/shoreline anglers (*n* = 30)	100%	100%	0%
Members of associations (*n* = 55)	100%	78%	2%
Divers (may also be anglers) (*n* = 34)	100%	85%	0%
Charter guides (*n* = 6)	100%	50%	100% (work)

Very few anglers reported using a device to sink rockfish after release. Charter guides (34%) and angler association members (12%) were most likely to use this practice (Table 8).

Table 8: Rockfish Release Practices by User Group

User Group	Use device to sink fish and release	Puncture swim bladder	Dehook and release while keeping fish in the water	Dehook and release with fish out of the water
Boat-based anglers (*n* = 443)	3%	5%	72%	9%
Pier/shoreline anglers (*n* = 30)	0%	3%	27%	60%
Members of associations (*n* = 55)	12%	8%	46%	17%
Divers (may also be anglers) (*n* = 34)	100%	0%	0%	3%
Charter guides (*n* = 6)	34%	0%	67%	17%

Totals do not add up to 100% because respondents could choose and"Other". "Other" results few in number and thus not shown.

Willingness to take proactive measures to reduce rockfish mortality also varied by user group. Charter guides and boat-based anglers reported they were most willing to use a device to submerge rockfish. Most surveyed anglers across all user groups were not open to using prescribed hook and bait combinations that may result in less incidental rockfish catch. Finally, most user groups were willing to learn more about rockfish catch and release techniques, with boat-based anglers, pier and shoreline anglers, and charter guides most willing (Table 9).

Table 9: Willingness to take Measures to Decrease Rockfish Mortality by User Group

User Group	Use equipment to submerge rockfish	Use prescribed hook sizes and bait combinations	Willing to learn more about catch avoidance/release
Boat-based anglers (*n* = 443)	2.98	2.60	4.27
Pier/shoreline anglers (*n* = 30)	2.40	2.80	4.07
Members of associations (*n* = 55)	2.37	2.22	3.20
Divers (may also be anglers) (*n* = 34)	2.53	2.18	3.29
Charter guides (*n* = 6)	3.83	2.17	4.0

Scale: 1 = not willing to take the measure at all, 5 = very willing to take the measure

Differences in Preferences for Recovery

There was variation between user groups for preferences for recovery measures. The most distinct user group was members of angler associations. Only 15% of association members prefer reserves, in contrast to all other groups whereby 43-74% of the surveyed population prefers marine reserves. Charter guides and angler association members prefer derelict gear removal more than any other recovery method (84% and 70%, respectively). There was relatively little support for hatchery supplementation among all user groups, and most were in favor of habitat restoration. User groups also wrote in "Other" preferences, such as a complete closure of commercial fisheries in Puget Sound, pollution clean-up and prevention, enforcement, and education (Table 10).

Table 10: Preferences for Rockfish Recovery by User Group

User Group	Marine reserves	Artificial reefs	Hatchery supple-mentation	Derelict gear removal	Habitat restoration	Other
Boat-based anglers (n = 443)	43%	38%	11%	37%	49%	63%
Pier/shoreline anglers (n = 30)	54%	47%	20%	50%	67%	60%
Members of associations (n = 55)	15%	52%	21%	70%	44%	15%
Divers (may also be anglers) (n = 34)	74%	59%	3%	56%	68%	50%
Charter guides (n = 6)	50%	67%	33%	83%	33%	0%

Communication uses also varied among user groups. Charter guides utilized online information far more than any other user group, though all user groups showed a preference for WDFW emails lists and websites (from about 50-80% in most cases). The WDFW sportfishing regulation pamphlet was an important source of information source (greater than 80% use) to all user groups. Signs were also noted as heavily used by pier and shoreline anglers (30% use them, 60% said they preferred to use them).

Results: Boat-Based Anglers

Demographics - Representative boat anglers (n = 443)

Of the 456 anglers randomly approached at boat launches and marinas representative of the heaviest use, 443 completed the survey for a response rate of 97%.

The population was predominately male (423), with 20 female respondents. The population was also predominately Caucasian (411), followed by smaller populations of Asian Americans respondents (25); Black or African American respondents (4); a Hispanic respondent (1); and (2) who were classified as Other respondents.

Respondents (n = 443) had a mean age of 51 years (SD = 12.52; $Range$ = 78), were Washington State residents for an average of 44 years (SD = 16.61; $Range$ = 77), had an average of 30 years of fishing experience (SD = 15.85; $Range$ = 69), and participated in 27 fishing trips per year (SD = 35.04; $Range$ = 199).

Among the respondents, 13% (N = 57) reported participation one or more angler associations and 0.4% (N = 2) said they were members of a diving association. Some reported participating in both diving and angling activities (5.3%, N = 23). About half (47%, N = 11) of all the divers who are also anglers said that they dive for non-consumptive purposes, such as wildlife viewing or photography.

Respondents stated they primarily fished in Central Puget Sound, or MCAs 9, 10, and 11 (Table 11).

Table 11: Fishing by MCA Among Boat-Based Anglers (n = 443)

Fishing by MCA	Frequency	Percentage
Central Puget Sound (Areas 9,10,11)	285	64%
Whidbey Basin (Area 8-1, 8-2)	182	41%
North Puget Sound/San Juan Islands (Area 7)	144	32%
Strait of Juan de Fuca (Areas 5,6)	125	28%
Hood Canal (Area 12)	32	7%
South Puget Sound (Area 13)	51	11%

Totals add up to more than 100% because anglers often provided more than one answer.

Angler Knowledge

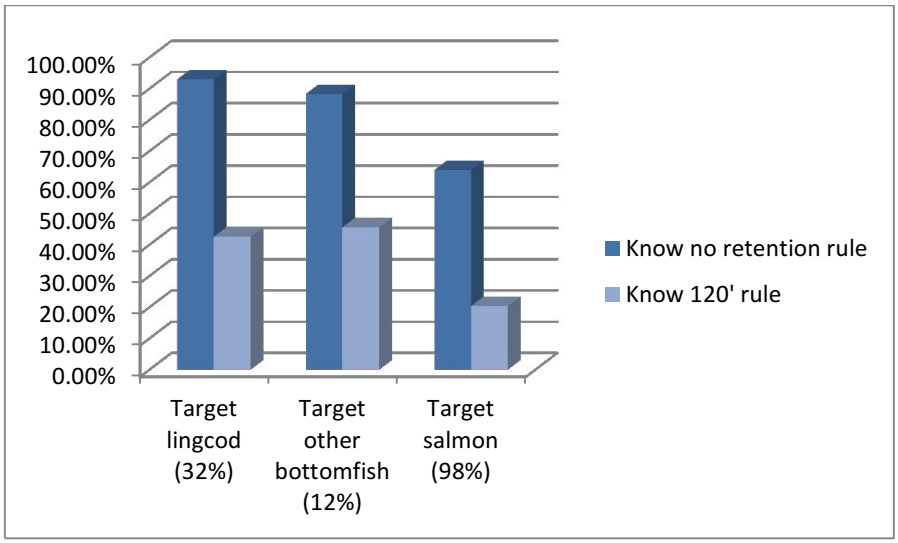
Significant correlations only existed between fishing by MCA and the seven different measures of rockfish knowledge (knowledge of long life, reproduction, no retention, no fishing at depth, and recognition of yelloweye rockfish, canary rockfish, and bocaccio) in areas where anglers were most likely to be targeting or used to target rockfish – the Strait de Juan de Fuca (MCAs 5 & 6) and North Puget Sound (MCA 7). Fishing in the Strait de Juan de Fuca was significantly correlated with all seven of the measures of knowledge (P-value <0.001). Fishing in North Puget Sound was significantly correlated with all measures of knowledge except being able to identify yelloweye rockfish and bocaccio (P-value <0.001). No other MCA was significantly correlated with any of the measures of knowledge, which is important to note as managers seek to raise awareness about rockfish.

Of the 141 anglers (or 32% of the boat-based angling population) who stated they fish for lingcod, only 43% stated they know about the bottomfishing depth regulation that gear must be kept above 120 feet. The majority (93%) of anglers targeting lingcod were aware of the no rockfish retention regulation. Similarly, of anglers who stated they fished for other bottomfish (68 anglers, or 12% of the boat-based angling population), only 46% knew about

the depth regulation intended to reduce barotrauma-related rockfish mortality, while 88% knew that rockfish retention is prohibited (Figure 2).

Anglers who target salmon composed 98% of the fishing population surveyed and of those anglers, 94% target Chinook salmon (in addition to other salmonids). Of those anglers who said they fished for salmon, 36% did not know they could not legally retain rockfish and about 80% did not know of the depth regulation while targeting bottomfish (Figure 2).

Figure 2: Knowledge of Rockfish Regulations by Angler Targets (*n*=443)

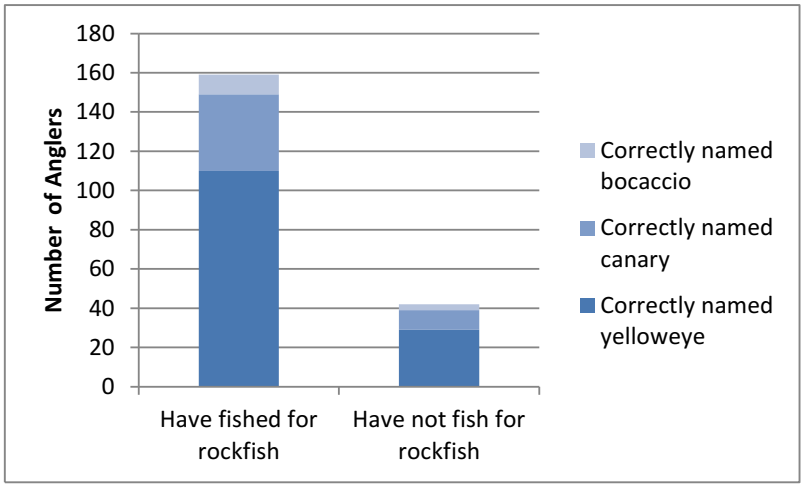


Fishing target responses are not mutually exclusive. Respondents frequently stated they fished for multiple species.

Anglers' ability to identify all species of rockfish was very low, with yelloweye and black rockfish being the most commonly recognized. Anglers who had fished for rockfish in the past demonstrated better capabilities in identifying the ESA-listed species of rockfish (Figure 3). Recognition for yelloweye was the greatest (59%) among those who have fished for rockfish, while anglers who had not fished for rockfish demonstrated significantly less recognition of yelloweye rockfish (11%). Recognition of all other rockfish species – aside

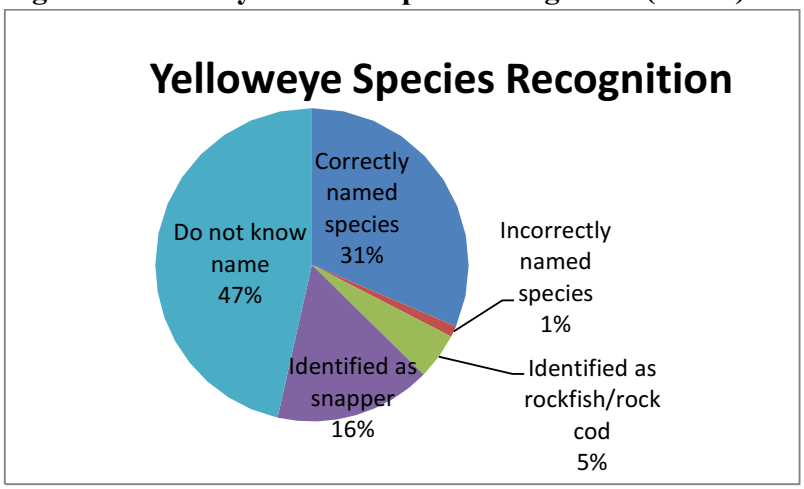
from black rockfish - was very low across both groups, notably for the ESA-listed canary rockfish and bocaccio (Figure 3).

Figure 3: Rockfishing Experience and Species Identification Knowledge (*n*=443)



Of the total survey set of boat-based anglers, 31% identified yelloweye to the correct species common name, 47% could not provide any name for the fish, and 16% identified them as being as being a "snapper" or "red snapper" (Figure 4).

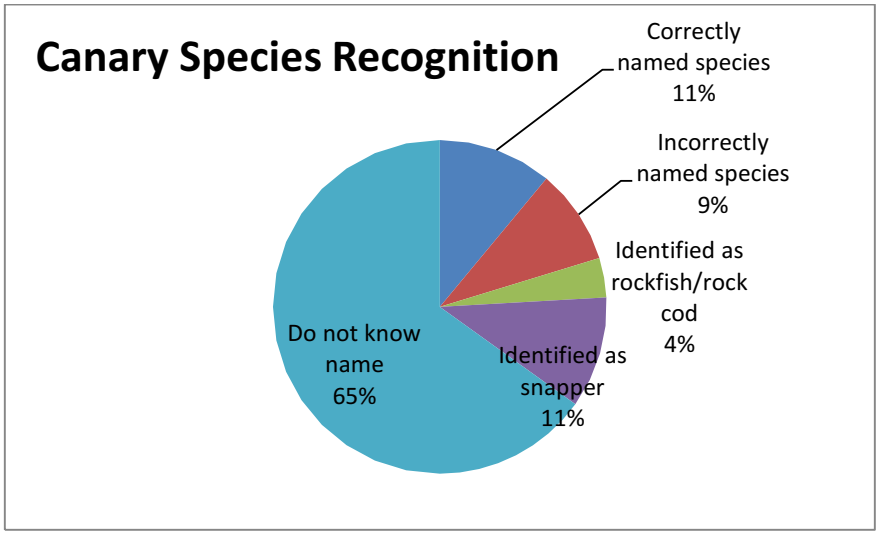
Figure 4: Yelloweye rockfish species recognition (*n*=443)



Totals may add up to more than 100% because anglers often provided more than one name.

Of the surveyed boat-based anglers 65% could not identify canary rockfish to their common name, or to any to other name. Of the 41 anglers (or 9% of anglers) who incorrectly named canary rockfish, 40 (or 98%) stated it was a yelloweye rockfish. Many called also canary general names, such as snapper (11%), rockfish, or rock cod (4%). Only 11% were able to identify canary to the correct common species name (Figure 5).

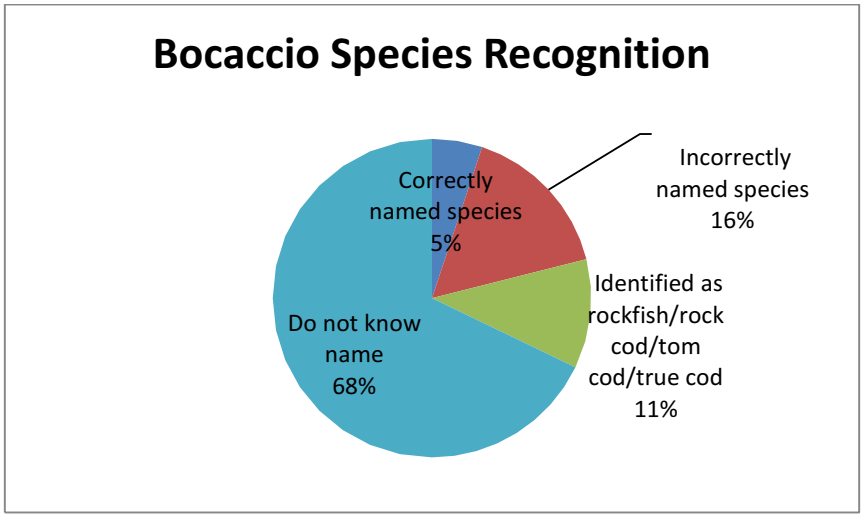
Figure 5: Canary rockfish species recognition (*n*=443)



Totals may add up to more than 100% because anglers often provided more than one name.

Of the 11 species tested bocaccio was one of the most frequently incorrectly named, and was often mistaken for greenling (or kelp greenling). Almost 16% of anglers stated bocaccio was kelp greenling. The majority (68%) of surveyed boat-based anglers did not know the common species name or any other name for the fish, and only 5% were able to identify the fish (Figure 6).

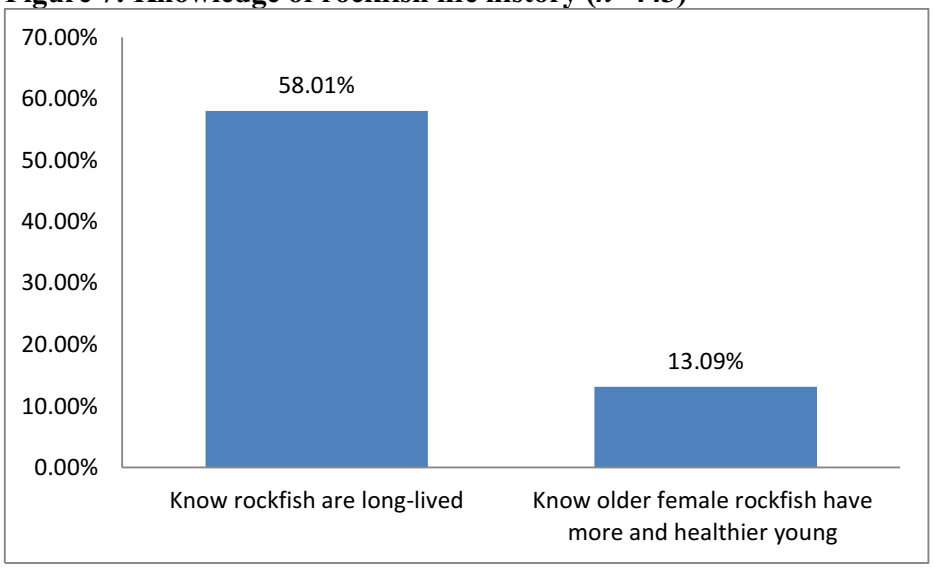
Figure 6: Bocaccio rockfish species recognition (*n*=443)



Totals may add up to more than 100% because anglers often provided more than one name.

Knowledge about rockfish biology among all anglers is primarily limited to knowing that they are long lived. Over half of respondents, or 58%, indicated they thought rockfish are long-lived. Few anglers (13%) responded that they understood that older female rockfish produce more and healthier young than younger rockfish (Figure 7).

Figure 7: Knowledge of rockfish life history (*n*=443)

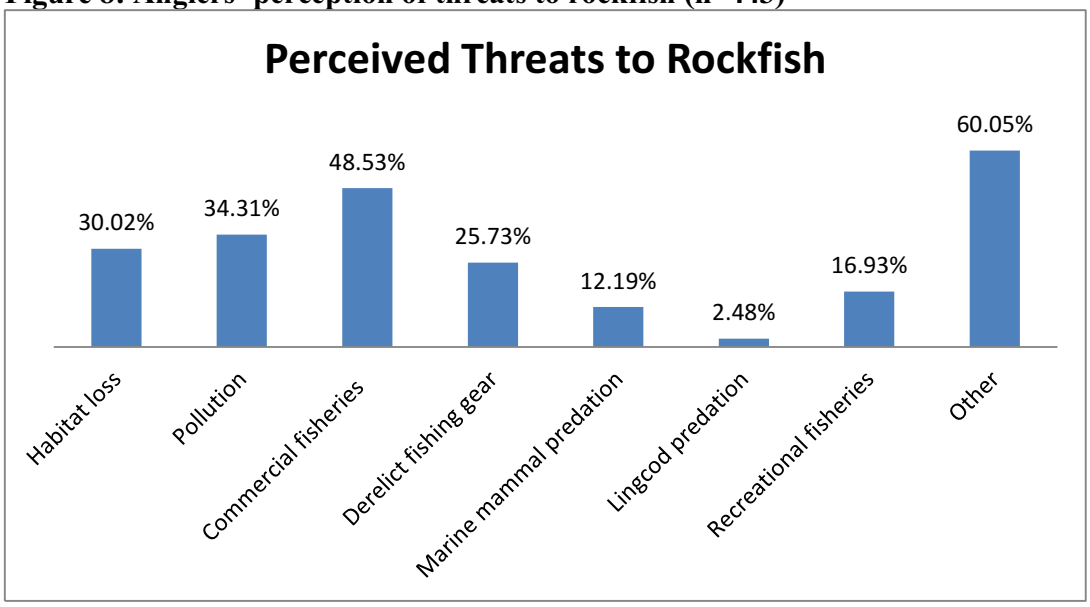


Angler Perceptions

Perceptions of rockfish abundance did not vary as widely as knowledge about rockfish. The majority of anglers (67%) stated populations in the areas in which they fish are low or very low; 5% stated populations were average; and less than 1% stated populations were abundant. Some anglers (24%) said they did not know about populations at all and few said that rockfish were either improving, or that they see juveniles but very few adults (about 1% and 4%, respectively).

Perceptions about threats to rockfish, however, did vary greatly across surveyed boat-based anglers. The majority of anglers (49%) stated that commercial fisheries are a threat to rockfish, while pollution and habitat loss followed closely at 34% and 30%, respectively. More than a quarter of anglers surveyed (26%) said derelict fishing gear was a threat. Only 17% said that they thought recreational fisheries themselves were a threat. Many anglers also named various "Other" threats to rockfish (60%), ranging from impacts that commercial fisheries had on the region in the past (33%), overfishing in general (20%), and bycatch (13%). A quarter of surveyed anglers (25%) responded they did not know the threats to rockfish (Figure 8).

Figure 8: Anglers' perception of threats to rockfish (n=443)



Totals add up to more than 100% because anglers often provided more than one answer.

Correlations were calculated between all measured perceived threats with all seven measures of knowledge to test if there were significant associations between knowledge of rockfish and anglers' perceptions of threats to rockfish. The perception of bycatch as a threat was significantly correlated with six of the seven measures of rockfish knowledge (knowledge of long life, reproduction, no retention and depth regulations, recognition of yelloweye and canary rockfish but not bocaccio) ($P<0.001$). Perceiving recreational fisheries as a threat was also significantly correlated with all measures of rockfish knowledge aside from being able to identify canary and bocaccio ($P<0.001$). Some other perceptions of threat were significantly correlated with some measures knowledge of rockfish, but were correlated across far fewer measures of knowledge than bycatch and recreational fisheries. Perceiving habitat loss and derelict gear as a threat, for example, significantly correlated with only three

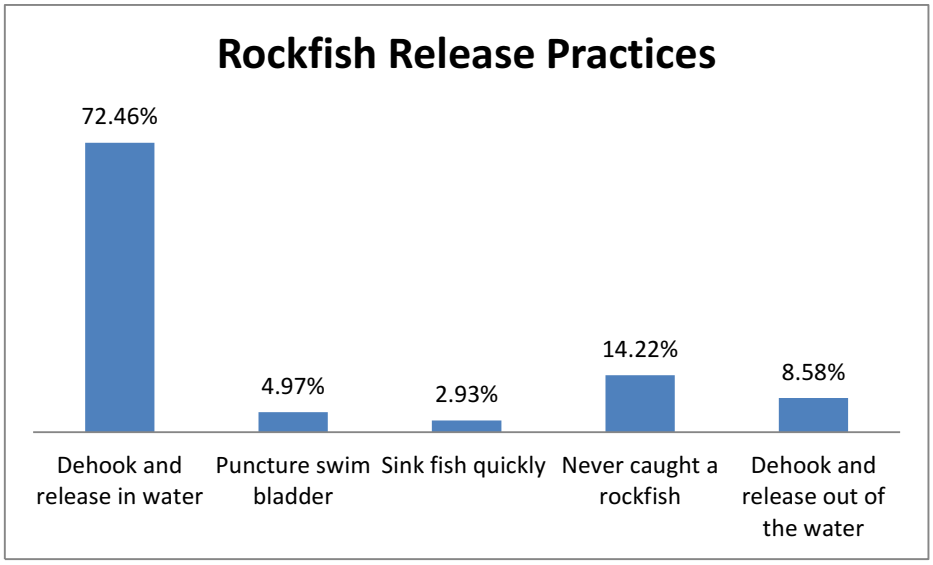
measures of knowledge (knowledge that rockfish are long-lived and the no retention and depth regulations) (P<0.001).

Angler Fishing Practices

Of respondents who indicated they did fish for rockfish in the past, 188 (42.44%) stated they stopped fishing for rockfish an average of 4.09 years ago (*SD* = 7.52, *Range* = 39), two years before the closure. Note that having fished for rockfish does not indicate the fishing trips were to target rockfish only; many anglers indicated they only targeted rockfish at the end of the fishing day when their trip was otherwise unsuccessful. The majority of respondents indicated they generally target salmon (98%) and crab (52%).

Most anglers follow WDFW recommendations to keep the fish in the water for their release, but only 3% of anglers reporting using a sinking device when releasing rockfish (Figure 9).

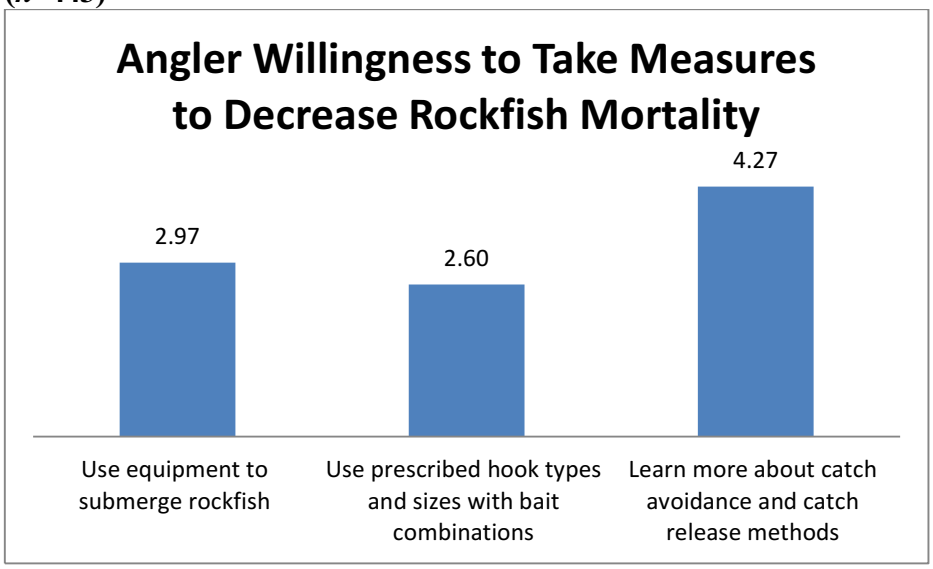
Figure 9: Anglers' rockfish release practices (*n*=443)



Totals add up to more than 100% because anglers often provided more than one answer.

