Oregon's Non-Consumptive Recreational Ocean User Community

Understanding an ocean stakeholder

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Executive summary

Oregon is in the midst of major changes to the way it manages use of the ocean off its shores. Consideration for all stakeholder groups will contribute to defensible decisions regarding the use of ocean and coastal resources. This relies on an understanding of the various stakeholders in ocean resources, which is lacking for some groups.

This research sought to improve the understanding of one such group, which to date has not been thoroughly documented: the non-consumptive recreational ocean user (NROU) community. The NROU group includes surfers, kayakers, boaters, divers, and many others, and it makes economic, cultural, and environmental contributions to Oregon's coastal communities. Members of this group are both residents of coastal communities and visitors from other regions of Oregon, and their numbers are expected to grow.

This report details what we have learned from research about this group as a whole and by the subgroups that comprise this community of interest: what they require for recreation, their values and opinions, and where they are recreating. We also sought to gauge their attitudes toward alternative energy, specifically marine renewable energy, which is an emerging use and stakeholder of the ocean off of Oregon's coast. This new ocean use has the potential to conflict with existing uses, if not carefully planned. Our study aims to provide information on the NROU community to help facilitate sound ocean planning for all uses and users.

Summary of major findings

- Ocean recreation is a highly important part of the lives of the NROU community and it is important to their well-being.
- Residents of Oregon's coastal and inland communities and visitors from out of state and abroad make up the NROU community.
- The NROU community makes important economic and cultural contributions to Oregon's coastal communities. In a sense, they are a renewable resource for Oregon's coastal communities.
- In choosing where to recreate, the NROU community is motivated first by proximity, followed by conditions, accessibility, facilities, crowd levels, aesthetics, and familiarity (order varies by recreation type and individual).
- The NROU community of Oregon enjoys their recreation for fun; experiencing nature and viewing and interacting with wildlife; physical exercise; mental challenge and sense

of accomplishment; and for solitude, escape, and relaxation.

- Longitudinal shoreline structures such as jetties and headlands are some of the most important locations for non-consumptive recreational ocean use. Others include underwater reefs, sandbars, emergent rocks and islands, underwater banks and upwelling areas, density fronts, and river plumes.
- Other factors valued by the NROU community include parking, launch ramps and associated facilities (bathrooms, benches), crossable bars (jetties), charter availability, and trails.
- The NROU community has a keen understanding of and unique connection with the ocean. They are adept at understanding and predicting favorable conditions.
- This group as a whole relies heavily on Internet sources of information (such as regarding conditions), on personal visual observation, and on observation made by family and friends.
- Ocean issues of concern to the NROU community include water quality, marine reserves, fishing regulations, climate change, and marine renewable energy.
- The Oregon NROU community is sensitive to changes in ocean and coastal management such as certain ocean area exclusions, restrictions to access at certain locations on land (access points, facilities), changes in oceanographic characteristics and patterns, and changes to biological communities and habitat.
- Many people participate in multiple forms of ocean recreation that may include additional non-consumptive and consumptive uses. This sort of "crossover" is common in recreation and also exists among Oregon's ocean recreationalists. Some forms of ocean recreation add value to others; crabbing is popular with divers, fishing with boaters, and wildlife-viewing was mentioned by each of our four groups as a valued component to their main type of recreation. Boat-based nature viewers are on the water to encounter wildlife, but so too are waveriders, divers, and boaters.
- There remains much to learn about this community to aid in planning and decision-making.

The NROU community of Oregon enjoys their recreation for fun; experiencing nature and viewing and interacting with wildlife; physical exercise; mental challenge and sense of accomplishment; and for solitude, escape, and relaxation.

The NROU group includes surfers, kayakers, boaters, divers, and many others, and it makes economic, cultural, and environmental contributions to Oregon's coastal communities.

Introduction and context

Oregon is rich with recreational avenues through which to seek thrills, to exercise, or simply to escape. The Northwest generally has higher levels of participation in outdoor recreation than the national average, and Oregon, in particular, is very active. A 2001 study by the Oregon Parks and Recreation Department (OPRD) found that 73 percent of households statewide had recreated outdoors in the previous year (OPRD 2003). Oregon offers mountains, forests, rivers, desert, and the ocean; it is a paradise for outdoor recreation and a land of roof-racked vehicles for good reason.

Ocean recreation, in particular, serves as an example of the hardiness and fortitude of Oregonians. Regular sea temperatures that hover in the low- to mid-50s, near-constant wind, and up to 190 rainy days a year can make the ocean a harsh place to recreate in Oregon (Oregon Climate Service 2009). On the other hand, that same wind is harnessed by sailors and windsurfers and contributes to the regular surf enjoyed by waveriders. Add abundant wildlife, natural beauty, lower crowds than elsewhere on the west coast, and guaranteed public access to the shore, and it's clear: Oregon's coast offers outstanding opportunities for ocean recreation.

To many Oregonians, this is obvious, and various forms of surfing, diving, kayaking, boating, and wildlife watching are all popular in the state's more than 1,000 square miles of ocean and the waters beyond. Driving along Route 101, one is sure to encounter passing vehicles with surfboards and kayaks bound to their roofs. On windy days, the sky may be colored with oversized kites towing kiteboards along the coast. And weekends in Newport, Depoe Bay, Garibaldi, and elsewhere may feature the excited buzz of whale watchers returning from a day on the water.

Surfers, kayakers, kiteboarders, and boat-based nature viewers, along with divers, wind surfers, boaters, and many others, are Oregon's non-consumptive recreational ocean users. They are neighbors and business owners, community leaders and family members, employees and friends. They are an important group of people making economic and cultural contributions to coastal communities, and one with a stake in the outstanding public ocean resources near and far from Oregon's shores. They are often stewards of the beaches and sea, and they are coming to play on the ocean from all over Oregon and beyond. They are also currently underrepresented in the literature, and are poorly understood.

Why study the non-consumptive recreational ocean user (NROU) community?

While some types of ocean use—such as recreational and commercial fishing—have received research attention, little research has been directed at this important community of interest: Oregon's non-consumptive recreational ocean users (NROU). That is, those recreating on the ocean without removing its resources.

Oceans are supporting more human activities than ever before, with more on the horizon. Increasingly, humans are being recognized as a part of the marine ecosystem, rather than as exogenous, or separate, influences. Human interactions with ocean and coastal resources are being incorporated into management decisions with this in mind in what is known as ecosystem-based management (EBM) (McLeod et al. 2005).

The number of people recreating on the ocean off the Oregon coast is growing (OPRD 2003). At the same time, the state has launched several ambitious projects that will reshape the planning and use of its territorial sea. Understanding and including all stakeholders, including the NROU community, in planning and decision-making will be important to the long-term success of ocean resource management and conservation. Stakeholder inclusion is consistent with Oregon's participatory natural resource planning traditions and official mandate with both marine renewable energy and marine-reserves planning, two contemporary ocean planning challenges.

This reshaping of ocean planning falls under the umbrella of what is known as coastal and marine spatial planning (CMSP), an effort to facilitate efficient spatial and temporal allocation of human uses, where productivity and efficiency is maximized and impact and conflict is minimized (Ehler 2008). It is also a tool used to implement an EBM approach to managing these resources. When used properly, CMSP could be used to protect ecologically sensitive areas, site energy installations with minimal impacts, and route shipping lanes to avoid migrating mammals.

CMSP has gained traction nationally. In an overhaul of the way in which

U.S. coasts, oceans, and Great Lakes are managed, President Obama's July 2010 *Final Recommendations of the Interagency Ocean Policy Task Force* lays out marine EBM as the framework to make informed, deliberate, transparent choices among multiple objectives, and CMSP is the way to apply this framework by helping to guide ocean decision-making.

This is important to Oregon, which has a Territorial Sea Plan that contains elements of CMSP and is party to the May 2008 *West Coast Governors' Agreement on Ocean Health Action Plan*. This plan for west coast ocean planning also contains elements of CMSP, and spatial management of the ocean is currently prominent in the state's political conversation.

