

Understanding Cape Perpetua Visitors: A Two-Year Survey to Assess Visitors' Marine Reserve Awareness, Demographics, and Trip Characteristics

Haley Epperly

Briana Goodwin

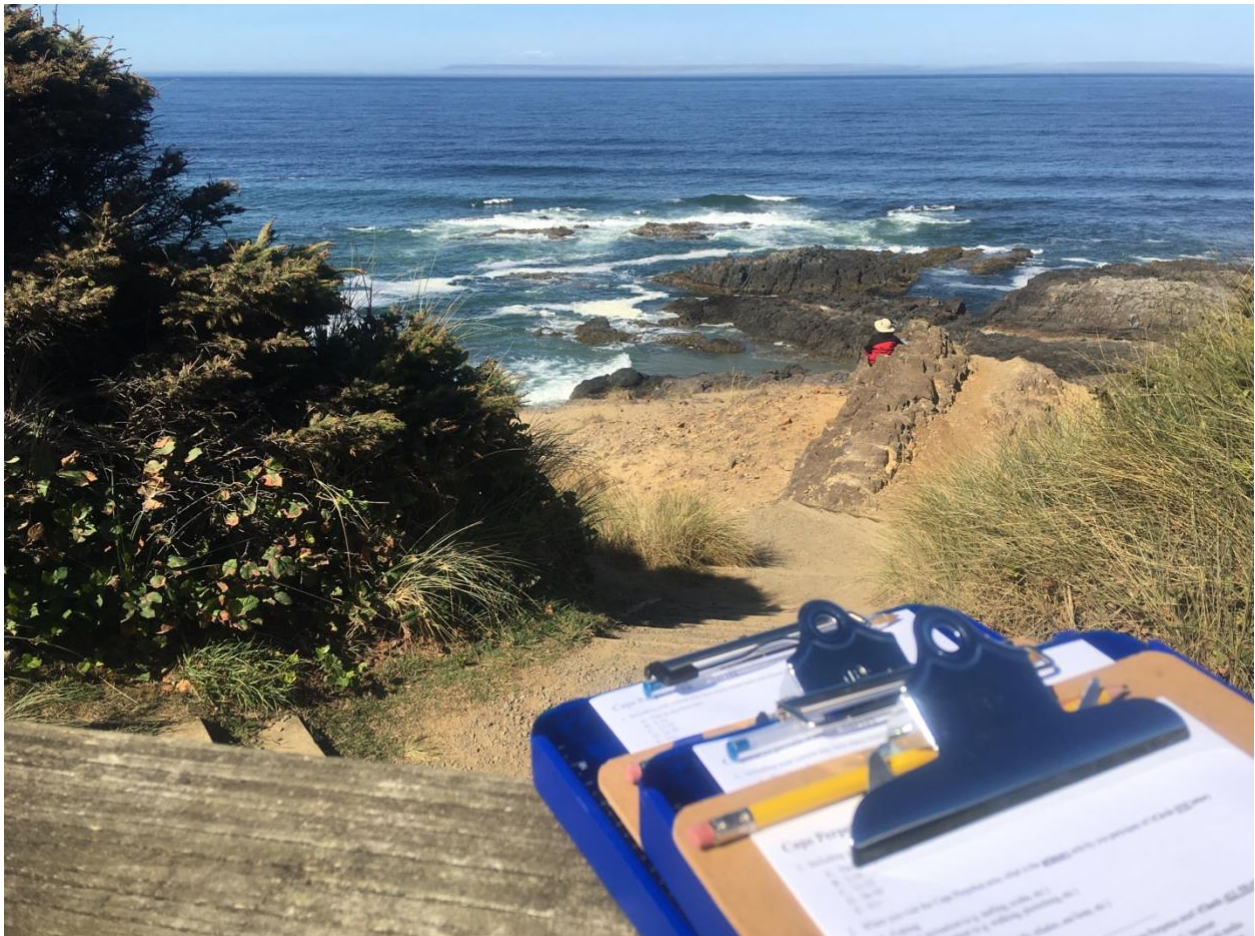
Charlie Plybon

Tara DuBois

Thomas Swearingen

Conducted for and in cooperation with the Cape Perpetua Collaborative

2020



Acknowledgements

While **Surfrider Foundation** played a leadership role in this project, we would like to acknowledge that this survey study and resulting report would not have been possible without the key support and engagement of many partners, funders and individuals. This study reflects the many shared goals and vision of the [Cape Perpetua Collaborative](#) and as such all collaborative partners were instrumental in guiding the design and execution of this survey. **The Oregon Department of Fish and Wildlife (ODFW) Marine Reserves Program** and **the City of Yachats** played key roles in both guiding the survey design and analysis and partial funding of the project. The ODFW played a significant role in ensuring a robust and academic survey design comparable with other human dimension surveys conducted by their program and that of other state agencies. Additional support for this project was also granted by the **Oregon Community Foundation** and the **David and Lucile Packard Foundation**.

The synergy of the Cape Perpetua Collaborative and the execution of the nearly 1000 surveys (over the course of 2 years in all seasons rain or shine!) wouldn't have been possible without **Tara DuBois**. Surfrider Foundation would like to especially recognize her powerful efforts for this project and ongoing local leadership.



A couple taking the intercept survey at a wayside near Cape Perpetua.

Executive Summary

Objectives

Understanding Cape Perpetua visitors is useful for local community organizations serving these visitors. The main objectives of this survey were to better understand Cape Perpetua visitors' marine reserve awareness and knowledge, demographics and characteristics, and tourism decisions and opinions.

Methods

The survey was distributed for two years from November 2017 through November 2019 at five sites near Cape Perpetua Marine Reserve. Survey distribution followed a visitor intercept method and was randomized by time of day, day of the week, and sampling site order. The survey instrument was designed for comparability with previous surveys along the Oregon coast.

Results

A total of 919 surveys were completed, 8% of which were coastal residents, 33% non-coastal Oregon residents, and 59% non-Oregon residents. Survey respondents were analyzed as a whole and also disaggregated into coastal residents, non-coastal Oregon residents, and non-Oregon residents for analyses.

Section 1. Demographics and values

- Considering all respondents, 8% were from Washington, 7% from California, and 12% were international visitors. The average respondent age was 50 years and the average level of education was 17 years. More than half of the respondents were female (57%), with 43% being male and 1% being nonbinary. On average, respondents leaned toward the protectionist side of the protection – use continuum when asked about their level of agreement with statements regarding the protection or use of marine resources.

Section 2. Visitation to the Cape Perpetua area

- For approximately half of all respondents (49%), it was their first time visiting Cape Perpetua. For coastal residents, 63% had visited Cape Perpetua at least ten times previously, compared to 35% for non-coastal Oregon residents and 7% for non-Oregon residents. General beach recreation (29%) and hiking (30%) were the primary activities respondents participated in during their visit.
- Compared to physical activity in their day-to-day life, 38% of all respondents indicated their level of physical activity at Cape Perpetua was greater. Nearly three-quarters of all respondents (73%) reported health benefits from their visit to Cape Perpetua. Respondents reported receiving many health benefits from their visit including stress reduction (85%), improved mental health (82%), and anxiety reduction (75%). Coastal residents reported receiving the most health benefits from their visit.

Section 3. Information sources

- At least 10% of respondents indicated they used magazines, other print media, family and friends, the internet, and social media to obtain information about the Cape Perpetua area. When asked what information source they preferred to use to obtain information about Cape

Perpetua, respondents indicated that the internet was their preferred source (59%). For coastal residents, only 40% indicated the internet was their preferred source while 23% indicated social media was their preferred source.

Section 4. Marine reserve awareness

- Of all respondents, 44% indicated they had visited an Oregon marine reserve, while this proportion was closer to two-thirds for Oregon residents. Similarly, 37% of all respondents were aware of Cape Perpetua Marine Reserve while approximately half of Oregon residents were aware of the reserve. Coastal residents reported the highest levels of perceived knowledge about Oregon marine reserves, with 37% of respondents reporting having ‘moderate’ or ‘extreme’ levels of knowledge about the reserves. Non-Oregon residents reported the lowest levels of perceived knowledge, with 59% indicating they were not knowledgeable about Oregon marine reserves.

Section 5. Trip characteristics and expenditures

- Typical Cape Perpetua visitor groups consisted of two adults. Approximately three-quarters of all respondents (76%) stayed overnight on the coast during their trip for an average of 4 nights. Respondents stayed overnight primarily in the towns of Newport (22%), Yachats (29%), and Florence (25%). More Oregon residents stayed in Yachats than non-Oregon residents (40% vs. 26%). Over half of all respondents spent money on groceries (67%), lodging (64%), restaurants (79%), and fuel (71%). Respondents spent on average \$88 on groceries, \$423 on lodging, \$134 on restaurants, and \$70 on fuel.

Section 6. Yachats services and satisfaction

- Over half of all respondents (55%) visited Yachats during their trip to the coast. The majority of respondents were satisfied with their trip to Yachats (87%). From those respondents that visited Yachats, 26% indicated increased food and beverage options would have improved their visit. Just under 10% of respondents indicated increases in lodging options, family friendly activities, recreational outfitters/guides, and recreational gear rentals would have improved their visit to Yachats. From those respondents that did not visit Yachats, 17% indicated increases in food and beverage options would convince them to visit Yachats.

Section 7. Comparison with previous surveys

- This section deals with comparisons to previous coastal visitor surveys (Swearingen et al. 2016a, Swearingen et al. 2017, Epperly et al. 2017, Bergerson 2019) and surveys of Oregon residents, both coastal (Needham et al. 2013) and non-coastal (Needham et al. 2016). All of the comparable surveys used the same survey distribution method (i.e. visitor intercept surveys) except for the Needham et al. (2013, 2016) surveys which were distributed via mail. Given the differences in distribution methods that may lead to not directly comparable responses, we use caution when comparing this survey with the Needham et al. (2013, 2016) mail survey responses. Additionally, the OPRD report presented results from both a visitor intercept survey of day-use visitors and an internet survey of overnight park users (Bergerson 2019). In this report, we only use results from the day-use visitors because the visitor intercept methods match the Cape Perpetua survey methods, making the results more comparable. However, we

acknowledge that some bias may be introduced by excluding the overnight park visitors that received an internet survey.

- Compared to previous coastal surveys, average age, education level, and gender ratio were similar in this survey (Swearingen et al. 2016a, Epperly et al. 2017, Bergerson 2019).
- Similar to results found in the Needham et al. (2013, 2016) surveys, respondents leaned toward the protectionist side on the protection – use continuum.
- Responses to the primary activity question varied widely across all surveys, likely due to the variance in activity options listed in each survey. In this survey, respondents were significantly more likely to indicate their level of physical activity was higher at Cape Perpetua than their day-to-day life than respondents from the state parks survey (Bergerson 2019). A similar percentage of respondents in this survey and the state park survey indicated they received all the listed health benefits (e.g. reducing your stress) from their visit to the coast.
- More of the Needham et al. (2013, 2016) respondents indicated they used the newspaper, radio, and television as information sources, while in this survey, respondents reported they used family and friends and the internet. These differences may be a factor of different sampling methods, with the Needham et al. (2013, 2016) surveys being mail surveys to Oregon residents. Similar to the state park survey (Bergerson 2019) and the 2016 Oregon Department of Fish and Wildlife (ODFW) coastwide survey (Epperly et al. 2017), the majority of respondents in this survey indicated that the internet was their preferred source of information.
- Compared to the Needham et al. (2013, 2016) respondents, a similar proportion of Oregon residents in this survey indicated they have visited an Oregon marine reserve. Awareness of Cape Perpetua Marine Reserve has increased from 7% in 2012 (Swearingen et al. 2017), to 29% in 2014 (Swearingen et al. 2016a), to 37% in this survey. Perceived knowledge levels of Oregon marine reserves were similar between the Needham et al. (2013) coastal respondents and this survey's coastal respondents, and also between the Needham et al. (2016) I-5 corridor respondents and this survey's non-coastal Oregon respondents.
- Compared to the 2014 ODFW Cape Perpetua survey, group sizes, the percentage of respondents staying the night on the coast, and travel expenditures were similar in this survey.

Section 8. Modeling variables that predict marine reserve awareness, perceived marine reserve knowledge, and visitation to Yachats

- The best models for predicting both marine reserve awareness and perceived marine reserve knowledge included the variables frequency of visitation to Cape Perpetua and the respondent indicating if they had visited an Oregon marine reserve. Respondents that had visited Cape Perpetua more frequently and indicated they had visited an Oregon marine reserve were more likely to be aware of Cape Perpetua Marine Reserve and have higher perceived knowledge about reserves.
- The best predictor of whether a respondent had visited Yachats was their place of residence (grouped by coastal Oregon, non-coastal Oregon, and non-Oregon residents). Non-coastal Oregon residents were significantly more likely to visit Yachats during their trip to the coast than non-Oregon residents.

Section 9. Seasonal differences between survey responses

- There were significant differences between survey responses and survey respondents in the summer and non-summer months. Significantly more Oregonians (both coastal and non-coastal) were surveyed in the non-summer months (72%) than in the summer months (28%). Respondents in the non-summer months were significantly more likely to have visited Cape Perpetua more frequently and have higher knowledge about Cape Perpetua Marine Reserve. Significantly more respondents in the summer months were staying the night on the coast (71% vs. 84%) during their trip and staying for a longer duration (3.8 vs. 4.6 nights).

Discussion

Through this two-year intercept survey of Cape Perpetua visitors, we were able to capture the first comprehensive understanding of Cape Perpetua visitors' marine reserve awareness, demographics, trip characteristics and opinions.