Anglers were also asked to rate their willingness to take particular actions to recovery rockfish, such as using a sinking device to release rockfish, using hook and bait combinations that may result in decreased rockfish catch, and learning more about rockfish catch/release methods. On a scale from 1-5 (1 being not willing, 5 meaning very willing), the most positive result was that most anglers ranked their willingness to learn about rockfish catch/release methods high (mean score = 4.27). Anglers were lukewarm to using sinking devices (2.97) and less willing to use prescribed hook and bait combinations (2.60) (Figure 10).

Figure 10: Anglers' willingness to take certain measure to decrease rockfish mortality (*n*=443)



On a scale from 1 to 5, with 5 meaning "very willing" and 1 meaning "not willing at all"

There was a significant correlation between three MCAs (North Puget Sound (MCA 7), Strait of Juan de Fuca (MCAs 5,6) and Hood Canal (MCA 12)) and anglers' willingness to take all three measures to decrease rockfish mortality (listed above in Figure 10) ($P<0.001$). There was no correlation in Central Sound, Whidbey Basin, or in South Puget Sound with anglers' willingness to take these three measures to decrease mortality. However,

there was a significant correlation between fishing in South Puget Sound (MCA 13) and anglers stating they are willing to use devices to sink rockfish and decrease mortality from bycatch (P<0.001).

All measures of knowledge about rockfish (with the exception of being able to identify bocaccio) were significantly correlated with being willing to use equipment to sink and release rockfish as well as being willing to learn more about catch avoidance and release methods (P<0.001). Willingness to use prescribed terminal tackle was only significantly correlated with knowing about rockfish reproduction and being able to identify yelloweye rockfish (P<0.001).

Anglers who fished for rockfish in the past were most likely to report that they would take all three of the measures to reduce mortality, and there was a significant correlation between these variables (Table 12) (P<0.001).

Table 12: Spearman's Rho Correlation Matrix: Fished for Rockfish/Yrs. Fishing and Willingness to Take Steps to Decrease Mortality from Incidental Catch

	Years Fishing	Have fished for Rockfish
Have fished for rockfish	**0.24***	
Willing to use equipment to sink & release rockfish	0.14	**0.36***
Willing to use prescribed terminal tackle	0.02	**0.24***
Willing to learn more to about catch avoidance & release methods	**0.18***	**0.28***

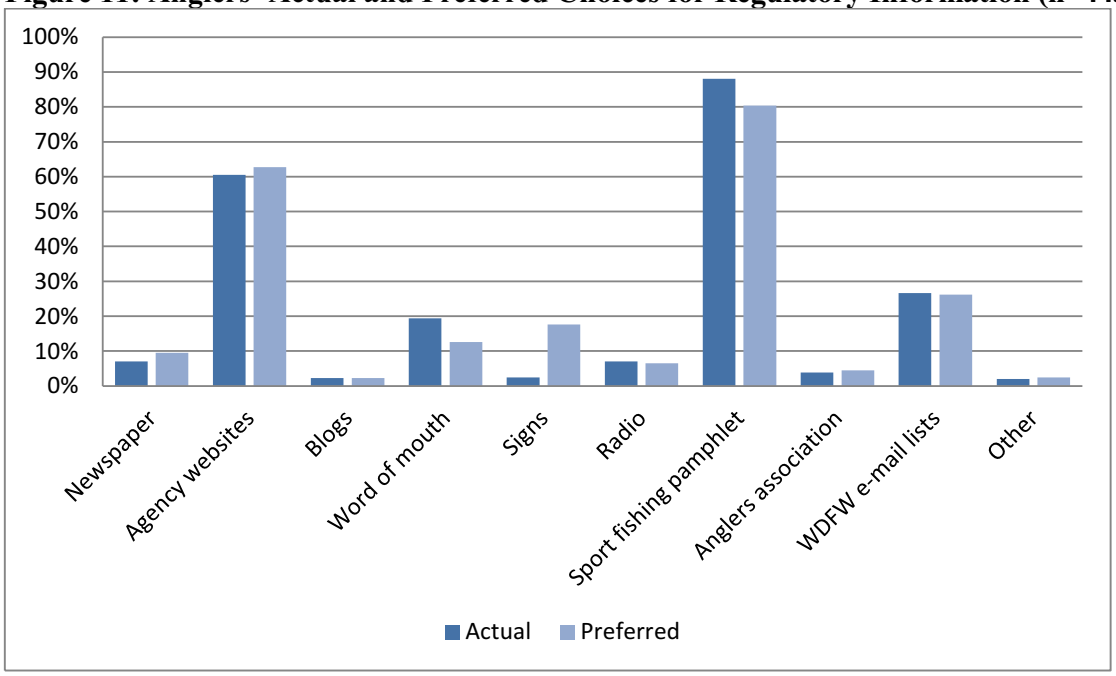
*P-value <0.001.

Angler Preferences

Anglers reported preferring and obtaining fishing regulations through means that were generally similar. Outlets most popular were the WDFW Sportfishing regulation

booklet (more than 80%), agency website (more than 60%), and the WDFW email lists (about 25%). However, about 17% of anglers did prefer to see more posts on the most important of topics on signs at launches (Figure 11).

Figure 11: Anglers' Actual and Preferred Choices for Regulatory Information (n=443)



Totals add up to more than 100% because anglers often provided more than one answer.

The preferences for rockfish recovery among the general boat-based angling population is not based upon demographics or fishing experience, but is primarily associated with what anglers perceive as the primary threat to rockfish and rockfish recovery (Tables 13 and 14).

The most important predictor variables among anglers who prefer marine reserves as a method for recovery were knowledge of rockfishes' long lives and perceiving recreational fisheries and pollution as a threat to rockfish. Anglers who viewed recreational fisheries as a threat to rockfish were more than two times more likely to prefer marine reserves than

anglers who did not view them as a threat (Table 13). Anglers who knew that rockfish are long-lived and anglers who perceived pollution as a threat to rockfish were also nearly two times more likely than anglers who did not know about rockfish longevity or view pollution as a threat to rockfish (Table 13).

Table 13: Multiple Logistic Regression Results for Response Variable "Prefer Marine Reserves for Rockfish Recovery"

Predictor variable	Coefficient	Standard error	P-value	Odds ratio
Intercept	*-1.50*	*0.22*	*<0.001*	*0.20*
Have fished for rockfish	0.27	0.23	0.25	1.30
Recreational fisheries are a threat to rockfish*	**0.80**	**0.31**	**0.01**	**2.23**
Habitat loss is a threat to rockfish	0.45	0.25	0.07	1.57
Pollution is a threat to rockfish*	**0.66**	**0.24**	**0.01**	**1.94**
Know rockfish are long-lived*	**0.54**	**0.25**	**0.03**	**1.73**
Know no rockfish retention regulation	0.39	0.27	0.14	1.48

*P-values < 0.05 are significant.

Those who perceived commercial fisheries or habitat loss to be a threat to rockfish were more likely to prefer artificial reefs as a potential recovery method than anglers who did not perceive those variables to be a threat by nearly a factor of two. Those who perceived derelict gear to be a threat to rockfish were more than three times as likely to prefer artificial reefs as those who did not perceive it to be a threat (Table 14).

Table 14: Multiple logistic regression results for response variable "Prefer artificial reefs for rockfish recovery"

Predictor variable	Coefficient	Standard error	P-value	Odds ratio
Intercept	*-1.59*	*0.22*	*<0.001*	*0.20*
Have fished for rockfish	0.11	0.26	0.66	1.12
Commercial fisheries are a threat to rockfish*	**0.60**	**0.25**	**0.02**	**1.82**
Habitat loss is a threat to rockfish*	**0.67**	**0.27**	**0.01**	**1.96**
Derelict fishing gear is a threat to rockfish*	**1.17**	**0.28**	**<0.001**	**3.22**
Know rockfish are long-lived	0.31	0.26	0.23	1.36
Know no rockfish retention regulation	0.05	0.29	0.86	1.05

*P-values < 0.05 are significant.

Because all other variables did not significantly contribute to preferences for recovery, the most parsimonious model included three significant predictors of preference for marine reserves: perceiving recreational fisheries as a threat to rockfish, perceiving pollution as a threat to rockfish, and knowledge that rockfish are long-lived.

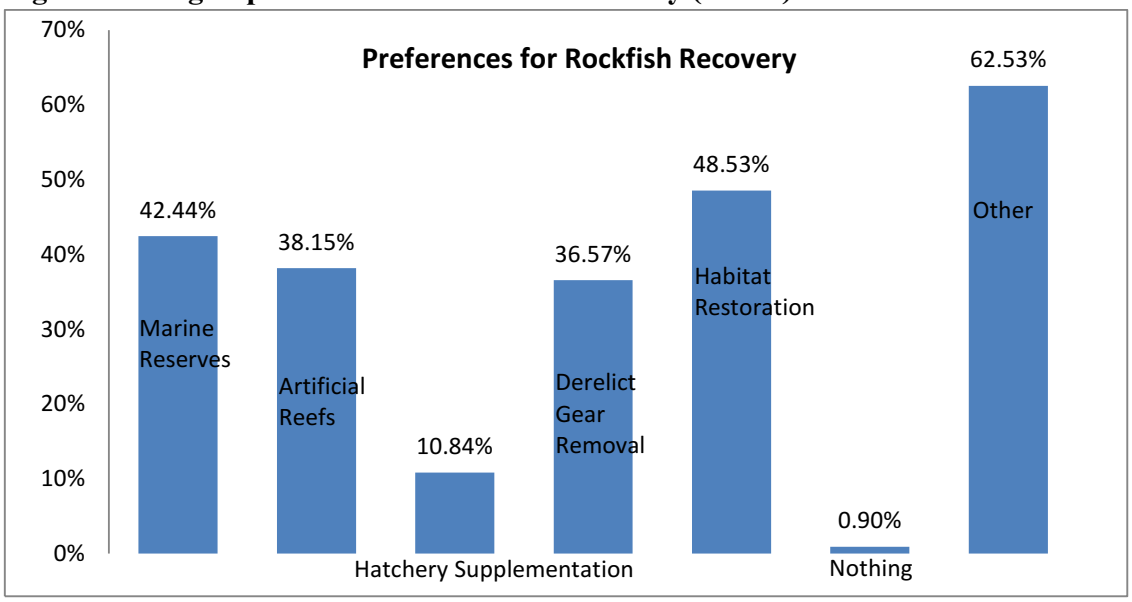
The most parsimonious model included three significant predictors of preference for artificial reefs: perceiving commercial fisheries, derelict fishing gear, and habitat loss as threats to rockfish.

Years fishing is significantly correlated with perceiving commercial fishing (past or present) as a threat to rockfish, indicating that many anglers have memories of past commercial fisheries that may influence their perceptions today ($P<0.001$). Membership within an angler association within the representative boat-based angling population was not significantly correlated with preferring artificial reefs, nor is not being a member of an angler associations significantly correlated with preferring marine reserves. Fishing in any particular MCA was also not significantly correlated with any preference for rockfish recovery.

Overall, preferences for rockfish recovery measures among anglers varied. Nearly 49% of surveyed anglers preferred habitat restoration as a recovery measure, 42% preferred marine reserves, 38% preferred artificial reefs, 37% preferred derelict gear removal, and almost 11% preferred hatcheries. The "Other" option within the recovery selections was considerable - about 63% of surveyed anglers indicated they preferred recovery options other than or in addition to those listed in the survey. Of those anglers, 23% of anglers stated they preferred a long-term closure of the rockfish fishery (as WDFW has already done), 20% preferred closure of all commercial gillnetting within Puget Sound waters, 6% preferred

education, and the remaining preferred enforcement or stopping pollution (both under 5%). About 17% stated they did not know what recovery options they prefer or which options would be best (Figure 12).

Figure 12: Angler preferences for rockfish recovery (*n*=443)



Totals add up to more than 100% because anglers often provided more than one answer.

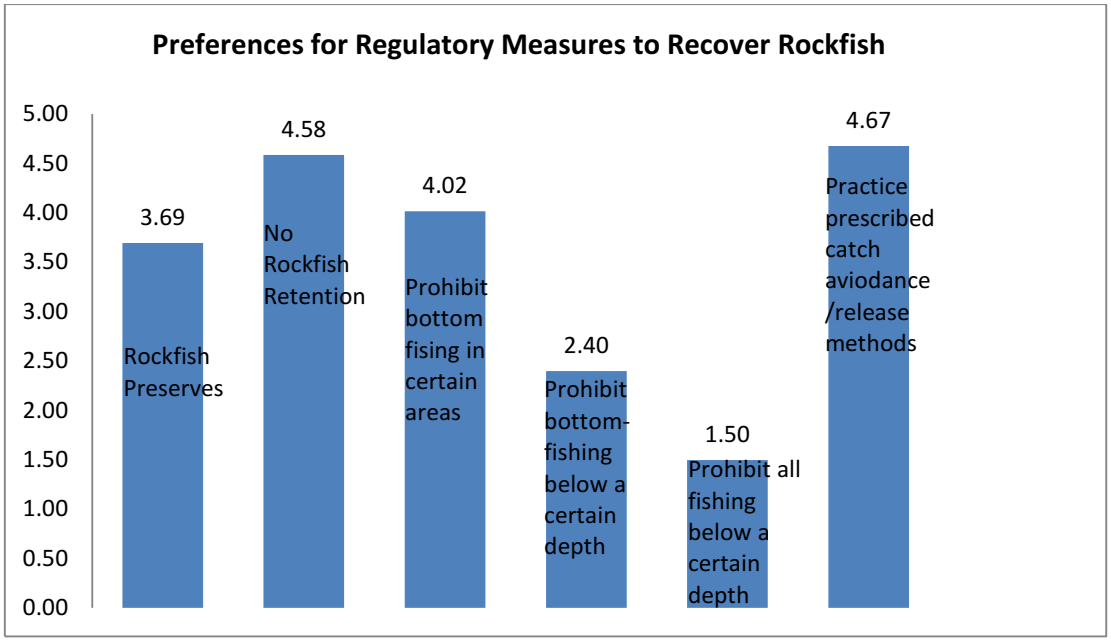
Anglers often chose more than one recovery measure. For example, 16 anglers (4%) chose all six recovery measures (marine reserves, artificial reefs, hatchery supplementation, derelict gear removal, habitat restoration, and "other"). A total of 37 anglers (8%) chose some combination of five of the six measures, 56 anglers (13%) picked four of the six measures, 71 (16%) chose three of the six measures, 81 (18%) those two of the six measures, and 179 anglers (40%) chose only one of the six measures for rockfish recovery.

The most common examples of these preferences for a combination of recovery measures included: preference for marine reserves and derelict gear removal; preference for artificial reefs and derelict gear removal; preference for habitat restoration, derelict gear

removal, and artificial reefs; and preference for habitat restoration, marine reserves, and artificial reefs.

Anglers were also asked their preference for fishing regulations, some of which are already in place, to understand support for and the potential efficacy of the measures. Surveyed anglers generally supported full closures of areas and no retention over depth restrictions (Figure 13). As reported in the *Angler Knowledge* section, the majority of anglers also did not know about depth restrictions.

Figure 13: Angler Preference for Regulatory Measures to Recover Rockfish (*n*=443)



On a scale from 1 to 5, 1 meaning "not preferred", 5 meaning "most preferred"

Discussion

Knowledge and Perceptions are a Strong Predictor of Recovery Choices

The boat-based angling population in Puget Sound had a range of views regarding measures that should be taken to recover rockfish. Generally, perceptions of risk were tied to preferences for different recovery measures. However, there were also some instances in which perceptions of risk did not match up with preferred recovery measures. For example, 30% of anglers viewed habitat loss as a threat but a disproportionately higher percentage identified habitat restoration and artificial reefs as preferred recovery measures (49% and 38%, respectively).

Anglers who demonstrated knowledge about rockfish in conjunction with perceiving multiple threats to rockfish (recreational fisheries and pollution) preferred marine reserves. These anglers have an understanding of rockfish, and perceive humans have a direct effect on rockfish through recreational pursuits as well as through the indirect effects of pollution.

In contrast, knowledge of rockfish life history did not significantly contribute to anglers' preference for prefer artificial reefs. The most significant predictors were the perception that commercial fisheries, derelict gear, and habitat loss are a threat to rockfish. This finding is particularly interesting because there have been no rockfish fisheries in Puget Sound since 1999 (Palsson *et al*. 2009). This could be related the conflict between recreational and commercial fishers who are completing for finite resources, and could be addressed by providing easily understood information about the effects of both industries (Charles 1992). Only 75 anglers (17%) viewed recreational fisheries to be a threat to

rockfish, indicating that anglers may not be aware of their potential collective impact on rockfish.

Additionally, different anglers and also managers may demonstrate different knowledge and perceptions due to a number of other factors, namely differences in sources and breadth of information available to them, personal background, and available methods to compare information (Verweij *et al.* 2010). Finally, cultural and economic or scientific values may be variables that dictate both knowledge and management preferences (Kellert 1985; Martin-Lopez *et al*. 2007).

Historical Use and Values are a Strong Indicator of Support to Take Action to Decrease Rockfish Mortality

Anglers who have fished for rockfish in the past had greater knowledge about their life history, and were more willing to take steps to conserve them. This indicates that a direct linkage to their resource may motivate anglers take measures to recover their resources. This finding is consistent with other studies that show that experience with and knowledge about a species may increase willingness and support to conserve them (Stankey and Shindler 2006; Martin-Lopez *et al*. 2007).

However, most surveyed anglers reported that they have never fished for rockfish. Most anglers want to fish for, have knowledge of, and value salmon and crab. Anglers may lack knowledge about the full range of values associated with ESA-listed rockfish (Kellert 1985). Without an economically valued rockfish fishery (Palsson *et al*. 2009) or cultural ties (Williams *et al*. 2010), managers need to demonstrate other evidence of their worth, such as

their prevalence in the marine ecosystem (Donnelly et al. 1995) that is shared with salmon and crab. Without knowledge of rockfish and a valuation of their worth it may be difficult to garner support for their recovery (Kellert 1985; Stankey and Shindler 2006; Martin-Lopez *et al*. 2007).

Implications of Rockfish Species Identification

The WDFW enumerates rockfish bycatch by conducting creel surveys of less than 20% of recreational fishing trips in the Puget Sound, which are then supplemented with randomized phone surveys (Cheng *et al*. 2010). All rockfish must be released requiring anglers voluntarily report the released catch (of all fish species). Because encounter rates with ESA-listed rockfish are likely rare and angler identification of these species is poor, there is considerable but unknown imprecision in these estimates. An example of this threat was that almost 71 anglers (16%) thought the ESA-listed bocaccio was greenling or kelp greenling, which anglers are allowed to keep 15 per day if bottomfishing is open in that MCA (WDFWb 2011).

Recommendations

Increase Rockfish Relevancy and Visibility to Anglers

It is clear that rockfish do not hold cultural or economic value for the majority of anglers surveyed (Williams *et al*. 2010). It is also clear that this is critical for anglers to support their recovery (Kellert 1985; Stankey and Shindler 2006; Martin-Lopez *et al*. 2007). Unlike many managers and scientists who utilize ecosystem based management and may

recognize rockfishes' inherit value as part of a larger ecosystem, education and outreach must make explicit these connections to anglers as well to garner support.

In contrast to charismatic ESA-listed animals like salmon and Southern Resident killer whales in Puget Sound that benefit from multiple, high-profile education campaigns to inform the public of regulations to protect them, rockfish have less notoriety. Often times anglers also do not know where in the WDFW regulation pamphlet to find information about rockfish (personal observation).

While WDFW and NOAA stress laws about killer whales three times in the 2011-2012 Sportfishing pamphlet – including a full page spread on the highly visible last page and another warning at the beginning - information about rockfish species is found deep within the pamphlet only one time (p. 100 and 101). One of the two pages includes identification information and the other page is dedicated to conservation techniques. In contrast to the three whale warnings, language about rockfish closures are not graphically stressed in the text and legal implications of not following rockfish regulations are not mentioned (WDFWb 2011). In short, the page is text heavy and may not be as effective as the pages that highlight the killer whale regulations. Salmon are also mentioned far greater times in the Sportfishing pamphlet, and anglers are invited to take part in salmon recovery work in the pamphlet, which may further engage anglers.

This survey found that the WDFW Sportfishing regulation pamphlet was the most used information source for fishing regulations. In order to enhance angler knowledge of rockfish species identification, release methods and regulations, future WDFW regulation books should include more frequent, visible (perhaps on the final page), and more

pronounced text and graphics. Given that only 3% of the boat-based fishing population reported using a device to sink rockfish, information about the benefits of the device and rockfish handling techniques should be highlighted in greater depth and frequency. As studies have demonstrated, using this device may significantly decrease mortality after release (Hochhalter and Reed 2011) in addition to reduced time out at the surface (Jarvis and Lowe 2008). Pier and shoreline anglers also expressed a desire for more rockfish information on the docks, and managers could also capitalize on this opportunity. Additionally, information could be posted on information boards adjacent to boat launches to reach a larger number of anglers.

Information should be text-light, frequent and highly visible, tie the regulations to rockfish attributes that make them vulnerable, and make recovering rockfish relevant to anglers by stressing their larger role in the marine ecosystem which supports all species.

Bridging Differences Between Different User Groups and Managers

Managers will be able to use this study to better understand how differing knowledge, practices, perceptions, and preference variables interact. The lack of knowledge about rockfish and desires for different recovery preference could be especially challenging (Renyard and Hilborn 1986; Stankley and Shindler 2006; Beaudreau *et al*. 2011). Providing recreational anglers with first-hand research experiences similar to researchers' and managers' experience may help bridge differences in information obtained, and thereby differences in perceptions (Verweij *et al.* 2010). Managers should create more opportunities for group information processing to bridge the gap between anglers, who primarily obtain

information from first-hand observation on the water, and fisheries professionals, who obtain information from a variety of sources and process information on a broader and longer term scale (Verweij *et al.* 2010).

Information should also be provided regarding steps managers are taking to reduce all forms of rockfish threats so that anglers do not feel that the onus of recovery is solely upon them. Anecdotal evidence recorded during survey administration suggests that some anglers feel that regulations disproportionally target them and their activities.

Anglers showed a deep interest in being involved in management decisions. Therefore, including anglers in management meetings or additional surveys and interviews similar to this study would also be beneficial. Some anglers also demonstrated a desire to learn how to decrease rockfish mortality, so workshops may be helpful in addition to more information in the Sportfishing pamphlet. Finally, enlisting anglers to create, when appropriate, or test gear that may be used to decrease bycatch mortality is also recommended. Jenkins (2010) has illustrated that gear adoption is far higher when the inventor is a local angler.

Further Research Opportunities

If user groups and stakeholders do not see value in recovering threatened or endangered species, current future recover efforts may be in vain (Kellert 1985; Stankey and Shindler 2006). A study to understand if and how stakeholders could find economic, social, ecological, or other value in rockfish recovery could be helpful to further inform recovery outreach and planning. This research did not explicitly ask the question of anglers, though

anecdotal evidence from conversations with anglers before and after the surveys suggests that many anglers would only value rockfish if there is a perceived tie to salmon or crab populations, and that many do not presently have an interest in rockfish recovery.

Anecdotal evidence from conversations also suggested that anglers would not oppose any recovery measure as long as it did not interfere with current salmon and crab fishing practices and popular locations. Spatial maps overlaying rockfish hotspots and potential rockfish habitat should be overlain with the most popular salmon and crab fishing areas. These maps should be generated in cooperation with knowledgeable anglers in order to enhance their legitimacy for any subsequent management decisions (Verweij *et al.* 2010). Understanding areas likely to present the most conflict may improve the efficacy of recovery efforts.

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Appendix A: Survey as Administered to Participants

(at boat launches, marinas, piers, shorelines, & adjacent dive areas)

Sport Fishing Questionnaire: Understanding Local Knowledge, Practices, and Preferences for Puget Sound Rockfish Conservation and Recovery

The purpose of this survey is to understand your knowledge about rockfish, your practices as you encounter them, and your preferences for their recovery. The report of survey findings and any related publications will not include names of any survey participants. This research has been approved by the University of Washington Human Subjects Division. Thank you for sharing your knowledge and time with me.
Please check your answers in the below boxes with a ☒ or ☑.

Section 1: The following will help me understand your fishing habits in Puget Sound/San Juan Islands.