Documenting a baseline profile of Oregon's NROU community is critical to understanding the needs, values, and contributions of this stakeholder group; to facilitate their engagement in future decision-making; and to make defensible decisions regarding ocean places. Indeed, recognizing the interdependency between ocean resources and ocean users means that identification and understanding of different stakeholders, their practices, expectations, and interests is key to successful CMSP (Pomeroy and Duvier 2008). Research has demonstrated that in making CMSP decisions, understanding and engaging stakeholders can improve trust, communication, and good faith among constituencies (Morin-Dalton 2005, Pomeroy and Duvier 2008). Doing so early and in all stages improves the success of planning efforts by allowing for identification and avoidance of potential problems and resistance (National Oceanic and Atmospheric Administration [NOAA] 2005).

Unfortunately, some information required to make management decisions has typically not been collected by management approaches of the past (Evans and Klinger 2008), and social data is frequently thin.

With Oregon in the midst of a variety of planning challenges, our study was developed to fill the void in information about the NROU community and address a historic lack of regard afforded human dimensions of resource management (Hannah pers. comm., Conway et al. 2010). One such planning challenge in particular, wave energy development, represented an opportunity to highlight the need for this information. While supporters of wave energy development in Oregon point to its role in transitioning to renewable energy, the creation of jobs in coastal communities, and a position for Oregon as a national leader in wave energy, the idea also comes with concerns (Hunter 2009). Apprehensions include potential impact on commercial and recreational fishing and on the environment. Impacts on fishing are routinely considered in wave energy projects globally (Neumann et al. 2006) and in Oregon (Koch 2008). Biological and environmental impacts are also gaining much attention and concern in Oregon (Koch 2008, Hunter 2009). However, information on the impacts on non-consumptive forms of ocean recreation, such as surfing and diving, is lacking.

In September of 2009, Oregon State University researchers launched a baseline study of this group of Oregon's ocean users. In partnership with Oregon Sea Grant, the Surfrider Foundation Oregon Chapters, and the Oregon Wave Energy Trust, we offer the first baseline assessment of Oregon's non-consumptive recreational ocean users.

> Increasingly, humans are being recognized as a part of the marine ecosystem, rather than as exogenous, or separate, influences.

The objectives of this research were to

- identify, describe, and document the non-consumptive recreational ocean user (NROU) community,
- document NROU use (extent/level/depth/location),
- document the environmental, economic, and socio-cultural contributions the NROU community brings to Oregon's coastal ocean places, and
- provide baseline data that will be informative and could be helpful toward the NROU community's continued access of the multi-use ocean.

Methods

We had four target groups (waveriders, divers, boaters, boat-based wildlife viewers) in each geographical region of the Oregon coast (Table 1). Efforts were made to interview a diversity of ages and genders.

Using a "snowball" methodology, where several key informants were identified as starting points, we began reaching out to the NROU community (Berg 2001). These individuals (n=20) were typically well-connected individuals as business owners or leaders in interest organizations and were selected based on interest group and geographical location.

Key individuals were first interviewed using a semi-structured format in which predetermined questions represented a loose guiding framework (Robson 2002). Interviews were recorded and later analyzed for thematic content.

We built a mailing list for the survey portion of the study by accessing potential participants via snowballing of key informants. We found that, in part due to informants' hesitation to provide direct access to mailing lists, listserves, etc., that the NROU community can be difficult to reach. While some informants provided direct access, most were instead willing to share hard and electronic copies of our project summary and our contact information with people in their networks. Additionally, informants were willing to provide contact information for a few specific individuals within their networks whom they believed would be able to contribute to our study, and recommend additional contacts themselves. Recommended individuals were then contacted and asked to participate in our survey and recommend more individuals to our study, directly or by sharing our

User group	Interview participants Region*					Survey respondents**
	North coast	North-central coast	South-central coast	South coast	Willamette Valley	
Waveriders	1	1	1	1	2	107
Divers	1	1	1	1	2	45
Boaters	1	1	0	1	1	55
Boat-based nature viewers	0	2	0	1	1	24

Table 1. *Distribution of interviewees by geographical region of Oregon and by main type of non-consumptive ocean recreation. *North coast = WA border to Neskowin; North-central coast = Neskowin to Florence; South-central = Florence to just north of Cape Blanco; South = Cape Blanco to CA border.*

Survey respondents by main type of recreation.

***There were 259 valid respondents; however, 28 were excluded due to incompatibilty with our target population (lived out of state, participated in onshore recreation only, did not complete critical sections of survey).*

project information. This was repeated with all contacts. Additional recruiting efforts included posting project information to blogs, message boards, and Facebook pages. While the NROU community was difficult to reach initially, inquiries from interested individuals have continued—a year so far after sampling ended.

Using these combined approaches, we built a survey mailing list of 490 people with which to conduct a mail survey. The survey was 10 pages long and contained questions designed to learn baseline information about our study population, their familiarity with alternative energy sources, and their attitudes about current and future domestic energy policy. The survey instrument was peer-reviewed and went through two rounds of testing and three rounds of review. Once administered under the protocols outline by Salant and Dillman (1994), the response rate was 53 percent (n=259).

Our combination of interviews, a mail survey, literature review, and observational data-gathering enabled us to paint a picture of Oregon's NROU community and initiate an understanding of this important group of ocean users.

Who are Oregon's non-consumptive recreational ocean users?

Respondents from the mail survey represented 17 Oregon counties, with a considerable number of surveys also received from Washington and California and as far away as New Brunswick and Texas. In our analysis, we considered only Oregon residents.

For our study, we lumped these users into four main categories: waveriders (surfers, wind-surfers, kayak surfers, kite-boarders), divers (scuba, freedive, snorkel), boaters (sailors, power boaters, kayakers), and boat-based wildlife viewers (charter and private boat). This was done for ease of organization. Surveys revealed that a diversity of uses exists within our four main categories, and we considered this in our analysis.

Interviews revealed that many people participate in multiple forms of ocean recreation that may include additional non-consumptive and consumptive uses. Of survey respondents, 56 percent indicated that they enjoyed waveriding as either a primary (40 percent) or secondary form of ocean recreation. For example, many surfers also enjoy fishing, and many boaters also described themselves as wildlife viewers. One national study found that divers were 1.6, 1.39, and 1.25 times more likely to participate in snorkeling, sailing, and surfing/windsurfing, respectively, than the general population (Diving Equipment and Marketing Association [DEMA] 2010). This sort of "cross-over" is common in recreation and exists among Oregon's ocean recreationalists. Some forms of ocean recreation add value to others. Crabbing is popular with divers, fishing with boaters, and wildlife-viewing was mentioned by each of our four groups as a valued component to their main type of recreation. Boat-based nature-viewers are on the water to encounter wildlife, but so too are waveriders, divers, and boaters.

Our survey population was largely middle-aged, highly educated, liberal males (Table 2). This is not atypical of those involved in ocean and coastal recreation. One study of Oregon coastal recreationalists found that people with high incomes generally visit the beach more (Oregon Department

RESPONDENT DEMOGRAPHICS

Average age: 48

Sex: 67% male

Education: 78% college graduates

Employment: 54% full time, 16% retired

Average length of Oregon residence: 27 years

Political affiliation: 16% very liberal; 43% liberal; 22% moderate; 12% conservative; 3% very conservative

Table 2. *Respondent demographics.*

of Human Services [ODHS] 2005), and a national study of ocean recreation found that surfers, divers, windsurfers, snorkelers, and power boaters are heavily (by a margin of 14-48 percent) male-dominated, and that sailing, kayaking, and wildlife viewing are slightly (by 4 to 6 percent) male-dominated.

Since native Hawaiians were first documented riding waves on wooden planks in 1779, modern surfing has grown into an industry conservatively estimated at at$7.48 billion nationally (Surf Industry Manufacturers Association [SIMA] 2007). Surfers are making important economic and cultural contributions worldwide and include 3.8 million participants in the U.S. (NOAA 2005). In Oregon, surfing plays an important role in coastal communities. The state supports at least 30 surf shops, with many more independent surfboard-shapers, surfing camps, and related organizations. Annual surf contests and events are held coast-wide, and Lincoln City even boasts a big-wave contest that is included on the Big Wave World tour, one of only five stops for the tour. The Surfrider Foundation counts a network (members and contacts) of more than 1,200 surfers and other recreational users in Oregon (Stevenson 2009), but this accounts for only a fraction of the total surfers in Oregon (Plybon pers. comm.). Surf culture is evident on the Oregon coast, and our study finds that waveriders are making important economic, cultural, and environmental contributions to coastal communities.