- Awareness of Cape Perpetua Marine Reserve has increased substantially since 2012, with now half of Oregon residents being aware of the reserve. The increase in awareness demonstrates that outreach efforts to increase awareness have had some success, though it is unclear which efforts have been most effective.
- Despite 63% of all respondents indicating they were unaware of Cape Perpetua Marine Reserve, only 47% of respondents perceived themselves as not knowledgeable about Oregon marine reserves. This discrepancy between awareness and knowledge may be explained by respondents' familiarity with another Oregon marine reserve, familiarity with another state's marine reserve system, a perceived general idea of what a reserve system entails, or a perceived idea that their knowledge is greater than it is (i.e. Dunning-Kruger effect; Dunning 2011).
- Information on respondents' frequency of visitation to Cape Perpetua can be used to better tailor communication messages to target audiences. People that frequently visit the ocean or live nearby may seek out information on marine resources more often and therefore have greater knowledge about ocean systems (Duda et al. 2007). However, people that spend more time near the ocean may only have a superficial understanding of ocean systems (Perry et al. 2014). Understanding that this dichotomy exists can be useful when approaching communication efforts with coastal residents or frequent coastal visitors.
- There were no demographic variables (e.g. gender, age, education level) that predicted marine reserve awareness or perceived knowledge, which suggests that there is not one demographic group of coastal visitors that engagement efforts need to target. Only frequency of visitation to Cape Perpetua and whether the respondent indicated they have visited a marine reserve predicted awareness and perceived knowledge. To influence frequency of visitation, organizations could increase the number of and accessibility to events held at Cape Perpetua. Bringing more visitors to Cape Perpetua may increase their exposure to marine reserve knowledge or increase their interest in seeking out information on Oregon marine reserves.
- While respondents reported using a variety of communication sources, outreach efforts targeted at reaching the broader audience should use the internet for dissemination as this was the preferred source. To target coastal residents, outreach efforts could also include social media as 23% of coastal residents reported social media as their preferred information source. When asked where residents obtained information about broader Oregon marine reserves, respondents from the Needham et al. (2013, 2016) surveys indicated they used fishing brochures, newspapers, and television. These differences may be a factor of different sampling

methods, with the Needham et al. (2013, 2016) surveys being mail surveys to Oregon residents. Combining results from these surveys, organizations can decide where to best appropriate resources for the most effective communication.

- A “frame” refers to how a message is presented to the audience, and framing theory posits that this delivery influences how people process the information presented (Goffman 1974). Understanding the value orientations of target audiences can inform how to create an appropriate frame so the message is perceived as intended by the disseminating organization. On average, respondents in both this survey and the Needham et al. (2013, 2016) surveys tended to disagree with the use value statements and agree with the protectionist value statements. Therefore, to reach the greatest number of respondents, organizations might consider framing marine reserves as a conservation strategy. However, to reach the smaller proportion of respondents that agree more with the use value statements, and may be less likely to support marine reserves, organizations might consider framing marine reserves as a research tool or a management tool for increasing harvestable marine species populations.
- Through this survey we learned more about Cape Perpetua visitors’ trip characteristics, which is helpful information for coastal businesses. Most Cape Perpetua visitors stay overnight on the Oregon coast, primarily in the communities of Newport, Yachats and Florence. The only variable that predicted whether a respondent visited Yachats was residence, with non-coastal Oregon residents being significantly more likely to visit Yachats during their trip than non-Oregon residents. Most respondents that visited Yachats indicated satisfaction with their visit, with only 3% of respondents reporting dissatisfaction. While satisfaction was high, some respondents would like to see more food and beverage options.
- The health benefits respondents reported receiving from their visit to Cape Perpetua can be used for marketing purposes for the general region, though not specifically for the marine reserve.
- Given that respondent demographics in this survey were highly similar to respondent demographics in previous coastal surveys (Swearingen et al. 2016a, Epperly et al. 2017, Bergerson 2019), we believe we have captured a representative sample of coastal visitors. While these comparable surveys were only distributed in the summer, this Cape Perpetua survey was distributed year-round for two years. The main difference we observed between the summer and non-summer months was an increase in Oregonian respondents in the non-summer months.
- Now that we know marine reserve awareness is increasing with approximately half of Oregonian visitors being aware of Cape Perpetua Marine Reserve, we can begin to assess whether the marine reserve is influencing visitors’ trip decisions. Based on lessons learned and results from this survey, partners of the Cape Perpetua Collaborative wrote a report with suggestions on how to improve the survey instrument and sampling design. For access to the full report, please contact Charlie Plybon at Cplybon@Surfrider.org. The Cape Perpetua Collaborative may adjust the survey instrument and sampling design accordingly and continue to distribute the survey in the Cape Perpetua area.

Table of Contents

| | |
|--|----|
| Acknowledgements | i |
| Executive Summary | ii |
| Introduction | 1 |
| Materials and Methods | 2 |
| Study Site | 2 |
| Survey Instrument | 3 |
| Data Collection | 3 |
| Analytical Methods | 4 |
| Results | 6 |
| Section 1. Demographics and values | 6 |
| Section 2. Visitation to the Cape Perpetua area | 8 |
| Section 3. Information sources | 10 |
| Section 4. Marine reserve awareness | 11 |
| Section 5. Trip characteristics and expenditures | 12 |
| Section 6. Yachats services and satisfaction | 14 |
| Section 7. Comparison with previous surveys | 15 |
| Section 8. Modeling variables that predict marine reserve awareness, perceived marine reserve knowledge, and visitation to Yachats | 25 |
| Section 9. Seasonal differences between survey responses | 25 |
| Discussion | 27 |
| Literature Cited | 31 |
| Appendix S1 – Survey instrument | 33 |
| Appendix S2 – Zip codes for coastal communities | 36 |

Introduction

The Cape Perpetua Marine Reserve and associated Marine Protected Areas are centrally located on the Oregon coast and enjoyed by both locals and tourists. Local NGOs, tribes, and state and federal agencies with an interest in the Cape Perpetua area have formed the Cape Perpetua Collaborative with the vision to *“foster conservation and collaboration within local communities for scientific exchange, management, awareness, and stewardship from the land to the sea in and around Cape Perpetua Marine Reserve”*. To better serve the visitors to Cape Perpetua and the communities surrounding the reserve, the Cape Perpetua Collaborative worked with Surfrider Foundation and the Oregon Department of Fish and Wildlife to lead a two-year effort to better understand Cape Perpetua visitors.

The Cape Perpetua Collaborative’s vision includes general awareness of the Cape Perpetua Marine Reserve; however, previous research from 2014 demonstrated that most Cape Perpetua visitors were unaware of the recently implemented marine reserve (Swearingen et al. 2016b). Since then, partners of the Cape Perpetua Collaborative have enacted communication efforts to spread awareness of the reserve. To determine whether these efforts have been successful, we must assess current awareness and knowledge of marine reserves and how these numbers have changed over time. Increasing marine reserve awareness helps visitors understand and abide by the pertinent regulations at the site. On a broader level, increasing awareness informs visitors of the actions the state is taking towards improving marine conservation and research. Additionally, previous research has demonstrated that those with greater marine knowledge may be more likely to support marine conservation (Steel et al. 2005).

An interesting question regarding the marine reserves is whether the reserves will have any economic benefits to nearby coastal communities (e.g. increased number of visitors to communities located near reserves). In order to begin to answer this question for Cape Perpetua, we must first determine whether visitors are aware of the marine reserve. If visitors to Cape Perpetua are unaware of Cape Perpetua Marine Reserve, this lack of awareness indicates the reserve could not be influencing prior trip decisions.

The Cape Perpetua Collaborative is working to enhance public outreach and engagement around the Cape Perpetua area to communicate ideas including cultural and natural resource protection and stewardship. While visitation to the Cape Perpetua area has been steadily increasing to the high volume seen today, very little is known about these visitors. Previous surveys assessing Cape Perpetua visitors captured information only about visitors during the summers of 2012 (Swearingen et al. 2017) and 2014 (Swearingen et al. 2016b). This snapshot of visitors may not fully represent the suite of characteristics of all visitors. For example, visitors in winter may be less likely to have school aged children than visitors in summer taking advantage of school summer break. For the Cape Perpetua Collaborative to lead effective public outreach and engagement efforts, they must first understand visitors’ demographics, interests, visitation patterns, and communication preferences. This information can help inform how to best disseminate information to reach targeted audiences.

Understanding the audience’s value orientations toward the marine environment can also assist in creating effective outreach materials. Each visitor falls somewhere along a protection – use continuum scale based on their responses to statements regarding the protection or use of marine resources (Needham et al. 2016). Visitors with protectionist-oriented values may be more receptive to outreach materials focused on marine reserves benefitting marine species, while those with use-oriented values may be more receptive to materials focused on benefits to humans.

The Cape Perpetua Collaborative also serves to support sustainable tourism in communities near the Cape Perpetua area. To understand the tourism impact from Cape Perpetua visitors, we must assess visitors' general trip characteristics. These characteristics include coastal communities where visitors are staying, group size and ages, and estimated trip expenditures. Additionally, understanding how visitors physically and mentally benefit from their time spent in the Cape Perpetua area allows us to determine how this area influences visitors' subjective wellbeing, which can be used for tourism marketing. While we know that visiting the Oregon coast has positive effects on some aspects of wellbeing, determining exactly how these visits improve wellbeing and what proportion of visitors experience these positive effects is important (Bergerson 2019).

Yachats is the closest community to the Cape Perpetua Marine Reserve, with a portion of its shoreline falling adjacent to the northern Marine Protected Area. Given its proximity, Yachats is one of the primary communities served by the Cape Perpetua Collaborative. To provide helpful information for the Yachats business community, we must first assess the level of visitor satisfaction and gather suggestions for improvement from previous Yachats visitors. Equally important is understanding why some coastal visitors chose not to visit Yachats during their trip to the Cape Perpetua area.

To address these gaps in our knowledge, partners of the Cape Perpetua Collaborative worked with Surfrider Foundation and the Oregon Department of Fish and Wildlife to administer a two-year intercept survey to Cape Perpetua visitors. Previous surveys of coastal visitors have primarily occurred in the summer months (Swearingen et al. 2016b, Swearingen et al. 2017, Epperly et al. 2017, Bergerson 2019). This survey was the first to collect year-round data on Cape Perpetua visitors for multiple years, creating a more comprehensive understanding of visitors. The main objectives of this survey were to better understand Cape Perpetua visitors' marine reserve awareness and knowledge, demographics and characteristics, and tourism decisions and opinions. The Cape Perpetua Collaborative can share this information with local communities to increase their understanding of benefits visitors receive from their visit to Cape Perpetua and to improve tourism opportunities based on visitor demographics and desires. Additionally, the Cape Perpetua Collaborative can use this information to improve public outreach and engagement through better informed and targeted efforts.

Materials and Methods

Study Site

The Cape Perpetua area is located on the Oregon coast between the communities of Yachats and Florence. Yachats is a small coastal community (population = 690 as of 2010 Census) located in Lincoln County with tourism as the community's main economic industry (US Census 2010). The Cape Perpetua area is a popular destination for both locals and tourists because of the scenic overlooks, opportunities for wildlife viewing, hiking, and exploring tidepools, and proximity to the Sea Lion Caves and Heceta Head Lighthouse. The Cape Perpetua Marine Reserve and the two associated Marine Protected Areas and Seabird Protection Area were implemented on January 1, 2014, making this area the largest marine reserve in Oregon (ODFW Marine Reserves Regulations). No take of animals or seaweed is allowed in the marine reserve while some fishing activities are allowed in the surrounding protected areas. Ocean development is not allowed in either the reserve or protected areas.

Survey Instrument

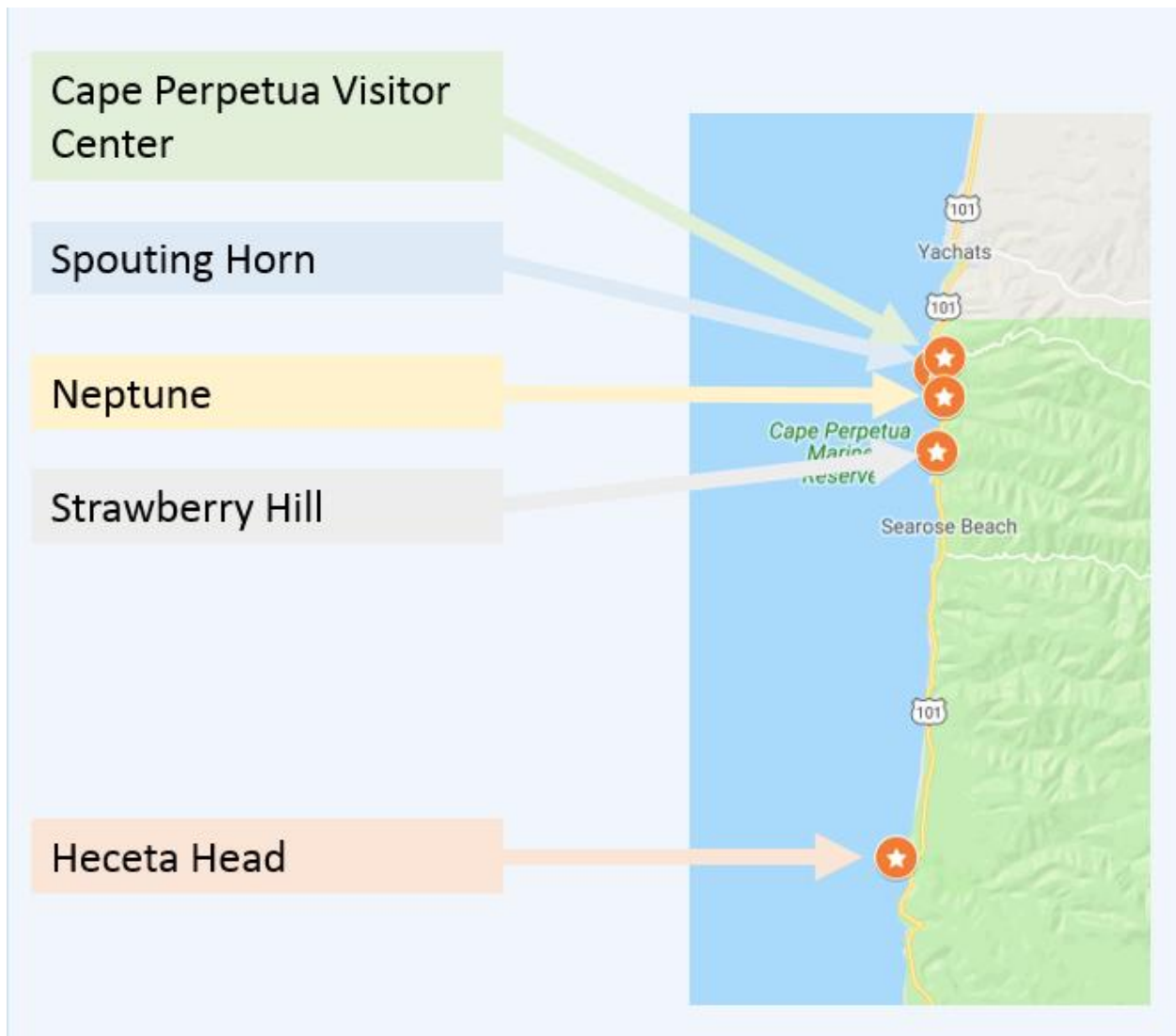
We designed the survey instrument to capture information about visitors to the Cape Perpetua area to better inform the organizations and communities serving these visitors (Appendix S1). To increase the relevance and applicability of this survey, we designed the survey for comparability with previous surveys including the Oregon Department of Fish and Wildlife (ODFW) marine reserve visitor intercept surveys (Swearingen et al. 2016a, Swearingen et al. 2016b, Swearingen et al. 2017), ODFW ocean awareness survey (Epperly et al. 2017), Oregon Parks and Recreation Department (OPRD) state park visitor survey (Bergerson 2019) and the Needham et al. (2013, 2016) marine reserve mail surveys. To be able to compare across multiple surveys, we included questions and response scales used in the aforementioned surveys. Questions included in the survey asked respondents about their frequency of visitation to Cape Perpetua, what activities they participated in while at Cape Perpetua, how their visit influenced their mental and physical health, how they currently receive and would prefer to receive information about the area, and general demographics (i.e. age, gender and education). To determine where a respondent fell on the protection – use continuum, a portion of the survey involved asking respondents to what extent they agreed or disagreed with statements such as ‘The needs of humans are more important than those of marine areas’ and ‘Marine areas have value whether humans are present or not’. To assess visitors’ marine reserve awareness, the survey included questions about marine reserve visitation and knowledge. Lastly, to better understand visitors’ potential economic impacts and tourism needs, the survey included questions about the respondent’s trip such as where they were staying on the coast and for how long, the amount spent on various items (e.g. groceries, lodging, etc.), and how to improve trip visitation and satisfaction, specifically in the community of Yachats.