1. How long have you been fishing in Puget Sound/San Juan Islands? _____ year(s)

2. How frequently do you fish in Puget Sound/San Juan Islands in a typical year? _____ time(s)

3. Has the frequency of your fishing trips in Puget Sound/San Juan Islands changed over the years?
   ☐ No
   ☐ Yes
   If yes, why?
   _____
   _____

4. Which species do you regularly target when you fish in Puget Sound/San Juan Islands?
   Check all that apply.
   ☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
   ☐ Crab ☐ Shrimp ☐ No preference ☐ Other _____

5. Which type of salmon do you regularly fish for in Puget Sound/San Juan Islands? Check all that apply.
   ☐ Chinook (King) ☐ Coho (Silver) ☐ Pink (Humpy) ☐ Chum ☐ Any Salmonid

6. With which gear type(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.
   ☐ Standard mooching gear (herring) ☐ Jigging ☐ Fly-fishing rod ☐ Trolling (downriggers)
   ☐ Spear ☐ Other _____

7. From which area(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.
   ☐ From shore ☐ From piers ☐ From boats (in water up to 120 ft.) ☐ While diving
   ☐ From boats (in water 120 ft. or more) ☐ Other _____

Section 2: The following questions will help me understand your ideas about rockfish and your preferences for recovery and communication with regulating agencies.

1. How would you generally characterize rockfish populations in the areas you regularly fish in Puget Sound/San Juan Islands? Check only one. If you do not know, please state so.
   ☐ Abundant ☐ Average ☐ Low ☐ Other _____

2. What do you feel are currently the greatest threat(s) to rockfish in Puget Sound/San Juan Islands? Check all that apply.
   ☐ Habitat loss ☐ Pollution ☐ Commercial fisheries ☐ Derelict fishing gear
   ☐ Predation from marine mammals ☐ Predation from lingcod ☐ Recreational fisheries
   ☐ Other _____

3. In which way(s) do you currently obtain information about fishing regulations? Check all that apply.
   ☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
   ☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association ☐ WDFW e-mail lists
   ☐ Other _____

4. How would you prefer to learn about updates for rockfish conservation and other fisheries conservation efforts? Check all that apply.
   ☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
   ☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association ☐ WDFW e-mail lists
   ☐ Direct Mail ☐ Other_____

5. Have the current rockfish regulations in Puget Sound/San Juan Islands caused you to fish less frequently?
   ☐ Yes ☐ No
   If yes, which species do you fish for less frequently? Check all that apply.
   ☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
   ☐ Crab ☐ Shrimp ☐ Other _____

6. What measures do you think would best conserve and recover rockfish in Puget Sound/San Juan Islands? Check all that apply.
   ☐ Marine Reserves ☐ Artificial reefs ☐ Hatchery supplementation ☐ Derelict gear removal
   ☐ Habitat Restoration ☐ Nothing ☐ Other_____

7. If it is necessary to protect rockfish from commercial/recreational fisheries, which protection do you prefer? Circle your rank from 1-5, with 1 meaning the protection is not preferred at all and 5 the most the preferred.

Designated rockfish reserves where no fishing is allowed	1	2	3	4	5
Fishing regulations that prohibit retention of rockfish	1	2	3	4	5
Fishing regulations that prohibit bottomfishing in certain areas	1	2	3	4	5
Fishing regulations that prohibit bottomfishing below a certain depth	1	2	3	4	5
Fishing regulations that prohibit all fishing below a certain depth	1	2	3	4	5
Fisheries conservation without reserves (practice prescribed catch avoidance/catch release methods)	1	2	3	4	5

Section 3: Please tell me about yourself as a recreational angler.

1. How long have you been living in Washington? _____ years

2. Why do you fish? Check all that apply.
   ☐ Sport (fun, relaxation, etc.) ☐ Food ☐ Other _____

3. What is your age? _____ years

4. Please indicate if you are a member of a recreational angler's group or association. Check all that apply.
   ☐ Puget Sound Anglers ☐ Coastal Conservation Association (CCA) ☐ None
   ☐ Other _____

5. Are/were you a charter fishing guide?
   ☐ Yes ☐ No

Section 4: This section will help me understand what you know about rockfish and the knowledge you can share to conserve them.

1. Which method(s) do you use when releasing accidentally caught rockfish? Check all that apply.
   ☐ Dehook and release without removing the fish from the water ☐ Puncture swim bladder (fizzing)
   ☐ Sink fish quickly using a device designed to release it at depth ☐ I have never caught a rockfish
   ☐ Remove the fish from the water to dehook, then release ☐ Other _____

2. When you release rockfish do you regularly see the fish float or swim down/away?
   ☐ Float ☐ Swim down or away ☐ Other _____

3. Which measure would you most be willing to take to increase rockfish survival after it is caught?
   Circle your rank from 1-5, with 1 meaning the measure is not preferred at all and 5 the most preferred.

Use equipment designed to rapidly submerge rockfish and release them at depth	1	2	3	4	5
Use hook types and sizes with bait combinations that result in decreased rockfish catch	1	2	3	4	5
Learn more about catch avoidance and catch release methods through pamphlets, talks, etc.	1	2	3	4	5

4. Which of the following statements about Rockfish are true? Check all that apply.
   ☐ Rockfish live to be very old ☐ Rockfish have life spans similar to salmon
   ☐ Rockfish taste good ☐ Rockfish juveniles live in the same habitat as adults ☐ Do not know
   ☐ Older female rockfish generally have healthier offspring than younger female rockfish

5. What are the current rockfish fishing regulation(s) in Puget Sound/San Juan Islands? Check all that apply.
   ☐ Keep 1 rockfish per day ☐ No fishing deeper than 120 ft. while salmon or halibut fishing
   ☐ No fishing deeper than 120 ft. while bottomfishing ☐ No retention of rockfish ☐ Do not know

6. Do you know which species of rockfish are listed on the Endangered Species List Puget Sound/San Juan Islands?
   ☐ Yes ☐ No
   If yes, will you please list them? _____

7. Which areas do you most regularly fish in in Puget Sound/San Juan Islands? Refer to the attached Marine Catch Area map on the next page for reference. Check all areas that apply.
   ☐ Central Puget Sound (Areas 9, 10, 11) ☐ Whidbey Basin (Area 8-1, 8-2)
   ☐ North Puget Sound/San Juan Islands (Area 7) ☐ Strait of Juan de Fuca (Areas 5, 6)
   ☐ Hood Canal (Area 12) ☐ South Puget Sound (Area 13)

8. Make an X on the attached Catch Area Map on the next page that corresponds to the area(s) you most frequently fish. If you frequent more than one location, please limit your Xs to 3 locations only.

9. Did you fish for rockfish in the past Puget Sound/San Juan Islands? ☐ Yes ☐ No
   If yes, how many years ago did you fish for rockfish? _____ year(s)

10. If you have memory of where rockfish were abundant in the past, please circle that area on the attached Catch Area Map on the next page. Please list the approximate year(s) you saw them and the species, if known.

    _____
    _____

11. Do you have any other knowledge about rockfish, preferences for their management, or preferences for communicating with regulatory agencies you would like to share? If so, please write below.

    _____
    _____
    _____

If you are interested you may obtain a summary of results by contacting me at the email address below. Results are anticipated to be complete by June 2012. Thank you for your participation.

Jennifer Heibult Sawchuk
Graduate Student Researcher

jenhsaw@uw.edu

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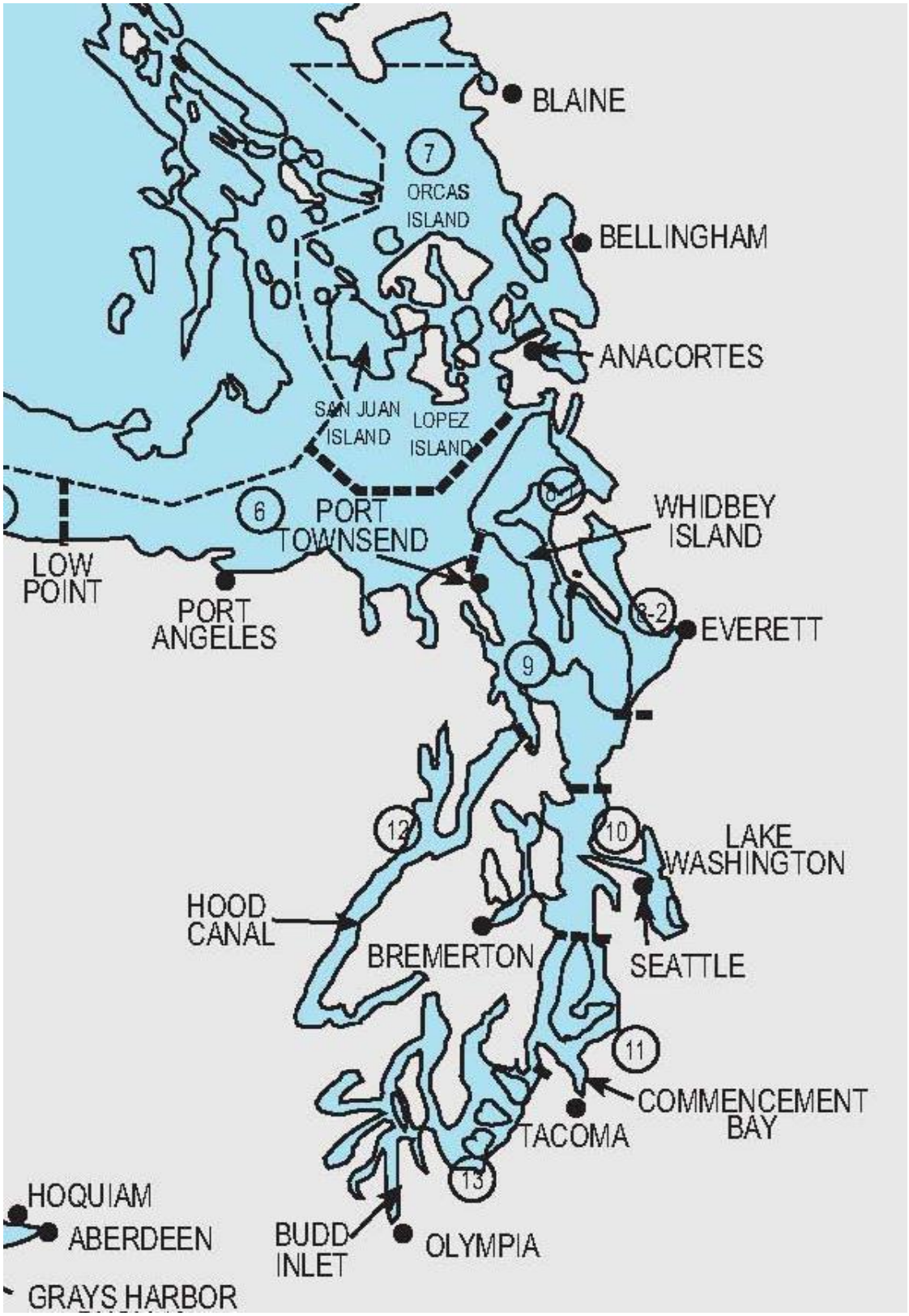
Box 355685
Seattle, WA 98105-6715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SAN JUAN ISLAND
LOPEZ ISLAND
6
PORT TOWNSEND
WHIDBEY ISLAND
LOW POINT
PORT ANGELES
8-2
EVERETT
9
12
10
LAKE WASHINGTON
HOOD CANAL
BREMERTON
SEATTLE
11
COMMENCEMENT BAY
TACOMA
13
HOQUIAM
ABERDEEN
BUDD INLET
OLYMPIA
GRAYS HARBOR

Section 5: Please tell me what you call the fish. This will help me understand if anglers have the same name for different species of fish or of any particular local names for fish. Please include local names, nicknames, family names, and particularly species names. If you do not know, please state so.

Photos available upon request.

Photo credit: Noelle Yochum and Janna Nichols.

Yelloweye rockfish
Black rockfish
Lingcod
Canary rockfish
Vermillion rockfish
Yellowtail rockfish
Bocaccio
Brown rockfish
Quillback rockfish
China rockfish
Copper rockfish

Appendix B: Survey as Given to Participants
(via postal mail to Puget Sound charter guides and at local PSA and CCA meetings)

Sport Fishing Questionnaire: Understanding Local Knowledge, Practices, and Preferences for Puget Sound Rockfish Conservation and Recovery

The purpose of this survey is to understand your knowledge about rockfish, your practices as you encounter them, and your preferences for their recovery. The report of survey findings and any related publications will not include names of any survey participants. This research has been approved by the University of Washington Human Subjects Division. Thank you for sharing your knowledge and time with me.
Please check your answers in the below boxes with a ☒ or ☑.

Section 1: The following will help me understand your fishing habits in Puget Sound/San Juan Islands.

1. How long have you been fishing in Puget Sound/San Juan Islands? _____ year(s)

2. How frequently do you fish in Puget Sound/San Juan Islands in a typical year? _____ time(s)

3. Has the frequency of your fishing trips in Puget Sound/San Juan Islands changed over the years?
   ☐ No
   ☐ Yes
   If yes, why?
   _____
   _____

4. Which species do you regularly target when you fish in Puget Sound/San Juan Islands?
   Check all that apply.
   ☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
   ☐ Crab ☐ Shrimp ☐ No preference ☐ Other _____

5. Which type of salmon do you regularly fish for in Puget Sound/San Juan Islands? Check all that apply.
   ☐ Chinook (King) ☐ Coho (Silver) ☐ Pink (Humpy) ☐ Chum ☐ Any Salmonid

6. With which gear type(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.
   ☐ Standard mooching gear (herring) ☐ Jigging ☐ Fly-fishing rod ☐ Trolling (downriggers)
   ☐ Spear ☐ Other _____

7. From which area(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.
   ☐ From shore ☐ From piers ☐ From boats (in water up to 120 ft.) ☐ While diving
   ☐ From boats (in water 120 ft. or more) ☐ Other _____

Section 2: The following questions will help me understand your ideas about rockfish and your preferences for recovery and communication with regulating agencies.

3. How would you generally characterize rockfish populations in the areas you regularly fish in Puget Sound/San Juan Islands? Check only one. If you do not know, please state so.
   ☐ Abundant ☐ Average ☐ Low ☐ Other _____

4. What do you feel are currently the greatest threat(s) to rockfish in Puget Sound/San Juan Islands? Check all that apply.
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   ☐ Predation from marine mammals ☐ Predation from lingcod ☐ Recreational fisheries
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   ☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association ☐ WDFW e-mail lists
   ☐ Other _____

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6. What measures do you think would best conserve and recover rockfish in Puget Sound/San Juan Islands? Check all that apply.
   ☐ Marine Reserves ☐ Artificial reefs ☐ Hatchery supplementation ☐ Derelict gear removal
   ☐ Habitat Restoration ☐ Nothing ☐ Other_____

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   ☐ Sink fish quickly using a device designed to release it at depth ☐ I have never caught a rockfish
   ☐ Remove the fish from the water to dehook, then release ☐ Other _____

3. When you release rockfish do you regularly see the fish float or swim down/away?
   ☐ Float ☐ Swim down or away ☐ Other _____

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   ☐ Older female rockfish generally have healthier offspring than younger female rockfish

5. What are the current rockfish fishing regulation(s) in Puget Sound/San Juan Islands? Check all that apply.
   ☐ Keep 1 rockfish per day ☐ No fishing deeper than 120 ft. while salmon or halibut fishing
   ☐ No fishing deeper than 120 ft. while bottomfishing ☐ No retention of rockfish ☐ Do not know

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   ☐ Hood Canal (Area 12) ☐ South Puget Sound (Area 13)

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   If yes, how many years ago did you fish for rockfish? _____ year(s)

10. If you have memory of where rockfish were abundant in the past, please circle that area on the attached Catch Area Map on the next page. Please list the approximate year(s) you saw them and the species, if known.

    _____
    _____

11. Do you have any other knowledge about rockfish, preferences for their management, or preferences for communicating with regulatory agencies you would like to share? If so, please write below.

    _____
    _____
    _____

If you are interested you may obtain a summary of results by contacting me at the email address below. Results are anticipated to be complete by June 2012. Thank you for your participation.

Jennifer Heibult Sawchuk
Graduate Student Researcher

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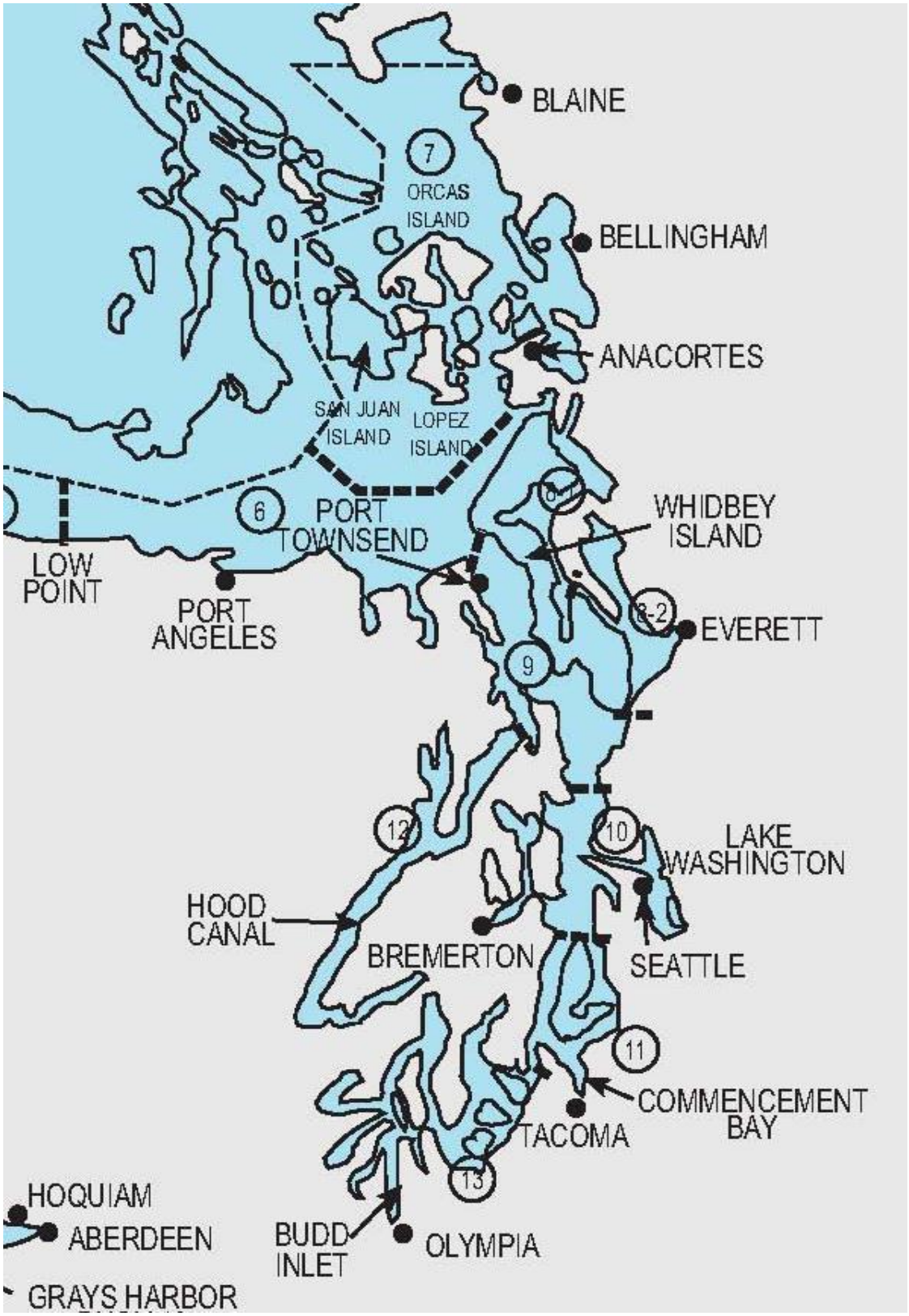
BLAINE
7
ORCAS ISLAND
BELLINGHAM
ANACORTES
SAN JUAN ISLAND
LOPEZ ISLAND
6
PORT TOWNSEND
WHIDBEY ISLAND
LOW POINT
PORT ANGELES
8-2
EVERETT
9
12
10
LAKE WASHINGTON
HOOD CANAL
BREMERTON
SEATTLE
11
COMMENCEMENT BAY
TACOMA
13
HOQUIAM
ABERDEEN
BUDD INLET
OLYMPIA
GRAYS HARBOR

Section 5: Please tell me what you call the fish. This will help me understand if anglers have the same name for different species of fish or of any particular local names for fish. Please include local names, nicknames, family names, and particularly species names. If you do not know, please state so.

Photos available upon request.

Photo credit: Noelle Yochum and Janna Nichols.

Black rockfish
Canary rockfish
Vermillion rockfish
Yellowtail rockfish
Bocaccio
Brown rockfish
Quillback rockfish
China rockfish
Copper rockfish

Appendix C: Handout Explaining the Study, Given to All Participants

Sport Fishing Questionnaire

Understanding Local Knowledge, Practices, and Preferences for Rockfish Conservation and Recovery

Jennifer Heibult Sawchuk
Graduate Student Researcher

jenhsaw@uw.edu

University of Washington
School of Marine and Environmental Affairs
Box 355685
Seattle, WA 98105-6715

Purpose

This study is designed to develop an understanding of recreational anglers' knowledge of different rockfish species and areas of past rockfish abundance, especially of those species listed on the Endangered Species List in Puget Sound and the San Juan Islands. The study is also aimed at understanding current angler practices as they encounter rockfish and anglers' perceptions of rockfish populations and preferences for their conservation and recovery. The study will help me to better understand whether rockfish knowledge, perceptions, and practices of anglers in Puget Sound and the San Juan Islands varies according to geographic region, age or years of angling experience, and expert type and how to better communicate information about rockfish to different anglers. This research has been approved by the University of Washington Human Subjects Division.

Your role

You are being invited to take part in this study because of your angling experience in Puget Sound and the San Juan Islands. Your participation is voluntary. If you decide to volunteer, you will be asked to complete one questionnaire that will take approximately 10 minutes. The questionnaire includes questions about your recreational fishing experience and your observations of different rockfish species in Puget Sound and the San Juan Islands as well as demographic questions.

Confidentiality

This is an anonymous survey. To help protect your confidentiality, results will be reported in a summarized manner so that you cannot be identified. Results from this study will be shared through presentations, research reports, or publications. Your name will not be used in any publications or presentations.

Thank you for sharing your knowledge and time with me. You may obtain a summary of results by contacting me at the email address above; results will be ready in June 2012. If you want to learn more about how you can help rockfish recovery, please visit http://wdfw.wa.gov/fishing/rockfish/mortality.html.

Appendix D: Responses with Descriptive Statistics for Surveys Administered to the Representative Boat-Based Angling Population

(boat-based anglers at boat launches and marinas)

Question 1. Total responses (N): 443 Did not respond: 0

How long have you been fishing in Puget Sound/San Juan Islands? _____ year(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. Fishing	30.56	251.30	15.85	0.75	30	69	1	70

Question 2. Total responses (N): 443 Did not respond: 0

How frequently do you fish in Puget Sound/San Juan Islands in a typical year?
_____ time(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Trips/Yr.	27.25	1227.75	35.04	1.66	20	600	0	600

Question 3. Total responses (N): 443 Did not respond: 0

Has the frequency of your fishing trips in Puget Sound/San Juan Islands changed over the years? ☐ Yes ☐ No
If yes, why?
_____

Answer	Frequency	Percentage
No change	200	45.15%
Yes, more trips	80	18.06%
Yes, fewer trips	173	38.05%
Why, more, due to retirement	39	8.80%
Why, less, due to less fish	92	20.77%
Why, less, due to less bottomfish	17	3.84%
Why, less, due to less fish, but salmon now improving so starting to fish more	18	4.06%

Why, less, due to the cost of fishing	13	2.93%
Why, less, due to family or work obligations	27	6.09%
Why, less, due to regulations	17	3.84%
Why, less or more, due to the quality of the fishing year	17	3.84%
Why, less, due to too many people fishing or overcrowding	40	9.03%

Question 4. Total responses (N): 443 Did not respond: 0

Which species do you regularly target when you fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
☐ Crab ☐ Shrimp ☐ No preference ☐ Other _____

Answer	Frequency	Percentage
Target salmon	432	97.52%
Target halibut	71	16.03%
Target lingcod	141	31.83%
Target rockfish	41	9.26%
Target other bottomfish	68	15.35%
Target crab	230	51.92%
Target shrimp	56	12.64%
No preference	1	0.23%
Target other	11	2.48%

Question 5. Total responses (N): 443 Did not respond: 0

Which type of salmon do you regularly fish for in Puget Sound/San Juan Islands? Check all that apply.

☐ Chinook (King) ☐ Coho (Silver) ☐ Pink (Humpy) ☐ Chum ☐ Any Salmonid

Answer	Frequency	Percentage
Target Chinook (king) salmon	416	93.91%
Target coho (silver) salmon	403	90.97%
Target pink (humpy) salmon	313	70.65%
Target chum salmon	169	38.15%
Target any salmonid	177	39.95%

Question 6. Total responses (N): 443 Did not respond: 0

With which gear type(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Standard mooching gear (herring) ☐ Jigging ☐ Fly-fishing rod
☐ Trolling (downriggers) ☐ Spear ☐ Other _____

Answer	Frequency	Percentage
Standard mooching gear (herring)	149	33.63%
Jigging	118	26.64%
Fly-fishing rod	33	7.45%
Trolling (downriggers)	437	98.65%
Spear	11	2.48%
Other	0	0.00%

Question 7. Total responses (N): 443 Did not respond: 0

From which area(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.

☐ From shore ☐ From piers ☐ From boats (in water up to 120 ft.)
☐ While diving ☐ From boats (in water 120 ft. or more) ☐ Other _____

Answer	Frequency	Percentage
From shore	41	9.26%
From piers	44	9.93%
From boats (in water up to 120 ft.)	431	97.29%
While diving	25	5.64%
From boats (in water 120 ft. or more)	406	92.10%

Question 8. Total responses (N): 443 Did not respond: 0

How would you generally characterize rockfish populations in the areas you regularly fish in Puget Sound/San Juan Islands? Check only one.