Surfing is the primary activity from autumn through spring and is the most common ocean-based (non-swimming) recreation at Oregon's beaches.

Bird watching is slightly (by 4 percent) female-dominated (NOAA 2005).

Nonetheless, we make no claims of broad representativeness. Rather, we present what we learned from the population we did study.

Waveriders

The Oregon coast is a waverider's paradise. Surf is frequent, crowds are sparser than those experienced in other locales, and a network of state parks offers ample access. Oregon waveriders are hardy individuals; immersing in the cold ocean involves cramming into a wetsuit nearly 1/4-inch thick (5–6 mm) or a cumbersome drysuit. Surfers are the most identifiable of Oregon's waveriders, but this group also includes kayak surfers, body boarders, body surfers, windsurfers, and kite boarders.

Waveriders made up our largest respondent group, at 46 percent of respondents (n=107 out of 231) (Table 1). The majority of these were surfers (including shortboard, longboard, and paddleboard). For this reason, we allot more attention to surfing than other forms of waveriding.

Waveriders pursue recreation despite cold waters and potentially dangerous conditions. They are also undeterred about potential health and safety concerns such as their higher risk of contracting gastrointestinal illness from water-borne sources (Stone et al. 2008) and extoses of the ear canal (Deleyiannis et al. 1996), and their higher risk of shark attack (McCosker and Lea 2006). Waveriders also brave often dangerous conditions and recreate year-round. Why?

Waveriding is a significant part of life for this group of ocean recreationalists. Indeed, 97 percent of our waveriding respondents indicated that their recreation was "important" (with 85 percent rating it as very important). Several participants indicated that they had altered their professional and

A wetsuit-clad shortboarder enjoys one the state's many sandbar breaks.

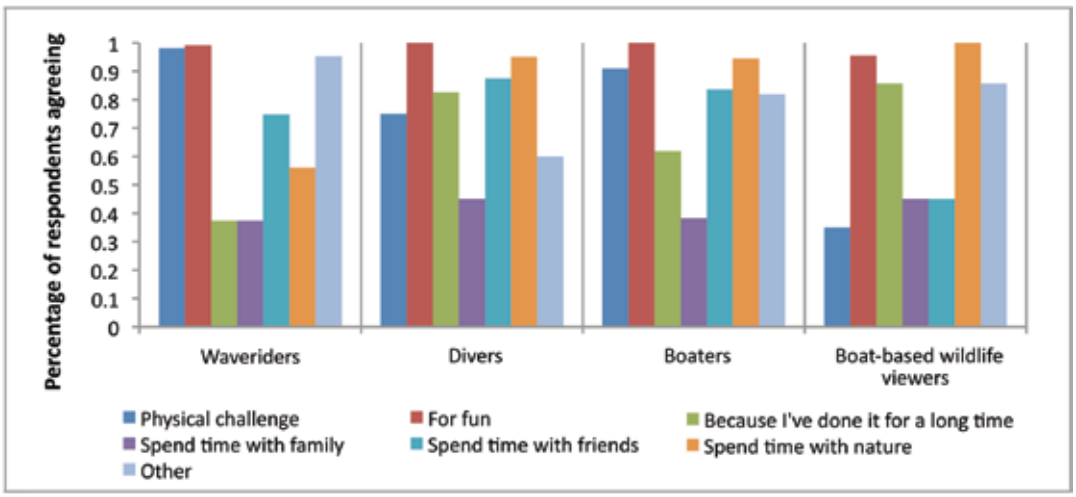

***Figure 1.**—Motivations for ocean recreation by preferred recreation group. Value on vertical axis represents percentage of respondents who indicated that they somewhat agreed or strongly agreed with provided motivation for recreation.*

personal lives to accommodate their recreation or had plans to do so in the future. Most are pursuing their form of waveriding recreation simply for fun, but they also highly value the physical exercise and challenge offered by waveriding (Figure 1). Oregon is rich with opportunities to view and interact with nature, and waveriders highly value spending time amongst and interacting with nature—including wildlife—as part of their experience and motivation (in fact, this was true of all the groups we studied). Hill and Abbott (2009) found that 100 percent of surfing respondents they surveyed agreed that "connecting with nature" was a goal of surfing, and that surfers have long portrayed themselves as environmentally concerned and linked to nature (Hill and Abbott 2009).

A key motivation for waveriding is the "escape" factor, with 86 percent of our respondents listing it as a key reason for recreating. This has also been identified in other studies (Lazarow 2007) as a central motivation of surfing. Other motivations mentioned specifically in responses to our survey included spirituality, solitude, reflection, and therapy. A feeling of mental challenge was also a repeat response. Interviewees and respondents to our survey described the psychological, mental, and spiritual benefits as being as central to their sport as the physical benefits. This element of surfing, in particular, has long been espoused by the sport's adherents, and Taylor (2007) even describes a sort of "surfing religious movement" that holds the "sensual practice" of surfing as its "sacred center."

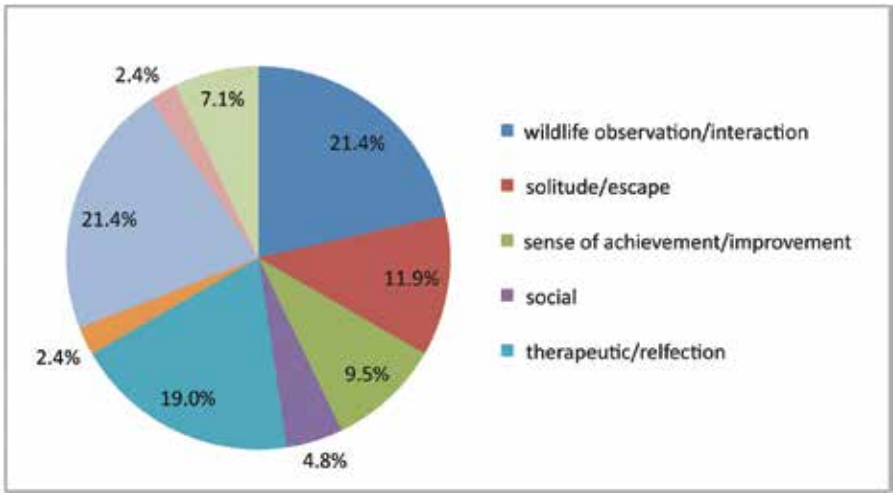

***Figure 2.**—"Other" write-in motivations provided by NROU respondents (all groups).*

Further, we found that waveriding sports such as surfing are considered by many adherents to be a "lifestyle" as much as a sport or hobby. It is an individualistic endeavor; it is less social than the other recreation groups examined in this study. Only 40 percent of waveriders we surveyed were strongly motivated to recreate to spend time with friends; 15 percent with family—second-lowest among all groups and below the total means. Clearly, part of its appeal is that it is a less socially oriented sport, free from the constraints and regulations of more traditional, organized sports, and an endeavor done for oneself (Hill and Abbott 2009).

Indeed, this form of recreation seemed to be a frequent part of the lifestyle for waveriders. Of our respondents, 47 percent of waveriders indicated that they recreate at least once a week, the highest frequency of recreation of

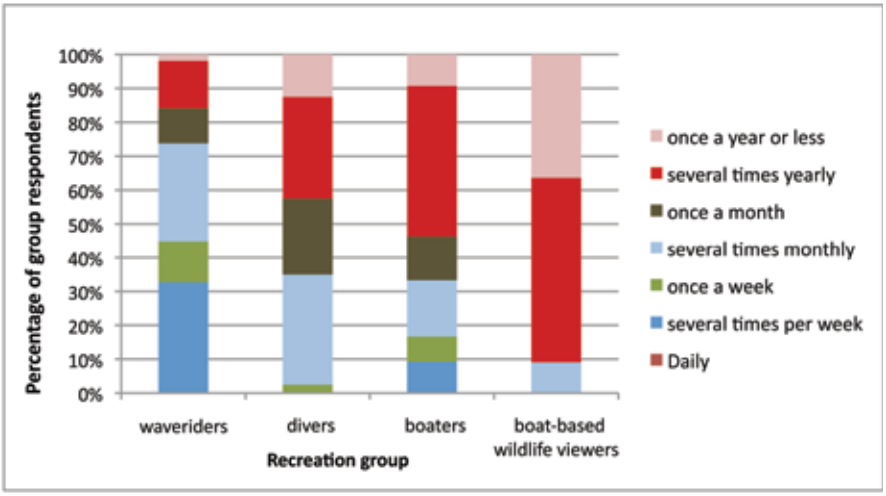

***Figure 3.**—Frequency of ocean recreation by group.*

any group we surveyed (Figure 3). No surfing respondents reported recreating fewer than several times per year. Several participants described surfing as "a way of life." Our results are similar to earlier studies—Stone et al. (2007) found that 44 percent of Oregon surfers they surveyed were recreating 5 to 10 or more days per month, with a mean of 77 days per year, and that most surfers recreated year-round. Further, other studies have found that surfing is the primary activity at Oregon's beaches from autumn through spring (Benedict et al. 2004) and is the most common ocean-based (non-swimming) recreation at Oregon beaches (Shelby and Tokarczyk 2002, Matsler 2009).