All of the comparable surveys used the same survey distribution method (i.e. visitor intercept surveys) except for the Needham et al. (2013, 2016) surveys which were distributed via mail. Given the differences in distribution methods that may lead to not directly comparable responses, we use caution when comparing this survey with the Needham et al. (2013, 2016) mail survey responses. Additionally, the OPRD report presented results from both a visitor intercept survey of day-use visitors and an internet survey of overnight park users (Bergerson 2019). In this report, we only use results from the day-use visitors because the visitor intercept methods match the Cape Perpetua survey methods, making the results more comparable. However, we acknowledge that some bias may be introduced by excluding the overnight park visitors that received an internet survey.

Data Collection

We administered surveys at five sample sites along the Cape Perpetua Marine Reserve and Marine Protected Areas for two years (November 2017 – November 2019). These five sites included the Cape Perpetua Visitor Center, Spouting Horn geological feature, Neptune State Scenic Viewpoint pull-off, Strawberry Hill Wayside, and Heceta Head Lighthouse State Scenic Viewpoint (Figure 1). We sampled at all sites one day per week, systematically rotating the sample day each week to ensure each day was equally sampled. To randomize time of day for visitor contacts, we systematically rotated the sampling order within the five sites and the sampling time [morning (9am-12pm), mid-day (11am-2pm), and afternoon (2pm-5pm in April through September and 1pm-4pm in October through March due to sunlight limitations)]. At each site, the surveyor contacted a universal sample of visitors for twenty minutes.

Figure 1. Map of sampling sites near Cape Perpetua for survey distribution



Analytical Methods

Survey respondents were analyzed as a whole and also disaggregated into coastal residents (Appendix S2), non-coastal Oregon residents, and all others (non-Oregon US residents and international visitors) for analyses and comparison among groups. These groupings allowed us to assess whether trends in the data were primarily driven by one group, and therefore not appropriate for describing all visitors. For example, a coastal resident is more likely to be making a day trip to the Cape Perpetua area than a foreign visitor, resulting in reduced expenditures. For each survey question, missing or not applicable data were removed, resulting in a sample size (n) for each question that varies from the total sample size. We used percentages (i.e. the percent of respondents that indicated each option in a question) for analyses and presenting results.

In Section 7, we compared responses between the relevant questions from this survey and previous comparable surveys (more information on comparable surveys can be found in Section 7). For each question, we visually compared survey responses with percentage tables. For surveys that used the same visitor intercept methods as the Cape Perpetua survey and used highly similar wording in survey questions, we statistically compared responses with chi-squared or t-tests using all data from this survey combined (coastal Oregonians, non-coastal Oregonians, and non-Oregonians).

In Section 8, we used generalized linear models to determine which variables predicted marine reserve awareness, perceived marine reserve knowledge, and whether a respondent visited Yachats. For marine reserve awareness and Yachats visitation, we used a binomial family with a logit link because the response was binomial (yes or no). For perceived marine reserve knowledge, we used a Poisson family with a log link because the data behaved like count data (discrete, positive and right skewed). To determine which variables predicted marine reserve awareness and perceived marine reserve knowledge, we included the variables frequency of visitation to Cape Perpetua, where the respondent preferred to obtain information about Cape Perpetua, whether the respondent indicated they have visited a marine reserve, and the respondent's residence, age and education level. To determine which variables predicted Yachats visitation, we included the variables primary activity at Cape Perpetua, and the respondent's residence, age, and education level. We used stepwise regression to determine the best model. Stepwise regression adds and subtracts each variable from the model one at a time to determine how each variable affects the model and then produces the best model (lowest Akaike information criterion [AIC]).

In Section 9, we compared respondent demographics and survey responses between the summer months (June 21 – September 22, 2018 and June 21 – September 23, 2019) and the non-summer months (November 2017 – June 20, 2018, September 23, 2018 – June 20, 2019, and September 24, 2019 – November 4, 2019). When the results were proportions (e.g. proportion of respondents staying overnight on the coast) we used chi-squared tests to compare responses. When the results were averages (e.g. average number of nights respondents stay on the coast) we used t-tests to compare responses.

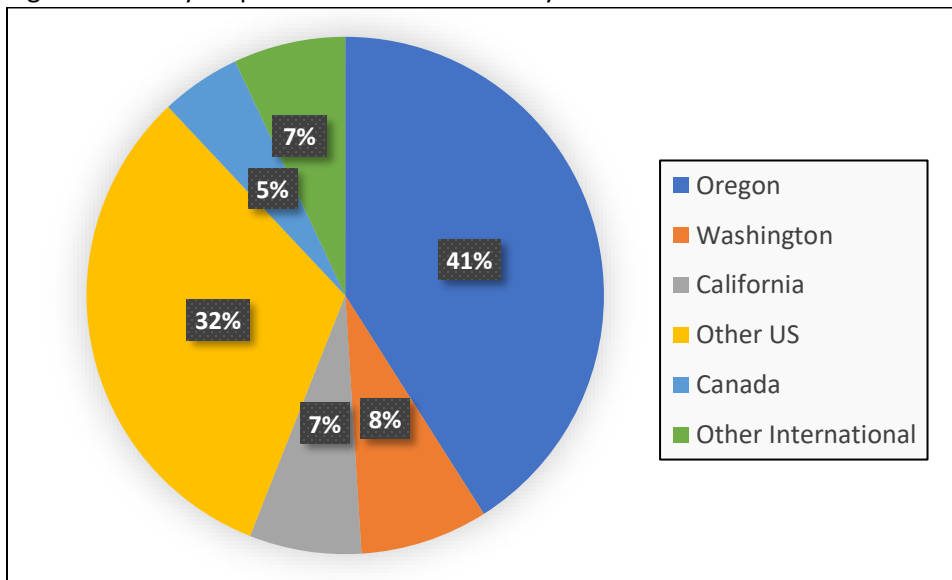
Results

We collected 919 surveys, 66 of which were coastal residents, 275 non-coastal Oregon residents, and 491 non-Oregon residents (87 respondents did not respond to the residence question).

Section 1. Demographics and values

Considering all respondents, 41% of respondents were Oregon residents, 8% were from Washington, 7% were from California, and 12% were international visitors (Figure 2). The largest proportion of international visitors were from Canada (5%).

Figure 2. Survey respondents' state or country of residence



The average respondent age was 50 years, which did not vary among groups. More female (56-60%) than male (39-43%) or non-binary (1-2%) visitors completed surveys in each group. The average level of education was between 16 – 17 years, which likely represents completion of a four-year undergraduate program.

On average, respondents in each group leaned toward the protectionist side on the protection – use continuum. We recoded the agreement scale so that -2 was strongly disagree and +2 was strongly agree, with neutral being 0 (Table 1). After recoding the scale, we calculated the mean for each statement. The means for the use value statements were negative for all groups, indicating that respondents, on average, disagreed with those statements. In contrast, the means for the protectionist value statement were positive for all groups, indicating that respondents, on average, agreed with those statements. Additionally, we summed the percentage of respondents that indicated they “agreed” or “strongly agreed” with each statement (Table 1). Using this interpretation, we found that few respondents agreed with the use value statements while most respondents agreed with the protectionist value statements.

Taken together, both interpretations of the data indicate that respondents fall toward the protectionist side of the continuum.

Table 1. Percentage in agreement with and mean value for each value statement ^a

| <i>Use value orientation</i> | All | Coastal | Oregon | Other |
|--|---------------------|--------------|--------------|--------------|
| The needs of humans are more important than those of marine areas | 11% Mean = -0.83 | 8% -1.00 | 6% -1.05 | 14% -0.72 |
| The primary value of marine areas is to provide benefits for humans | 12% Mean = -0.93 | 21% -0.65 | 10% -1.06 | 12% -0.91 |
| Marine areas exist primarily to be used by humans | 5% Mean = -1.15 | 6% -1.21 | 3% -1.28 | 6% -1.09 |
| The economic values that marine areas provide for humans are more important than the rights of species in these marine areas | 8% Mean = -0.89 | 12% -0.98 | 6% -1.02 | 8% -0.82 |
| <i>Protectionist value orientation</i> | All | Coastal | Oregon | Other |
| Marine areas should be protected for their own sake rather than to simply meet the needs of humans | 88% Mean = 1.36 | 83% 1.31 | 90% 1.42 | 88% 1.36 |
| Marine areas have value whether humans are present or not | 94% Mean = 1.55 | 98% 1.77 | 96% 1.65 | 93% 1.51 |
| Marine areas should have rights similar to the rights of humans | 57% Mean = 0.58 | 58% 0.60 | 56% 0.57 | 57% 0.59 |
| I object to fishing, harvesting, or collecting species from marine areas because it violates the rights of these species | 33% Mean = 0.07 | 35% 0.06 | 33% 0.07 | 33% 0.05 |

^a First numbers are percentages (%) of respondents who indicated they “agreed” or “strongly agreed” with the statement provided. Second numbers are mean values after recoding scale to -2 strongly disagree to 2 strongly agree, with 0 as neither agree nor disagree.

Section 2. Visitation to the Cape Perpetua area

For approximately half of all respondents (49%), it was their first time visiting the Cape Perpetua area (Table 2). The proportion of first-time visitors was highest among the respondents not from Oregon (68%) and was lowest among coastal residents (9%). For coastal residents, 63% had visited the Cape Perpetua area at least ten times previously, compared to 35% of non-coastal Oregon residents and 7% of non-Oregon residents.

Table 2. Frequency of visitation to Cape Perpetua

| Frequency of visitation | All | Coastal | Oregon | Other |
|-------------------------|-----|---------|--------|-------|
| First visit | 49% | 9% | 26% | 68% |
| 2-10 visits | 30% | 28% | 39% | 26% |
| 11-25 visits | 9% | 36% | 14% | 3% |
| 26-50 visits | 5% | 8% | 11% | 1% |
| More than 50 visits | 6% | 19% | 10% | 3% |

Respondents from all groups indicated that general beach recreation and hiking were the primary activities they participated in when visiting the Cape Perpetua area (Table 3). Very few respondents indicated their primary activity was fishing or water recreation.

Table 3. Primary activity visitors participate in when visiting Cape Perpetua

| Activity | All | Coastal | Oregon | Other |
|------------------|-----|---------|--------|-------|
| Fishing | 0% | 0% | 0% | 0% |
| Water Recreation | 1% | 0% | 1% | 0% |
| Beach Recreation | 29% | 32% | 35% | 24% |
| Tide Pooling | 8% | 7% | 8% | 9% |
| Wildlife Viewing | 13% | 7% | 11% | 16% |
| Hiking | 30% | 34% | 33% | 28% |
| Other | 19% | 20% | 11% | 23% |

Compared to physical activity in their day-to-day life, 50% of coastal residents indicated their level of physical activity at Cape Perpetua was greater (Table 4). Non-Oregon residents had the lowest proportion of respondents that indicated higher activity at Cape Perpetua (36%). Across all groups, few respondents reported a lower level of physical activity at Cape Perpetua than their day-to-day life (11-13%).

Table 4. Level of physical activity at Cape Perpetua compared to level of physical activity in day-to-day life

| Level of physical activity | All | Coastal | Oregon | Other |
|----------------------------|-----|---------|--------|-------|
| More at Cape Perpetua | 38% | 50% | 42% | 36% |
| Less at Cape Perpetua | 13% | 11% | 12% | 13% |
| About the same | 49% | 39% | 47% | 51% |

Nearly three-quarters of all respondents (73%) reported health benefits resulting from their visit to Cape Perpetua (Table 5). This number was highest for coastal residents (91%) and lowest for non-Oregon residents (66%).