☐ Abundant ☐ Average ☐ Low ☐ Other _____

Answer	Frequency	Percentage
Abundant	3	0.68%
Average	24	5.42%
Low	258	58.24%

Other	157	35.44%
Other: improving	6	1.35%
Other: very low/decimated*	38	8.58%
Other: see juveniles but adults scarce*	17	3.84%
Other: do not know*	105	23.70%

*Indicates the most common "other" answers.

Question 9. Total responses (N): 443 Did not respond: 0

What do you feel are currently the greatest threat(s) to rockfish in Puget Sound/ San Juan Islands? Check all that apply.

☐ Habitat loss ☐ Pollution ☐ Commercial fisheries ☐ Derelict fishing gear
☐ Predation from marine mammals ☐ Predation from lingcod
☐ Recreational fisheries ☐ Other _____

Answer	Frequency	Percentage
Habitat loss	133	30.02%
Pollution	152	34.31%
Commercial fisheries	215	48.53%
Derelict fishing gear	114	25.73%
Predation from marine mammals	54	12.19%
Predation from lingcod	11	2.48%
Recreational fisheries	75	16.93%
Other	266	60.05%
Other: past effects of commercial fisheries*	145	32.73%
Other: poaching*	28	6.32%
Other: tribes*	21	4.74%
Other: overfishing*	88	19.86%
Other: bycatch*	57	12.87%
Other: spearfishers*	27	6.09%
Other: do not know*	109	24.60%

*Indicates the most common "other" answers.

Question 10. Total responses (N): 443 Did not respond: 0

In which way(s) do you currently obtain information about fishing regulations? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Other _____

Answer	Frequency	Percentage
Newspaper	31	7.00%
Agency websites	278	62.75%
Blogs	10	2.26%
Word of mouth	86	19.41%
Signs	11	2.48%
Radio	31	7.00%
Sport fishing regulation booklet	390	88.04%
An angler's association	17	3.84%
WDFW email lists	118	26.64%
Other	9	2.03%

Question 11. Total responses (N): 443 Did not respond: 0

How would you prefer to learn about updates for rockfish conservation and other fisheries conservation efforts? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Direct Mail ☐ Other_____

Answer	Frequency	Percentage
Newspaper	42	9.48%
Agency websites	268	60.50%
Blogs	10	2.26%
Word of mouth	56	12.64%
Signs	78	17.61%
Radio	29	6.55%
Sport fishing regulation booklet	356	80.36%
An angler's association	20	4.51%
WDFW email lists	116	26.19%
Direct mail	3	0.68%
Other	11	2.48%

Question 12. Total responses (N): 443 Did not respond: 0

Have the current rockfish regulations in Puget Sound/San Juan Islands caused you to fish less frequently? ☐ Yes ☐ No

If yes, which species do you fish for less frequently? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish

☐ Crab ☐ Shrimp ☐ Other _____

Answer	Frequency	Percentage
No, regulations have not caused me to fish less frequently	373	84.20%
Yes, regulations have caused me to fish less frequently	69	15.58%
Yes, fish less for salmon	2	0.45%
Yes, fish less for halibut	9	2.03%
Yes, fish less for lingcod	40	9.03%
Yes, fish less for rockfish	51	11.51%
Yes, fish less for other bottomfish	11	2.48%
Yes, fish less for crab	3	0.68%
Yes, fish less for shrimp	5	1.13%
Yes, fish less for other	1	0.23%

Question 13. Total responses (N): 443 Did not respond: 0

What measures do you think would best conserve and recover rockfish in Puget Sound/ San Juan Islands? Check all that apply.

☐ Marine Reserves ☐ Artificial reefs ☐ Hatchery supplementation

☐ Derelict gear removal ☐ Habitat Restoration ☐ Nothing

☐ Other_____

Answer	Frequency	Percentage
Marine reserves	188	42.44%
Artificial reefs	169	38.15%
Hatchery supplementation	48	10.84%
Derelict gear removal	162	36.57%
Habitat restoration	215	48.53%
Nothing	4	0.90%
Other	277	62.53%

Other: Long-term rockfish closure (5-10 years)*	102	23.02%
Other: Close Puget Sound/San Juan Islands to all commercial and tribal gillnetting*	88	19.86%
Other: Close Puget Sound/San Juan Islands to all commercial fishing*	21	4.74%
Other: Clean up/prevent pollution*	15	3.39%
Other: Education*	25	5.64%
Other: Enforcement*	16	3.61%
Other: Do not know*	74	16.70%

*Indicates the most common "other".

Question 14. Total responses (N): 443 Did not respond: 0

If it is necessary to protect rockfish from commercial/recreational fisheries, which protection do you prefer? Circle your rank from 1-5, with 1 meaning the protection is not preferred at all and 5 the most the preferred.

Designated rockfish reserves where no fishing is allow	Frequency	Percentage
1	60	13.54%
2	38	8.58%
3	70	15.80%
4	60	13.54%
5	210	47.40%
Do not know	2	0.45%

Fishing regulations that prohibit retention of rockfish	Frequency	Percentage
1	14	3.16%
2	14	3.16%
3	19	4.29%
4	38	8.58%
5	356	80.36%
Do not know	2	0.45%

Fishing regulations that prohibit bottomfishing in certain areas	Frequency	Percentage
1	45	10.16%
2	23	5.19%
3	61	13.77%
4	55	12.42%
5	257	58.01%
Do not know	2	0.45%

Fishing regulations that prohibit bottomfishing below a certain depth	Frequency	Percentage
1	196	44.24%
2	77	17.38%
3	54	12.19%
4	20	4.50%
5	94	21.17%
Don't know	2	0.45%

Fishing regulations that prohibit all fishing below a certain depth	Frequency	Percentage
1	325	73.36%
2	59	13.32%
3	25	5.64%
4	10	2.26%
5	21	4.74%
Don't know	2	0.45%

Fisheries conservation without preserves (practice prescribed catch avoidance/catch release methods)	Frequency	Percentage
1	13	2.93%
2	3	0.68%
3	28	6.32%
4	18	4.06%
5	378	85.33%
Don't know	2	0.45%

Question 15. Total responses (N): 443 Did not respond: 0

How long have you been living in Washington? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. in WA	44.15	276.20	16.62	0.79	46	77	1	78

Question 16. Total responses (N): 443 Did not respond: 0

Why do you fish? Check all that apply.
☐ Sport (fun, relaxation, etc.) ☐ Food ☐ Other _____

Answer	Frequency	Percentage
Sport (fun, relaxation, etc.)	440	99.32%
Food	422	95.26%
Other	3	0.68%

Question 17. Total responses (N): 443 Did not respond: 0
What is your age? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Age	51.86	141.81	11.90	0.57	53	55	23	78

Question 18. Total responses (N): 443 Did not respond: 0

Please indicate if you are a member of a recreational angler's group or association.
Check all that apply.
☐ Puget Sound Anglers ☐ Coastal Conservation Association (CCA) ☐ None
☐ Other _____

	Frequency	Percentage
PSA member	30	6.77%
CCA member	14	3.16%
Member of other association	29	6.55%
Total association membership*	60	13.54%
Not part of an association	383	86.46%

*Total is not a sum of the associations because some anglers are part of multiple associations. This number also includes members of diving associations.

Question 19. Total responses (N): 443 Did not respond: 0

Are/were you a charter fishing guide?
☐ Yes ☐ No

	Frequency	Percentage
Not a Guide	442	99.77%
Guide (in past)	1	0.23%

Question 20. Total responses (N): 443 Did not respond: 0

Which method(s) do you use when releasing accidentally caught rockfish?
Check all that apply.
☐ Dehook and release without removing the fish from the water
☐ Puncture swim bladder (fizzing) ☐ I have never caught a rockfish
☐ Sink fish quickly using a device designed to release it at depth
☐ Remove the fish from the water to dehook, then release ☐ Other _____

	Frequency	Percentage
Dehook and release without removing the fish from the water	321	72.46%
Puncture swim bladder (fizzing)	22	4.97%
I have never caught a rockfish	63	14.22%
Sink fish quickly using a device designed to release it at depth	13	2.93%
Remove the fish from the water to dehook, then release	38	8.58%
Other	86	19.41%
Other: Use dehooker from WDFW or pliers*	55	12.42%

*Indicates the most common "other" answer.

Question 21. Total responses (N): 443 Did not respond: 0

When you release rockfish do you regularly see the fish float or swim down/away?
☐ Float ☐ Swim down or away ☐ Other _____

	Frequency	Percentage
See it float	217	48.98%
See it swim	266	60.05%
Other	191	43.12%
Other: 50/50*	62	14.00%
Other: Depends on depth*	54	12.19%
Other: I have never caught a rockfish*	63	14.22%

*Indicates the most common "other" answers.

Question 22. Total responses (N): 443 Did not respond: 0

Which measure would you most be willing to take to increase rockfish survival after it is caught? Circle your rank from 1-5, with 1 meaning the measure is not preferred at all and 5 the most preferred.

Use equipment designed to rapidly submerge rockfish and release them at depth	Frequency	Percentage
1	111	25.06%
2	93	20.99%
3	61	13.77%
4	78	17.61%
5	94	21.22%
Don't know	2	0.45%

Use hook types and sizes with bait combinations that result in decreased rockfish catch	Frequency	Percentage
1	130	29.35%
2	88	19.86%
3	84	18.96%
4	76	17.16%
5	58	13.09%
Don't know	2	0.45%

Learn more about catch avoidance and catch release methods through pamphlets, talks, etc.	Frequency	Percentage
1	21	4.74%
2	13	2.93%
3	60	13.54%

4	55	12.42%
5	289	65.24%
Don't know	2	0.45%

Question 23. Total responses (N): 443 Did not respond: 0

Which of the following statements about Rockfish are true? Check all that apply.
☐ Rockfish live to be very old ☐ Rockfish have life spans similar to salmon
☐ Rockfish taste good ☐ Rockfish juveniles live in the same habitat as adults
☐ Older female rockfish generally have healthier offspring than younger female rockfish
☐ Do not know

	Frequency	Percentage
Rockfish live to be very old	257	58.01%
Rockfish have life spans similar to salmon	9	2.03%
Rockfish taste good	274	61.85%
Rockfish juveniles live in the same habitat as adults	77	17.38%
Older female rockfish generally have healthier offspring that younger female rockfish	58	13.09%
Do not know	139	31.38%

Question 24. Total responses (N): 443 Did not respond: 0

What are the current rockfish fishing regulation(s) in Puget Sound/San Juan Islands?
Check all that apply.
☐ Keep 1 rockfish per day ☐ No fishing deeper than 120 ft. while salmon or halibut fishing
☐ No fishing deeper than 120 ft. while bottomfishing ☐ No retention of rockfish
☐ Do not know

	Frequency	Percentage
Keep 1 rockfish per day	22	4.97%
No fishing deeper than 120 ft. while salmon or halibut fishing	2	0.45%

No fishing deeper than 120 ft. while bottomfishing	90	20.32%
No retention of rockfish	282	63.66%
Do not know	137	30.93%

Question 25. Total responses (N): 443 Did not respond: 0

Do you know which species of rockfish are listed on the Endangered Species List Puget Sound/San Juan Islands? ☐ Yes ☐ No
If yes, will you please list them? _____

	Frequency	Percentage
Yes, respondent stated knew ESA-listed rockfish	140	31.60%
Yes, could name yelloweye rockfish	143	32.28%
Yes, could name canary rockfish	78	17.61%
Yes, could name bocaccio	7	1.58%
Yes, respondent knew all ESA-listed rockfish	7	1.58%
False yes (stated knew but could not name or incorrectly named species)	133	30.02%
No, respondent stated did not know ESA-listed species	293	66.14%

Question 26. Total responses (N): 443 Did not respond: 0

Which areas do you most regularly fish in in Puget Sound/San Juan Islands? Refer to the attached Marine Catch Area map on the next page for reference. Check all areas that apply.
☐ Central Puget Sound (Areas 9, 10, 11) ☐ Whidbey Basin (Area 8-1, 8-2)
☐ North Puget Sound/San Juan Islands (Area 7) ☐ Strait of Juan de Fuca (Areas 5, 6)
☐ Hood Canal (Area 12) ☐ South Puget Sound (Area 13)

	Frequency	Percentage
Central Puget Sound (Areas 9, 10, 11)	296	66.82%
Whidbey Basin (Area 8-1, 8-2)	182	41.08%
North Puget Sound/San Juan Islands (Area 7)	144	32.51%

Strait of Juan de Fuca (Areas 5, 6)	125	28.22%
Hood Canal (Area 12)	32	7.22%
South Puget Sound (Area 13)	51	11.51%

Question 27. Total responses (N): 35 Did not respond: 408

Make an X on the attached Catch Area Map on the next page that corresponds to the area(s) you most frequently fish. If you frequent more than one location, please limit your Xs to 3 locations only.

Answers vary by respondent. Top two answers listed.

Possession Point/Possession Sound
Around Camano Island

Question 28. Total responses (N): 443 Did not respond: 0

Did you fish for rockfish in the past Puget Sound/San Juan Islands?
☐ Yes ☐ No
If yes, how many years ago did you fish for rockfish? _____ year(s)

	Frequency	Percentage
Did not fish for rockfish	255	57.56%
Fished for rockfish	188	42.44%

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. ago fished for rockfish	4.09	56.50	7.52	0.36	0	40	0	40

Question 29. Total responses (N): 95 Did not respond: 348

If you have memory of where rockfish were abundant in the past, please circle that area on the attached Catch Area Map on the next page. Please list the approximate year(s) you saw them and the species, if known.

Answers vary by respondent. Top two answers listed.

Location	Approximate years	Species
All around San Juan Islands	1970s-1990s	Mostly yelloweye, but some stated all rockfish
Tacoma Narrows	1970s	--

Question 30. Total responses (N): 26 Did not respond: 417

Do you have any other knowledge about rockfish, preferences for their management, or preferences for communicating with regulatory agencies you would like to share? If so, please write below.

Answers vary by respondent. Top two answers listed.

Simplify regulations.
Would prefer full rockfish or bottomfish closures to complicated regulations requiring specific gear or difficult to understand area or depth closures.

Question 31. Total responses (N): 443 Did not respond: 0

(Shown a yelloweye rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Yelloweye rockfish	Frequency	Percentage
Know correct species name	138	31.15%
Provided incorrect species name	5	1.13%
Common incorrect species name (copper)	4	0.09%
Stated the fish was a "rockfish"	12	2.71%
Stated the fish was a "snapper" (including red/pink snapper)	71	16.03%

Stated the fish was a "rockcod"	9	2.03%
Stated do not know name	204	46.05%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 32. Total responses (N): 443 Did not respond: 0

(Shown a black rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Black rockfish	Frequency	Percentage
Know correct species name	123	27.77%
Stated the fish was a "seabass"	189	42.66%
Provided incorrect species name	1	0.23%
Common incorrect species name (blue)	1	0.23%
Stated the fish was a "rockfish"	6	1.35%
Stated the fish was a "snapper" (including red/pink snapper)	1	0.23%
Stated the fish was a "rockcod"	7	1.58%
Stated do not know name	163	36.79%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 33. Total responses (N): 443 Did not respond: 0

(Shown a lingcod picture (to test knowledge not only between rockfish but other bottomfish often found in same habitat).) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Lingcod	Frequency	Percentage
Know correct species name	377	85.10%
Provided incorrect species name	3	0.68%
Common incorrect species name (cabazon)	3	0.68%
Stated do not know name	61	13.77%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 34. Total responses (N): 443 Did not respond: 0

(Shown a china rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

China rockfish	Frequency	Percentage
Know correct species name	57	12.87%
Provided incorrect species name	24	5.42%
Common incorrect species name (cabazon)	19	4.29%
Stated the fish was a "rockfish"	7	1.58%
Stated the fish was a "rockcod"	11	2.48%
Stated do not know name	345	78.88%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 35. Total responses (N): 443 Did not respond: 0

(Shown a canary rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Canary rockfish	Frequency	Percentage
Know correct species name	49	11.06%
Provided incorrect species name	41	9.26%
Common incorrect species name (yelloweye)	40	9.03%
Stated the fish was a "rockfish"	12	2.71%
Stated the fish was a "snapper" (including red/pink snapper)	48	10.84%
Stated the fish was a "rockcod"	5	1.13%
Stated do not know name	289	65.24%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 36. Total responses (N): 443 Did not respond: 0

(Shown a copper rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Copper rockfish	Frequency	Percentage
Know correct species name	29	6.55%
Provided incorrect species name	51	11.51%
Common incorrect species name (yelloweye)	39	8.80%
Common incorrect species name (canary)	10	2.26
Stated the fish was a "rockfish"	14	3.16%
Stated the fish was a "snapper" (including red/pink snapper)	77	17.38%
Stated the fish was a "rockcod"	4	0.90%
Stated do not know name	264	59.59%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 37. Total responses (N): 443 Did not respond: 0

(Shown a brown rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Brown rockfish	Frequency	Percentage
Know correct species name	22	4.97%
Provided incorrect species name	1	0.23%
Common incorrect species name (copper)	1	0.23%
Stated the fish was a "rockfish"	12	2.71%
Stated the fish was a "rockcod"	9	2.03%
Stated do not know name	397	89.62%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 38. Total responses (N): 443 Did not respond: 0

(Shown a quillback rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Quillback rockfish	Frequency	Percentage
Know correct species name	76	17.16%
Provided incorrect species name	5	1.13%
Stated the fish was a "rockfish"	10	2.26%
Stated the fish was a "rockcod"	11	2.48%
Stated do not know yelloweye name	343	77.43%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 39. Total responses (N): 443 Did not respond: 0

(Shown a bocaccio picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Bocaccio rockfish	Frequency	Percentage
Know correct species name	23	5.19%
Provided incorrect species name	72	16.25%
Common incorrect species name (kelp greenling or greenling)	55	12.42%
Stated the fish was a "rockfish"	3	0.68%
Stated the fish was a "rockcod" (including true cod, tom cod, or cod)	47	10.61%
Stated do not know name	306	69.07%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 40. Total responses (N): 443 Did not respond: 0

(Shown a yellowtail rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Yellowtail rockfish	Frequency	Percentage
Know correct species name	25	5.64%
Provided incorrect species name	20	4.51%
Common incorrect species name (perch)	15	3.39%
Stated the fish was a "rockfish"	6	1.35%
Stated the fish was a "snapper" (including red/pink snapper)	2	0.45%
Stated the fish was a "rockcod"	3	0.68%
Stated do not know name	388	87.58%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 41. Total responses (N): 443 Did not respond: 0

(Shown a vermillion rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Vermillion rockfish	Frequency	Percentage
Know correct species name	12	2.71%
Provided incorrect species name	9	2.03%
Common incorrect species name (red rockfish)	5	1.13%
Stated the fish was a "rockfish"	15	3.39%
Stated the fish was a "snapper" (including red/pink snapper)	26	5.87%
Stated the fish was a "rockcod"	4	0.90%
Stated do not know name	376	85.78%

*Totals may not add up to 100 because respondents could provide more than one answer.

Demographics (Observed or asked). Total responses (N): 443 Did not respond: 0

Gender	Frequency	Percentage
Male	423	95.49%
Female	20	4.46%

Ethnicity/Race	Frequency	Percentage
White/Caucasian	411	92.78%
Asian	25	5.64%
Black/African American	4	0.90%
Hispanic	1	0.23%
Other	2	0.45%

Survey Location	Frequency	Percentage
Everett launch	107	24.15%
Shilshole launch	79	17.83%
Alki launch	62	14.00%
Point Defiance launch	30	6.77%
Point Defiance boat house	8	1.81%
Redondo launch	26	5.87%
Cornet Bay launch	18	4.06%
Anacortes launch	17	3.84%
Ediz Hook launch	17	3.84%
Bellingham launch	16	3.61%
Port Townsend marina and launch	16	3.61%
Mukilteo launch	13	2.93%
Potlatch launch (Hoodsport)	10	2.26%
Friday Harbor marina (San Juan Island)	9	2.03%

Roche Harbor marina and launch (San Juan Island)	7	1.58%
Zittels marina and launch (Olympia)	7	1.58%

Non-response Information	Frequency
Shilshole launch: White males 40-50 “in a hurry” and “need to feed kids”	2
Everett launch: White males 40-50 both “in a hurry”	5
Point Defiance launch: White males 40-50 “in a hurry” and “need to get kids to bathroom”	2
Bellingham launch: White male 50s “in a hurry”	1
Port Townsend launch: White male 40s “need to feed kids”	1
Mukilteo launch: White male 50s did not want to answer in the rain	1
Redondo launch: White male 50s “in a hurry”	1
Total	13

Appendix E: Responses with Descriptive Statistics for Surveys Administered to Pier and Shoreline Anglers

(at locations adjacent to heavily used boat launches and marinas)

Question 1. Total responses (N): 30 Did not respond: 0

How long have you been fishing in Puget Sound/San Juan Islands? _____ year(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. Fishing	24.90	216.71	14.72	2.69	23.5	57	1	58

Question 2. Total responses (N): 30 Did not respond: 0

How frequently do you fish in Puget Sound/San Juan Islands in a typical year?
_____ time(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Trips/Yr.	40.60	961.77	31.01	5.66	35	98	2	100

Question 3. Total responses (N): 30 Did not respond: 0

Has the frequency of your fishing trips in Puget Sound/San Juan Islands changed over the years? ☐ Yes ☐ No
If yes, why _____

Answer	Frequency	Percentage
No change	13	43.33%
Yes, more trips	3	10.00%
Yes, fewer trips	14	46.67%
Why, less, due to less fish	7	23.33%
Why, less or more, due to the quality of the fishing year	7	23.33%
Why, less, due to too many people fishing or overcrowding	3	10.00%

Question 4. Total responses (N): 30 Did not respond: 0

Which species do you regularly target when you fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
☐ Crab ☐ Shrimp ☐ No preference ☐ Other _____

Answer	Frequency	Percentage
Target salmon	19	63.33%
Target halibut	1	3.33%
Target lingcod	2	6.67%
Target rockfish	1	3.33%
Target other bottomfish	12	40.00%
Target crab	11	36.67%
Target shrimp	0	0.00%
No preference	9	30.00%
Target other	7	23.33%

Question 5. Total responses (N): 30 Did not respond: 0

Which type of salmon do you regularly fish for in Puget Sound/San Juan Islands? Check all that apply.

☐ Chinook (King) ☐ Coho (Silver) ☐ Pink (Humpy) ☐ Chum ☐ Any Salmonid

Answer	Frequency	Percentage
Target Chinook (king) salmon	22	73.33%
Target coho (silver) salmon	22	73.33%
Target pink (humpy) salmon	22	73.33%
Target chum salmon	17	56.67%
Target any salmonid	17	56.67%

Question 6. Total responses (N): 30 Did not respond: 0

With which gear type(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Standard mooching gear (herring) ☐ Jigging ☐ Fly-fishing rod
☐ Trolling (downriggers) ☐ Spear ☐ Other _____

Answer	Frequency	Percentage
Standard mooching gear (herring)	2	6.67%
Jigging	30	100.00%
Fly-fishing rod	1	3.33%
Trolling (downriggers)	5	16.67%
Spear	0	0.00%
Other	0	0.00%

Question 7. Total responses (N): 30 Did not respond: 0

From which area(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.

☐ From shore ☐ From piers ☐ From boats (in water up to 120 ft.)
☐ While diving ☐ From boats (in water 120 ft. or more) ☐ Other _____

Answer	Frequency	Percentage
From shore	10	33.33%
From piers	24	80.00%
From boats (in water up to 120 ft.)	12	40.00%
While diving	0	0.00%
From boats (in water 120 ft. or more)	11	36.67%
Other	0	0.00%

Question 8. Total responses (N): 30 Did not respond: 0

How would you generally characterize rockfish populations in the areas you regularly fish in Puget Sound/San Juan Islands? Check only one.
☐ Abundant ☐ Average ☐ Low ☐ Other _____

Answer	Frequency	Percentage
Abundant	0	0.00%
Average	1	3.33%
Low	18	60.00%
Other	11	36.67%
Other: very low/decimated*	4	13.33%
Other: see juveniles but adults scarce*	2	6.67%
Other: do not know*	7	23.33%

*Indicates the most common "other" answers.

Question 9. Total responses (N): 30 Did not respond: 0

What do you feel are currently the greatest threat(s) to rockfish in Puget Sound/ San Juan Islands? Check all that apply.
☐ Habitat loss ☐ Pollution ☐ Commercial fisheries ☐ Derelict fishing gear
☐ Predation from marine mammals ☐ Predation from lingcod
☐ Recreational fisheries ☐ Other _____

Answer	Frequency	Percentage
Habitat loss	10	33.33%
Pollution	22	73.33%
Commercial fisheries	9	30.00%
Derelict fishing gear	2	6.67%
Predation from marine mammals	0	0.00%
Predation from lingcod	0	0.00%
Recreational fisheries	6	20.00%
Other	10	33.33%
Other: overfishing*	4	13.33%
Other: bycatch*	1	3.33%
Other: do not know*	5	16.67%

*Indicates the most common "other" answers.