Out there too, in smaller numbers, are windsurfers, kite-boarders, kayak surfers, body boarders, and body surfers. Oregon was estimated to have about 24,000 windsurfers in 2003, although not all of these are ocean windsurfers. Most windsurfers appear to be using the Columbia River Gorge and various freshwater bodies, and windsurfing as a whole is in decline in Oregon—down nearly 14 percent from 1987 to 2002 (OPRD 2003). The south coast appears to be the most common destination for ocean-based windsurfing in Oregon. Our windsurfing respondents indicated that the south coast was a common destination for ocean windsurfers, and Shelby and Tokarczyk (2002) observed more windsurfers than any other type of ocean recreation on the southern Oregon coast. Kiteboarding, a relatively new sport, occurs in low numbers on Oregon's oceans when conditions favor, with much of it instead occurring in the Columbia River Gorge and in freshwater. When using the ocean, kitesurfers and windsurfers value many of the same characteristics as surfers—including parking and easy access, and features that offer some protection from wind-induced chop—such as jetties.

Surfing waves on a kayak may be done as a primary pursuit or may accompany other forms of kayaking. Some kayakers include playing in the surf zone as but one component of their planned recreation. Kayak surfers may use some of the same areas as surfers, and are thus likely to value some of the same characteristics of a spot, although we observed conflicts between kayak surfers and surfers, and such conflict was also noted by one kayak surfer responding to our survey.

Body surfers and boogie boarders commonly use waves closer to shore than surfers and kayak surfers do, although some may venture farther offshore, especially with the help of fins. Boogie boarders were the second-most commonly observed water-based activity (non-swimming) behind surfing in a 2005 study by the Oregon Department of Human Services. But these activities are commonly complementary rather than the primary motivation for a visit to the beach (ODHS 2006).

WHERE ARE WAVERIDERS RECREATING?

While the occurrence of ridable, breaking waves on Oregon's coast is dependent on several factors, there are some reliable components to the recipe (Table 3). Headlands are the most important features of Oregon's coastline for waveriding, particularly surfing. Waveriders value spots that are protected from Oregon's often harsh coastal winds, which have the ability to degrade the surf. During the summer,

Place characteristics favorable to Oregon waveriding

- Protective, wave-focusing structure (headland, jetty)
- Sandbar or rocky substrate facilitating breaking wave
- Offshore-flowing rip currents
- Parking
- Visual access to check conditions
- Low crowds

***Table 3.** Waveriding place characteristics.*

spots located on the southern side of headlands and jetties (also important) offer protection from northern winds, while the opposite is true in some locations when winds originate from southerly directions in fall and winter.

Headlands and jetties also offer constructive influence over local oceanography, helping in the deposition of sand that creates the sandbars needed to break waves or offering rocky substrate that produces a consistent break. For example, one study found that at least nine Oregon surf breaks improved following the installation of jetties, which facilitated nearby sandbar formation (Corne 2009). Headlands and jetties are also frequently the guiding walls of offshore-flowing rip currents, which serve as conveyor belts to transport waveriders beyond the breakers to favorable wave-catching positions.

Areas with important waveriding spots

- Seaside
- Ecola State Park
- Cannon Beach
- Arcadia Beach
- Manzanita
- Oswald West State Park
- Cape Lookout
- Pacific City
- Neskowin
- Lincoln City
- Gleneden Beach/ Boiler Bay
- Otter Rock
- Newport
- Yachats
- Winchester Bay
- Oregon Dunes NRA
- Coos Bay
- Bandon
- Seven Devils
- Bullard's Beach
- Port Orford
- Gold Beach
- Pistol River
- Brookings

Table 4. *Important waveriding spots, north to south.*

Swell direction, wind speed and direction, beach orientation, and tides are just a few of the other factors influencing whether a location will be favorable to waveriders, and as a group, they have become adept at predicting such occurrences.

Visual observations and reports from personal social networks (friends and family) are the most trusted sources of information—particularly for insight on conditions—and are often used in concert with other tools. Our waverider respondents reported high frequency of use (73 percent more than once a month) and trust in visual observation, often personally visiting favored locations to check conditions, as also found in a Winchester Bay study by Matsler (2009). We also found that moderate to high trust is placed in obtaining information from friends and family such as reports on conditions, and 46 percent report using their network of friends or family more than once a month. Waveriders appear to rely regularly on their network to receive updates on conditions, with several mentions of text-message updates (one interviewee received a wave report via text message during our interview).

Other sources of information for wave riders include activity-related organizations, which waveriders report using occasionally (several times a year to once a month). Waveriders are most frequently using the Internet to receive information, with 88 percent using Web sites more than once a month to seek information such as ocean and weather conditions. The use of NOAA buoys and Web sites linked to NOAA buoy data is specifically common and comes with relatively high levels of trust. The use of Web cams is also fairly common. Waveriders are skilled at reading and understanding oceanographic parameters relevant to their recreation, and they can plan their recreation with confidence.

Additional factors influence waveriders' decisions on when and where to recreate. Proximity to home or work is the biggest driver in deciding where to recreate, followed by conditions, which are subject to personal preferences and skill level. Familiarity, accessibility, and aesthetics are also important. Parking is important for accessibility, as 96 percent of waveriders take a personal vehicle to their recreation site and many waveriders rely on first-hand observation of conditions prior to recreating. One surfer we spoke with stated that vehicle access at beaches near protective headlands made for the most-important spots. In some places, parking is limited or subject to competition by other ocean and coastal users. A north coast surfer complained about competing with tourists and boaters for parking and not being afforded the same access rights as other users, such as dory boaters. Parking and access issues have persisted at Newport's Agate Beach wayside. Overall, however, Oregon's coastal public access policies and network of state parks are advantageous to ocean users and not necessarily enjoyed by recreationalists in other states.

Distance from home or work was identified as the top reason for not using an area, followed by conditions, unfamiliarity, and crowds. Surfers are specifically affected by crowding, and are motivated to seek out uncrowded locations. Table 4 lists areas in Oregon with important waveriding spots. Surfers are territorial, and in some Oregon locations, such as Cannon Beach and Seaside, aggressive behavior by local surfers toward visiting surfers and other ocean recreational users has been observed. An Internet wave camera has even reportedly been vandalized in Seaside, with territorial surfers suspected by some. This behavior is due to the recognition that quality surf spots are a limited resource, and the addition of another waverider to a spot takes opportunity from others using the spot. Waves are what economists consider a rival good, and conflict over this resource, especially among surfers, is well documented (Rider 1998, Daskalos 2007). Our survey respondents most frequently reported crowding as a reason waveriders were not using areas in the north and north-central parts of the Oregon coast. Others have documented this region of Oregon's coast as the one receiving the most ocean and coastal recreation (Shelby and Tokarczyk 2002).

The south-central and south coasts are renowned for comparably empty waves, and our survey respondents noted visiting as part of road trips as a common reason for using these regions of Oregon's coast. All interview respondents from non-south-central and south-coast regions stated that they enjoyed visiting these regions of the coast for lack of crowds as well as conditions, and several waveriders from the northern half of the coastline reported their intentions to retire to locations on the southern half of Oregon's coastline.

Headlands and jetties are the most important features of Oregon's coastline for waveriding, particularly surfing.