Table 5. Percentage of respondents that reported health benefits resulting from visit to Cape Perpetua

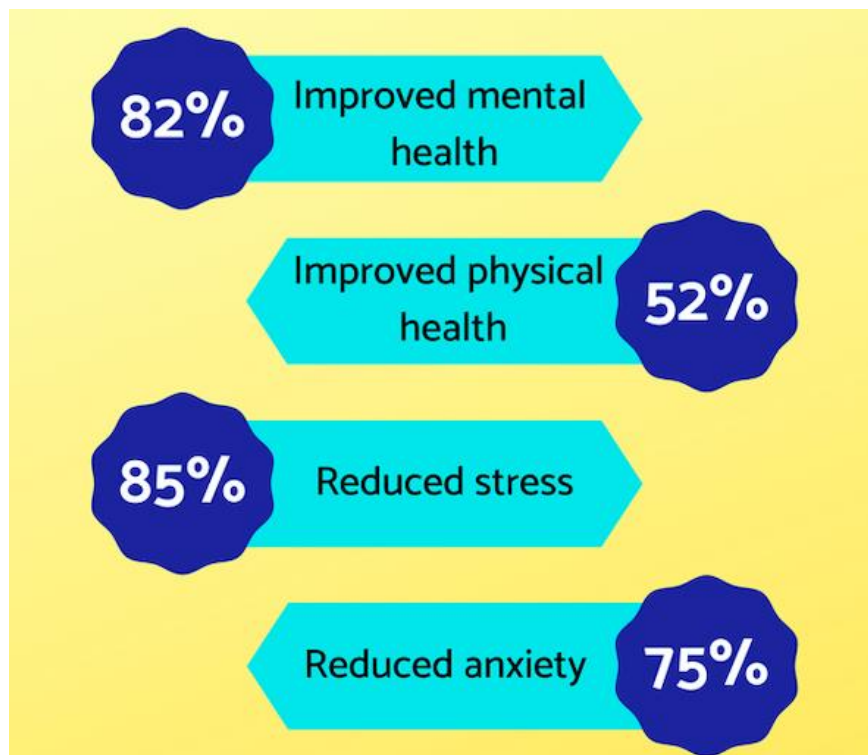
| Health benefits from visit | All | Coastal | Oregon | Other |
|----------------------------|-----|---------|--------|-------|
| Yes | 73% | 91% | 85% | 66% |
| No | 27% | 9% | 15% | 34% |

To interpret health benefit responses, we summed the percentage of respondents that indicated a “4” or “5” on the scale asking to what degree their visit to Cape Perpetua resulted in a health benefit, “5” being their visit resulted in a specific health benefit “a great deal” (Table 6). For each of the health benefits listed, over half of all respondents indicated they received that benefit (e.g. stress reduction) from their visit to Cape Perpetua. Coastal residents were most likely to report health benefits from their visit. Non-Oregon residents were the least likely to report health benefits. Nevertheless, approximately half of all Non-Oregon residents still reported receiving each benefit option listed.

Table 6. Health benefits resulting from visiting Cape Perpetua ^a

| Health benefit | All | Coastal | Oregon | Other |
|--|-----|---------|--------|-------|
| Reducing your stress | 85% | 86% | 87% | 86% |
| Improving your level of physical fitness | 51% | 64% | 52% | 48% |
| Improving your physical health | 52% | 66% | 51% | 50% |
| Improving your mental health | 82% | 84% | 84% | 81% |
| Reducing your anxiety | 75% | 84% | 78% | 75% |

^a Cell entries are percentages of respondents who indicated a 4 or 5 on a scale from 1 “Not at all” to 5 “A great deal”.



Section 3. Information sources

Respondents primarily used family and friends and the internet to obtain information about the Cape Perpetua area (Table 7). Coastal residents were more likely to also use science education (19%) and social media sources (17%) to obtain information; however, they were least likely to use the internet (33%). Non-Oregon residents were least likely to use family and friends (34%) or social media (8%) to obtain information.

Table 7. Information sources respondents used to obtain information about Cape Perpetua

| Information source | All | Coastal | Oregon | Other |
|--------------------|-----|---------|--------|-------|
| Newspaper | 3% | 7% | 6% | 1% |
| Magazine | 13% | 14% | 12% | 13% |
| Other print media | 15% | 9% | 14% | 16% |
| Family/friends | 42% | 50% | 55% | 34% |
| Science education | 5% | 19% | 7% | 2% |
| Radio | 1% | 3% | 1% | 0% |
| Internet | 53% | 33% | 52% | 56% |
| Social media | 10% | 17% | 13% | 8% |
| Television | 2% | 0% | 4% | 1% |
| Other | 23% | 33% | 24% | 24% |

The majority of respondents (59%) would prefer to obtain information about Cape Perpetua from the internet (Table 8). Nearly one-quarter of coastal residents would prefer to obtain information via social media, but this proportion was lower for non-coastal Oregon residents (11%) and non-Oregon residents (7%).

Table 8. Respondents' preferred information source to obtain information about Cape Perpetua

| Information source | All | Coastal | Oregon | Other |
|--------------------|-----|---------|--------|-------|
| Newspaper | 2% | 6% | 2% | 1% |
| Magazine | 5% | 2% | 5% | 5% |
| Other print media | 4% | 6% | 1% | 6% |
| Family/friends | 9% | 6% | 9% | 10% |
| Science education | 3% | 6% | 2% | 3% |
| Radio | 2% | 2% | 4% | 2% |
| Internet | 59% | 40% | 57% | 61% |
| Social media | 9% | 23% | 11% | 7% |
| Television | 3% | 2% | 6% | 2% |
| Other | 3% | 8% | 3% | 3% |

Section 4. Marine reserve awareness

Approximately two-thirds of all coastal and non-coastal Oregon respondents indicated they had visited an Oregon marine reserve (Table 9). This number was much lower for non-Oregon residents (31%). Across all groups, approximately one-fifth of respondents reported that they were unsure if they had ever visited an Oregon marine reserve.

Table 9. Visitation to an Oregon marine reserve

| Visited an Oregon marine reserve? | All | Coastal | Oregon | Other |
|-----------------------------------|-----|---------|--------|-------|
| No | 36% | 16% | 14% | 51% |
| Yes | 44% | 63% | 65% | 31% |
| Unsure | 20% | 22% | 21% | 19% |

Approximately half of all coastal residents (53%) and non-coastal Oregon residents (49%) were aware that Cape Perpetua was a marine reserve, compared to 28% for non-Oregon residents (Table 10).

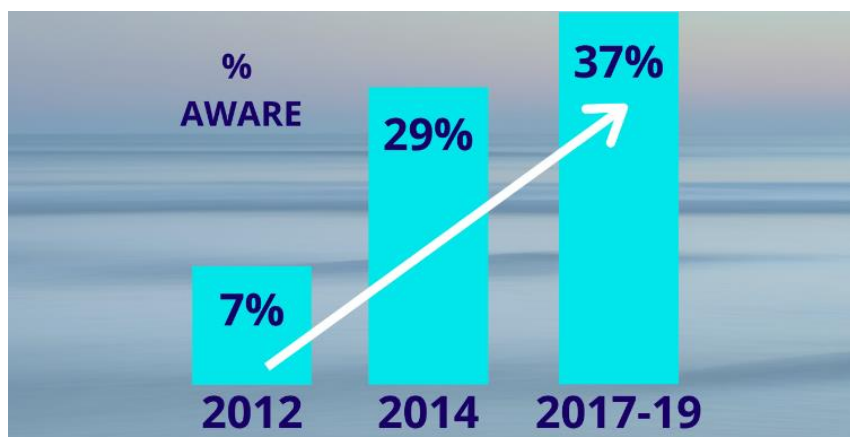
Table 10. Awareness of Cape Perpetua Marine Reserve

| Marine reserve awareness | All | Coastal | Oregon | Other |
|--------------------------|-----|---------|--------|-------|
| No | 63% | 47% | 51% | 72% |
| Yes | 37% | 53% | 49% | 28% |

Coastal residents reported the highest levels of perceived knowledge about marine reserves, with 37% of respondents reporting having ‘moderate’ or ‘extreme’ levels of knowledge about Oregon marine reserves compared to 24% for non-coastal Oregon residents (Table 11). Non-Oregon residents reported the lowest levels of perceived knowledge with 59% of respondents indicating they were not knowledgeable about Oregon marine reserves.

Table 11. Perceived knowledge about Oregon marine reserves

| Perceived marine reserve knowledge | All | Coastal | Oregon | Other |
|------------------------------------|-----|---------|--------|-------|
| Not Knowledgeable | 47% | 27% | 30% | 59% |
| Slightly Knowledgeable | 37% | 36% | 46% | 32% |
| Moderately Knowledgeable | 14% | 26% | 23% | 8% |
| Extremely Knowledgeable | 2% | 11% | 1% | 2% |



Section 5. Trip characteristics and expenditures

The most common group visiting Cape Perpetua consisted of two adults (Table 12). Coastal residents tended to have smaller groups (mode of 1 adult) with more seniors (0.62) and fewer youths (0.30).

Table 12. Number of people by age category visiting Cape Perpetua with respondent

| Group size | All | Coastal | Oregon | Other |
|---------------|------|---------|--------|-------|
| Youth (0-17) | 0.47 | 0.3 | 0.48 | 0.5 |
| Adult (18-64) | 1.72 | 1.17 | 1.93 | 1.67 |
| Senior (65+) | 0.55 | 0.62 | 0.54 | 0.53 |

^a Removed one outlier of 60 youth reported.

Approximately three-quarters of all respondents (76%) were staying overnight on the Oregon coast during their trip (Table 13). This number was highest for non-Oregon residents (84%). On average, respondents stayed 4 nights on the Oregon coast. By group, non-coastal Oregon residents stayed an average of 3 nights while non-Oregon residents stayed an average of 5 nights.

Table 13. Percentage of respondents staying overnight on the Oregon coast ^{a,b}

| Staying overnight? | All | Oregon | Other |
|--------------------|-----|--------|-------|
| Yes | 76% | 72% | 84% |
| No | 24% | 28% | 16% |

^a Coastal residents were not included as they live on the Oregon coast.

^b Respondents who reported staying more than 30 nights on the Oregon coast were removed as outliers.

Newport (22%), Yachats (29%), and Florence (25%) hosted the largest proportion of all respondents (Table 14). More non-coastal Oregon respondents stayed in Yachats than non-Oregon respondents (40% vs 26%) while fewer non-coastal Oregon respondents stayed in Newport than non-Oregon respondents (15% vs 26%).

Table 14. Communities respondents stayed in during visit to the Oregon coast ^a

| Town | All | Oregon | Other |
|--------------|-----|--------|-------|
| Lincoln City | 11% | 7% | 12% |
| Depoe Bay | 4% | 3% | 5% |
| Newport | 22% | 15% | 26% |
| Waldport | 10% | 11% | 9% |
| Yachats | 29% | 40% | 26% |
| Florence | 25% | 20% | 25% |
| Coos Bay | 8% | 5% | 10% |
| Other | 22% | 12% | 28% |

^a Coastal residents were not included as they live on the Oregon coast.

Over half of all respondents indicated they spent money on groceries (67%), lodging (64%), restaurants (79%), and fuel (71%) (Table 15). Of those respondents that spent money on the aforementioned items,

they spent on average \$88 on groceries, \$423 on lodging, \$134 on restaurants, and \$70 on fuel. Non-Oregon residents were more likely to spend money on all items than non-coastal Oregon residents, and non-Oregon residents' average expenditures were typically higher than non-coastal Oregon residents.

Table 15. Percentage of respondents who spent money on each item during their trip and average expenditures ^{a,b}

| Expenditure | | All | Oregon | Other |
|-----------------------------------|---------|-------|--------|-------|
| Grocery ^c | No | 33% | 40% | 27% |
| | Yes | 67% | 60% | 73% |
| | Average | \$88 | \$55 | \$109 |
| Lodging ^d | No | 36% | 39% | 29% |
| | Yes | 64% | 61% | 71% |
| | Average | \$423 | \$355 | \$462 |
| Restaurant | No | 21% | 23% | 16% |
| | Yes | 79% | 77% | 84% |
| | Average | \$134 | \$104 | \$160 |
| Fuel for car or boat ^e | No | 29% | 39% | 21% |
| | Yes | 71% | 61% | 79% |
| | Average | \$70 | \$50 | \$83 |
| Fees and licenses ^f | No | 55% | 55% | 52% |
| | Yes | 45% | 45% | 48% |
| | Average | \$23 | \$16 | \$27 |
| Retail items ^g | No | 51% | 56% | 45% |
| | Yes | 49% | 44% | 55% |
| | Average | \$64 | \$47 | \$72 |
| Recreational gear rentals | No | 93% | 97% | 90% |
| | Yes | 7% | 3% | 10% |
| | Average | \$123 | \$185 | \$120 |

^a Coastal residents were not included as they live on the Oregon coast.

^b Average expenditures were calculated from respondents who indicated they spent money on that item.

^c Removed one outlier above \$5,000 for groceries.

^d Removed three outliers above \$10,000 for lodging.

^e Removed one outlier above \$1,500 for fuel.

^f Removed two outliers above \$300 for fees and licenses.

^g Removed one outlier above \$1,000 for retail items.

Section 6. Yachats services and satisfaction

The same proportion of coastal residents and non-coastal Oregon residents (62%) visited Yachats during their trip to the Oregon coast (Table 16). Comparatively, only 51% of non-Oregon residents visited Yachats during their trip.

Table 16. Proportion of respondents that visited Yachats during their trip to the Oregon coast

| Visit Yachats? | All | Coastal | Oregon | Other |
|----------------|-----|---------|--------|-------|
| Yes | 55% | 62% | 62% | 51% |
| No | 45% | 38% | 38% | 49% |

Respondents who visited Yachats during their trip generally reported satisfaction with their visit (87%) (Table 17). Dissatisfaction with Yachats was extremely low, with the highest proportion of respondents reporting dissatisfaction (3%) belonging to the non-Oregon residents group.