Question 10. Total responses (N): 30 Did not respond: 0

In which way(s) do you currently obtain information about fishing regulations? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Other _____

Answer	Frequency	Percentage
Newspaper	6	20.00%
Agency websites	8	26.67%
Blogs	0	0.00%
Word of mouth	4	13.33%
Signs	9	30.00%
Radio	1	3.33%
Sport fishing regulation booklet	27	90.00%
An angler's association	2	6.67%
WDFW email lists	3	10.00%
Other	1	3.33%

Question 11. Total responses (N): 30 Did not respond: 0

How would you prefer to learn about updates for rockfish conservation and other fisheries conservation efforts? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Direct Mail ☐ Other_____

Answer	Frequency	Percentage
Newspaper	5	16.67%
Agency websites	9	30.00%
Blogs	0	0.00%
Word of mouth	5	16.67%
Signs	18	60.00%
Radio	1	3.33%
Sport fishing regulation booklet	27	90.00%
An angler's association	0	0.00%

WDFW email lists	3	10.00%
Direct mail	0	0.00%
Other	0	0.00%

Question 12. Total responses (N): 30 Did not respond: 0

Have the current rockfish regulations in Puget Sound/San Juan Islands caused you to fish less frequently? ☐ Yes ☐ No

If yes, which species do you fish for less frequently? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish

☐ Crab ☐ Shrimp ☐ Other _____

Answer	Frequency	Percentage
No, regulations have not caused me to fish less frequently	25	83.33%
Yes, regulations have caused me to fish less frequently	5	16.67%
Yes, fish less for salmon	0	0.00%
Yes, fish less for halibut	0	0.00%
Yes, fish less for lingcod	0	0.00%
Yes, fish less for rockfish	5	16.67%
Yes, fish less for other bottomfish	0	0.00%
Yes, fish less for crab	0	0.00%
Yes, fish less for shrimp	0	0.00%
Yes, fish less for other	0	0.00%

Question 13. Total responses (N): 30 Did not respond: 0

What measures do you think would best conserve and recover rockfish in Puget Sound/ San Juan Islands? Check all that apply.

☐ Marine Reserves ☐ Artificial reefs ☐ Hatchery supplementation

☐ Derelict gear removal ☐ Habitat Restoration ☐ Nothing

☐ Other_____

Answer	Frequency	Percentage
Marine reserves	16	53.33%
Artificial reefs	14	46.67%
Hatchery supplementation	6	20.00%

Derelict gear removal	15	50.00%
Habitat restoration	20	66.67%
Nothing	0	0.00%
Other	18	60.00%
Other: Long-term rockfish closure (5-10 years)*	6	20.00%
Other: Close Puget Sound/San Juan Islands to all commercial and tribal gillnetting*	1	3.33%
Other: Clean up/prevent pollution*	7	23.33%
Other: Education*	1	3.33%
Other: Enforcement*	2	6.67%
Other: Do not know*	2	6.67%

*Indicates the most common "other" answers.

Question 14. Total responses (N): 30 Did not respond: 0

If it is necessary to protect rockfish from commercial/recreational fisheries, which protection do you prefer? Circle your rank from 1-5, with 1 meaning the protection is not preferred at all and 5 the most the preferred.

Designated rockfish reserves where no fishing is allow	Frequency	Percentage
1	1	3.33%
2	0	0.00%
3	2	6.67%
4	2	6.67%
5	25	83.33%

Fishing regulations that prohibit retention of rockfish	Frequency	Percentage
1	0	0.00%
2	5	16.67%
3	2	6.67%
4	2	6.67%
5	21	70.00%

Fishing regulations that prohibit bottomfishing in certain areas	Frequency	Percentage
1	0	0.00%
2	2	6.67%
3	1	3.33%
4	4	13.33%
5	23	76.67%

Fishing regulations that prohibit bottomfishing below a certain depth	Frequency	Percentage
1	8	26.67%
2	2	6.67%
3	2	6.67%
4	1	3.33%
5	17	56.67%

Fishing regulations that prohibit all fishing below a certain depth	Frequency	Percentage
1	11	36.67%
2	5	16.67%
3	4	13.33%
4	1	3.33%
5	9	30.00%

Fisheries conservation without preserves (practice prescribed catch avoidance/catch release methods)	Frequency	Percentage
1	1	3.33%
2	0	0.00%
3	0	0.00%
4	0	0.00%
5	29	96.67%

Question 15. Total responses (N): 30 Did not respond: 0

How long have you been living in Washington? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. in WA	31.80	230.51	15.18	2.77	30	57	3	60

Question 16. Total responses (N): 30 Did not respond: 0

Why do you fish? Check all that apply.
☐ Sport (fun, relaxation, etc.) ☐ Food ☐ Other _____

Answer	Frequency	Percentage
Sport (fun, relaxation, etc.)	30	100.00%
Food	30	100.00%
Other	0	0.00%

Question 17. Total responses (N): 30 Did not respond: 0

What is your age? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Age	46.50	193.02	13.89	2.54	46.50	51	23	74

Question 18. Total responses (N): 30 Did not respond: 0

Please indicate if you are a member of a recreational angler's group or association.
Check all that apply.
☐ Puget Sound Anglers ☐ Coastal Conservation Association (CCA) ☐ None
☐ Other _____

	Frequency	Percentage
PSA member	0	0.00%
CCA member	0	0.00%
Member of other association	2	6.67%
Total association membership	2	6.67%
Not part of an association	28	93.33%

Question 19. Total responses (N): 30 Did not respond: 0

Are/were you a charter fishing guide?
☐ Yes ☐ No

	Frequency	Percentage
Not a Guide	30	100.00%
Have Guided	0	0.00%

Question 20. Total responses (N): 30 Did not respond: 0

Which method(s) do you use when releasing accidentally caught rockfish?
Check all that apply.
☐ Dehook and release without removing the fish from the water
☐ Puncture swim bladder (fizzing) ☐ I have never caught a rockfish
☐ Sink fish quickly using a device designed to release it at depth
☐ Remove the fish from the water to dehook, then release ☐ Other _____

	Frequency	Percentage
Dehook and release without removing the fish from the water	8	26.67%
Puncture swim bladder (fizzing)	1	3.33%

I have never caught a rockfish	3	10.00%
Sink fish quickly using a device designed to release it at depth	0	0.00%
Remove the fish from the water to dehook, then release	18	60.00%
Other	2	6.67%

Question 21. Total responses (N): 30 Did not respond: 0

When you release rockfish do you regularly see the fish float or swim down/away?
☐ Float ☐ Swim down or away ☐ Other _____

	Frequency	Percentage
See it float	2	6.67%
See it swim	24	80.00%
Other	2	6.67%
Other: Depends on depth*	2	6.67%

*Indicates the most common "other" answer.

Question 22. Total responses (N): 30 Did not respond: 0

Which measure would you most be willing to take to increase rockfish survival after it is caught? Circle your rank from 1-5, with 1 meaning the measure is not preferred at all and 5 the most preferred.

Use equipment designed to rapidly submerge rockfish and release them at depth	Frequency	Percentage
1	8	26.67%
2	5	16.67
3	9	30.00%
4	3	10.00%
5	3	10.00%

Use hook types and sizes with bait combinations that result in decreased rockfish catch	Frequency	Percentage
1	3	10.00%
2	5	16.67%
3	11	36.67%
4	7	23.33%
5	2	6.67%

Learn more about catch avoidance and catch release methods through pamphlets, talks, etc.	Frequency	Percentage
1	1	3.33%
2	0	0.00%
3	6	20.00%
4	2	6.67%
5	19	63.33%

Question 23. Total responses (N): 30 Did not respond: 0

Which of the following statements about Rockfish are true? Check all that apply.
☐ Rockfish live to be very old ☐ Rockfish have life spans similar to salmon
☐ Rockfish taste good ☐ Rockfish juveniles live in the same habitat as adults
☐ Older female rockfish generally have healthier offspring than younger female rockfish
☐ Do not know

	Frequency	Percentage
Rockfish live to be very old	13	43.33%
Rockfish have life spans similar to salmon	3	10.00%
Rockfish taste good	18	60.00%
Rockfish juveniles live in the same habitat as adults	10	33.33%
Older female rockfish generally have healthier offspring than	3	10.00%

younger female rockfish		
Do not know	8	26.67%

Question 24. Total responses (N): 30 Did not respond: 0

What are the current rockfish fishing regulation(s) in Puget Sound/San Juan Islands? Check all that apply.

☐ Keep 1 rockfish per day ☐ No fishing deeper than 120 ft. while salmon or halibut fishing
☐ No fishing deeper than 120 ft. while bottomfishing ☐ No retention of rockfish
☐ Do not know

	Frequency	Percentage
Keep 1 rockfish per day	2	6.67%
No fishing deeper than 120 ft. while salmon or halibut fishing	0	0.00%
No fishing deeper than 120 ft. while bottomfishing	2	6.67%
No retention of rockfish	21	70.00%
Do not know	7	23.33%

Question 25. Total responses (N): 30 Did not respond: 0

Do you know which species of rockfish are listed on the Endangered Species List Puget Sound/San Juan Islands? ☐ Yes ☐ No
If yes, will you please list them? _____

	Frequency	Percentage
Yes, respondent stated knew ESA-listed rockfish	7	23.33%
Yes, could name yelloweye rockfish	5	16.67%
Yes, could name canary rockfish	3	10.00%
Yes, could name bocaccio	0	0.00%
Yes, respondent knew all ESA-listed rockfish	0	0.00%
False yes (stated knew but could not name or incorrectly named species)	7	23.33%
No, respondent stated did not know ESA-listed species	23	76.67%

Question 26. Total responses (N): 30 Did not respond: 0

Which areas do you most regularly fish in in Puget Sound/San Juan Islands? Refer to the attached Marine Catch Area map on the next page for reference. Check all areas that apply.
☐ Central Puget Sound (Areas 9, 10, 11) ☐ Whidbey Basin (Area 8-1, 8-2)
☐ North Puget Sound/San Juan Islands (Area 7) ☐ Strait of Juan de Fuca (Areas 5, 6)
☐ Hood Canal (Area 12) ☐ South Puget Sound (Area 13)

	Frequency	Percentage
Central Puget Sound (Areas 9, 10, 11)	24	80.00%
Whidbey Basin (Area 8-1, 8-2)	0	0.00%
North Puget Sound/San Juan Islands (Area 7)	2	6.67%
Strait of Juan de Fuca (Areas 5, 6)	4	13.33%
Hood Canal (Area 12)	6	20.00%
South Puget Sound (Area 13)	2	6.67%

Question 27. Total responses (N): 0 Did not respond: 30

Make an X on the attached Catch Area Map on the next page that corresponds to the area(s) you most frequently fish. If you frequent more than one location, please limit your Xs to 3 locations only.

Respondents did not provide specific locations but responded they mainly fished off piers.

Off Piers.

Question 28. Total responses (N): 30 Did not respond: 0

Did you fish for rockfish in the past Puget Sound/San Juan Islands?
☐ Yes ☐ No
If yes, how many years ago did you fish for rockfish? _____ year(s)

	Frequency	Percentage
Did not fish for rockfish	17	56.67%
Fished for rockfish	13	43.33%

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. ago fished for rockfish	5.23	52.05	7.21	1.32	2	25	0	25

Question 29. Total responses (N): 1 Did not respond: 29

If you have memory of where rockfish were abundant in the past, please circle that area on the attached Catch Area Map on the next page. Please list the approximate year(s) you saw them and the species, if known.

Location	Approximate years	Species
Edmunds	Recent	--
Seacrest Park	--	Unknown, possibly coppers
Redondo	--	--

Question 30. Total responses (N): 1 Did not respond: 29

Do you have any other knowledge about rockfish, preferences for their management, or preferences for communicating with regulatory agencies you would like to share? If so, please write below.

One response to report:

Put up rockfish information on reader boards at piers and boat launches.

Question 31. Total responses (N): 30 Did not respond: 0

(Shown a yelloweye rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Yelloweye rockfish	Frequency	Percentage
Know correct species name	3	10.00%
Provided incorrect species name	1	3.33%
Common incorrect species name (copper)	1	3.33%

Stated the fish was a "rockfish"	1	3.33%
Stated the fish was a "snapper" (including red/pink snapper)	4	13.33%
Stated the fish was a "rockcod"	1	3.33%
Stated do not know name	20	66.67%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 32. Total responses (N): 30 Did not respond: 0

(Shown a black rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Black rockfish	Frequency	Percentage
Know correct species name	3	10.00%
Stated the fish was a "seabass"	10	33.33%
Provided incorrect species name	0	0.00%
Stated the fish was a "rockfish"	1	0.23%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	17	56.67%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 33. Total responses (N): 443 Did not respond: 0

(Shown a lingcod picture (to test knowledge not only between rockfish but other bottomfish often found in same habitat).) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Lingcod	Frequency	Percentage
Know correct species name	21	56.67%
Provided incorrect species name	0	0.00%
Stated the fish was a "rockfish"	1	0.23%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%

Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	8	26.7%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 34. Total responses (N): 30 Did not respond: 0

(Shown a china rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

China rockfish	Frequency	Percentage
Know correct species name	1	3.33%
Provided incorrect species name	0	0.00%
Stated the fish was a "rockfish"	2	6.67%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	27	90.00%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 35. Total responses (N): 30 Did not respond: 0

(Shown a canary rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Canary rockfish	Frequency	Percentage
Know correct species name	2	6.67%
Provided incorrect species name	2	6.67%
Common incorrect species name (yelloweye)	2	6.67%
Stated the fish was a "rockfish"	2	6.67%
Stated the fish was a "snapper" (including red/pink snapper)	2	6.67%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	22	73.33%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 36. Total responses (N): 443 Did not respond: 0

(Shown a copper rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Copper rockfish	Frequency	Percentage
Know correct species name	1	3.33%
Provided incorrect species name	3	10.00%
Common incorrect species name (canary)	2	6.67%
Stated the fish was a "rockfish"	2	6.67%
Stated the fish was a "snapper" (including red/pink snapper)	6	20.00%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	18	60.00%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 37. Total responses (N): 30 Did not respond: 0

(Shown a brown rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Brown rockfish	Frequency	Percentage
Know correct species name	1	3.33%
Provided incorrect species name	0	0.00%
Stated the fish was a "rockfish"	2	6.67%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	27	90.00%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 38. Total responses (N): 30 Did not respond: 0

(Shown a quillback rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Quillback rockfish	Frequency	Percentage
Know correct species name	1	3.33%
Provided incorrect species name	2	6.67%
Common incorrect species name (tiger rockfish)	2	6.67%
Stated the fish was a "rockfish"	2	6.67%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know yelloweye name	25	83.33%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 39. Total responses (N): 30 Did not respond: 0

(Shown a bocaccio picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Bocaccio rockfish	Frequency	Percentage
Know correct species name	0	0.00%
Provided incorrect species name	6	20.00%
Common incorrect species name (kelp greenling or greenling)	6	20.00%
Stated the fish was a "rockfish"	1	0.23%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod" (including true cod, tom cod, or cod)	2	6.67%
Stated do not know name	21	70.00%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 40. Total responses (N): 30 Did not respond: 0

(Shown a yellowtail rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Yellowtail rockfish	Frequency	Percentage
Know correct species name	1	3.33%
Provided incorrect species name	3	10.00%
Common incorrect species name (perch)	3	10.00%
Stated the fish was a "rockfish"	1	3.33%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	25	83.33%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 41. Total responses (N): 30 Did not respond: 0

(Shown a vermillion rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Vermillion rockfish	Frequency	Percentage
Know correct species name	0	0.00%
Provided incorrect species name	1	3.33%
Common incorrect species name (red rockfish)	1	3.33%
Stated the fish was a "rockfish"	1	3.33%
Stated the fish was a "snapper" (including red/pink snapper)	2	6.67%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	26	86.67%

*Totals may not add up to 100 because respondents could provide more than one answer.

Demographics (Observed or asked). Total responses (N): 30 Did not respond: 0

Gender	Frequency	Percentage
Male	30	100.00%
Female	0	0.00%

Ethnicity/Race	Frequency	Percentage
White/Caucasian	18	60.00%
Asian	9	30.00%
Black/African American	3	10.00%
Hispanic	0	0.00%
Other	0	0.00%

Location	Frequency	Percentage
Shilshole Pier	8	26.67%
Redondo Pier	10	33.33%
Point Defiance Pier	6	20.00%
Hoodsport Shore	6	20.00%

Non-response Information	Frequency
Redondo pier: Asian males in 40s-60s “do not speak English”	5
Point Defiance pier: Asian male in 50s “do not speak English”	1
Total	6

Appendix F: Responses with Descriptive Statistics for Surveys Given to Angler's Association Members

(local Puget Sound Anglers and Coastal Conservation Association chapters)

Question 1. Total responses (N): 55 Did not respond: 0

How long have you been fishing in Puget Sound/San Juan Islands? _____ year(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. Fishing	27.53	282.29	16.81	2.27	30	60	2	62

Question 2. Total responses (N): 55 Did not respond: 0

How frequently do you fish in Puget Sound/San Juan Islands in a typical year?
_____ time(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Trips/Yr.	23.67	389.11	19.73	2.66	20	99	1	100

Question 3. Total responses (N): 55 Did not respond: 0

Has the frequency of your fishing trips in Puget Sound/San Juan Islands changed over the years? ☐ Yes ☐ No
If yes, why? _____

Answer	Frequency	Percentage
No change	14	25.45%
Yes, more trips	11	20.00%
Yes, fewer trips	30	54.55%
Why, more, due to retirement	4	7.27%
Why, less, due to less fish	12	21.82%
Why, less, due to less fish, but salmon now improving so starting to fish more	1	1.82%
Why, less, due to the cost of fishing	4	7.27%
Why, less, due to family or work obligations	8	14.55%
Why, less, due to regulations	12	21.82%

*Totals do not add up to 100% because some respondents provided multiple answers and some did not provide an answer to why.

Question 4. Total responses (N): 55 Did not respond: 0

Which species do you regularly target when you fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
☐ Crab ☐ Shrimp ☐ No preference ☐ Other _____

Answer	Frequency	Percentage
Target salmon	55	100.00%
Target halibut	27	49.09%
Target lingcod	26	47.27%
Target rockfish	7	12.73%
Target other bottomfish	6	10.91%
Target crab	40	72.73%
Target shrimp	24	43.64%
No preference	0	0.00%
Target other	1	1.82%

Question 5. Total responses (N): 55 Did not respond: 0

Which type of salmon do you regularly fish for in Puget Sound/San Juan Islands? Check all that apply.

☐ Chinook (King) ☐ Coho (Silver) ☐ Pink (Humpy) ☐ Chum ☐ Any Salmonid

Answer	Frequency	Percentage
Target Chinook (king) salmon	53	96.36%
Target coho (silver) salmon	54	98.18%
Target pink (humpy) salmon	38	69.09%
Target chum salmon	13	23.64%
Target any salmonid	10	18.18%

Question 6. Total responses (N): 55 Did not respond: 0

With which gear type(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Standard mooching gear (herring) ☐ Jigging ☐ Fly-fishing rod
☐ Trolling (downriggers) ☐ Spear ☐ Other _____

Answer	Frequency	Percentage
Standard mooching gear (herring)	20	36.36%
Jigging	17	30.91%
Fly-fishing rod	1	1.82%
Trolling (downriggers)	54	98.18%
Spear	0	0.00%
Other	0	0.00%

Question 7. Total responses (N): 54 Did not respond: 1

From which area(s) do you regularly fish in Puget Sound/San Juan Islands?
Check all that apply.
☐ From shore ☐ From piers ☐ From boats (in water up to 120 ft.)
☐ While diving ☐ From boats (in water 120 ft. or more) ☐ Other _____

Answer	Frequency	Percentage
From shore	4	7.41%
From piers	7	12.96%
From boats (in water up to 120 ft.)	50	92.59%
While diving	1	1.85%
From boats (in water 120 ft. or more)	45	83.33%
Other	0	0.00%

Question 8. Total responses (N): 52 Did not respond: 3

How would you generally characterize rockfish populations in the areas you regularly fish in Puget Sound/San Juan Islands? Check only one.
☐ Abundant ☐ Average ☐ Low ☐ Other _____

Answer	Frequency	Percentage
Abundant	5	9.62%
Average	16	30.77%
Low	24	46.15%
Other	8	15.38%
Other: improving*	2	3.85%
Other: very low/decimated*	1	1.92%
Other: do not know*	5	9.62%

*Indicates the most common "other" answers.

Question 9. Total responses (N): 51 Did not respond: 4

What do you feel are currently the greatest threat(s) to rockfish in Puget Sound/ San Juan Islands? Check all that apply.

☐ Habitat loss ☐ Pollution ☐ Commercial fisheries ☐ Derelict fishing gear
☐ Predation from marine mammals ☐ Predation from lingcod
☐ Recreational fisheries ☐ Other _____

Answer	Frequency	Percentage
Habitat loss	15	29.41%
Pollution	15	29.41%
Commercial fisheries	33	64.71%
Derelict fishing gear	34	66.67%
Predation from marine mammals	18	35.29%
Predation from lingcod	3	5.88%
Recreational fisheries	4	7.84%
Other	10	19.61%
Other: past effects of commercial fisheries*	5	9.80%
Other: overfishing*	2	3.92%
Other: bycatch*	1	1.96%
Other: do not know*	2	3.92%

*Indicates the most common "other" answers.

Question 10. Total responses (N): 52 Did not respond: 3

In which way(s) do you currently obtain information about fishing regulations? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Other _____

Answer	Frequency	Percentage
Newspaper	17	32.69%
Agency websites	29	55.77%
Blogs	10	19.23%
Word of mouth	18	34.62%
Signs	2	3.85%
Radio	4	7.69%

Sport fishing regulation booklet	39	75.00%
An angler's association	31	59.62%
WDFW email lists	25	48.08%
Other	0	0.00%

Question 11. Total responses (N): 52 Did not respond: 3

How would you prefer to learn about updates for rockfish conservation and other fisheries conservation efforts? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Direct Mail ☐ Other_____

Answer	Frequency	Percentage
Newspaper	8	15.83
Agency websites	26	50.00%
Blogs	4	7.69%
Word of mouth	3	5.77%
Signs	0	0.00%
Radio	3	5.77%
Sport fishing regulation booklet	20	38.46%
An angler's association	29	55.77%
WDFW email lists	33	63.46%
Direct mail	1	1.92%
Other	1	1.92%

Question 12. Total responses (N): 51 Did not respond: 4

Have the current rockfish regulations in Puget Sound/San Juan Islands caused you to fish less frequently? ☐ Yes ☐ No

If yes, which species do you fish for less frequently? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
☐ Crab ☐ Shrimp ☐ Other _____

Answer	Frequency	Percentage
No, regulations have not caused me to fish less frequently	29	56.86%
Yes, regulations have caused me to fish less frequently	22	43.14%
Yes, fish less for salmon	4	7.84%

Yes, fish less for halibut	4	7.84%
Yes, fish less for lingcod	11	9.01%
Yes, fish less for rockfish	15	29.41%
Yes, fish less for other bottomfish	6	11.76%
Yes, fish less for crab	2	3.92%
Yes, fish less for shrimp	4	7.84%
Yes, fish less for other	0	0.00%

Question 13. Total responses (N): 52 Did not respond: 3

What measures do you think would best conserve and recover rockfish in Puget Sound/ San Juan Islands? Check all that apply.

☐ Marine Reserves ☐ Artificial reefs ☐ Hatchery supplementation
☐ Derelict gear removal ☐ Habitat Restoration ☐ Nothing
☐ Other_____

Answer	Frequency	Percentage
Marine reserves	10	19.23%
Artificial reefs	35	67.31%
Hatchery supplementation	15	28.85%
Derelict gear removal	47	90.38%
Habitat restoration	28	53.85%
Nothing	0	0.00%
Other	8	15.38%
Other: Close Puget Sound/San Juan Islands to all commercial and tribal gillnetting*	4	7.69%
Other: Close Puget Sound/San Juan Islands to all commercial fishing*	1	1.92%
Other: Education*	2	3.85%
Other: Do not know*	1	1.92%

*Indicates the most common "other" answers.

Question 14. Total responses (N): 50 Did not respond: 5

If it is necessary to protect rockfish from commercial/recreational fisheries, which protection do you prefer? Circle your rank from 1-5, with 1 meaning the protection is not preferred at all and 5 the most the preferred.

Designated rockfish reserves where no fishing is allow	Frequency	Percentage
1	29	58.00%
2	4	8.00%
3	3	6.00%
4	6	12.00%
5	8	16.00%

Fishing regulations that prohibit retention of rockfish	Frequency	Percentage
1	9	18.00%
2	2	4.00%
3	8	16.00%
4	9	18.00%
5	22	44.00%

Fishing regulations that prohibit bottomfishing in certain areas	Frequency	Percentage
1	13	26.00%
2	7	14.00%
3	13	26.00%
4	7	14.00%
5	10	20.00%

Fishing regulations that prohibit bottomfishing below a certain depth	Frequency	Percentage
1	21	42.00%
2	5	10.00%
3	12	24.00%

4	6	12.00%
5	6	12.00%

Fishing regulations that prohibit all fishing below a certain depth	Frequency	Percentage
1	34	68.00%
2	6	12.00%
3	6	12.00%
4	1	2.00%
5	2	4.00%

Fisheries conservation without preserves (practice prescribed catch avoidance/catch release methods)	Frequency	Percentage
1	3	6.00%
2	1	2.00%
3	7	14.00%
4	9	18.00%
5	30	60.00%

Question 15. Total responses (N): 54 Did not respond: 1

How long have you been living in Washington? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. in WA	43.65	299.25	17.30	2.35	46.50	67	10	77

Question 16. Total responses (N): 54 Did not respond: 1

Why do you fish? Check all that apply.
☐ Sport (fun, relaxation, etc.) ☐ Food ☐ Other _____

	Frequency	Percentage
Sport (fun, relaxation, etc.)	54	100.00%
Food	43	79.63%
Other	1	1.85%

Question 17. Total responses (N): 54 Did not respond: 1

What is your age? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Age	57.72	126.43	11.24	1.53	57	45	34	79

Question 18. Total responses (N): 54 Did not respond: 1

Please indicate if you are a member of a recreational angler's group or association. Check all that apply.