Spots important for bodysurfing coincide with beaches popular for swimming: Short Sands, Cape Kiwanda, Cannon Beach, Seaside, Manzanita, and South Beach top the list (ODHS 2005), and on more than one occasion we observed body surfing at Agate Beach as well. These waveriders are using beaches with protection from the roughest surf and winds, and coves in particular are favorable.

WAVERIDERS SUPPORT AND ARE PART OF COASTAL COMMUNITIES

With an average roundtrip distance of 109 miles traveled (from home or office) to recreate on the ocean, many of our waveriding respondents were no stranger to traveling a distance to surf, windsurf, of kayak surf (Figure 4). While waverider respondents reported the lowest average distance traveled to recreate, 35 percent were traveling more than 150 miles per round trip, and 53 percent came from a noncoastal community. An equal percentage (35 percent) reported short travel durations, with 25 or fewer round-trip miles to get to their favored location and 39 percent living in the coastal community closest to their favored spot.

Most waveriding respondents (64 percent) are making day trips; those visiting from outside a coastal community reported staying for a few hours (38 percent for 1 to 3 hours, 34 percent 4 to 6 hours), with an average stay of 4.9 hours, the lowest of our four recreation groups (Figure 5). Nearly a quarter are staying more than a day, and those staying overnight average just over 2 days per stay, the second lowest of our four groups. Windsurfers appear more driven by conditions than other waveriders (and less deterred by distance), and we found that they are therefore averaging more miles traveled per trip and slightly longer stays than other waveriders.

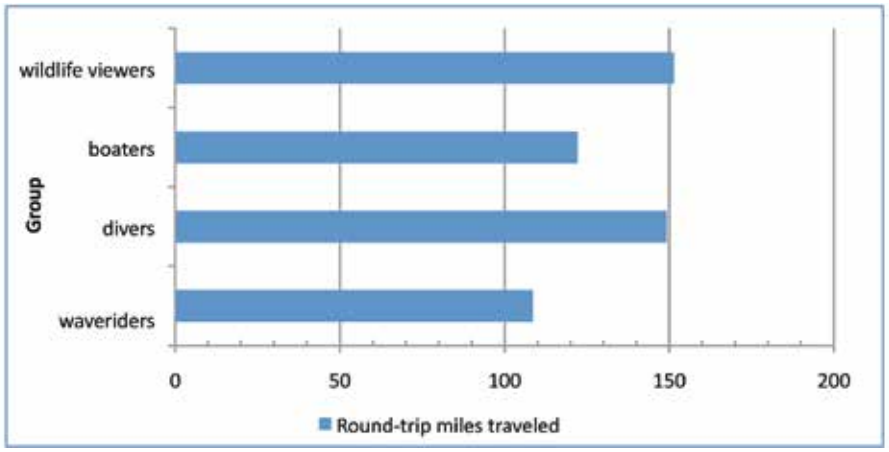

***Figure 4.**—Mean round-trip distances (in miles) traveled for ocean recreation by group. Respondents were asked to estimate the distance typically driven to pursue their preferred NROU activity.*

Waveriders spent the least on lodging, gas, and restaurant/bar, but the most on shopping and gear, when spending on these items (Table 5). With new surfboards priced at roughly $500–1000 or more, wetsuits roughly $150–600 (Oregon Surf Shop, Ocean Pulse Surf Shop, Seaside Surf Shop), and outlets for gear readily available on the Oregon coast, surfers are spending considerable sums on gear. Many of the surfers we spoke with own multiple boards, and regular surfers may replace some gear (gloves, booties) annually. Drysuits, often used by kayak surfers, may cost from $600 to $2,000, and kayaks may cost several hundred to over $3,000 (REI 2010, West Marine 2010).

Many waveriders live close to where they recreate, in Oregon's coastal communities. Several surfers we spoke to described shaping their lives to facilitate their surfing lifestyle, and part of that was living at the coast. Others began surfing because they lived at the coast. Waveriders are a group connected to Oregon's ocean place, and many consider themselves as stewards of the ocean and coastal environments. Surfrider Foundation, an organization established by surfers which counts surfers as a large part of its membership, is active in providing environmental contributions to the Oregon coast. This organization runs the Blue Water Task Force, a program that monitors water quality at numerous beaches on the Oregon coastline, benefitting all NROU as well as the over one-million Oregonians who visit the state's beaches annually (OPRD 2003). Surfrider Foundation and other organizations also help to coordinate beach and river and highway cleanups and work on environmental advocacy issues. We observed surfers participating in the state's marine reserve community team meetings. Surfers also participate in the organization of community events such as surf contests and benefits, including, for example, their recent support of a cancer survivor struggling with medical bills and a fund to build a skate park for the children of Pacific City.

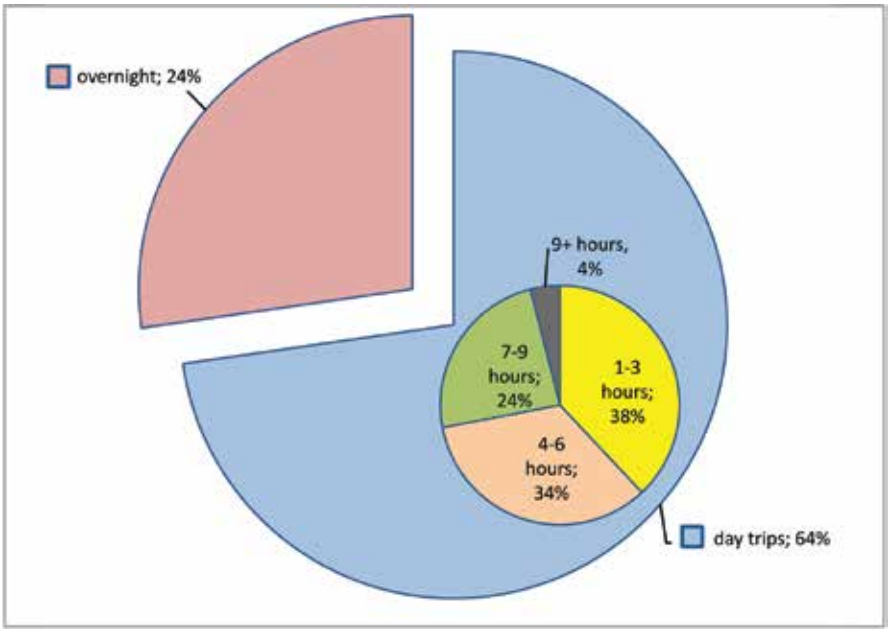

***Figure 5.**—Average length of recreation-related stay indicated by respondents. Large pie graph indicates percentages staying overnight when recreating on the ocean vs. those making day trips. Inner pie graph indicates length of day trips indicated by respondents.*

Average spending by recreation group per round-trip					
User group	Gas	Bar/restaurant	Gear+	Shopping+	Lodging**
Waveriders	$32	$23	$72	$42	$81
Divers	$41	$38	$35	$36	$145
Boaters	$33	$42	$90	$43	$146
Boat-based nature-viewers	$38	$51	—-	$40	$143

***Table 5.** Average expenditures by group.*

+When spending on indicated item.

***Per multi-day trip, when spending on lodging.*

Lazarow et al. (2009) describe surfing's role in communities:

"It is clear that surfing's influence extends beyond recreation and tourism and it can bring a "social fabric" that helps define communities and people. Surfing as an activity and as a culture in particular link generations, bring people together, provide an avenue for outdoor-based physical activity, be good for business, and can help build towns communities."

It is evident from our study that this is true of surfing and Oregon's coastal communities.

Divers

Our study looked at both professional and recreational divers, and respondents were largely recreational scuba divers, but this group also includes free divers and snorkelers.

Like waveriding, diving in Oregon is not for the faint of heart. Cold, rough, and frequently turbid waters make Oregon diving far from the Caribbean reef experience. Oregon divers are instead accustomed to wearing thick wetsuits or drysuits and heavy weight belts. They are used to waiting for narrow windows when the ocean is calm and tides are right, and for dry spells that make for clearer bay waters. Conditions can change season-to-season and hour-to-hour, and diving in general requires planning.