Table 17. Respondents' satisfaction with Yachats visit ^a

| Satisfaction with Yachats | All | Coastal | Oregon | Other |
|---------------------------|-----|---------|--------|-------|
| Strongly Dissatisfied | 1% | 0% | 0% | 1% |
| Slightly Dissatisfied | 2% | 0% | 2% | 2% |
| Neither | 10% | 16% | 7% | 11% |
| Slightly Satisfied | 21% | 24% | 19% | 23% |
| Extremely Satisfied | 66% | 61% | 72% | 63% |

^a Percentages calculated from respondents that visited Yachats.

From those respondents that visited Yachats during their trip, 26% indicated increased food and beverage options would have improved their visit (Table 18). Both non-coastal Oregon residents and non-Oregon residents indicated increased lodging options would have improved their visit. Coastal residents reported they would appreciate more recreational outfitters (13%) and recreational gear rental businesses (21%), though these services were less important to the other groups.

Table 18. Percentage of respondents who indicated increases in the following services would have improved their visit to Yachats ^a

| Service | All | Coastal | Oregon | Other |
|-------------------------------------|-----|---------|--------|-------|
| More food/beverage options | 26% | 21% | 29% | 25% |
| More lodging options | 9% | 0% | 11% | 11% |
| More family friendly activities | 10% | 15% | 12% | 8% |
| More recreational outfitters/guides | 8% | 13% | 6% | 9% |
| More recreational gear rentals | 9% | 21% | 6% | 9% |
| Other | 12% | 10% | 18% | 9% |

^a Percentages calculated from respondents that visited Yachats.

Based on responses from respondents that did not visit Yachats, increases in any of the following services would not convince a large proportion of them to visit Yachats (Table 19). The largest proportion of all respondents (17%) indicated increases in food and beverage options would convince them to visit Yachats. For both coastal residents and non-coastal Oregon residents, 14-15% indicated increases in family friendly activities would convince them to visit Yachats.

Table 19. Percentage of respondents who indicated increases in the following services would have convinced them to visit Yachats ^a

| Service | All | Coastal | Oregon | Other |
|-------------------------------------|-----|---------|--------|-------|
| More food/beverage options | 17% | 14% | 22% | 13% |
| More lodging options | 9% | 14% | 10% | 7% |
| More family friendly activities | 11% | 14% | 15% | 10% |
| More recreational outfitters/guides | 6% | 7% | 7% | 7% |
| More recreational gear rentals | 5% | 7% | 5% | 5% |
| Other | 8% | 7% | 14% | 4% |

^a Percentages calculated from respondents that did not visit Yachats.

Section 7. Comparison with previous surveys

The questions included in this survey were derived from previous surveys of coastal visitors, coastal residents, and Oregon residents. In this section, we compared responses between the relevant questions from this survey and previous comparable surveys. We visually compared survey responses with percentage tables and we statistically compared survey responses with chi-squared or t-tests where appropriate. The comparable surveys include, 1) a 2012-2013 mail survey distributed to coastal residents to assess perceptions of the Oregon marine reserves (Needham et al. 2013), 2) a 2016 mail survey distributed to residents along Oregon’s I-5 corridor to assess perceptions of the Oregon marine reserves (Needham et al. 2016), 3) a 2012 visitor intercept survey of Cape Perpetua visitors administered by ODFW (Swearingen et al. 2017), 4) a 2014 visitor intercept survey of Cape Perpetua visitors administered by ODFW (Swearingen et al. 2016a), 5) a 2016 visitor intercept survey administered coastwide by ODFW (Epperly et al. 2017), and 6) a 2017 visitor intercept survey administered at coastal state parks by OPRD (Bergerson 2019). Where the comparable questions were from the Needham et al. coastal and I-5 corridor resident surveys, we presented this report’s survey data separated out by coastal and non-coastal Oregon residents for better comparison purposes. Where the comparable questions were from the other listed surveys of coastal visitors, we presented this report’s survey data compositely for comparison purposes. Where the survey questions slightly differ, we noted and explained the differences in the table footnotes.

The mean age (48-52 years) and years of education (16-17 years) were similar across all surveys (Table 20). Similar proportions of respondents in this survey were residents of Oregon (41-43%), Washington (8-9%), and California (7-10%) as compared to the 2014 ODFW survey of Cape Perpetua visitors ($p = 0.62$). However, the 2016 ODFW coastwide visitor intercept survey included fewer Oregon residents (36%, $p = 0.07$) and more Washington residents (17%), while the OPRD coastal state parks visitor intercept survey included significantly more Oregon residents (61%, $p < 0.001$). These differences were likely a factor of survey location, with more Oregon residents visiting coastal Oregon state parks. All

surveys reported a higher proportion of female (52-59%) than male (41-48%) respondents, and there were no significant differences between gender proportions among surveys.

Table 20. Survey comparison: Demographics of coastal visitors ^a

| Demographic | This survey: all data | 2014 ODFW Cape Perpetua visitors | 2016 ODFW coastwide visitors | OPRD coastwide visitors |
|---------------------------|-----------------------|----------------------------------|------------------------------|-------------------------|
| Mean age (years) | 50 | 52 | 48 | 48 |
| Mean education (years) | 17 | 16 | 16 | NA |
| <i>State of residence</i> | | | | |
| Oregon | 41% | 43% | 36% | 61% |
| Washington | 8% | 9% | 17% | 11% |
| California | 7% | 10% | 7% | 10% |
| <i>Gender</i> | | | | |
| Male | 43% | 45% | 48% | 41% |
| Female | 57% | 55% | 52% | 59% |
| Nonbinary | 1% | NA | NA | NA |

^a NA indicates this option was not listed in the survey.

Respondents from all surveys leaned toward the protectionist side on the protection – use continuum (Table 21). We recoded the agreement scale so that -2 was strongly disagree and +2 was strongly agree, with neutral being 0. After recoding the scale, we calculated the mean for each statement. The means for the use value statements were negative for all groups, indicating that respondents, on average, disagreed with those statements. In general, the use value statement means for this survey were greater negative values than the Needham et al. surveys, indicating Cape Perpetua respondents more strongly disagreed with the use value statements than the Needham et al. respondents. In contrast, the means for the protectionist value statement were positive for all groups, indicating that respondents, on average, agreed with those statements. The protectionist value statement means for this survey were larger than the Needham et al. surveys, indicating Cape Perpetua respondents more strongly agreed with the protectionist value statements than the Needham et al. respondents.

In addition, we summed the percentage of respondents that indicated they “agreed” or “strongly agreed” with each statement. Using this interpretation, we found that few respondents agreed with the use value statements while most respondents agreed with the protectionist value statements. In general, a smaller percentage of Cape Perpetua respondents agreed with the use value statements than the Needham et al. respondents. Similarly, a larger percentage of Cape Perpetua respondents agreed with the protectionist value statements than the Needham et al. respondents. Both interpretations of these data indicate that all respondents fall toward the protectionist side of the continuum, and Cape Perpetua respondents generally fall slightly more towards the protectionist side than the Needham et al. respondents.

Table 21. Survey comparison: Percentage in agreement with and mean value for each protection or use value statement ^a

| | This survey: all data | This survey: coastal residents | This survey: non-coastal Oregon residents | Needham et al. coastal residents | Needham et al. I-5 corridor residents |
|--|-----------------------|--------------------------------|---|----------------------------------|---------------------------------------|
| <i>Use value orientation</i> | | | | | |
| The needs of humans are more important than those of marine areas | 11% Mean = -0.83 | 8% -1.00 | 6% -1.05 | 18% -0.48 | 11% -0.76 |
| The primary value of marine areas is to provide benefits for humans | 12% Mean = -0.93 | 21% -0.65 | 10% -1.06 | 24% -0.42 | 15% -0.79 |
| Marine areas exist primarily to be used by humans | 5% Mean = -1.15 | 6% -1.21 | 3% -1.28 | 13% -0.77 | 6% -1.05 |
| The economic values that marine areas provide for humans are more important than the rights of species in these marine areas | 8% Mean = -0.89 | 12% -0.98 | 6% -1.02 | 16% -0.55 | 5% -1.11 |
| <i>Protectionist value orientation</i> | | | | | |
| Marine areas should be protected for their own sake rather than to simply meet the needs of humans | 88% Mean = 1.36 | 83% 1.31 | 90% 1.42 | 68% 0.77 | 79% 1.07 |
| Marine areas have value whether humans are present or not | 94% Mean = 1.55 | 98% 1.77 | 96% 1.65 | 88% 1.22 | 91% 1.38 |
| Marine areas should have rights similar to the rights of humans | 57% Mean = 0.58 | 58% 0.60 | 56% 0.57 | 35% 0.01 | 43% 0.25 |
| I object to fishing, harvesting, or collecting species from marine areas because it violates the rights of these species | 33% Mean = 0.07 | 35% 0.06 | 33% 0.07 | 21% -0.50 | 19% -0.46 |

^a First numbers are percentages (%) of respondents who indicated they “agreed” or “strongly agreed” with the statement provided. Second numbers are mean values after recoding scale to -2 strongly disagree to 2 strongly agree, with 0 as neither agree nor disagree.

Across all surveys, the primary activities visitors reported they participated in on the coast were general beach recreation and hiking (Table 22). The Needham et al. coastal and I-5 corridor studies reported the highest proportions of respondents who engaged in fishing (27% and 15%, respectively) during their visit to the coast. These differences in primary activity results observed between the Needham et al. (2013, 2016) surveys and this Cape Perpetua survey may be a factor of survey methodology. The Needham et al. (2013, 2016) studies used mail surveys to ask Oregon residents their primary activity when they visit the coast. These responses are likely to be different from those given by respondents physically located at Cape Perpetua when completing a visitor intercept survey.

Table 22. Survey comparison: Primary activity at Oregon coast or respondent location ^a

| Activity | This survey all data | This survey: coastal residents | This survey: non-coastal Oregon residents | Needham et al. coastal residents ^b | Needham et al. I-5 corridor residents ^b | 2012 ODFW Cape Perpetua visitors ^c | 2014 ODFW Cape Perpetua visitors ^d | 2016 ODFW coastwide visitors ^e | OPRD coastwide visitors ^f |
|------------------|----------------------|--------------------------------|---|---|--|---|---|---|--------------------------------------|
| Fishing | 0% | 0% | 0% | 27% | 15% | 1% | 11% | 3% | 1% |
| Water Recreation | 1% | 0% | 1% | 10% | 9% | 0% | 6% | 3% | 17% |
| Beach Recreation | 29% | 32% | 35% | NA | NA | 13% | 51% | 73% | 16% |
| Tide Pooling | 8% | 7% | 8% | 8% | 17% | NA | 0% | NA | 3% |
| Wildlife Viewing | 13% | 7% | 11% | 16% | 11% | 65% | 6% | 11% | 1% |
| Hiking | 30% | 34% | 33% | NA | NA | NA | 10% | NA | 24% |
| Other | 19% | 20% | 11% | 39% | 48% | 21% | 16% | 10% | 38% |

^a NA indicates this activity was not listed as an option in the survey.

^b The Needham et al. 2013 coastal resident and 2016 I-5 corridor resident surveys asked respondents to identify their primary activity on the Oregon coast. These surveys contained additional activity options not included in the Cape Perpetua survey, which have been grouped into the “other” category.

^c The 2012 ODFW Cape Perpetua visitor intercept survey asked respondents to identify the main purpose of their trip to the Oregon coast.

^d The 2014 ODFW Cape Perpetua visitor intercept survey asked respondents to identify their primary activity at Cape Perpetua.

^e The 2016 ODFW coastwide visitor intercept survey asked respondents to identify their primary activity on the Oregon coast.

^f The 2017 OPRD coastwide visitor intercept survey asked respondents to identify their primary activity at the state park where they were being surveyed. This survey contained additional activity options not included in the Cape Perpetua survey, which have been grouped into the “other” category.

There were significant differences in the proportions of respondents that selected each level of physical activity between the Cape Perpetua survey and the OPRD coastwide visitor intercept survey ($p < 0.001$). More respondents in the Cape Perpetua survey indicated that their level of physical activity at Cape Perpetua was more than their day-to-day life compared to the OPRD state park visitors (Table 23). Additionally, nearly twice as many (22% vs 13%) OPRD state park respondents indicated their level of activity at the state park was lower than their day-to-day life.

Table 23. Survey comparison: Level of physical activity at survey location compared to level of physical activity in day-to-day life

| Level of physical activity | This survey: all data | OPRD coastwide visitors ^a |
|----------------------------|--------------------------|---|
| More at survey location | 38% | 32% |
| Less at survey location | 13% | 22% |
| About the same | 49% | 46% |

^a The 2017 OPRD coastwide visitor intercept survey asked respondents about their level of physical activity at the state park where they were being surveyed relative to their day-to-day life.

To interpret health benefit responses for this Cape Perpetua survey, we summed the percentage of respondents that indicated a “4” or “5” on the scale indicating the degree to which their visit to Cape Perpetua resulted in a health benefit, “5” being their visit resulted in a specific health benefit “a great deal” (Table 24). This was the same methodology used in the OPRD coastwide visitor intercept survey. For each of the health benefits listed, over half of all respondents in this survey and in the OPRD survey indicated they received that benefit (e.g. stress reduction) from their visit to the Oregon coast. Significantly more OPRD respondents indicated they received the health benefits “improving your physical health” ($p < 0.001$) and “reducing your anxiety” ($p < 0.001$) than Cape Perpetua respondents. While these results are statistically significant, this significance is likely achieved because of the large sample size in both this survey and the OPRD survey. The differences in the proportion of respondents that indicated they received the health benefits “improving your physical health” (this survey 52%, OPRD survey 60%) and “reducing your anxiety” (this survey 75%, OPRD survey 83%) are likely not substantively important.

Table 24. Survey comparison: Health benefits resulting from visit ^a

| Health benefit | This survey: all data | OPRD coastwide visitors ^b |
|--|--------------------------|---|
| Reducing your stress | 85% | 88% |
| Improving your level of physical fitness | 51% | 52% |
| Improving your physical health | 52% | 60% |
| Improving your mental health | 82% | 85% |
| Reducing your anxiety | 75% | 83% |

^a Cell entries are percentages (%) of respondents who indicated a 4 or 5 on a scale from 1 “Not at all” to 5 “A great deal”.