☐ Puget Sound Anglers ☐ Coastal Conservation Association (CCA) ☐ None
☐ Other _____

	Frequency	Percentage
PSA member	47	87.04%
CCA member	25	46.30%
Member of other association	4	7.41%
Total association membership	53	98.15%
Not part of an association	1	1.85%

*Totals add up more than 100% because respondents were able to check more than one option.

Question 19. Total responses (N): 54 Did not respond: 1

Are/were you a charter fishing guide?
☐ Yes ☐ No

	Frequency	Percentage
Not a Guide	54	100.00%
Guide (in past)	0	0.00%

Question 20. Total responses (N): 52 Did not respond: 3

Which method(s) do you use when releasing accidentally caught rockfish?
Check all that apply.
☐ Dehook and release without removing the fish from the water
☐ Puncture swim bladder (fizzing) ☐ I have never caught a rockfish
☐ Sink fish quickly using a device designed to release it at depth
☐ Remove the fish from the water to dehook, then release ☐ Other _____

	Frequency	Percentage
Dehook and release without removing the fish from the water	31	59.62%
Puncture swim bladder (fizzing)	5	9.62%
I have never caught a rockfish	6	11.54%
Sink fish quickly using a device designed to release it at depth	10	19.23%
Remove the fish from the water to dehook, then release	12	23.08%
Other	1	1.92%

Question 21. Total responses (N): 50 Did not respond: 5

When you release rockfish do you regularly see the fish float or swim down/away?
☐ Float ☐ Swim down or away ☐ Other _____

	Frequency	Percentage
See it float	15	30.00%
See it swim	37	74.00%
Other	10	20.00%

* Totals may equal more than 100% because respondents marked more than once response.

Question 22. Total responses (N): 51 Did not respond: 4

Which measure would you most be willing to take to increase rockfish survival after it is caught? Circle your rank from 1-5, with 1 meaning the measure is not preferred at all and 5 the most preferred.

Use equipment designed to rapidly submerge rockfish and release them at depth	Frequency	Percentage
1	9	17.65%
2	3	5.88%
3	14	27.45%
4	8	15.69%
5	17	33.33%

Use hook types and sizes with bait combinations that result in decreased rockfish catch	Frequency	Percentage
1	13	25.49%
2	7	13.73%
3	14	27.45%
4	7	13.73%
5	10	19.61%

Learn more about catch avoidance and catch release methods through pamphlets, talks, etc.	Frequency	Percentage
1	2	3.92%
2	1	1.96%
3	6	11.76%
4	17	33.33%
5	25	49.02%

Question 23. Total responses (N): 52 Did not respond: 3

Which of the following statements about Rockfish are true? Check all that apply.
☐ Rockfish live to be very old ☐ Rockfish have life spans similar to salmon
☐ Rockfish taste good ☐ Rockfish juveniles live in the same habitat as adults
☐ Older female rockfish generally have healthier offspring than younger female rockfish
☐ Do not know

	Frequency	Percentage
Rockfish live to be very old	39	75.00%
Rockfish have life spans similar to salmon	3	5.77%
Rockfish taste good	35	67.31%
Rockfish juveniles live in the same habitat as adults	10	19.23%
Older female rockfish generally have healthier offspring that younger female rockfish	15	28.85%
Do not know	9	17.31%

Question 24. Total responses (N): 52 Did not respond: 3

What are the current rockfish fishing regulation(s) in Puget Sound/San Juan Islands?
Check all that apply.
☐ Keep 1 rockfish per day ☐ No fishing deeper than 120 ft. while salmon or halibut fishing
☐ No fishing deeper than 120 ft. while bottomfishing ☐ No retention of rockfish
☐ Do not know

	Frequency	Percentage
Keep 1 rockfish per day	6	11.54%
No fishing deeper than 120 ft. while salmon or halibut fishing	3	5.77%
No fishing deeper than 120 ft. while bottomfishing	21	40.38%
No retention of rockfish	30	57.69%
Do not know	10	19.23%

Question 25. Total responses (N): 53 Did not respond: 2

Do you know which species of rockfish are listed on the Endangered Species List Puget Sound/San Juan Islands? ☐ Yes ☐ No
If yes, will you please list them? _____

	Frequency	Percentage
Yes, respondent stated knew ESA-listed rockfish	20	37.74%
Yes, could name yelloweye rockfish	18	33.96%
Yes, could name canary rockfish	12	22.64%
Yes, could name bocaccio	9	16.98%
Yes, respondent knew all ESA-listed rockfish	7	1.58%
False yes (stated knew but could not name or incorrectly named species)	13	24.53%
No, respondent stated did not know ESA-listed species	33	62.26%

Question 26. Total responses (N): 53 Did not respond: 2

Which areas do you most regularly fish in in Puget Sound/San Juan Islands? Refer to the attached Marine Catch Area map on the next page for reference. Check all areas that apply.
☐ Central Puget Sound (Areas 9, 10, 11) ☐ Whidbey Basin (Area 8-1, 8-2)
☐ North Puget Sound/San Juan Islands (Area 7) ☐ Strait of Juan de Fuca (Areas 5, 6)
☐ Hood Canal (Area 12) ☐ South Puget Sound (Area 13)

	Frequency	Percentage
Central Puget Sound (Areas 9, 10, 11)	47	88.68%
Whidbey Basin (Area 8-1, 8-2)	34	64.15%
North Puget Sound/San Juan Islands (Area 7)	14	26.42%
Strait of Juan de Fuca (Areas 5, 6)	9	16.98%
Hood Canal (Area 12)	3	5.66%
South Puget Sound (Area 13)	0	0.00%

Question 27. Total responses (N): 23 Did not respond: 32

Make an X on the attached Catch Area Map on the next page that corresponds to the area(s) you most frequently fish. If you frequent more than one location, please limit your Xs to 3 locations only.

Answers vary by respondent. Top two answers listed.

Possession Point/Possession Sound
Around Camano Island

Question 28. Total responses (N): 50 Did not respond: 5

Did you fish for rockfish in the past Puget Sound/San Juan Islands?
☐ Yes ☐ No
If yes, how many years ago did you fish for rockfish? _____ year(s)

	Frequency	Percentage
Did not fish for rockfish	24	48.00%
Fished for rockfish	26	52.00%

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. ago fished for rockfish	3.98	54.39	7.37	1.04	1	30	0	30

Question 29. Total responses (N): 18 Did not respond: 37

If you have memory of where rockfish were abundant in the past, please circle that area on the attached Catch Area Map on the next page. Please list the approximate year(s) you saw them and the species, if known.

Answers vary by respondent. Top two answers listed.

Location	Approximate years	Species
All around San Juan Islands	1970s-1990s	--
Possession Point/Possession Sound	1980s-1990s	Coppers, unknown

Question 30. Total responses (N): 8 Did not respond: 47

Do you have any other knowledge about rockfish, preferences for their management, or preferences for communicating with regulatory agencies you would like to share? If so, please write below.

Answers vary by respondent. Top answer listed.

Removing derelict fishing gear should be priority.

Question 31. Total responses (N): 48 Did not respond: 7

(Shown a canary rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Canary rockfish	Frequency	Percentage
Know correct species name	5	10.42%
Provided incorrect species name	15	31.25%
Common incorrect species name (yelloweye)	14	29.17%
Stated the fish was a "rockfish"	2	4.17%
Stated the fish was a "snapper" (including red/pink snapper)	5	10.42%
Stated the fish was a "rockcod"	1	2.08%
Stated do not know name	21	43.75%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 32. Total responses (N): 48 Did not respond: 7

(Shown a black rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Black rockfish	Frequency	Percentage
Know correct species name	16	33.33%
Stated the fish was a "seabass"	22	45.83%
Provided incorrect species name	0	0.00%
Stated the fish was a "rockfish"	0	0.00%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	19	39.58%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 33. Total responses (N): 48 Did not respond: 7

(Shown a china rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

China rockfish	Frequency	Percentage
Know correct species name	7	14.58%
Provided incorrect species name	8	16.67%
Common incorrect species name (quillback)	4	8.33%
Common incorrect species name (cabazon)	3	6.25
Stated the fish was a "rockfish"	0	0.00%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	2	4.17%
Stated do not know name	31	64.58%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 34. Total responses (N): 48 Did not respond: 7

(Shown a copper rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Copper rockfish	Frequency	Percentage
Know correct species name	1	2.08%
Provided incorrect species name	13	27.08%
Common incorrect species name (canary)	10	20.83
Stated the fish was a "rockfish"	2	4.17%
Stated the fish was a "snapper" (including red/pink snapper)	8	16.67%
Stated the fish was a "rockcod"	1	2.08%
Stated do not know name	23	47.92%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 35. Total responses (N): 48 Did not respond: 7

(Shown a brown rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Brown rockfish	Frequency	Percentage
Know correct species name	0	0.00%
Provided incorrect species name	9	18.75%
Common incorrect species name (copper)	2	4.17%
Common incorrect species name (quillback)	2	4.17%
Common incorrect species name (puget sound)	2	4.17%
Stated the fish was a "rockfish"	2	4.17%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	1	2.08%
Stated do not know name	37	77.08%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 36. Total responses (N): 48 Did not respond: 7

(Shown a bocaccio picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Bocaccio rockfish	Frequency	Percentage
Know correct species name	3	6.25%
Provided incorrect species name	10	20.83%
Common incorrect species name (kelp greenling or greenling)	5	10.42%
Stated the fish was a "rockfish"	0	0.00%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod" (including true cod, tom cod, or cod)	8	16.67%
Stated do not know name	26	54.17%

*Totals may not add up to 100 because respondents could provide more than one answer.

Demographics (Observed or asked). Total responses (N): 55 Did not respond: 0

Gender	Frequency	Percentage
Male	55	100.00%
Female	0	0.00%

Ethnicity/Race	Frequency	Percentage
White/Caucasian	54	98.18%
Asian	0	0.00%
Black/African American	0	0.00%
Hispanic	0	0.00%
Other	1	1.81%

Location of Survey	Frequency	Percentage
Puget Sound Anglers Meeting, Edmunds	44	80.00%
Coastal Conservation Association Meeting, Everett (N. Snohomish Chapter)	9	16.36%
Individual Meeting with Coastal Conservation Association Leader	2	3.64%

Appendix G: Responses with Descriptive Statistics for Surveys Administered to Divers Who May also be Anglers

(at dive locations adjacent to heavily-used boat launches and marinas)

Question 1. Total responses (N): 34 Did not respond: 0

How long have you been fishing in Puget Sound/San Juan Islands? _____ year(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. Fishing	32.94	249.21	15.79	2.71	40	57	3	60

Question 2. Total responses (N): 34 Did not respond: 0

How frequently do you fish in Puget Sound/San Juan Islands in a typical year?
_____ time(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Trips/Yr.	22.97	279.06	16.71	2.87	24	58	2	60

Question 3. Total responses (N): 34 Did not respond: 0

Has the frequency of your fishing trips in Puget Sound/San Juan Islands changed over the years? ☐ Yes ☐ No
If yes, why? _____

Answer	Frequency	Percentage
No change	19	55.88%
Yes, more trips	7	20.59%
Yes, fewer trips	11	32.35%
Why, more, due to retirement	4	11.76%
Why, less, due to less fish	6	17.65%
Why, less, due to less bottomfish	1	2.94%
Why, less, due to less fish, but salmon now improving so starting to fish more	1	2.94%
Why, less, due to the cost of fishing	2	5.88%
Why, less, due to regulations	1	2.94%
Why, less, due to too many people fishing or overcrowding	1	2.94%

*Totals may add up to more than 100% because respondents could provide more than one answer.

Question 4. Total responses (N): 34 Did not respond: 0

Which species do you regularly target when you fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
☐ Crab ☐ Shrimp ☐ No preference ☐ Other _____

Answer	Frequency	Percentage
Target salmon	24	70.59%
Target halibut	8	23.53%
Target lingcod	17	50.00%
Target rockfish	7	20.59%
Target other bottomfish	7	20.59%
Target crab	15	44.12%
Target shrimp	5	14.71%
No preference	0	0.00%
Target other	2	5.88%

Question 5. Total responses (N): 34 Did not respond: 0

Which type of salmon do you regularly fish for in Puget Sound/San Juan Islands? Check all that apply.

☐ Chinook (King) ☐ Coho (Silver) ☐ Pink (Humpy) ☐ Chum ☐ Any Salmonid

Answer	Frequency	Percentage
Target Chinook (king) salmon	25	73.53%
Target coho (silver) salmon	25	73.53%
Target pink (humpy) salmon	13	38.24%
Target chum salmon	5	14.71%
Target any salmonid	6	17.65%

Question 6. Total responses (N): 34 Did not respond: 0

With which gear type(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Standard mooching gear (herring) ☐ Jigging ☐ Fly-fishing rod
☐ Trolling (downriggers) ☐ Spear ☐ Other _____

Answer	Frequency	Percentage
Standard mooching gear (herring)	15	44.12%
Jigging	11	32.35%
Fly-fishing rod	4	11.76%
Trolling (downriggers)	25	73.53%
Spear	15	44.12%
Other	0	0.00%

Question 7. Total responses (N): 34 Did not respond: 0

From which area(s) do you regularly fish in Puget Sound/San Juan Islands?
Check all that apply.
☐ From shore ☐ From piers ☐ From boats (in water up to 120 ft.)
☐ While diving ☐ From boats (in water 120 ft. or more) ☐ Other _____

Answer	Frequency	Percentage
From shore	6	17.65%
From piers	3	8.82%
From boats (in water up to 120 ft.)	23	67.65%
While diving	12	35.29%
From boats (in water 120 ft. or more)	20	58.82%
Other	0	0.00%

Question 8. Total responses (N): 34 Did not respond: 0

How would you generally characterize rockfish populations in the areas you regularly fish in Puget Sound/San Juan Islands? Check only one.
☐ Abundant ☐ Average ☐ Low ☐ Other _____

Answer	Frequency	Percentage
Abundant	0	0.00%
Average	3	8.82%
Low	18	52.94%
Other	12	35.29%
Other: improving*	5	14.71%
Other: very low/decimated*	2	5.88%

Other: see juveniles but adults scarce*	6	17.65%
Other: do not know*	3	8.82%

*Indicates the most common "other" answers.

Question 9. Total responses (N): 34 Did not respond: 0

What do you feel are currently the greatest threat(s) to rockfish in Puget Sound/ San Juan Islands? Check all that apply.

☐ Habitat loss ☐ Pollution ☐ Commercial fisheries ☐ Derelict fishing gear
☐ Predation from marine mammals ☐ Predation from lingcod
☐ Recreational fisheries ☐ Other _____

Answer	Frequency	Percentage
Habitat loss	16	47.06%
Pollution	16	47.06%
Commercial fisheries	21	61.76%
Derelict fishing gear	16	47.06%
Predation from marine mammals	6	17.65%
Predation from lingcod	1	2.94%
Recreational fisheries	11	32.35%
Other	16	47.06%
Other: past effects of commercial fisheries	15	44.12%
Other: poaching	4	11.76%
Other: overfishing	12	35.29%
Other: bycatch	6	17.65%
Other: spearfishers	6	17.65%

*Indicates the most common "other" answers.

Question 10. Total responses (N): 34 Did not respond: 0

In which way(s) do you currently obtain information about fishing regulations? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Other _____

Answer	Frequency	Percentage
Newspaper	1	2.94%
Agency websites	22	64.71%

Blogs	2	5.88%
Word of mouth	7	20.59%
Signs	2	5.88%
Radio	1	2.94%
Sport fishing regulation booklet	30	88.24%
An angler's association	1	2.94%
WDFW email lists	8	23.53%
Other	0	0.00%

Question 11. Total responses (N): 34 Did not respond: 0

How would you prefer to learn about updates for rockfish conservation and other fisheries conservation efforts? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Direct Mail ☐ Other_____

Answer	Frequency	Percentage
Newspaper	2	5.88%
Agency websites	22	64.71%
Blogs	0	0.00%
Word of mouth	6	17.65%
Signs	6	17.65%
Radio	2	5.88%
Sport fishing regulation booklet	29	85.29%
An angler's association	2	5.88%
WDFW email lists	7	20.59%
Direct mail	0	0.00%
Other	0	0.00%

Question 12. Total responses (N): 34 Did not respond: 0

Have the current rockfish regulations in Puget Sound/San Juan Islands caused you to fish less frequently? ☐ Yes ☐ No

If yes, which species do you fish for less frequently? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
☐ Crab ☐ Shrimp ☐ Other _____

Answer	Frequency	Percentage
No, regulations have not caused me to fish less frequently	21	61.76%
Yes, regulations have caused me to fish less frequently	8	23.53%
Yes, fish less for salmon	1	2.94%
Yes, fish less for halibut	1	2.94%
Yes, fish less for lingcod	7	20.59%
Yes, fish less for rockfish	7	20.59%
Yes, fish less for other bottomfish	11	2.49%
Yes, fish less for crab	1	2.94%
Yes, fish less for shrimp	0	0.00%
Yes, fish less for other	1	2.94%

Question 13. Total responses (N): 34 Did not respond: 0

What measures do you think would best conserve and recover rockfish in Puget Sound/ San Juan Islands? Check all that apply.

☐ Marine Reserves ☐ Artificial reefs ☐ Hatchery supplementation
☐ Derelict gear removal ☐ Habitat Restoration ☐ Nothing
☐ Other_____

Answer	Frequency	Percentage
Marine reserves	25	73.53%
Artificial reefs	20	58.82%
Hatchery supplementation	1	2.94%
Derelict gear removal	19	55.88%
Habitat restoration	23	67.65%
Nothing	0	0.00%
Other	17	50.00%
Other: Long-term rockfish closure (5-10 years)*	5	14.71%
Other: Close Puget Sound/San Juan Islands to all commercial and tribal gillnetting*	7	20.59%
Other: Close Puget Sound/San Juan Islands to all commercial fishing*	1	2.94%
Other: Clean up/prevent pollution*	2	5.88%
Other: Education*	4	11.76%

Other: Enforcement*	2	5.88%

*Indicates the most common "other" answers.

Question 14. Total responses (N): 34 Did not respond: 0

If it is necessary to protect rockfish from commercial/recreational fisheries, which protection do you prefer? Circle your rank from 1-5, with 1 meaning the protection is not preferred at all and 5 the most the preferred.

Designated rockfish reserves where no fishing is allow	Frequency	Percentage
1	1	2.94%
2	2	5.88%
3	3	8.82%
4	1	2.94%
5	27	79.41%

Fishing regulations that prohibit retention of rockfish	Frequency	Percentage
1	0	0.00%
2	1	2.94%
3	2	5.88%
4	2	5.88%
5	29	85.29%

Fishing regulations that prohibit bottomfishing in certain areas	Frequency	Percentage
1	3	8.82%
2	4	11.76%
3	3	8.82%
4	4	12.12%
5	19	57.58%

Fishing regulations that prohibit bottomfishing below a certain depth	Frequency	Percentage
1	13	38.24%
2	9	26.47%
3	4	11.76%
4	3	8.82%
5	5	14.71%

Fishing regulations that prohibit all fishing below a certain depth	Frequency	Percentage
1	18	52.94%
2	9	26.47%
3	4	11.76%
4	2	5.88%
5	1	2.94%

Fisheries conservation without preserves (practice prescribed catch avoidance/catch release methods)	Frequency	Percentage
1	0	0.00%
2	1	2.94%
3	1	2.94%
4	1	2.94%
5	31	91.76%

Question 15. Total responses (N): 34 Did not respond: 0

How long have you been living in Washington? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. in WA	50.65	204.24	14.29	2.45	55.5	47	23	70

Question 16. Total responses (N): 34 Did not respond: 0

Why do you fish? Check all that apply.
☐ Sport (fun, relaxation, etc.) ☐ Food ☐ Other _____

	Frequency	Percentage
Sport (fun, relaxation, etc.)	34	100.00%
Food	29	85.29%
Other	9	26.47%
Other: pictures*	7	20.59%

*Indicates the most common "other" answer.

Question 17. Total responses (N): 34 Did not respond: 0

What is your age? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Age	53.09	176.14	13.27	2.28	56.5	47	23	70

Question 18. Total responses (N): 34 Did not respond: 0

Please indicate if you are a member of a recreational angler's group or association.
Check all that apply.
☐ Puget Sound Anglers ☐ Coastal Conservation Association (CCA) ☐ None
☐ Other _____

	Frequency	Percentage
PSA member	1	2.94%
CCA member	0	0.00%
Member of other association	6	17.65
Total association membership	7	20.59%
Not part of an association	27	79.41%

Question 19. Total responses (N): 34 Did not respond: 0

Are/were you a charter fishing guide?
☐ Yes ☐ No

	Frequency	Percentage
Not a Guide	100	100.00%
Guide (in past)	0	0.00%

Question 20. Total responses (N): 34 Did not respond: 0

Which method(s) do you use when releasing accidentally caught rockfish?
Check all that apply.
☐ Dehook and release without removing the fish from the water
☐ Puncture swim bladder (fizzing) ☐ I have never caught a rockfish
☐ Sink fish quickly using a device designed to release it at depth
☐ Remove the fish from the water to dehook, then release ☐ Other _____

	Frequency	Percentage
Dehook and release without removing the fish from the water	17	50.00%
Puncture swim bladder (fizzing)	0	0.00%
I have never caught a rockfish	5	14.71%
Sink fish quickly using a device designed to release it at depth	0	0.00%
Remove the fish from the water to dehook, then release	1	2.94%
Other	0	0.00%

Question 21. Total responses (N): 34 Did not respond: 0

When you release rockfish do you regularly see the fish float or swim down/away?
☐ Float ☐ Swim down or away ☐ Other _____

	Frequency	Percentage
See it float	13	38.24%
See it swim	13	38.24%
Other	16	47.06%
Other: Depends on depth -- 50/50*	6	17.65%
Other: N/A*	9	26.47%

*Indicates the most common "other" answers.

Question 22. Total responses (N): 34 Did not respond: 0

Which measure would you most be willing to take to increase rockfish survival after it is caught? Circle your rank from 1-5, with 1 meaning the measure is not preferred at all and 5 the most preferred.

Use equipment designed to rapidly submerge rockfish and release them at depth	Frequency	Percentage
1	2	5.89%
2	6	17.65%
3	4	11.76%
4	5	14.71%
5	8	23.53%
N/A	9	26.47%

Use hook types and sizes with bait combinations that result in decreased rockfish catch	Frequency	Percentage
1	4	11.76%
2	6	17.65%

3	4	11.76%
4	9	26.47%
5	2	5.89%
N/A	9	26.47%

Learn more about catch avoidance and catch release methods through pamphlets, talks, etc.	Frequency	Percentage
1	0	0.00%
2	2	5.89%
3	2	5.89%
4	3	8.82%
5	18	52.94%
N/A	9	26.47%

Question 23. Total responses (N): 34 Did not respond: 0

Which of the following statements about Rockfish are true? Check all that apply.
☐ Rockfish live to be very old ☐ Rockfish have life spans similar to salmon
☐ Rockfish taste good ☐ Rockfish juveniles live in the same habitat as adults
☐ Older female rockfish generally have healthier offspring than younger female rockfish
☐ Do not know

	Frequency	Percentage
Rockfish live to be very old	25	73.53%
Rockfish have life spans similar to salmon	1	2.94%
Rockfish taste good	22	64.71%
Rockfish juveniles live in the same habitat as adults	5	14.71%
Older female rockfish generally have healthier offspring that younger female rockfish	9	26.47%
Do not know	7	20.59%

Question 24. Total responses (N): 34 Did not respond: 0

What are the current rockfish fishing regulation(s) in Puget Sound/San Juan Islands? Check all that apply.
☐ Keep 1 rockfish per day ☐ No fishing deeper than 120 ft. while salmon or halibut fishing
☐ No fishing deeper than 120 ft. while bottomfishing ☐ No retention of rockfish
☐ Do not know

	Frequency	Percentage
Keep 1 rockfish per day	0	0.00%
No fishing deeper than 120 ft. while salmon or halibut fishing	0	0.00%
No fishing deeper than 120 ft. while bottomfishing	13	38.24%
No retention of rockfish	27	79.41%
Do not know	7	20.59%

Question 25. Total responses (N): 34 Did not respond: 0

Do you know which species of rockfish are listed on the Endangered Species List Puget Sound/San Juan Islands? ☐ Yes ☐ No
If yes, will you please list them? _____

	Frequency	Percentage
Yes, respondent stated knew ESA-listed rockfish	19	55.88%
Yes, could name yelloweye rockfish	20	58.82%
Yes, could name canary rockfish	13	38.24%
Yes, could name bocaccio	2	5.88%
Yes, respondent knew all ESA-listed rockfish	2	5.88%
False yes (stated knew but could not name or incorrectly named species)	17	50.00%
No, respondent stated did not know ESA-listed species	11	32.35%

Question 26. Total responses (N): 34 Did not respond: 0

Which areas do you most regularly fish in in Puget Sound/San Juan Islands? Refer to the attached Marine Catch Area map on the next page for reference. Check all areas that apply.