Indeed, Oregon divers are tough, but they are out there in abundance. The Professional Association of Dive Instructors (PADI), the world's largest recreational dive training organization (and the only organization certifying divers in Oregon), has certified nearly 9,000 entry-level divers from Oregon since 2006 (PADI pers. comm.). The state supports at least 34 dive shops and dive travel outlets (Oregon Business Registry Database 2010), most of which are located on the coast or in the Willamette Valley, as well as several dive clubs. The state had about 40,000 divers and snorkelers in 2001, and this number has grown considerably (OPRD 2003). Of course, this community is not always diving in Oregon. Diving contains a travel element: all interviewees mentioned travel as a major component of diving (including regional, national, and international), and 20 percent of diver respondents to the survey specifically wrote in "travel" as a motivator to dive. Many divers venture to destinations, such as those with warm, clear waters and reefs; wrecks; walls; or some other feature that attracts a diversity of marine life. Many more travel regionally, diving in the Puget Sound and Hood Canal in Washington as well as the California coastline and British Columbia.

Still, diving is popular in Oregon, and doing so in cold water comes with a pride element.

We had no difficulty accessing divers for our study. Of our respondents, 56 percent dive at least once a month, while 31 percent dive several times annually (Figure 3). Divers are recreating for some of the same reasons that waveriders are, particularly to spend time with nature and view wildlife (73 percent of respondents; Figure 1). Diving undoubtedly requires a certain level of fitness, and many divers are strongly motivated by the physical challenge of diving (40 percent of respondents), but as a group they are less driven by the physical challenge than waveriders are.

In addition to being a unique nature experience, diving contains a social element. Divers reported valuing their recreation as a chance to spend time with friends and family more highly than any other group. Preparing for a dive with dive partners and recounting an underwater adventure afterward ("après dive") are important parts of the dive experience. Group trips are not uncommon with divers, as Oregon shops and clubs organize local, regional, and international trips. The social element is also a safety precaution: most divers recognize the danger in their recreation (there were at least 12 dive-related fatalities in Oregon waters between 1990 and 2006, at least 92 reported decompression illness treatments between 1990 and 2003, and many more injuries) and avoid going alone (Divers Alert Network [DAN] 2008). In a question asking why divers enjoyed diving with family members, the most popular write-in response related to safety reasons. Diving with a partner involves trusting that person in a potentially dangerous environment, and divers develop special relationships with their "dive partners" or "dive buddies." As a group, they

Divers typically undergo training and recreate with a partner.

are highly trained, with 82 percent of our respondents having taken formal lessons, and serious divers take pride in continuing dive education. Training organizations offer specialties from altitude diving to deep-water diving, and indeed, Oregon diving takes place in freshwater, too.

The necessity of certification and education helps to link divers with dive shops and dive-related organizations. In our study, divers were the most likely group to use gear suppliers (49 percent at least once a month) and the second-most likely to use activity-related organizations (48 percent at least once a month) as sources of information. In general, divers are a fairly well-organized community, centered around shops and organizations as well as clubs and online communities. This contributes to the social aspects of diving revealed by our participants. As a group, high trust in information provided by friends and family was reported, and 79 percent use their social networks for information—such as condition reports—at least once monthly. As with waveriders, the highest trust was associated with visual observation, which 73 percent of divers use more than once monthly—the most frequent means of obtaining information relevant to their recreation. This may include in-person condition checks or use of online sources, such as NOAA buoy data and tide tables. As with waveriders, divers have a keen understanding of the ocean environment, motivated by the necessity of planning their recreation.

Divers also highly value their recreation: 83 percent of respondents indicated that it was "important" (with 58 percent rating it as "very important"). Other reasons described as motivations to dive included mental challenge—relating to the exploration of a drastically different environment than the one humans inhabit—and the challenge of familiarizing oneselfwith the wild denizens of the dive area. Many divers become skilled in the identification of marine flora and fauna.

WHERE IS DIVING OCCURRING?

In general, diving focuses on a specific attraction, such as a rock wall, reef, wreck, or biological community (Bowers et al. 2010), and it is heavily reliant on natural areas (Davis and Tisdell 1996). Favored Oregon dive sites (Table 6) are frequently influenced by the quality of the marine-life viewing opportunities they offer. Additional considerations are required for diving in Oregon, and much diving here occurs in areas protected from the raging surf and currents. Bays, river mouths, and jetties are particularly popular. Bay and jetty sites are typically more accessible, with parking, facilities, and easier entry points that don't require a boat. In addition to calmer waters, jetties offer structure for wildlife habitat. In these locations, however, tides can be a concern, and divers typically time their dives to overlap with slack tide to avoid battling a current for the entire dive. They must also beware of boaters, with whom occasional conflict occurs.

Place characteristics favorable to diving

- Protective structure (headland, jetty, bay)
- Underwater structure (reef, dock)
- Biological communities
- Access (parking, proximity, trail)
- Facilities (bathroom, benches, ladder, boat launch, crossable bar, etc.)
- Low crowds

Table 6. *Diving place characteristics.*

Oregon also has some respected dive spots farther from shore. These include nearshore rocky areas, such as those marked by Whale Head Rock off of Brookings, and Seal Rock south of Newport. Headlands such as Cape Lookout also offer good diving, with protection depending on prevailing ocean conditions. Diving near shore, where dive sites can be accessed by swimming from the beach, offer different challenges. These sites are often difficult to get to, requiring a walk with (or while wearing) heavy gear. Waves and rocky shores offer hazards, and divers must be wary of changing conditions. Wind, waves, and summer plankton blooms can make visibility poor.

Farther from shore, rocky reefs such as the Pinnacles off Newport and Gull Rock off Depoe Bay offer abundant wildlife, kelp forests, and impressive structures. These require boats to access as well as the availability of a harbor from which to launch or charter-boat operators to facilitate a dive offshore. Such dives are also highly dependent on ocean conditions, with calm days infrequent on the Oregon coast.

Proximity (to home or work) weighs in as the most important factor in the preference of certain Oregon locations over others. Respondents listed proximity as the chief reason for choosing an area of the Oregon coast, and distance as the biggest deterrent. Conditions (including marine life) are the next-most important incentive for using an area, and accessibility/availability of facilities is also important.

Important diving areas

- Barview County Park
- Nehalem Bay State Park
- Tillamook Bay docks
- Cape Lookout
- Cape Kiwanda
- Siletz Bay
- Yaquina Bay docks
- Newport jetties
- Newport Pinnacles
- Alsea Bay
- Florence jetties
- Winchester Bay jetties
- Oregon Dunes National Recreation Area
- Orford Reef
- Port Orford/Redfish Rocks
- Whale's Head Rock, Brookings

Table 7. *Important diving areas.*

Other commonly mentioned reasons for not using certain areas included lack of facilities and unfamiliarity. Most divers (95 percent) are using a personal vehicle to get to their recreation location and thus require parking facilities. Parking in proximity to a dive entry is important and is an influence for those diving from shore, as it minimizes the distance gear must be lugged and allows for visual check of conditions. Matsler (2009) similarly found that proximity of parking to a dive spot was important to divers. Our participants also mentioned appreciating diving access improvements, such as ladders and steps, as well as bathrooms and tables—features typically found at state parks.

Although divers say proximity is important, they will travel to destinations offering favorable features, too (Table 7). A common motivation for divers from the north and north-central coast to use the south and south-central Oregon coast was the appeal of a road-trip destination. Seventy-six percent of diving respondents indicated that they travel from noncoastal communities; the average round-trip distance to recreate was 149 miles (Figure 4), the second-highest of the groups surveyed. The largest segment (48 percent) of divers travels between 101 and 150 miles round-trip, and the presence of dive shops in Willamette Valley cities further demonstrates that many divers likely travel from inland communities. Divers were the most likely of our groups to stay overnight (43 percent) for their recreation, but they also indicated the shortest average length of multiple-day stays of all groups (1.85 days; Figure 5). Day trips averaged 6.8 hours, and divers represented the second-longest day trips of all groups.

Divers spend the most on gas ($41) per trip and the second most on lodging per trip when staying overnight ($145; Table 2). This group spent the least on shopping and gear, which involves more of an initial investment than an ongoing one, but much of which is expensive. Air fills, gear rental, take permits, parking fees, and access fees are some of the recurring expenses incurred by diving recreation.

In addition to economic contributions, divers are active in coastal communities. Dive shops typically offer classes, and the Oregon Coast Aquarium, a staple for tourists and locals alike in the Newport area, is dependent on volunteer divers to maintain its display tanks. Divers also occasionally contribute to research, as the Oregon Department of Fish and Wildlife does not have its own program, and volunteer divers have been recruited to maintain oceanographic equipment and boats.