^b The 2017 OPRD coastwide visitor intercept survey asked respondents about health benefits resulting from their visit to the state park where they were surveyed.

Fewer respondents in this survey reported using a variety of sources to gain information than in the comparable surveys (Table 25). Many of the Needham et al. coastal and I-5 corridor residents and the ODFW coastwide visitors used the newspaper, radio, and television as information sources. For comparison, only 1-2% of respondents in this survey used those sources to acquire information on the Cape Perpetua area. The largest proportion of respondents in this survey indicated they used the internet for information, and this trend was also observed in the ODFW coastwide visitor survey and the OPRD state park visitor survey.

Table 25. Survey comparison: Information sources respondents used to obtain information ^a

| Information source | This survey: all data | This survey: coastal residents | This survey: non-coastal Oregon residents | Needham et al. coastal residents ^b | Needham et al. I-5 corridor residents ^b | 2016 ODFW coastwide visitors ^c | OPRD coastwide visitors ^d |
|--------------------|-----------------------|--------------------------------|---|---|--|---|--------------------------------------|
| Newspaper | 3% | 7% | 6% | 80% | 49% | 45% | 21% |
| Magazine | 13% | 14% | 12% | 64% | 38% | 31% | 24% |
| Other print media | 15% | 9% | 14% | 48% ^e | 30% ^e | 12% | 40% ^f |
| Family/friends | 42% | 50% | 55% | 68% | 44% | 33% | 67% |
| Science education | 5% | 19% | 7% | NA | NA | 37% | NA |
| Radio | 1% | 3% | 1% | 63% | 40% | 31% | 16% |
| Internet | 53% | 33% | 52% | 30% ^g | 31% ^g | 81% | 70% |
| Social media | 10% | 17% | 13% | 20% | 22% | 38% | 39% |
| Television | 2% | 0% | 4% | 65% | 47% | 53% | 17% |
| Other | 23% | 33% | 24% | NA | NA | 7% | NA |

^a NA indicates this information source was not listed as an option in the survey.

^b The Needham et al. 2013 coastal resident and 2016 I-5 corridor resident surveys asked respondents to identify their sources for information on Oregon marine reserves. These surveys contained additional source options not included in the Cape Perpetua survey.

^c The 2016 ODFW coastwide visitor intercept survey asked respondents to identify their sources for information on ocean related issues.

^d The 2017 OPRD coastwide visitor intercept survey asked respondents to identify their sources for information used when considering visiting the state park where they were being surveyed. This survey contained additional source options not included in the Cape Perpetua survey.

^e Other print media option in survey was fishing regulation brochures.

^f Multiple print media options were listed so this percentage is at least 40%.

^g Multiple internet options were listed so this percentage is at least 30% for coastal residents and 31% for I-5 corridor residents.

The majority of respondents in this survey (59%) indicated that the internet was their preferred source of information, which was also the preferred source for the 2016 ODFW coastwide visitors (43%) and the OPRD state park visitors (59%) (Table 26). The Needham et al. coastal and I-5 corridor residents showed a greater variety of preferred sources, with the newspaper (21% and 26%, respectively) and television (25% and 20%, respectively) showing up as top preferred sources. Nearly one-quarter of the coastal residents from this survey indicated social media was their preferred source of information, while this number was only 1% for coastal residents surveyed by Needham et al. (2013).

We were only able to statistically compare the current Cape Perpetua survey with the 2016 ODFW coastwide visitor intercept survey because both surveys used the same distribution methods and the information sources listed were the same for both surveys. There were significant differences in the

proportion of respondents using each information source as their preferred source ($p < 0.001$). More respondents at Cape Perpetua were using family/friends and the internet, while more of the 2016 ODFW coastwide respondents were using the newspaper, science education resources, and television. These differences may be a factor of differences in the survey wording. The Cape Perpetua survey asked respondents where they obtain information about Cape Perpetua, and this information is likely often used for travel purposes. In contrast, the 2016 ODFW coastwide survey asked respondents where they obtain information on ocean related issues. Following newsworthy topics is likely more often accomplished with sources such as the newspaper, science education, radio and television, while learning about travel opportunities is likely more often accomplished through internet searches and conversations with friends and family.

Table 26. Survey comparison: Preferred information source to obtain information ^a

| Information source | This survey: all data | This survey: coastal residents | This survey: non-coastal Oregon residents | Needham et al. coastal residents ^b | Needham et al. I-5 corridor residents ^b | 2016 ODFW coastwide visitors ^c | OPRD coastwide visitors ^d |
|--------------------|-----------------------|--------------------------------|---|---|--|---|--------------------------------------|
| Newspaper | 2% | 6% | 2% | 26% | 21% | 9% | 1% |
| Magazine | 5% | 2% | 5% | 7% | 6% | 4% | 1% |
| Other print media | 4% | 6% | 1% | 6% ^e | 6% ^e | 2% | 5% |
| Family/friends | 9% | 6% | 9% | 1% | 1% | 1% | 16% |
| Science education | 3% | 6% | 2% | NA | NA | 9% | NA |
| Radio | 2% | 2% | 4% | 5% | 14% | 6% | 2% |
| Internet | 59% | 40% | 57% | 11% | 14% | 43% | 59% |
| Social media | 9% | 23% | 11% | 1% | 8% | 8% | 5% |
| Television | 3% | 2% | 6% | 25% | 20% | 17% | 1% |
| Other | 3% | 8% | 3% | 18% | 12% | 1% | 10% |

^a NA indicates this information source was not listed as an option in the survey.

^b The Needham et al. 2013 coastal resident and 2016 I-5 corridor resident surveys asked respondents to identify their sources for information on Oregon marine reserves. These surveys contained additional source options not included in the Cape Perpetua survey, which have been grouped into the “other” category.

^c The 2016 ODFW coastwide visitor intercept survey asked respondents to identify their sources for information on ocean related issues.

^d The 2017 OPRD coastwide visitor intercept survey asked respondents to identify their sources for information used when considering visiting the state park where they were being surveyed. This survey contained additional source options not included in the Cape Perpetua survey which have been grouped into the “other” category.

^e Other print media option in survey was fishing regulation brochures.

The proportions of coastal and non-coastal Oregon residents from this survey that indicated they had visited a marine reserve (63% and 65%, respectively) were similar to the proportions of coastal and I-5 corridor residents from the Needham et al. surveys (67% and 60%, respectively) (Table 27).

Table 27. Survey comparison: Visitation to an Oregon marine reserve ^a

| Visited an Oregon marine reserve? | This survey: all data | This survey: coastal residents | This survey: non-coastal Oregon residents | Needham et al. coastal residents | Needham et al. I-5 corridor residents |
|-----------------------------------|-----------------------|--------------------------------|---|----------------------------------|---------------------------------------|
| No | 36% | 16% | 14% | 33% | 40% |
| Yes | 44% | 63% | 65% | 67% | 60% |
| Unsure | 20% | 22% | 21% | NA | NA |

^a NA indicates this answer was not listed as an option in the survey.

A greater proportion of respondents were aware that Cape Perpetua was a marine reserve in this survey than in the 2014 ODFW survey of Cape Perpetua visitors (37% vs 29%) (Table 28). However, the difference in proportion of respondents aware of Cape Perpetua Marine Reserve between 2014 and the current survey is not significant ($p = 0.10$). Awareness has grown significantly since the 2012 ODFW survey of Cape Perpetua visitors (7%, $p < 0.001$).

Table 28. Survey comparison: Awareness of Cape Perpetua Marine Reserve

| Marine reserve awareness | This survey: all data | 2012 ODFW Cape Perpetua visitors ^a | 2014 ODFW Cape Perpetua visitors |
|--------------------------|-----------------------|---|----------------------------------|
| No | 63% | 93% | 71% |
| Yes | 37% | 7% | 29% |

^a The 2012 ODFW Cape Perpetua visitor intercept survey asked respondents if they were aware that the state will be implementing a marine reserve in this area in a few years.

Similar proportions of coastal residents from this survey indicated they had ‘moderate’ or ‘extreme’ levels of knowledge about marine reserves compared to the Needham et al. coastal residents (37% and 40%, respectively) (Table 29). This pattern also held when comparing this survey’s non-coastal Oregon residents with the Needham et al. I-5 corridor residents (24% and 21%, respectively).

Table 29. Survey comparison: Perceived knowledge about Oregon marine reserves

| Perceived marine reserve knowledge | This survey: all data | This survey: coastal residents | This survey: non-coastal Oregon residents | Needham et al. coastal residents | Needham et al. I-5 corridor residents |
|------------------------------------|-----------------------|--------------------------------|---|----------------------------------|---------------------------------------|
| Not Knowledgeable | 47% | 27% | 30% | 18% | 36% |
| Slightly Knowledgeable | 37% | 36% | 46% | 43% | 43% |
| Moderately Knowledgeable | 14% | 26% | 23% | 37% | 20% |
| Extremely Knowledgeable | 2% | 11% | 1% | 3% | 1% |

Compared to Cape Perpetua visitors surveyed by ODFW in 2014, respondents reported smaller group sizes for each age category in this survey, though these differences were not statistically significant ($p = 0.08$, Table 30).

Table 30. Survey comparison: Number of people by age category visiting Cape Perpetua with respondent

| Group size | This survey: all data | 2014 ODFW Cape Perpetua visitors |
|---------------|--------------------------|--|
| Youth (0-17) | 0.47 | 0.92 |
| Adult (18-64) | 1.72 | 2.4 |
| Senior (65+) | 0.55 | 0.3 |

Approximately three-quarters of respondents indicated they were staying overnight on the Oregon coast both in this survey and in the 2014 ODFW survey of Cape Perpetua visitors (76% and 72%, respectively, $p = 0.56$) (Table 31). The average number of nights spent on the Oregon coast during their trip was slightly higher for respondents from the 2014 survey than this survey (4 and 5 nights, respectively), though this difference was not significant ($p = 0.09$).

Table 31. Survey comparison: Percentage of respondents staying overnight on the Oregon coast and mean number of nights stayed ^a

| Staying overnight? | This survey: all data | 2014 ODFW Cape Perpetua visitors |
|-----------------------|--------------------------|-------------------------------------|
| Yes | 76% | 72% |
| No | 24% | 28% |
| Mean number of nights | 4 | 5 |

^a Respondents who reported staying more than 30 nights on the Oregon coast were removed as outliers.

The greatest proportions of respondents across all surveys indicated they spent money on restaurants and fuel during their trip (Table 32). Two-thirds of respondents across both surveys indicated they spent money on groceries during their trip. The proportion of respondents spending money on each item is relatively similar between this survey and the 2014 survey of Cape Perpetua visitors by ODFW. The amount spent on each item is also relatively similar between the two surveys, with the exception being recreational gear rentals (\$123 for this survey compared to \$46 for the 2014 ODFW survey).

Table 32. Survey comparison: Percentage of respondents who spent money on each item during their trip and average expenditures ^a

| Expenditure | | This survey: all data | 2014 ODFW Cape Perpetua visitors |
|-----------------------------------|---------|--------------------------|-------------------------------------|
| Grocery ^b | No | 33% | 33% |
| | Yes | 67% | 67% |
| | Average | \$88 | \$125 |
| Lodging ^c | No | 36% | 44% |
| | Yes | 64% | 56% |
| | Average | \$423 | \$401 |
| Restaurant | No | 21% | 16% |
| | Yes | 79% | 84% |
| | Average | \$134 | \$178 |
| Fuel for car or boat ^d | No | 29% | 21% |
| | Yes | 71% | 79% |
| | Average | \$70 | \$97 |
| Fees and licenses ^e | No | 55% | 53% |
| | Yes | 45% | 47% |
| | Average | \$23 | \$18 |
| Retail items ^f | No | 51% | 51% |
| | Yes | 49% | 49% |
| | Average | \$64 | \$68 |
| Recreational gear rentals | No | 93% | 86% |
| | Yes | 7% | 14% |
| | Average | \$123 | \$46 |

^a Average expenditures were calculated from respondents who indicated they spent money on that item.

^b Removed one outlier above \$5,000 for groceries.

^c Removed three outliers above \$10,000 for lodging.

^d Removed one outlier above \$1,500 for fuel.

^e Removed two outliers above \$300 for fees and licenses.

^f Removed one outlier above \$1,000 for retail items.

Section 8. Modeling variables that predict marine reserve awareness, perceived marine reserve knowledge, and visitation to Yachats

The best models for predicting both marine reserve awareness and perceived marine reserve knowledge included the variables frequency of visitation to Cape Perpetua and the respondent indicating if they had visited an Oregon marine reserve. Respondents that had visited Cape Perpetua more frequently were more likely to be aware of Cape Perpetua Marine Reserve and perceive their marine reserve knowledge levels as higher than those that had visited Cape Perpetua less frequently ($p < 0.001$ for marine reserve awareness model and $p = 0.03$ for perceived marine reserve knowledge model). Similarly, respondents that indicated they had visited a marine reserve were more likely to be aware of Cape Perpetua Marine Reserve and perceive their marine reserve knowledge levels as higher than those that indicated they had not visited a marine reserve or were unsure if they had visited a marine reserve ($p < 0.001$ for marine reserve awareness model and $p < 0.001$ for perceived marine reserve knowledge model).

The best predictor of whether a respondent had visited Yachats was their place of residence. Residence denotes whether a respondent is a coastal Oregonian, non-coastal Oregonian, or non-Oregonian. Non-coastal Oregonians were significantly more likely to visit Yachats during their trip to the Oregon coast than non-Oregonians. There were no significant differences in Yachats visitation between coastal Oregonians and non-Oregonians or between coastal Oregonians and non-coastal Oregonians.

Section 9. Seasonal differences between survey responses

There were significant differences between survey responses and survey respondents in the summer months (June 21 – September 22, 2018 and June 21 – September 23, 2019) and the non-summer months (November 2017 – June 20, 2018, September 23, 2018 – June 20, 2019, and September 24, 2019 – November 4, 2019). Below we discussed only the significant differences. Responses not included below were not significantly different between the summer and non-summer months.