☐ Central Puget Sound (Areas 9, 10, 11) ☐ Whidbey Basin (Area 8-1, 8-2)
☐ North Puget Sound/San Juan Islands (Area 7) ☐ Strait of Juan de Fuca (Areas 5, 6)
☐ Hood Canal (Area 12) ☐ South Puget Sound (Area 13)

	Frequency	Percentage
Central Puget Sound (Areas 9, 10, 11)	22	64.71%
Whidbey Basin (Area 8-1, 8-2)	11	32.35%
North Puget Sound/San Juan Islands (Area 7)	19	55.88%
Strait of Juan de Fuca (Areas 5, 6)	16	47.06%
Hood Canal (Area 12)	3	8.82%
South Puget Sound (Area 13)	4	11.76%

Question 27. Total responses (N): 1 Did not respond: 33

Make an X on the attached Catch Area Map on the next page that corresponds to the area(s) you most frequently fish. If you frequent more than one location, please limit your Xs to 3 locations only.

Top three locations listed.

Off McMicken Island in South Sound
San Juan Islands
Off Shilshole launch

Question 28. Total responses (N): 34 Did not respond: 0

Did you fish for rockfish in the past Puget Sound/San Juan Islands?

☐ Yes ☐ No

If yes, how many years ago did you fish for rockfish? _____ year(s)

	Frequency	Percentage
Did not fish for rockfish	12	35.29%
Fished for rockfish	21	61.76%

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. ago fished for rockfish	4.58	47.46	6.89	1.18	2	30	0	30

Question 29. Total responses (N): 13 Did not respond: 21

If you have memory of where rockfish were abundant in the past, please circle that area on the attached Catch Area Map on the next page. Please list the approximate year(s) you saw them and the species, if known.

Answers vary by respondent. Top three answers listed.

Location	Approximate years	Species
All around San Juan Islands	1970s-1990s	Copper, unknown
Owen's Beach	--	--
Sund Rock	--	--

Question 30. Total responses (N): 0 Did not respond: 34

Do you have any other knowledge about rockfish, preferences for their management, or preferences for communicating with regulatory agencies you would like to share? If so, please write below.

Question 31. Total responses (N): 34 Did not respond: 0

(Shown a yelloweye rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Yelloweye rockfish	Frequency	Percentage
Know correct species name	18	52.94%

Stated the fish was a "rockfish"	5	14.71%
Stated the fish was a "snapper" (including red/pink snapper)	4	11.76%
Stated the fish was a "rockcod"	1	2.94%
Stated do not know name	6	17.65%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 32. Total responses (N): 34 Did not respond: 0

(Shown a black rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Black rockfish	Frequency	Percentage
Know correct species name	15	44.12%
Stated the fish was a "seabass"	10	29.41%
Stated the fish was a "rockfish"	2	5.88%
Stated do not know name	7	20.59%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 33. Total responses (N): 34 Did not respond: 0

(Shown a lingcod picture (to test knowledge not only between rockfish but other bottomfish often found in same habitat).) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Lingcod	Frequency	Percentage
Know correct species name	32	94.12%
Stated do not know name	2	5.88%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 34. Total responses (N): 34 Did not respond: 0

(Shown a china rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

China rockfish	Frequency	Percentage

Know correct species name	18	52.94%
Provided incorrect species name	3	8.82%
Common incorrect species name (cabazon)	3	8.82%
Stated the fish was a "rockfish"	2	5.88%
Stated do not know name	11	32.35%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 35. Total responses (N): 34 Did not respond: 0

(Shown a canary rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Canary rockfish	Frequency	Percentage
Know correct species name	11	32.35%
Provided incorrect species name	6	17.65%
Common incorrect species name (yelloweye)	6	17.65%
Stated the fish was a "rockfish"	2	5.88%
Stated the fish was a "snapper" (including red/pink snapper)	4	11.76%
Stated do not know name	11	32.35%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 36. Total responses (N): 34 Did not respond: 0

(Shown a copper rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Copper rockfish	Frequency	Percentage
Know correct species name	7	20.59%
Provided incorrect species name	7	20.59%
Common incorrect species name (yelloweye)	6	17.65%
Stated the fish was a "rockfish"	7	20.59%
Stated the fish was a "snapper" (including red/pink snapper)	6	17.65%

Stated do not know name	8	23.53%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 37. Total responses (N): 34 Did not respond: 0

(Shown a brown rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Brown rockfish	Frequency	Percentage
Know correct species name	2	5.88%
Provided incorrect species name	1	2.94%
Stated the fish was a "rockfish"	4	11.76%
Stated do not know name	28	82.35%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 38. Total responses (N): 34 Did not respond: 0

(Shown a quillback rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Quillback rockfish	Frequency	Percentage
Know correct species name	17	17.19%
Provided incorrect species name	2	5.88%
Stated the fish was a "rockfish"	1	2.94%
Stated do not know name	14	41.18%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 39. Total responses (N): 34 Did not respond: 0

(Shown a bocaccio picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Bocaccio rockfish	Frequency	Percentage
Know correct species name	4	11.76%
Provided incorrect species name	9	26.47%

Common incorrect species name (kelp greenling or greenling)	8	23.53%
Stated the fish was a "rockcod" (including true cod, tom cod, or cod)	3	8.82%
Stated do not know name	18	52.94%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 40. Total responses (N): 34 Did not respond: 0

(Shown a yellowtail rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Yellowtail rockfish	Frequency	Percentage
Know correct species name	2	5.88%
Provided incorrect species name	3	8.82%
Common incorrect species name (perch)	2	5.88%
Stated the fish was a "rockfish"	1	2.94%
Stated do not know name	28	82.35%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 41. Total responses (N): 34 Did not respond: 0

(Shown a vermillion rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Vermillion rockfish	Frequency	Percentage
Know correct species name	2	5.88%
Provided incorrect species name	1	2.94%
Common incorrect species name (red rockfish)	1	2.94%
Stated the fish was a "rockfish"	10	29.41%
Stated the fish was a "snapper" (including red/pink snapper)	1	2.94%
Stated do not know name	22	64.71%

*Totals may not add up to 100 because respondents could provide more than one answer.

Demographics (Observed or asked). Total responses (N): 34 Did not respond: 0

Gender	Frequency	Percentage
Male	28	82.36%
Female	6	17.65%

Ethnicity/Race	Frequency	Percentage
White/Caucasian	33	97.06%
Asian	0	0.00%
Black/African American	0	0.00%
Hispanic	0	0.00%
Other	1	2.94%

Location	Frequency	Percentage
Angler & Diver (also spears)	8	23.53%
Angler & Diver (no spear)	14	41.18%
Diver only (also spears)	4	11.76%
Diver only (no spear)	8	23.53%

Location of Survey	Frequency	Percentage
Shilshole dive area	7	20.59%
Redondo dive area	2	5.88%
Alki dive area	9	26.47%
Everett launch	3	8.83%
Bellingham launch	2	5.88%
Anacortes launch	3	8.83%
Port Townsend launch	2	5.88%
Ediz Hook launch	3	8.83%

Friday Harbor marina	3	8.83%

Non-response Information	Frequency
Everett launch: White males 40-50 both “in a hurry”	4
Bellingham launch: White male 50s “in a hurry”	1
Port Townsend launch: White male 40s “need to feed kids”	1
Total	4

Appendix H: Responses with Descriptive Statistics for Surveys Given to Charter Guides

(via postal mail)

Question 1. Total responses (N): 6 Did not respond: 0

How long have you been fishing in Puget Sound/San Juan Islands? _____ year(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. Fishing	30.17	92.17	9.60	3.92	30.5	20	20	40

Question 2. Total responses (N): 6 Did not respond: 0

How frequently do you fish in Puget Sound/San Juan Islands in a typical year?
_____ time(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Trips/Yr.	196.67	48336.67	219.86	89.76	122.5	590	10	600

Question 3. Total responses (N): 6 Did not respond: 0

Has the frequency of your fishing trips in Puget Sound/San Juan Islands changed over the years? ☐ Yes ☐ No
If yes, why?
_____

Answer	Frequency	Percentage
No change	2	33.33%
Yes, more trips	1	16.67%
Yes, fewer trips	3	50.00%
Why, less, due to less fish	1	16.67%
Why, less, due to regulations	1	16.67%

*Totals do not add up to 100% because some respondents provided multiple answers and some did not provide an answer to why.

Question 4. Total responses (N): 6 Did not respond: 0

Which species do you regularly target when you fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
☐ Crab ☐ Shrimp ☐ No preference ☐ Other _____

Answer	Frequency	Percentage
Target salmon	6	100.00%
Target halibut	1	16.67%
Target lingcod	3	50.00%
Target rockfish	1	16.67%
Target other bottomfish	2	33.33%
Target crab	4	66.67%
Target shrimp	1	16.67%
No preference	0	0.00%
Target other	0	0.00%

Question 5. Total responses (N): 6 Did not respond: 0

Which type of salmon do you regularly fish for in Puget Sound/San Juan Islands? Check all that apply.

☐ Chinook (King) ☐ Coho (Silver) ☐ Pink (Humpy) ☐ Chum ☐ Any Salmonid

Answer	Frequency	Percentage
Target Chinook (king) salmon	6	100.00%
Target coho (silver) salmon	6	100.00%
Target pink (humpy) salmon	5	83.33%
Target chum salmon	3	50.00%
Target any salmonid	1	16.67%

Question 6. Total responses (N): 6 Did not respond: 0

With which gear type(s) do you regularly fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Standard mooching gear (herring) ☐ Jigging ☐ Fly-fishing rod
☐ Trolling (downriggers) ☐ Spear ☐ Other _____

Answer	Frequency	Percentage
Standard mooching gear (herring)	1	16.67%
Jigging	3	50.00%
Fly-fishing rod	0	0.00%
Trolling (downriggers)	6	100.00%
Spear	0	0.00%
Other	0	0.00%

Question 7. Total responses (N): 6 Did not respond: 0

From which area(s) do you regularly fish in Puget Sound/San Juan Islands?
Check all that apply.

☐ From shore ☐ From piers ☐ From boats (in water up to 120 ft.)
☐ While diving ☐ From boats (in water 120 ft. or more) ☐ Other _____

Answer	Frequency	Percentage
From shore	1	16.67%
From piers	1	16.67%
From boats (in water up to 120 ft.)	6	100.00%
While diving	0	0.00%
From boats (in water 120 ft. or more)	5	83.33%
Other	0	0.00%

Question 8. Total responses (N): 6 Did not respond: 0

How would you generally characterize rockfish populations in the areas you regularly fish in Puget Sound/San Juan Islands? Check only one.

☐ Abundant ☐ Average ☐ Low ☐ Other _____

Answer	Frequency	Percentage
Abundant	1	16.67%
Average	1	16.67%
Low	2	33.33%
Other	2	33.33%
Other: see juveniles but adults scarce*	1	16.67%
Other: do not know*	1	16.67%

*Indicates the most common "other" answers.

Question 9. Total responses (N): 6 Did not respond: 0

What do you feel are currently the greatest threat(s) to rockfish in Puget Sound/ San Juan Islands? Check all that apply.

☐ Habitat loss ☐ Pollution ☐ Commercial fisheries ☐ Derelict fishing gear
☐ Predation from marine mammals ☐ Predation from lingcod
☐ Recreational fisheries ☐ Other _____

Answer	Frequency	Percentage
Habitat loss	1	16.67%
Pollution	3	50.00%
Commercial fisheries	2	33.33%
Derelict fishing gear	6	100.00%
Predation from marine mammals	3	50.00%
Predation from lingcod	0	0.00%
Recreational fisheries	2	33.33%
Other	0	0.00%

Question 10. Total responses (N): 6 Did not respond: 0

In which way(s) do you currently obtain information about fishing regulations? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Other _____

Answer	Frequency	Percentage
Newspaper	1	16.67%
Agency websites	2	33.33%
Blogs	1	16.67%
Word of mouth	1	16.67%
Signs	0	0.00%
Radio	0	0.00%
Sport fishing regulation booklet	5	83.33%
An angler's association	1	16.67%
WDFW email lists	4	66.67%
Other	0	0.00%

Question 11. Total responses (N): 6 Did not respond: 0

How would you prefer to learn about updates for rockfish conservation and other fisheries conservation efforts? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Direct Mail ☐ Other_____

Answer	Frequency	Percentage
Newspaper	2	33.33%
Agency websites	3	50.00%
Blogs	1	16.67%
Word of mouth	1	16.67%
Signs	2	33.33%
Radio	1	16.67%
Sport fishing regulation booklet	2	33.33%
An angler's association	2	33.33%
WDFW email lists	5	83.33%
Direct mail	1	16.67%
Other	0	0.00%

Question 12. Total responses (N): 6 Did not respond: 0

Have the current rockfish regulations in Puget Sound/San Juan Islands caused you to fish less frequently? ☐ Yes ☐ No

If yes, which species do you fish for less frequently? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
☐ Crab ☐ Shrimp ☐ Other _____

Answer	Frequency	Percentage
No, regulations have not caused me to fish less frequently	3	50.00%
Yes, regulations have caused me to fish less frequently	3	50.00%
Yes, fish less for salmon	0	0.00%
Yes, fish less for halibut	1	16.67%
Yes, fish less for lingcod	2	33.33%
Yes, fish less for rockfish	3	50.00%
Yes, fish less for other bottomfish	0	0.00%

Yes, fish less for crab	1	16.67%
Yes, fish less for shrimp	1	16.67%
Yes, fish less for other	0	0.00%

Question 13. Total responses (N): 6 Did not respond: 0

What measures do you think would best conserve and recover rockfish in Puget Sound/ San Juan Islands? Check all that apply.

☐ Marine Reserves ☐ Artificial reefs ☐ Hatchery supplementation
☐ Derelict gear removal ☐ Habitat Restoration ☐ Nothing
☐ Other_____

Answer	Frequency	Percentage
Marine reserves	3	50.00%
Artificial reefs	4	66.67%
Hatchery supplementation	2	33.33%
Derelict gear removal	5	83.33%
Habitat restoration	2	33.33%
Nothing	0	0.00%
Other	0	0.00%

Question 14. Total responses (N): 6 Did not respond: 0

If it is necessary to protect rockfish from commercial/recreational fisheries, which protection do you prefer? Circle your rank from 1-5, with 1 meaning the protection is not preferred at all and 5 the most the preferred.

Designated rockfish reserves where no fishing is allowed	Frequency	Percentage
1	3	50.00%
2	0	0.00%
3	1	16.67%
4	1	16.67%
5	1	16.67%

Fishing regulations that prohibit retention of rockfish	Frequency	Percentage
1	1	16.67%
2	1	16.67%
3	1	16.67%
4	0	0.00%
5	3	50.00%

Fishing regulations that prohibit bottomfishing in certain areas	Frequency	Percentage
1	1	16.67%
2	1	16.67%
3	2	33.33%
4	0	0.00%
5	2	33.33%

Fishing regulations that prohibit bottomfishing below a certain depth	Frequency	Percentage
1	3	50.00%
2	1	16.67%
3	1	16.67%
4	1	16.67%
5	0	0.00%

Fishing regulations that prohibit all fishing below a certain depth	Frequency	Percentage
1	5	83.33%
2	0	0.00%
3	0	0.00%
4	0	0.00%
5	1	16.67%

Fisheries conservation without preserves (practice prescribed catch avoidance/catch release methods)	Frequency	Percentage
1	4	66.67%
2	0	0.00%
3	1	16.67%
4	0	0.00%
5	1	16.67%

Question 15. Total responses (N): 6 Did not respond: 0

How long have you been living in Washington? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. in WA	41.00	240.40	15.50	6.33	39.00	41	22	63

Question 16. Total responses (N): 6 Did not respond: 1

Why do you fish? Check all that apply.
☐ Sport (fun, relaxation, etc.) ☐ Food ☐ Other _____

Fisheries conservation without preserves (practice prescribed catch avoidance/catch release methods)	Frequency	Percentage
Sport (fun, relaxation, etc.)	6	100.00%
Food	3	50.00%
Other	6	100.00%
Other: work as guide	6	100.00%

Question 17. Total responses (N): 6 Did not respond: 0

What is your age? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Age	49.33	229.87	15.16	6.19	53	34	31	65

Question 18. Total responses (N): 6 Did not respond: 0

Please indicate if you are a member of a recreational angler's group or association. Check all that apply.

☐ Puget Sound Anglers ☐ Coastal Conservation Association (CCA) ☐ None
☐ Other _____

	Frequency	Percentage
PSA member	2	33.33%
CCA member	3	50.00%
Member of other association	3	50.00%
Not part of an association	1	16.67%

*Totals add up more than 100% because respondents were able to check more than one option.

Question 19. Total responses (N): 6 Did not respond: 0

Are/were you a charter fishing guide?

☐ Yes ☐ No

	Frequency	Percentage
Not a Guide	0	0.00%
Guide	6	100.00%

Question 20. Total responses (N): 6 Did not respond: 0

Which method(s) do you use when releasing accidentally caught rockfish?
Check all that apply.
☐ Dehook and release without removing the fish from the water
☐ Puncture swim bladder (fizzing) ☐ I have never caught a rockfish
☐ Sink fish quickly using a device designed to release it at depth
☐ Remove the fish from the water to dehook, then release ☐ Other _____

	Frequency	Percentage
Dehook and release without removing the fish from the water	4	66.67%
Puncture swim bladder (fizzing)	0	0.00%
I have never caught a rockfish	1	16.67%
Sink fish quickly using a device designed to release it at depth	2	33.33%
Remove the fish from the water to dehook, then release	1	16.67%
Other	0	0.00%

Question 21. Total responses (N): 6 Did not respond: 0

When you release rockfish do you regularly see the fish float or swim down/away?
☐ Float ☐ Swim down or away ☐ Other _____

	Frequency	Percentage
See it float	2	33.33%
See it swim	5	83.33%
Other	1	16.67%

* Totals may equal more than 100% because respondents marked more than once response.

Question 22. Total responses (N): 6 Did not respond: 0

Which measure would you most be willing to take to increase rockfish survival after it is caught? Circle your rank from 1-5, with 1 meaning the measure is not preferred at all and 5 the most preferred.

Use equipment designed to rapidly submerge rockfish and release them at depth	Frequency	Percentage
1	1	16.67%
2	1	16.67%
3	0	0.00%
4	0	0.00%
5	4	66.67%

Use hook types and sizes with bait combinations that result in decreased rockfish catch	Frequency	Percentage
1	3	50.00%
2	1	16.67%
3	1	16.67%
4	0	0.00%
5	1	16.67%

Learn more about catch avoidance and catch release methods through pamphlets, talks, etc.	Frequency	Percentage
1	1	16.67%
2	0	0.00%
3	0	0.00%
4	2	33.33%
5	3	50.00%

Question 23. Total responses (N): 6 Did not respond: 0

Which of the following statements about Rockfish are true? Check all that apply.
☐ Rockfish live to be very old ☐ Rockfish have life spans similar to salmon
☐ Rockfish taste good ☐ Rockfish juveniles live in the same habitat as adults
☐ Older female rockfish generally have healthier offspring than younger female rockfish
☐ Do not know

	Frequency	Percentage
Rockfish live to be very old	6	100.00%
Rockfish have life spans similar to salmon	0	0.00%
Rockfish taste good	6	100.00%
Rockfish juveniles live in the same habitat as adults	1	16.67%
Older female rockfish generally have healthier offspring that younger female rockfish	1	16.67%
Do not know	0	0.00%

Question 24. Total responses (N): 6 Did not respond: 0

What are the current rockfish fishing regulation(s) in Puget Sound/San Juan Islands?
Check all that apply.
☐ Keep 1 rockfish per day ☐ No fishing deeper than 120 ft. while salmon or halibut fishing
☐ No fishing deeper than 120 ft. while bottomfishing ☐ No retention of rockfish
☐ Do not know

	Frequency	Percentage
Keep 1 rockfish per day	1	16.67%
No fishing deeper than 120 ft. while salmon or halibut fishing	1	16.67%
No fishing deeper than 120 ft. while bottomfishing	3	50.00%
No retention of rockfish	5	83.33%
Do not know	0	0.00%

Question 25. Total responses (N): 6 Did not respond: 0

Do you know which species of rockfish are listed on the Endangered Species List Puget Sound/San Juan Islands? ☐ Yes ☐ No
If yes, will you please list them? _____

	Frequency	Percentage
Yes, respondent stated knew ESA-listed rockfish	2	33.33%
Yes, could name yelloweye rockfish	2	33.33%
Yes, could name canary rockfish	2	33.33%
Yes, could name bocaccio	2	33.33%
Yes, respondent knew all ESA-listed rockfish	2	33.33%
False yes (stated knew but could not name or incorrectly named species)	0	0.00%
No, respondent stated did not know ESA-listed species	4	66.67%

Question 26. Total responses (N): 6 Did not respond: 0

Which areas do you most regularly fish in in Puget Sound/San Juan Islands? Refer to the attached Marine Catch Area map on the next page for reference. Check all areas that apply.
☐ Central Puget Sound (Areas 9, 10, 11) ☐ Whidbey Basin (Area 8-1, 8-2)
☐ North Puget Sound/San Juan Islands (Area 7) ☐ Strait of Juan de Fuca (Areas 5, 6)
☐ Hood Canal (Area 12) ☐ South Puget Sound (Area 13)

	Frequency	Percentage
Central Puget Sound (Areas 9, 10, 11)	6	100.00%
Whidbey Basin (Area 8-1, 8-2)	3	50.00%
North Puget Sound/San Juan Islands (Area 7)	0	0.00%
Strait of Juan de Fuca (Areas 5, 6)	0	0.00%
Hood Canal (Area 12)	0	0.00%
South Puget Sound (Area 13)	2	33.33%

Question 27. Total responses (N): 6 Did not respond: 0

Make an X on the attached Catch Area Map on the next page that corresponds to the area(s) you most frequently fish. If you frequent more than one location, please limit your Xs to 3 locations only.

Answers vary by respondent. Top answer listed.

Possession Point/Possession Sound

Question 28. Total responses (N): 6 Did not respond: 0

Did you fish for rockfish in the past Puget Sound/San Juan Islands?
☐ Yes ☐ No
If yes, how many years ago did you fish for rockfish? _____ year(s)

	Frequency	Percentage
Did not fish for rockfish	2	33.33%
Fished for rockfish	4	66.67%

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. ago fished for rockfish	6.17	90.17	9.50	3.88	3.5	25	0	25

Question 29. Total responses (N): 6 Did not respond: 0

If you have memory of where rockfish were abundant in the past, please circle that area on the attached Catch Area Map on the next page. Please list the approximate year(s) you saw them and the species, if known.

Answers vary by respondent. Top three answers listed.

Location	Approximate years	Species
Vashon Island	--	--
Point Defiance	--	--

Blake Island		

Question 30. Total responses (N): 1 Did not respond: 5

Do you have any other knowledge about rockfish, preferences for their management, or preferences for communicating with regulatory agencies you would like to share? If so, please write below.

Answers vary by respondent. Top answer listed.

Close all inner Puget Sound for 10 years to bottomfishing.

Question 31. Total responses (N): 6 Did not respond: 0

(Shown a canary rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Canary rockfish	Frequency	Percentage
Know correct species name	0	0.00%
Provided incorrect species name	3	50.00%
Common incorrect species name (yelloweye)	3	50.00%
Stated the fish was a "rockfish"	0	0.00%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	3	50.00%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 32. Total responses (N): 6 Did not respond: 0

(Shown a black rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Black rockfish	Frequency	Percentage
Know correct species name	4	66.67%
Stated the fish was a "seabass"	5	83.33%

Provided incorrect species name	0	0.00%
Stated the fish was a "rockfish"	0	0.00%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	0	0.00%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 33. Total responses (N): 6 Did not respond: 0

(Shown a china rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

China rockfish	Frequency	Percentage
Know correct species name	3	50.00%
Provided incorrect species name	1	16.67%
Common incorrect species name (quillback)	1	16.67%
Stated the fish was a "rockfish"	0	0.00%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	1	16.67%
Stated do not know name	2	33.33%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 34. Total responses (N): 6 Did not respond: 0

(Shown a copper rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Copper rockfish	Frequency	Percentage
Know correct species name	1	16.67%
Provided incorrect species name	1	16.67%
Common incorrect species name (canary)	1	16.67%
Stated the fish was a "rockfish"	0	0.00%

Stated the fish was a "snapper" (including red/pink snapper)	1	16.67%
Stated the fish was a "rockcod"	0	0.00%
Stated do not know name	3	50.00%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 35. Total responses (N): 6 Did not respond: 0

(Shown a brown rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Brown rockfish	Frequency	Percentage
Know correct species name	1	16.67%
Provided incorrect species name	0	0.00%
Stated the fish was a "rockfish"	0	0.00%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod"	1	16.67%
Stated do not know name	4	66.67%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 36. Total responses (N): 6 Did not respond: 0

(Shown a bocaccio picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Bocaccio rockfish	Frequency	Percentage
Know correct species name	1	16.67%
Provided incorrect species name	0	0.00%
Stated the fish was a "rockfish"	0	0.00%
Stated the fish was a "snapper" (including red/pink snapper)	0	0.00%
Stated the fish was a "rockcod" (including true cod, tom cod, or cod)	0	0.00%
Stated do not know name	5	83.33%

*Totals may not add up to 100 because respondents could provide more than one answer.

Demographics (Observed or asked). Total responses (N): 55 Did not respond: 0

Gender	Frequency	Percentage
Male	6	100.00%
Female	0	0.00%

Ethnicity/Race	Frequency	Percentage
White/Caucasian	6	100.00%
Asian	0	0.00%
Black/African American	0	0.00%
Hispanic	0	0.00%
Other	0	0.00%

Location of Survey	Frequency	Percentage
Puget Sound Anglers Meeting, Edmunds	1	16.67%
Shilshole launch	2	33.33%
Postal mail	3	50.00%

Appendix I: Responses with Descriptive Statistics for All Surveyed Respondents

(boat-based anglers, piers and shoreline anglers, members of angler associations, and divers)*

* Does not include charter guides due to insufficient response for statistical analysis.