Much of diving in Oregon is actually consumptive. Divers are very often motivated by the harvest of Dungeness and red rock crab and other shellfish, as well as numerous fish species, with spear-guns and slings. Indeed, many of the diving sites considered some of Oregon's best overlap with productive habitat for crab and clams. Part of the social element of the après-dive described by interviewees included preparing and cooking the day's catch. In Oregon, where visibility often can be quite poor and divers sometimes can't recreate to simply enjoy the view, it should be no surprise that consumptive diving, where one needs only to see far enough to scoop up a crab or spear a fish, is popular.

Boaters and kayakers

Boating in Oregon involves a diversity of forms. Our survey reached sea kayakers, estuarine (bay) kayakers, power boaters, sailors, and rowers. Kayakers in general made up a large percentage (56 percent) of this group and were our third-largest respondent group overall (13 percent of total; n=31 out of 231; Table 1).

Oregon has more than 1,000 square miles of ocean, in addition to its bays and estuaries and access to federal waters beyond 3 miles offshore. Boaters have access to more of this area than any other non-consumptive recreational group. But while power boaters and sailors are able to venture farther offshore, kayakers are more likely to stay closer to shore and in bays and estuaries. Among the variety of boating forms we explored is a corresponding variety of values, needs,

Boaters rely on a safe bar crossing—no guarantee in coastal Oregon—to access the ocean.

and perspectives. Oregon's oceangoing non-consumptive boaters were our most diverse group and also our most difficult to reach.

The rough nature of Oregon's ocean presents difficulties to boating. The state is notorious for its hazardous bar crossings where bays enter the sea (Tillotson and Komar 1997); the Columbia is reputed to be the second-most treacherous in the world, and Tillamook has a similar reputation that a deadly capsizing in 2003 didn't help (although conditions have since improved). The Oregon State Marine Board provides cautionary chartlettes to aid *specifically* in crossing the Yaquina and Rogue River bars in addition to the Columbia and Tillamook bars. Over 900 shipwrecks have occurred off Oregon's coast (N. Reed pers. comm.).

Due to such hazards, most recreational boating in Oregon is done in calmer waters. An Oregon State Marine Board (OSMB) survey (2002) found that 90 percent of Oregon's recreational boating is done in lakes, reservoirs, and rivers; 6 percent in bays; and only 4 percent in the Pacific Ocean (excluding nonmotorized boats under 12 feet, such as kayaks and small sailboats).

Further, boating is frequently done to facilitate other activities, including wildlife-viewing and diving, creating overlap among our target groups. A large number of the boaters we approached did so to facilitate fishing and crabbing. OSMB (2002) estimated that 92 percent of recreational ocean-boating days and 94 percent of bay-boating days are fishing/crabbing trips. Consumptive recreational activities are highly popular among Oregon coastal boaters, yet not within the main scope of the interests of this study. They are worth mentioning, however; besides representing a large percentage of Oregon's ocean recreationalists, there is evidence that they also value non-consumptive aspects of their primary, more-consumptive recreation. A national study on recreational fishing and boating estimates that 43 percent of all boating and fishing participants also enjoy nature observation while boating and fishing. The same study suggests that an additional 8 percent also enjoy snorkeling and scuba diving while boating and fishing (Recreational Boating and Fishing Foundation and Outdoor Foundation 2009). Our findings confirm that such crossover is occurring among Oregon's ocean recreationalists and that non-consumptive activities can be important enhancers to consumptive activities, and vice-versa. All power boaters we approached were boating primarily to fish or crab, and all boaters indicated that experiencing nature and viewing wildlife wereimportant parts of their experience.

In addition to the challenging ocean conditions, Oregon's recreational ocean boaters also must contend with regulations, permits, access limitations, and crowds. Parking is important, as 85 percent of our surveyed boaters use a personal vehicle to travel to their place of recreation. Power boaters require extra parking space for trailers at launch sites (kayakers and sailors may use trailers, too). Parking was identified as an issue in some places, and most complaints among sailors and power boaters with public facilities were aimed at launch lines, launch fees, and a lack of facilities in general. Kayakers were less limited by facilities but still rely on parking and put-ins.

Boating is also expensive. Our boating respondents indicated that when spending on gear, they spent 60 percent more on average than the next-highest-spending group (waveriders). In addition to fueling their automobiles, power boaters must fuel their boats. Other expenses include insurance, launch fees, registration, maintenance, repairs, and the boats and kayaks themselves (Table 2). Boaters also outspent other groups

Place characteristics favorable to boating

- Launch & mooring facilities (put-in, tie up, ramp, parking)
- Crossable bar
- Open space
- Protective structure (headlands and jetties)
- Biological communities & aesthetics
- Facilities (bathroom, benches, ladder, boat launch, crossable bar, etc.)

Table 8. *Place characteristics for boating.*

on lodging (10 percent more than the next-highest), "other" items (46 percent more than the next-highest), and spent the second most on shopping and when visiting a restaurant or bar than other groups we surveyed. They were also the most likely to be either employed full-time or retired (82 percent) and the second-most likely to have at least a college degree (82 percent). The Oregon State Marine Board suggests that boating is more popular with mature adults—the average age of boat owners in Oregon in 2002 was 54 (OSMB 2002). The average age of boaters taking our survey was just over 55.

Like other ocean recreation types, boaters become adept at reading ocean conditions. All types of boating respondents to our survey reported using visual observations frequently (44 percent more than once a month), with power boaters and sailors more likely to do so than kayakers. Power boaters and sailors were also more driven by proximity and more deterred by distance when choosing a recreation location than were kayakers. All groups relied on Internet sources for information, including NOAA buoy data, weather reports, and tide tables. This group was also most likely to use and trust activity-related organizations, such as kayaking clubs and yacht clubs, as sources of information (56 percent at least once a month) and the most likely to use newspapers and media (38 percent occasionally).

Boaters are typically recreating on the coast for four- to six-hour day trips (Figure 5). Multi-day trips are typically two to three days, with one-night stays more common. Boaters were the second-most likely to stay overnight of all groups, behind divers. Most ocean boating occurs from June to September, when conditions are most favorable; boaters are more inclined to remain in bays and estuaries during winter months.

While similarities exist with our boating subgroups, kayakers, power-boaters, and sailors differ in many aspects of their recreation as well.

Sailing commonly takes advantage of protected baywaters.

SAILORS

Sailing is popular in Oregon, with at least 48 yacht clubs and sailing associations statewide; a 2003 study by OPRD estimated 21,000 Oregon sailors in 2001–02. The vast majority of these, however, are located in, or associated with sailing freshwater, such as lakes, rivers, and reservoirs (Oregon Business Registry Database 2010)—the Columbia River and Willamette River systems are particularly popular. And while sailing also occurs in bays and the adjoining ocean, sailing represents only 8–14 percent of Oregon's ocean boating by days and only 2 percent of Oregon's total bay-boating activities (OSMB 2002, OPRD 2003). These numbers exclude unmotorized boats under 12 feet (such as small sailboats), which do not need to be registered. Use of small sailboats does occur in freshwater and occasionally in saltwater, but is less likely in the ocean and in bays due to the decreased stability of these small vessels in choppier waters. Sailing also appears to have decreased in popularity drastically overall in Oregon, with registrations having declined by 83 percent from 1990 to 2002. This represented the largest decline amidst an overall 25 percent decline in boating registrations during this time (OSMB2002). Another study found a similarly drastic decline in sailing popularity (59 percent in user occasions) from 1987 to 2000 (OPRD 2003).