Significantly more Oregonians were surveyed in the non-summer months (72%) than in the summer months (28%, $p < 0.001$, Table 33). This trend holds true when breaking the Oregonian group into coastal Oregon residents and non-coastal Oregon residents. Significantly more coastal Oregon residents and non-coastal Oregon residents were surveyed in the non-summer months (79% and 68%, respectively) than in the summer months (21% and 32%, respectively, $p < 0.001$, Table 34).

Table 33. Seasonal comparison: Respondent residence (Oregonians and non-Oregonians)

| Residence | Not Summer | Summer | Total |
|---------------|------------|--------|-------|
| Oregonian | 72% | 28% | 100% |
| Non-Oregonian | 55% | 45% | 100% |

Table 34. Seasonal comparison: Respondent residence (Coastal Oregonians, non-coastal Oregonians, and non-Oregonians)

| Residence | Not Summer | Summer | Total |
|-----------------------|------------|--------|-------|
| Coastal Oregonian | 79% | 21% | 100% |
| Non-coastal Oregonian | 68% | 32% | 100% |
| Non-Oregonian | 55% | 45% | 100% |

There were significant differences in respondents' frequency of visitation to the Cape Perpetua area between the summer and non-summer months ($p = 0.02$, Table 35). More respondents in the summer months were visiting Cape Perpetua for the first time. In the non-summer months, 23% of respondents had visited Cape Perpetua at least ten times previously, while this number was only 15% for respondents in the summer months.

Table 35. Seasonal comparison: Frequency of visitation to Cape Perpetua

| Response | Not Summer | Summer |
|----------------|------------|--------|
| 1) First visit | 46% | 55% |
| 2) 2 thru 10 | 31% | 30% |
| 3) 11 thru 25 | 10% | 6% |
| 4) 26 thru 50 | 6% | 3% |
| 5) 51+ | 7% | 6% |
| Total | 100% | 100% |

There were significant differences in respondents' perceived level of marine reserve knowledge between the summer and non-summer months ($p = 0.04$, Table 36). More respondents in the summer months considered themselves not knowledgeable about marine reserves.

Table 36. Seasonal comparison: Perceived marine reserve knowledge

| Knowledge level | Not Summer | Summer |
|-----------------------------|------------|--------|
| 1) Not knowledgeable | 44% | 52% |
| 2) Slightly knowledgeable | 38% | 34% |
| 3) Moderately knowledgeable | 16% | 11% |
| 4) Extremely knowledgeable | 2% | 3% |
| Total | 100% | 100% |

In the summer months, a significantly larger percentage of respondents were staying overnight on the coast during their trip (84% vs. 71%, $p < 0.001$, Table 37). The average number of nights respondents stayed on the coast was also significantly different between the summer and non-summer months ($p = 0.02$). Respondents in the summer reported staying an average of 4.6 nights on the coast while respondents in the non-summer months reported staying an average of 3.8 nights (removed outliers over 30 nights).

Table 37. Seasonal comparison: Percentage of respondents staying overnight on the coast

| Staying overnight? | Not Summer | Summer |
|--------------------|------------|--------|
| 1) Yes | 71% | 84% |
| 2) No | 29% | 16% |
| Total | 100% | 100% |

Discussion

Through this two-year intercept survey of Cape Perpetua visitors, we were able to capture the first comprehensive understanding of Cape Perpetua visitors' marine reserve awareness, demographics, trip characteristics and opinions.

Awareness of Cape Perpetua Marine Reserve by visitors to the area has increased from 7% in summer of 2012 (18 months prior to marine reserve implementation on January 1, 2014, Swearingen et al. 2017) to 29% in 2014 (six months after marine reserve implementation, Swearingen et al. 2016b), to 37% today. We also determined that 53% of coastal residents and 49% of non-coastal residents were aware of the reserve, indicating that the primary audience (Oregonians) was more aware of the reserve than cumulative visitor awareness would suggest. This increase in awareness from 2012 to today demonstrates that outreach efforts to increase awareness from partners of the Cape Perpetua Collaborative and potentially additional organizations have had some success. However, determining which efforts have been most effective is not possible from this survey.

Despite 63% of all visitors indicating they were unaware that Cape Perpetua was a marine reserve, only 47% of all visitors perceived themselves as not knowledgeable about Oregon marine reserves. Therefore, 16% of visitors who indicated they were unaware of Cape Perpetua Marine Reserve still perceive themselves as at least slightly knowledgeable about Oregon marine reserves. This trend was observed when breaking down the data into coastal residents and non-coastal Oregon residents, with a higher proportion of respondents reporting they were unaware of the reserve than the proportion reporting themselves as not knowledgeable about Oregon marine reserves. This discrepancy between awareness of Cape Perpetua Marine Reserve and general Oregon marine reserve knowledge may be explained by respondents' familiarity with another Oregon marine reserve, familiarity with another state's marine reserve system, a perceived general idea of what a reserve system entails, or a perceived idea that their knowledge is greater than it is (i.e. Dunning-Kruger effect; Dunning 2011).

This survey also provided information on respondents' frequency of visitation to Cape Perpetua, which can be used to tailor communication messages to target audiences. The proportion of respondents that had visited Cape Perpetua greater than ten times was 63% for coastal residents and 35% for non-coastal

Oregon residents. People that frequently visit the ocean or live nearby may seek out information on marine resources more often, and therefore have greater knowledge about ocean systems (Duda et al. 2007). However, people that spend more time near the ocean may only have a superficial understanding of ocean systems (Perry et al. 2014). Understanding that this dichotomy exists can be useful when approaching communication efforts with coastal residents or frequent coastal visitors. These groups will likely perceive themselves as knowledgeable about ocean systems, even if their understanding is superficial. Therefore, communication efforts might want to use an approach that acknowledges an understanding of the marine area may have already been formed, whether the understanding is factual or not.

The only two variables that significantly predicted marine reserve awareness and perceived marine reserve knowledge were respondents' frequency of visitation to Cape Perpetua and whether the respondent indicated they had visited a marine reserve. There were no demographic variables (e.g. gender, age, education level) that predicted marine reserve awareness or perceived knowledge, which suggests that there is not one demographic group of coastal visitors that engagement efforts need to target. As previously mentioned, people that spend more time in an area generally perceive themselves as having greater knowledge of that area (Duda et al. 2007, Perry et al. 2014). Therefore, we would expect that respondents who visit Cape Perpetua more frequently are more likely to be aware of Cape Perpetua Marine Reserve and more likely to perceive themselves as knowledgeable about the reserve. The Cape Perpetua Collaborative can use this information to create targeted outreach and engagement efforts. For example, they could increase the number of and accessibility to events held at Cape Perpetua. This would increase the frequency in which people visit the coast, therefore potentially increasing their exposure to marine reserve knowledge or increasing their interest in seeking out information on Oregon marine reserves. Important to keep in mind is that there are likely additional variables influencing marine reserve awareness and perceived knowledge that we did not include in this survey instrument.

Through this survey, the Cape Perpetua Collaborative was able to gather information about visitor demographics and communication preferences, which can be used to more effectively disseminate information to reach the target audiences. The majority of Cape Perpetua visitors were not from Oregon, were around 50 years old, and had completed approximately 16-17 years of education. Most visitors came to the area to participate in general beach recreation and hiking activities.

The majority of visitors used family, friends, and the internet to gather information about Cape Perpetua. While respondents reported using a variety of communication sources, outreach efforts targeted at reaching the broader audience should use the internet for dissemination as this was the preferred Cape Perpetua information source for all visitor respondents. To specifically target coastal residents, outreach efforts could also include social media as 23% of coastal residents reported social media as their preferred information source for Cape Perpetua related information. When asked where coastal residents and I-5 corridor residents obtained information about broader Oregon marine reserves, respondents from the Needham et al. (2013, 2016) surveys also indicated they used fishing brochures, newspapers, and television. These differences in preferred information sources observed between this survey and the Needham et al. (2013, 2016) surveys may be a factor of wording and sample distribution. The Cape Perpetua visitor intercept survey asked respondents their preferred information source for information on the Cape Perpetua area. Those interested in visiting Cape Perpetua are likely to use the internet as a quick means to obtain information about visitor-related

activities (e.g. where to stay, eat, recreate, etc.). However, the Needham et al. (2013, 2016) mail surveys to Oregon residents asked respondents their preferred information source for information on the Oregon marine reserves. Oregonians may be more likely to obtain information on the science, news and management of the marine reserves through information sources that include a variety of local science, news and management information (e.g. newspapers). Combining results from these surveys, organizations can decide where to best appropriate resources for the most effective communication. For example, to disseminate information on Cape Perpetua to non-coastal Oregon residents, an organization may want to use a combination of internet resources for Cape Perpetua specific information (results from this survey) with newspaper articles and television methods for broader Oregon marine reserves information (results from Needham et al. 2016).

To further inform how to frame messages to target audiences, this survey assessed visitors' environmental values on a protection – use continuum. A “frame” refers to how a message is presented to the audience, and framing theory posits that this delivery influences how people process the information presented (Goffman 1974). Understanding the value orientations of target audiences can inform how to create an appropriate frame so the message is perceived as intended by the disseminating organization. On average, respondents in both this survey and the Needham et al. (2013, 2016) surveys tended to disagree with the use value statements and agree with the protectionist value statements. Therefore, to reach the greatest number of respondents, organizations might consider framing marine reserves as a conservation strategy. However, to reach the smaller proportion of respondents that agree more with the use value statements, and may be less likely to support marine reserves, organizations might consider framing marine reserves as a research tool or a management tool for increasing harvestable marine species populations.

Through this survey we learned more about Cape Perpetua visitors' trip characteristics, which is helpful information for coastal businesses. Most Cape Perpetua visitors stay overnight on the Oregon coast, primarily in the communities of Newport, Yachats and Florence. Interesting to note is that one-quarter of respondents stay in Florence, which is approximately 23 miles from Cape Perpetua. Another interesting result is that 40% of non-coastal Oregon residents reported staying in Yachats during their trip, while this number was only 26% for non-Oregon residents. This discrepancy may indicate non-Oregon residents were less aware of lodging and tourism opportunities in Yachats than Oregon residents. Additionally, 51% of non-Oregon residents reported visiting Yachats during their trip, which is 11% less than the 62% of coastal residents and 62% of non-coastal Oregon residents that visited Yachats. In fact, the only variable that predicted whether a respondent visited Yachats was residence (grouped by coastal Oregonian, non-coastal Oregonians, and non-Oregonian). Non-coastal Oregonians were significantly more likely to visit Yachats during their trip than non-Oregonians. Demographics (e.g. age, gender, education) did not influence whether a respondent visited Yachats. The vast majority of respondents that did visit Yachats indicated satisfaction with their visit, with only 3% of respondents reporting they were dissatisfied with their visit. The primary service respondents would like to see more of in Yachats is food and beverage options. Coastal residents would also appreciate more family friendly activities, recreational outfitters, and recreational gear rental businesses.

Respondents reported receiving a variety of health benefits from their visit to Cape Perpetua including reduced stress and anxiety and improved general physical and mental health. The reported perceived health benefits derived from a visit to Cape Perpetua were similar to the responses from visitors at state parks coastwide (Bergerson 2019). These known perceived benefits can be used for marketing purposes

for the general Cape Perpetua region, though not specifically for the marine reserve. For example, businesses can advertise that 85% of visitors reported a reduction in stress resulting from their visit to Cape Perpetua.

Given that respondent demographics in this survey were highly similar to respondent demographics in previous coastal surveys (Swearingen et al. 2016a, Epperly et al. 2017, Bergerson 2019), we believe we have captured a representative sample of coastal visitors. While these comparable surveys were only distributed in the summer, this Cape Perpetua survey was distributed year-round for two years. The main difference we observed between the summer and non-summer months was an increase in Oregonian respondents in the non-summer months. The higher number of Oregonians visiting at least partially explains all significant differences found between responses in the summer and non-summer months. For example, Oregonians are more likely to visit Cape Perpetua due to proximity, which likely explains why more respondents in the summer months (more non-Oregonians) were visiting Cape Perpetua for the first time. Similarly, Oregonians are less likely to stay the night on the coast, presumably because they can typically drive home after a day trip. This likely explains why more respondents in the summer months indicated they were staying overnight on the coast during their trip. This difference is also partially explained by more families taking vacations during the summer months when their children are on a break from school. Lastly, Oregonians consider themselves more knowledgeable about Oregon marine reserves, which explains why perceived knowledge levels are higher in the non-summer months.

This survey has provided extensive information on Cape Perpetua visitors from all seasons. Now that we know marine reserve awareness is increasing with approximately half of Oregonian visitors being aware of Cape Perpetua Marine Reserve, we can begin to assess whether the marine reserve is influencing visitors' trip decisions. One way we may approach this is by including a question on future surveys asking the respondent's trip motive (i.e. their reason for visiting Cape Perpetua) and providing a variety of options for the respondent to select including "to visit a marine reserve". Based on lessons learned and results from this survey, partners of the Cape Perpetua Collaborative wrote a report with suggestions on how to improve the survey instrument and sampling design. This report suggests questions to consider excluding from future survey instruments that would result in a decrease in respondent burden (i.e. the effort and time a respondent uses to complete the survey) and not provide the most widely useable information. This report also suggests questions to amend for clarity purposes and questions to include in future survey instruments to better understand Cape Perpetua visitors. Lastly, this report suggests amendments to the sampling design to increase the number of Oregonian respondents, which are the target audience. For access to the full report, please contact Charlie Plybon at Cplybon@Surfrider.org. The Cape Perpetua Collaborative will adjust the survey instrument and sampling design accordingly and continue to distribute the survey in the Cape Perpetua area.

Literature Cited

Bergerson, T. (2019). *Visitor survey of day use and overnight use at Oregon state park coastal region parks*. Salem, OR: Oregon Parks and Recreation Department. PDF link:

<https://www.oregon.gov/oprd/PLANS/docs/scorp/surveys/2019%20Coastal%20Region%20Survey%20Report.pdf>

Duda, M., Jones, M., Criscione, A., Craun, C., Beppler, T., Winegard, T., Lanier, A., Bissell, S. J., Herrick, J. B. (2007). California residents' opinions on and attitudes toward coastal fisheries and their management, *Responsive Management*, Harrisonburg, VA.