Question 1. Total responses (N): 538 Did not respond: 0

How long have you been fishing in Puget Sound/San Juan Islands? _____ year(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. Fishing	29.91	252.37	15.89	0.68	30	69	1	70

Question 2. Total responses (N): 538 Did not respond: 0

How frequently do you fish in Puget Sound/San Juan Islands in a typical year?
_____ time(s)

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Trips/Yr.	27.37	1118.42	35.04	1.44	20	600	0	600

Question 3. Total responses (N): 538 Did not respond: 0

Has the frequency of your fishing trips in Puget Sound/San Juan Islands changed over the years? ☐ Yes ☐ No
If yes, why?
_____

Answer	Frequency	Percentage
No change	236	43.87%
Yes, more trips	105	19.52%
Yes, fewer trips	218	40.52%
Why, more, due to retirement	43	7.99%
Why, less, due to less fish	111	20.63%
Why, less, due to less bottomfish	17	3.16%
Why, less, due to less fish, but salmon now improving so	19	3.53%

starting to fish more		
Why, less, due to the cost of fishing	18	3.35%
Why, less, due to family or work obligations	35	6.51%
Why, less, due to regulations	29	5.39%
Why, less or more, due to the quality of the fishing year	24	4.46%
Why, less, due to too many people fishing or overcrowding	43	7.99%

Question 4. Total responses (N): 538 Did not respond: 0

Which species do you regularly target when you fish in Puget Sound/San Juan Islands? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
☐ Crab ☐ Shrimp ☐ No preference ☐ Other _____

Answer	Frequency	Percentage
Target salmon	506	94.05%
Target halibut	99	18.40%
Target lingcod	173	32.16%
Target rockfish	49	9.11%
Target other bottomfish	86	15.99%
Target crab	281	52.23%
Target shrimp	80	14.87%
No preference	10	1.86%
Target other	21	3.90%

Question 5. Total responses (N): 538 Did not respond: 0

Which type of salmon do you regularly fish for in Puget Sound/San Juan Islands? Check all that apply.

☐ Chinook (King) ☐ Coho (Silver) ☐ Pink (Humpy) ☐ Chum ☐ Any Salmonid

Answer	Frequency	Percentage
Target chinook (king) salmon	492	91.45%
Target coho (silver) salmon	480	89.22%
Target pink (humpy) salmon	374	69.52%
Target chum salmon	200	37.17%
Target any salmonid	205	38.10%

Question 6. Total responses (N): 538 Did not respond: 0

With which gear type(s) do you regularly fish in Puget Sound/San Juan Islands?
Check all that apply.
☐ Standard mooching gear (herring) ☐ Jigging ☐ Fly-fishing rod
☐ Trolling (downriggers) ☐ Spear ☐ Other _____

Answer	Frequency	Percentage
Standard mooching gear (herring)	171	31.78%
Jigging	165	30.67%
Fly-fishing rod	35	6.51%
Trolling (downriggers)	497	92.38%
Spear	15	2.79%
Other	0	0.00%

Question 7. Total responses (N): 538 Did not respond: 0

From which area(s) do you regularly fish in Puget Sound/San Juan Islands?
Check all that apply.
☐ From shore ☐ From piers ☐ From boats (in water up to 120 ft.)
☐ While diving ☐ From boats (in water 120 ft. or more) ☐ Other _____

Answer	Frequency	Percentage
From shore	55	10.24%
From piers	75	13.97%
From boats (in water up to 120 ft.)	494	91.99%
While diving	36	6.70%
From boats (in water 120 ft. or more)	465	86.59%

Question 8. Total responses (N): 535 Did not respond: 0

How would you generally characterize rockfish populations in the areas you regularly fish in Puget Sound/San Juan Islands? Check only one.
☐ Abundant ☐ Average ☐ Low ☐ Other _____

Answer	Frequency	Percentage
Abundant	8	1.50%
Average	42	7.85%
Low	303	56.64%
Other	182	34.02%
Other: improving*	12	2.24%
Other: very low/decimated*	44	8.22%
Other: see juveniles but adults scarce*	20	3.74%
Other: do not know*	117	21.87%

*Indicates the most common "other" answers.

Question 9. Total responses (N): 534 Did not respond: 0

What do you feel are currently the greatest threat(s) to rockfish in Puget Sound/ San Juan Islands? Check all that apply.
☐ Habitat loss ☐ Pollution ☐ Commercial fisheries ☐ Derelict fishing gear
☐ Predation from marine mammals ☐ Predation from lingcod
☐ Recreational fisheries ☐ Other _____

Answer	Frequency	Percentage
Habitat loss	163	30.52%
Pollution	194	36.33%
Commercial fisheries	265	49.63%
Derelict fishing gear	153	28.65%
Predation from marine mammals	72	13.48%
Predation from lingcod	15	2.81%
Recreational fisheries	91	17.04%
Other	289	54.12%
Other: past effects of commercial fisheries*	156	29.21%
Other: poaching*	32	5.99%
Other: tribes*	21	3.93%
Other: overfishing*	101	18.91%

Other: bycatch*	64	11.99%
Other: spearfishers*	31	5.81%
Other: do not know*	116	21.72%

*Indicates the most common "other" answers.

Question 10. Total responses (N): 535 Did not respond: 0

In which way(s) do you currently obtain information about fishing regulations? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Other _____

Answer	Frequency	Percentage
Newspaper	55	10.28%
Agency websites	324	60.56%
Blogs	21	3.93%
Word of mouth	109	20.37%
Signs	22	4.11%
Radio	36	6.73%
Sport fishing regulation booklet	464	86.73%
An angler's association	50	9.35%
WDFW email lists	147	27.48%
Other	10	1.87%

Question 11. Total responses (N): 535 Did not respond: 0

How would you prefer to learn about updates for rockfish conservation and other fisheries conservation efforts? Check all that apply.

☐ Newspaper ☐ Agency websites ☐ Blogs ☐ Word of mouth ☐ Signs
☐ Radio ☐ Sport fishing regulation booklet ☐ An angler's association
☐ WDFW e-mail lists ☐ Direct Mail ☐ Other_____

Answer	Frequency	Percentage
Newspaper	56	10.47%
Agency websites	312	58.32%
Blogs	14	2.62%
Word of mouth	65	12.15%

Signs	99	18.50%
Radio	33	6.17%
Sport fishing regulation booklet	410	76.64%
An angler's association	49	9.16%
WDFW email lists	153	28.60%
Direct mail	4	0.75%
Other	12	2.24%

Question 12. Total responses (N): 534 Did not respond: 0

Have the current rockfish regulations in Puget Sound/San Juan Islands caused you to fish less frequently? ☐ Yes ☐ No

If yes, which species do you fish for less frequently? Check all that apply.

☐ Salmon ☐ Halibut ☐ Lingcod ☐ Rockfish ☐ Other bottomfish
☐ Crab ☐ Shrimp ☐ Other _____

Answer	Frequency	Percentage
No, regulations have not caused me to fish less frequently	434	81.12%
Yes, regulations have caused me to fish less frequently	101	18.91%
Yes, fish less for salmon	6	1.12%
Yes, fish less for halibut	13	2.43%
Yes, fish less for lingcod	55	10.30%
Yes, fish less for rockfish	75	14.04%
Yes, fish less for other bottomfish	17	3.18%
Yes, fish less for crab	5	0.94%
Yes, fish less for shrimp	9	1.69%
Yes, fish less for other	1	0.19%

Question 13. Total responses (N): 535 Did not respond: 0

What measures do you think would best conserve and recover rockfish in Puget Sound/ San Juan Islands? Check all that apply.

☐ Marine Reserves ☐ Artificial reefs ☐ Hatchery supplementation
☐ Derelict gear removal ☐ Habitat Restoration ☐ Nothing
☐ Other_____

Answer	Frequency	Percentage
Marine reserves	223	41.68%
Artificial reefs	225	42.06%
Hatchery supplementation	69	12.90%
Derelict gear removal	229	42.80%
Habitat restoration	273	51.03%
Nothing	4	0.75%
Other	309	57.76%
Other: Long-term rockfish closure (5-10 years)*	110	20.26%
Other: Close Puget Sound/San Juan Islands to all commercial and tribal gillnetting*	95	20.56%
Other: Close Puget Sound/San Juan Islands to all commercial fishing*	22	4.11%
Other: Clean up/prevent pollution*	24	4.49%
Other: Education*	30	5.61%
Other: Enforcement*	20	3.74%
Other: Do not know*	77	14.39%

*Indicates the most common “other” answers.

Question 14. Total responses (N): 533 Did not respond: 0

If it is necessary to protect rockfish from commercial/recreational fisheries, which protection do you prefer? Circle your rank from 1-5, with 1 meaning the protection is not preferred at all and 5 the most the preferred.

Designated rockfish reserves where no fishing is allow	Frequency	Percentage
1	90	16.89%
2	42	7.88%
3	75	14.07%
4	68	12.76%
5	253	47.47%
Do not know	2	0.38%

Fishing regulations that prohibit retention of rockfish	Frequency	Percentage
1	23	4.32%
2	21	3.94%
3	29	5.44%
4	49	9.19%
5	409	76.74%
Do not know	2	0.38%

Fishing regulations that prohibit bottomfishing in certain areas	Frequency	Percentage
1	61	11.47%
2	32	6.02%
3	77	14.47%
4	66	12.41%
5	294	55.26%
Do not know	2	0.45%

Fishing regulations that prohibit bottomfishing below a certain depth	Frequency	Percentage
1	230	43.15%
2	87	16.32%
3	69	12.95%
4	28	5.25%
5	117	21.95%
Don't know	2	0.38%

Fishing regulations that prohibit all fishing below a certain depth	Frequency	Percentage
1	375	70.36%
2	73	13.70%
3	36	6.75%
4	13	2.44%
5	32	6.00%
Don't know	2	0.38%

Fisheries conservation without preserves (practice prescribed catch avoidance/catch release methods)	Frequency	Percentage
1	17	3.19%
2	4	0.75%
3	35	6.67%
4	28	5.25%
5	446	83.68%
Don't know	2	0.38%

Question 15. Total responses (N): 537 Did not respond: 0

How long have you been living in Washington? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. in WA	43.56	284.19	16.86	0.73	46	77	1	78

Question 16. Total responses (N): 537 Did not respond: 0

Why do you fish? Check all that apply.
☐ Sport (fun, relaxation, etc.) ☐ Food ☐ Other _____

	Frequency	Percentage
Sport (fun, relaxation, etc.)	534	99.26%
Food	500	0.75%
Other	15	2.79%

Question 17. Total responses (N): 537 Did not respond: 0

What is your age? _____ years

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Age	52.23	149.25	12.22	0.53	53	56	23	79

Question 18. Total responses (N): 537 Did not respond: 0

Please indicate if you are a member of a recreational angler's group or association.
Check all that apply.
☐ Puget Sound Anglers ☐ Coastal Conservation Association (CCA) ☐ None
☐ Other _____

	Frequency	Percentage
PSA member	77	14.34%

CCA member	39	7.26%
Member of other association	39	7.26%
Total association membership*	118	21.97%
Not part of an association	419	78.03%

*Totals reflect that some anglers are part of multiple associations.

Question 18. Total responses (N): 538 Did not respond: 0

Are/were you a charter fishing guide?
☐ Yes ☐ No

	Frequency	Percentage
Not a Guide	537	99.81%
Guide (in past)	1	0.19%

Question 18. Total responses (N): 534 Did not respond: 0

Which method(s) do you use when releasing accidentally caught rockfish?
Check all that apply.
☐ Dehook and release without removing the fish from the water
☐ Puncture swim bladder (fizzing) ☐ I have never caught a rockfish
☐ Sink fish quickly using a device designed to release it at depth
☐ Remove the fish from the water to dehook, then release ☐ Other _____

	Frequency	Percentage
Dehook and release without removing the fish from the water	361	67.48%
Puncture swim bladder (fizzing)	28	5.23%
I have never caught a rockfish	72	13.46%
Sink fish quickly using a device designed to release it at depth	23	4.30%
Remove the fish from the water to dehook, then release	68	12.71%
Other	90	16.82%
Other: Use dehooker from WDFW or pliers*	55	10.28%

*Indicates the most common "other" answer.

Question 19. Total responses (N): 533 Did not respond: 0

When you release rockfish do you regularly see the fish float or swim down/away?
☐ Float ☐ Swim down or away ☐ Other _____

	Frequency	Percentage
See it float	235	44.09%
See it swim	328	61.54%
Other	191	35.83%
Other: 50/50*	62	11.63%
Other: Depends on depth*	57	10.69%
Other: I have never caught a rockfish*	72	13.51%

*Indicates the most common "other" answers.

Question 20. Total responses (N): 534 Did not respond: 0 CHECK TOTAL

Which measure would you most be willing to take to increase rockfish survival after it is caught? Circle your rank from 1-5, with 1 meaning the measure is not preferred at all and 5 the most preferred.

Use equipment designed to rapidly submerge rockfish and release them at depth	Frequency	Percentage
1	128	23.97%
2	101	18.91%
3	85	15.92%
4	89	16.67%
5	115	21.54%
Don't know	2	0.37%
N/A	4	0.75%

Use hook types and sizes with bait combinations that result in decreased rockfish catch	Frequency	Percentage
1	146	27.34%
2	100	18.73%
3	109	20.41%
4	91	17.04%
5	70	13.12%
Don't know	2	0.37%
N/A	4	0.75%

Learn more about catch avoidance and catch release methods through pamphlets, talks, etc.	Frequency	Percentage
1	24	4.49%
2	14	2.62%
3	72	13.48%
4	74	13.86%
5	334	62.55%
Don't know	2	0.37%
N/A	4	0.75%

Question 20. Total responses (N): 535 Did not respond: 0

Which of the following statements about Rockfish are true? Check all that apply.
☐ Rockfish live to be very old ☐ Rockfish have life spans similar to salmon
☐ Rockfish taste good ☐ Rockfish juveniles live in the same habitat as adults
☐ Older female rockfish generally have healthier offspring than younger female rockfish
☐ Do not know

	Frequency	Percentage
Rockfish live to be very old	316	59.07%
Rockfish have life spans similar to salmon	16	2.99%
Rockfish taste good	334	62.34%
Rockfish juveniles live in the same habitat as adults	97	18.13%
Older female rockfish generally have healthier offspring that younger female rockfish	79	14.77%
Do not know	159	29.72%

Question 21. Total responses (N): 535 Did not respond: 0

What are the current rockfish fishing regulation(s) in Puget Sound/San Juan Islands?
Check all that apply.
☐ Keep 1 rockfish per day ☐ No fishing deeper than 120 ft. while salmon or halibut fishing
☐ No fishing deeper than 120 ft. while bottomfishing ☐ No retention of rockfish
☐ Do not know

	Frequency	Percentage
Keep 1 rockfish per day	30	5.61%
No fishing deeper than 120 ft. while salmon or halibut fishing	5	0.93%
No fishing deeper than 120 ft. while bottomfishing	120	22.43%
No retention of rockfish	341	63.74%
Do not know	156	29.16%

Question 22. Total responses (N): 536 Did not respond: 0

Do you know which species of rockfish are listed on the Endangered Species List Puget Sound/San Juan Islands? ☐ Yes ☐ No
If yes, will you please list them? _____

	Frequency	Percentage
Yes, respondent stated knows ESA-listed rockfish	172	32.09%
Yes, could name yelloweye rockfish	175	32.65%
Yes, could name canary rockfish	97	18.10%
Yes, could name bocaccio	17	3.17%
Yes, respondent knew all ESA-listed rockfish	17	3.17%
False yes (stated knew but could not name or incorrectly named species)	155	28.92%
No, respondent stated did not know ESA-listed species	350	65.30%

Question 23. Total responses (N): 533 Did not respond: 0

Which areas do you most regularly fish in in Puget Sound/San Juan Islands? Refer to the attached Marine Catch Area map on the next page for reference. Check all areas that apply.
☐ Central Puget Sound (Areas 9, 10, 11) ☐ Whidbey Basin (Area 8-1, 8-2)
☐ North Puget Sound/San Juan Islands (Area 7) ☐ Strait of Juan de Fuca (Areas 5, 6)
☐ Hood Canal (Area 12) ☐ South Puget Sound (Area 13)

	Frequency	Percentage
Central Puget Sound (Areas 9, 10, 11)	377	70.47%
Whidbey Basin (Area 8-1, 8-2)	220	41.28%
North Puget Sound/San Juan Islands (Area 7)	167	31.33%
Strait of Juan de Fuca (Areas 5, 6)	146	27.39%
Hood Canal (Area 12)	42	7.84%
South Puget Sound (Area 13)	57	10.63%

Question 24. Total responses (N): 59 Did not respond: 479

Make an X on the attached Catch Area Map on the next page that corresponds to the area(s) you most frequently fish. If you frequent more than one location, please limit your Xs to 3 locations only.

Answers vary by respondent. Top two answers listed.

Possession Point/Possession Sound
Around Camano Island

Question 24. Total responses (N): 533 Did not respond: 0

Did you fish for rockfish in the past Puget Sound/San Juan Islands?
☐ Yes ☐ No
If yes, how many years ago did you fish for rockfish? _____ year(s)

	Frequency	Percentage
Did not fish for rockfish	302	56.66%
Fished for rockfish	238	44.65%

	Mean	Variance	Std. Dev.	Std. Err.	Median	Range	Min	Max
Yrs. ago fished for rockfish	4.13	55.28	7.44	0.32	0	40	0	40

Question 25. Total responses (N): 119 Did not respond: 419
If you have memory of where rockfish were abundant in the past, please circle that area on the attached Catch Area Map on the next page. Please list the approximate year(s) you saw them and the species, if known.

Answers vary by respondent. Top two answers listed.

Location	Approximate years	Species
All around San Juan Islands	1970s-1990s	Mostly yelloweye, but some stated all rockfish
Tacoma Narrows	--	--

Question 25. Total responses (N): 35 Did not respond: 0

Do you have any other knowledge about rockfish, preferences for their management, or preferences for communicating with regulatory agencies you would like to share? If so, please write below.

Answers vary by respondent. Top two answers listed.

Simplify regulations.
Would prefer full rockfish or bottomfish closures to complicated regulations requiring specific gear or difficult to understand area or depth closures.

Question 26. Total responses (N): 483 Did not respond: 0

(Shown a yelloweye rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Yelloweye rockfish	Frequency	Percentage
Know correct species name	148	30.64%
Provided incorrect species name	6	1.24%
Common incorrect species name (copper)	5	10.35%
Stated the fish was a "rockfish"	15	3.11%
Stated the fish was a "snapper" (including red/pink snapper)	76	15.73%
Stated the fish was a "rockcod"	10	2.07%
Stated do not know name	224	42.18%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 27. Total responses (N): 531 Did not respond: 0

(Shown a black rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Black rockfish	Frequency	Percentage
Know correct species name	149	28.06%
Stated the fish was a "seabass"	223	42.00%

Provided incorrect species name	1	0.19%
Common incorrect species name (blue)	1	0.19%
Stated the fish was a "rockfish"	8	1.51%
Stated the fish was a "rockcod"	7	1.32%
Stated do not know name	199	41.20%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 28. Total responses (N): 483 Did not respond: 0

(Shown a lingcod picture (to test knowledge not only between rockfish but other bottomfish often found in same habitat).) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Lingcod	Frequency	Percentage
Know correct species name	408	84.47%
Provided incorrect species name	3	0.62%
Common incorrect species name (cabazon)	3	0.62%
Stated the fish was a "rockfish"	1	0.21%
Stated do not know name	69	12.99%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 29. Total responses (N): 531 Did not respond: 0

(Shown a china rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

China rockfish	Frequency	Percentage
Know correct species name	72	13.56%
Provided incorrect species name	33	6.21%
Common incorrect species name (cabazon)	23	4.33%
Common incorrect species name (quillback)	5	0.94%
Stated the fish was a "rockfish"	10	1.88%

Stated the fish was a "rockcod"	13	2.45%
Stated do not know name	404	76.08%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 30. Total responses (N): 531 Did not respond: 0

(Shown a canary rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Canary rockfish	Frequency	Percentage
Know correct species name	63	11.86%
Provided incorrect species name	58	10.92%
Common incorrect species name (yelloweye)	54	10.17%
Stated the fish was a "rockfish"	17	3.20%
Stated the fish was a "snapper" (including red/pink snapper)	56	10.55%
Stated the fish was a "rockcod"	6	1.13%
Stated do not know name	333	62.71%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 31. Total responses (N): 531 Did not respond: 0

(Shown a copper rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Copper rockfish	Frequency	Percentage
Know correct species name	33	6.21%
Provided incorrect species name	69	12.99%
Common incorrect species name (yelloweye)	41	7.72%
Common incorrect species name (canary)	20	3.77%
Stated the fish was a "rockfish"	24	4.52%
Stated the fish was a "snapper" (including red/pink snapper)	91	17.14%
Stated the fish was a "rockcod"	5	0.94%

Stated do not know name	306	57.63%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 32. Total responses (N): 531 Did not respond: 0

(Shown a brown rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Brown rockfish	Frequency	Percentage
Know correct species name	23	4.33%
Provided incorrect species name	11	2.07%
Common incorrect species name (copper)	3	0.56%
Stated the fish was a "rockfish"	18	3.39%
Stated the fish was a "rockcod"	10	1.88%
Stated do not know name	469	97.10%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 33. Total responses (N): 483 Did not respond: 0

(Shown a quillback rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Quillback rockfish	Frequency	Percentage
Know correct species name	84	17.39%
Provided incorrect species name	8	1.66%
Stated the fish was a "rockfish"	10	2.26%
Stated the fish was a "snapper" (including red/pink snapper)	1	0.23%
Stated the fish was a "rockcod"	13	2.45%
Stated do not know name	370	69.68%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 34. Total responses (N): 531 Did not respond: 0

(Shown a bocaccio picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Bocaccio rockfish	Frequency	Percentage
Know correct species name	27	5.08%
Provided incorrect species name	90	16.95%
Common incorrect species name (kelp greenling or greenling)	68	12.81%
Stated the fish was a "rockfish"	4	0.75%
Stated the fish was a "rockcod" (including true cod, tom cod, or cod)	58	10.92%
Stated do not know name	359	74.33%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 35. Total responses (N): 483 Did not respond: 0

(Shown a yellowtail rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Yellowtail rockfish	Frequency	Percentage
Know correct species name	26	5.38%
Provided incorrect species name	23	4.76%
Common incorrect species name (perch)	15	3.11%
Stated the fish was a "rockfish"	7	1.45%
Stated the fish was a "rockcod"	2	0.41%
Stated do not know name	423	87.58%

*Totals may not add up to 100 because respondents could provide more than one answer.

Question 36. Total responses (N): 483 Did not respond: 0

(Shown a vermillion rockfish picture.) Please tell me what you call this fish. Include nicknames, local names, or family names, but particular species names. Please state so if you do not know.

Vermillion rockfish	Frequency	Percentage
Know correct species name	13	2.69%
Provided incorrect species name	11	2.28%
Common incorrect species name (red rockfish)	6	1.13%
Stated the fish was a "rockfish"	22	4.55%
Stated the fish was a "snapper" (including red/pink snapper)	28	5.80%
Stated the fish was a "rockcod"	4	0.83%
Stated do not know name	409	84.68%

*Totals may not add up to 100 because respondents could provide more than one answer.

Demographics (Observed or asked). Total responses (N): 538 Did not respond: 0

Gender	Frequency	Percentage
Male	514	95.54%
Female	24	4.46%

Ethnicity/Race	Frequency	Percentage
White/Caucasian	494	91.82%
Asian	34	6.32%
Black/African American	7	1.30%
Hispanic	1	0.19%
Other	2	0.37%

Survey Location	Frequency	Percentage
Everett launch	107	19.89%
Shilshole launch	84	15.61%
Alki launch	68	12.64%
Point Defiance launch	30	5.58%
Point Defiance boat house	8	1.49%
Redondo launch	26	4.83%
Cornet Bay launch	18	3.35%
Anacortes launch/Washington Park	17	3.16%
Ediz Hook launch	17	3.16%
Bellingham launch	16	2.97%
Port Townsend marina and launch	16	2.97%
Mukilteo launch	13	2.42%
Potlatch launch (Hoodsport)	10	1.86%
Friday Harbor marina (San Juan Island)	9	1.67%
Roche Harbor marina and launch (San Juan Island)	7	1.30%
Zittels marina and launch (Olympia)	7	1.30%
Puget Sound Anglers Meeting, Edmunds	44	8.18%
Coastal Conservation Association Meeting, Everett (N. Snohomish Chapter)	9	1.67%
Individual Meeting with Coastal Conservation Association Leader	2	0.37%
Redondo pier	10	1.86%
Shilshole pier	8	1.49%
Point Defiance pier	6	1.12%
Hoodsport shore	6	1.12%

Non-response Information	Frequency
Shilshole launch: White males 40-50 “in a hurry” and “need to feed kids”	2
Everett launch: White males 40-50 both “in a hurry”	5
Point Defiance launch: White males 40-50 “in a hurry” and “need to get kids to bathroom”	2
Bellingham launch: White male 50s “in a hurry”	1
Port Townsend launch: White male 40s “need to feed kids”	1
Mukilteo launch: White male 50s did not want to answer in the rain	1
Redondo launch: White male 50s “in a hurry”	1
Redondo pier: Asian males in 40s-60s “do not speak English”	5
Point Defiance pier: Asian male in 50s “do not speak English”	1
Total	19