Dunning, D. (2011). Chapter five – The Dunning-Kruger effect: On being ignorant of one's own ignorance. *Advances in Experimental Social Psychology* 44: 247-296.

Epperly, H., Swearingen, T., & Dalaba, J. (2017). *2016 Visitor intercept survey: Coastal visitor ocean awareness*. Newport, OR: Marine Resources Program, Oregon Department of Fish and Wildlife (ODFW). PDF link: <https://oregonmarinereserves.com/content/uploads/2017/03/Visitor-Intercept-2016-Report.pdf>

Goffman, E. (1974). *Frame analysis: an essay on the organization of experience*. New York, NY et al.: Harper & Row.

Needham, M. D., Cramer, L. A., & Perry, E. E. (2013). *Coastal resident perceptions of marine reserves in Oregon*. Final project report for Oregon Department of Fish and Wildlife (ODFW). Corvallis, OR: Oregon State University, Department of Forest Ecosystems and Society; and the Natural Resources, Tourism and Recreation Studies Lab (NATURE). PDF link:

https://oregonmarinereserves.com/content/uploads/2016/02/HDRResearch_Report_CoastalResidentPerceptions_OSU_2013.pdf

Needham, M. D., Cramer, L. A., & Johnston, J. R. (2016). *Resident perceptions of the Oregon marine reserve system*. Final project report for Oregon Department of Fish and Wildlife (ODFW). Corvallis, OR: Oregon State University, Department of Forest Ecosystems and Society; and the Natural Resources, Tourism, and Recreation Studies Lab (NATURE). PDF link:

<https://oregonmarinereserves.com/content/uploads/2016/12/Needham2016.pdf>

Oregon Department of Fish and Wildlife (ODFW). 635-012-0020. *Division 12: Marine reserves and marine protected areas in the territorial sea*. PDF link:

<https://oregonmarinereserves.com/content/uploads/2015/12/OARs.pdf>

Perry, E. E., Needham, M. D., Cramer, L. A., Rosenberger, R. S. (2014). Coastal resident knowledge of new marine reserves in Oregon: the impact of proximity and attachment. *Ocean and Coastal Management* 95: 107-116.

Steel, B. S., Lovrich, N., Lach, D., & Fomenko, V. (2005). *Correlates and consequences of public knowledge concerning ocean fisheries management*. *Coastal Management* 33: 37-52.

Swearingen, T., & Epperly, H. (2016a). *2014 Visitor intercept survey: Cape Perpetua, Otter Rock, and Cascade Head Marine Reserves*. Newport, OR: Marine Resources Program, Oregon Department of Fish

and Wildlife (ODFW). PDF link: <https://oregonmarinereserves.com/content/uploads/2016/12/Visitor-Intercept-2014-Report.pdf>

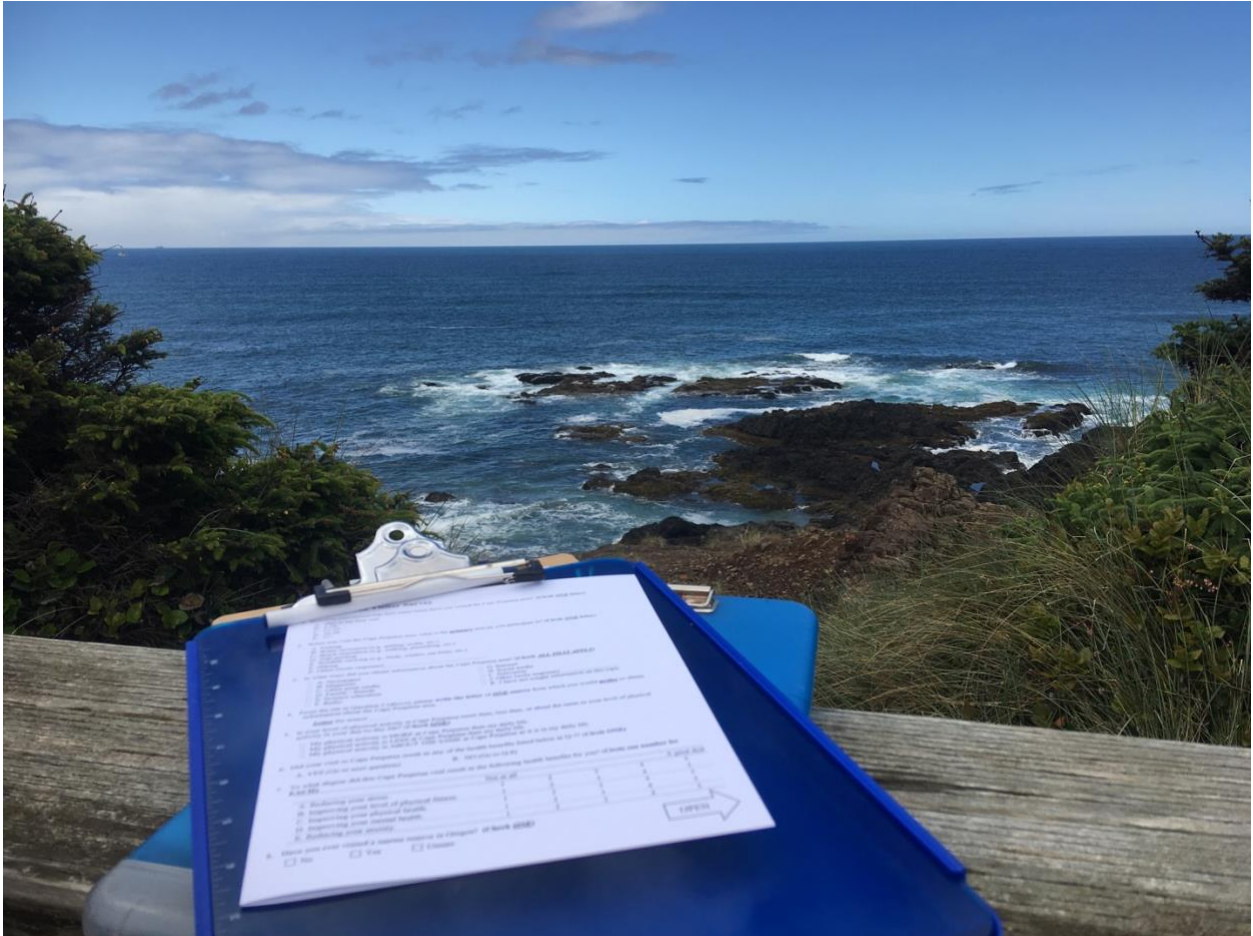
Swearingen, T., & Epperly, H. (2016b). *2015 Visitor intercept survey: Cape Falcon Marine Reserve*. Newport, OR: Marine Resources Program, Oregon Department of Fish and Wildlife (ODFW). PDF link: <https://oregonmarinereserves.com/content/uploads/2016/12/Visitor-Intercept-2015-Report.pdf>

Swearingen, T., Epperly, H., & Polis, H. (2017). *2012-13 Visitor intercept survey: Cape Perpetua, Otter Rock, and Cascade Head Marine Reserves*. Newport, OR: Marine Resources Program, Oregon Department of Fish and Wildlife (ODFW). PDF link: <https://oregonmarinereserves.com/content/uploads/2017/03/Visitor-Intercept-2013-Report.pdf>



Tara Dubois, our fearless Cape Perpetua Collaborative leader and field executor of intercept survey

Appendix S1 – Survey instrument



Nearly 1000 random intercept surveys were conducted over 2 years across 5 sites at Cape Perpetua

24. What is the **highest** level of education that you have achieved? (check **ONE**)

1 2 3 4 5 6 7 8 9 10 11 12
(Elementary thru High school)

13 14 15 16
(College or Technical School)

17 18 19 20 21 22 23 24+
(Graduate or Professional School)

25. Is there anything else you would like to tell us about your visit to the Cape Perpetua area? Please use this space for your comments. We appreciate your cooperation.

| |
|--|
| <p>ADMINISTRATIVE USE ONLY</p> <p>1. Date _____</p> <p>2. Time _____</p> <p>3. Sampling Location: _____</p> |
|--|

1. Including your current visit

- A. This is my first visit
- B. 2-10
- C. 11-25
- D. 26-50
- E. 51+

2. When you visit the Cape Perpetua area, what do you do?

- A. Fishing
- B. Water recreation
- C. Beach recreation
- D. Tide pooling
- E. Wildlife viewing
- F. Hiking
- E. Other (write response)

3. In what ways did you learn about the Cape Perpetua area?

- A. Newspaper
- B. Magazine
- C. Other print media
- D. Family / friends
- E. Science education
- F. Radio

4. From the list in Question 3, check the **Letter** for source of information about the Cape Perpetua area that you used.

Letter for source of information

5. Is your level of physical activity in your day-to-day life:

- My physical activity is low
- My physical activity is moderate
- My physical activity is high

6. Did your visit to Cape Perpetua affect your physical activity level?

- A. YES (Go to next question)

7. To what degree did the visit affect your physical activity level? (check **EACH**)

- A. Reducing your physical activity level
- B. Improving your physical activity level
- C. Improving your physical activity level
- D. Improving your physical activity level
- E. Reducing your physical activity level

8. Have you ever visited Cape Perpetua before?

- No Yes

9. To what extent do you disagree or agree with each of the following statements? (Circle one number for ***EACH***)

| | Strongly Disagree | Disagree | Neither | Agree | Strongly Agree |
|---|-------------------|----------|---------|-------|----------------|
| The needs of humans are more important than those of marine areas. | 1 | 2 | 3 | 4 | 5 |
| The primary value of marine areas is to provide benefits for humans. | 1 | 2 | 3 | 4 | 5 |
| Marine areas exist primarily to be used by humans. | 1 | 2 | 3 | 4 | 5 |
| Marine areas should be protected for their own sake rather than to simply meet the needs of humans. | 1 | 2 | 3 | 4 | 5 |
| Marine areas have value whether humans are present or not. | 1 | 2 | 3 | 4 | 5 |
| I would be offended or upset if there were more limits on human use of marine areas. | 1 | 2 | 3 | 4 | 5 |
| Marine areas should have rights similar to the rights of humans. | 1 | 2 | 3 | 4 | 5 |
| I object to fishing, harvesting, or collecting species from marine areas because it violates the rights of these species. | 1 | 2 | 3 | 4 | 5 |
| The economic values that marine areas provide for humans are more important than the rights of species in these marine areas. | 1 | 2 | 3 | 4 | 5 |
| It is important to take care of marine areas for the future. | 1 | 2 | 3 | 4 | 5 |
| It is important that healthy marine areas exist. | 1 | 2 | 3 | 4 | 5 |
| It is important that future generations can enjoy marine areas. | 1 | 2 | 3 | 4 | 5 |

10. Were you aware that there is a Marine Reserve at Cape Perpetua? (Check ***ONE***)

- No Yes

11. How knowledgeable do you feel about the topic of marine reserves in Oregon? (Check ***ONE***)

- Not Knowledgeable Slightly Knowledgeable Moderately Knowledgeable Extremely Knowledgeable

12. Including yourself, how many people are visiting Cape Perpetua with you? (Write ***ONE*** number for each)

- A. _____ Youth (0-17) B. _____ Adults (18-64) C. _____ Seniors (65+)

13. Is your group staying overnight on the Oregon coast during this trip? (Circle ***ONE***)

- A. YES (Go to next question) B. NO (Go to Q-16)

14. Which town(s) are you staying in? (Check ***ALL THAT APPLY***)

- A. Lincoln City G. Yachats
 B. Depoe Bay H. Florence
 C. Newport I. Coos Bay
 D. Waldport J. Other (write response) _____

15. How many nights will your group stay on the coast on this trip? (Write the number) _____ night(s)

16. Will your group spend the correct letter a

- Grocery store purchases
- Lodging?
- Restaurant dining?
- Fuel for a car or boat
- Fees and licenses (day use, fishing, etc.)
- Items at a retail store (souvenirs, clothing, etc.)
- Recreational gear rental (kayak, bikes, surfboard, etc.)

17. Did you visit Yachats?

A. YES (Go to Q-19)

18. Would increases in any of the following ***THAT APPLY.***

- More Food/Beverage
- More Lodging options
- More Family Friendly
- More Recreation
- More Recreation
- Other (write response)
- None of the above

GO TO Q-21

19. How satisfied or dissatisfied are you?

- Strongly Dissatisfied

20. Would increases in any of the following

- More Food/Beverage
- More Lodging options
- More Family Friendly
- More Recreation
- More Recreation
- Other (write response)
- None of the above

21. Please list your state and county.

A. STATE/COUNTY _____

22. What is your age? _____

23. What is your gender? _____

Appendix S2 – Zip codes for coastal communities

| Town | Zip Code |
|--------------------------|-----------------|
| Arch Cape | 97102 |
| Astoria | 97103 |
| Bandon | 97411 |
| Bay City | 97107 |
| Beaver | 97108 |
| Brookings-Harbor | 97415 |
| Cannon Beach | 97110 |
| Cloverdale | 97112 |
| Coos Bay/Charleston | 97420 |
| Coquille | 97423 |
| Depoe Bay | 97341 |
| Florence | 97439 |
| Gardiner | 97441 |
| Garibaldi | 97118 |
| Gold Beach | 97444 |
| Hebo | 97122 |
| Lakeside | 97449 |
| Lincoln Beach | 97388 |
| Lincoln City | 97367 |
| Manzanita | 97130 |
| Mapleton | 97453 |
| Nehalem | 97131 |
| Neskowin | 97149 |
| Newport | 97365 |
| North Bend | 97459 |
| Otis | 97368 |
| Pacific City | 97135 |
| Port Orford | 97465 |
| Reedsport/Winchester Bay | 97467 |
| Rockaway Beach | 97136 |
| Seal Rock | 97376 |
| Seaside/Gearhart | 97138 |
| Siletz | 97380 |
| Sixes | 97476 |
| South Beach | 97366 |
| Tillamook | 97141 |
| Toledo | 97391 |
| Waldport | 97394 |
| Warrenton | 97146 |
| Westlake | 97493 |
| Wheeler | 97147 |
| Yachats | 97498 |