Nonetheless, there is no shortage of wind on Oregon's ocean and bays. Based on data from studies by OPRD (2003) and OSMB (2002), we estimate that there are 800 ocean sailors in Oregon and about 1,300 bay sailors. And Oregon's active sailors appear to be a close group. Well-organized, sailing enthusiasts have established

yacht clubs in several coastal locations. Our survey respondents cite "spending time with family and friends" as important parts of their recreation—a theme common to all boaters—and over a quarter of them were taught to sail by a friend. Yacht clubs and sailing associations contribute to coastal communities by organizing and participating in events such as Blessing of the Fleet ceremonies, boat shows, seafood festivals, and a few regattas, although most races and regattas occur in freshwater. They also offer boating education courses, operate boat-rental services, organize high-school sailing programs, and organize charity fundraisers. The Yaquina Bay Yacht Club and the Astoria Yacht Club appear to be the two Oregon organizations most active in bay and ocean waters; they are also active within their local communities, hosting regattas, a Yaquina-Astoria ocean race, and other events. The Yaquina Bay Yacht Club even includes among its missions the promotion of civic benefits to area communities. The Astoria Yacht Club reports a membership of 131 (Astoria Yacht Club pers. comm.), and the Port of Astoria reports that about 13 percent of the slips in their port (73 sailboats in 565 occupied slips) are occupied by sailboats (G. Nielson pers. comm.). The Yaquina Bay Yacht Club boasts 90 members and has been a fixture in Newport since the 1940s (Yaquina Bay Yacht Club pers. comm.).

Sailors are the second-likeliest group to have taken lessons (behind divers), commonly offered by yacht clubs and sailing associations. Sailors report a sense of community with their fellow boaters at the dock, especially if they lease a slip, and 58 percent of our surveyed sailors came from the closest coastal community in which they were recreating. At a mean round-trip travel distance of 70 miles, sailors had the shortest commute to recreate. Many are members of coastal communities, and some have the option of staying on their boat as well; this group was second-lowest in lodging expenditure per trip when staying overnight (Table 2).

Sailors responding to our survey ranged widely in their frequency of recreation, with answers distributed fairly evenly (ranging from several times weekly to several times annually). The highest percentage of sailors responding to our survey indicated recreating several times per month (30 percent), with the second-highest (23 percent) indicating that they were sailing several times weekly. Most Oregon recreational boating, including sailing, occurs late spring–early fall, peaking in August, when conditions are best (OSMB 2002). This appears to be true of coastal sailors as well, and those responding that they recreated frequently probably do so in peak season, while sailing less from late fall to early spring, or remaining in bays if they do.

Most sailors participating in this study rated recreation as a big part of their lives. The majority (59 percent) rated sailing as very important, with an additional 32 percent stating that sailing was an important part of their lives. As with other groups surveyed, observing wildlife and experiencing nature were major motivations to sailor recreation (77 percent strongly agreed). Sailors also enjoy the tradition associated with their sport, and a majority (53 percent) also felt strongly that having done it for a long time was a motivation. Mental and physical challenge and a sense of improvement or achievement were also commonly mentioned themes by interviewees and survey participants, and, as with each of our groups, the "escape/solitude" theme was also prominent.

KAYAKERS

With the flexibility to launch from the roof of a car and off the beach or the trail, kayakers are not limited by the same facility needs as other boaters. While still depending on put-ins, parking, and permitting considerations, kayakers have freer access to the ocean and estuarine waters. Exploration, in fact, was a common motivational theme among kayakers. Kayakers appear to more commonly use estuaries and bays than the ocean (especially during non-summer months), although Oregon's nearshore ocean has many spots worthy of exploring by paddle; some kayakers also enter the surf zone to waveride. Trips along the Oregon coast that involve exploration of bays, sloughs, and the ocean together are not uncommon. Due to this freedom, kayaker respondents indicated a higher willingness to travel than other boaters, indicating that they were less likely to be influenced by proximity and more likely to be influenced by conditions and aesthetics than other boaters. They are also more likely to travel from their nearest coastal community to visit a distant coastal community to recreate. Kayakers spend the second highest

Important sea-kayaking areas

- Cannon Beach
- Nehalem Bay
- Barview County Park
- Tillamook Bay
- Netarts Bay
- Cape Kiwanda
- Agate Beach
- Oregon Dunes National Recreation Area

Table 9. *Important sea-kayaking areas.*

Kayakers explore estuaries, coastlines, and the surf zone off Oregon's coast.

of all recreation groups we surveyed on lodging per multi-day trip ($163; average multi-day trip 2.4 days), were the most likely of boaters to spend on lodging, and were the most likely to mention camping as a recreation-related expense (Table 2). Sea kayaking also has an expedition component, and "touring" may last multiple days.

Kayakers we surveyed are especially motivated to recreate to spend time with nature (93 percent strongly agreed) and wildlife observation was the most-common response to our "other" category. Treasured experiences described by some respondents (including paddling with orcas in Puget Sound and sea lions in Oregon) cement this love for sea kayaking. With nooks and crannies along its rocky coast, complete with arches and immense rocks—many hosting seabird colonies and pinniped haul-outs—the Oregon coast is described by kayakers as a nature-lover's paradise. Aesthetics were commonly mentioned as why certain areas were chosen for recreation.

Additional incentives for kayakers include enjoyment of solitude, and physical exercise. Sea kayaking also has an artistic side, and some participants mentioned constructing their own kayaks and having an appreciation for "traditional" kayaking cultures.

A 2003 report (OPRD) estimates that Oregon is home to about 26,000 sea kayakers, recreating a total of 100,000 user days. The same report estimates that 43 percent of these are using the ocean for their recreation, making for just over 11,000 sea kayakers using waters off Oregon's coast (OPRD 2003). Kayaking has surged in popularity in recent decades both nationally and in Oregon (James Kent Associates 2009), and the number of sea kayakers in Oregon has likely increased from this 2003 estimate. The same study found, as we did, that most sea kayaking occurs along the north/north-central coast, which is closer to major population centers. Respondents from these regions indicated that the south/south-central coast was important to them as trip destinations and that they visited for conditions (including aesthetics), exploration, and lack of crowds. Another study suggests that as a percentage of population, however, more Oregonians in south and south-central coast communities are sea kayakers (OPRD 2003). Some sea kayakers in Oregon belong to one of the many paddling clubs available that offer excursions, events, lessons, and community.

POWER BOATERS

Power boats, including motor boats and personal water craft (PWC), such as jet skis, are useful for many types of recreation, including water-skiing, cruising, and fishing. Water-skiing and related sports do not occur in Oregon's oceans at any level of significance (OPRD 2003), with rough conditions and cold water the likely impediments. Only about 2 percent of ocean boating is via PWC such as jet skis, the users of which enjoy Oregon's waves (OSMB 2002). Pacific City has played host to an international jet-ski competition, including charity fundraising, at Tierra Del Mar since 2009.

Only 1 percent of recreational ocean boating and 3 percent of bay boating in Oregon is done for cruising, which most frequently accompanies fishing (OSMB 2002) anyway. It is estimated that about 11,000 Oregonians participated in pleasure (non-fishing, non-water-skiing) power boating in the ocean off Oregon in 2002 (OSMB 2003). Most power boating in Oregon's

Popular Oregon bar-crossing locations

- Columbia River*
- Nehalam
- Tillamook Bay*
- Depoe Bay*
- Yaquina Bay*
- Siuslaw River/Florence*
- Winchester Bay*
- Coos Bay*
- Bandon
- Brookings*

**Also has USCG station*

Table 10. *Bar crossing locations.*

Place characteristics favorable to power boating

- Protective structure (headland, jetty, bay)
- Crossable Bar
- Underwater structure
- Biological communities
- Access (parking, proximity, trail)
- Facilities (bathroom, benches, ladder, boat launch, etc.)
- Low crowds

Table 11. *Power boating place characteristics.*

ocean, bays, and estuaries involves fishing or crabbing, and launch points can become extremely crowded on important fishing dates. Our survey participants indicated that although many boaters fish for fun, some feel that catching fish represents a return on their boat investment. Our power-boating participants reported feeling that their power-boating recreation was sensitive to fishing conditions and regulations. We found that charter fishing is also an important tourist attraction on the Oregon coast and thus, important for coastal economies in attracting visitors from Oregon as well as regionally. Some of the boat-based wildlife viewers we surveyed noted that they also go charter fishing when visiting the coast, and some companies specializing in charter fishing are also beginning to offer whale-watch tours.

Relaxation is an important incentive for boaters pursuing their form of recreation. One interviewee described an "island time" associated with their power boating on the ocean, where time seems to slow and stress is absent. Many boaters also seek a "whole package" when recreating at the coast—including dining, shopping, and sightseeing, especially when traveling from a distance. Power boaters are also using their boats to view scenery and wildlife, and there was overlap here with the boat-based wildlife-viewing group we looked at.

Power boaters are heavily influenced by proximity when choosing where to recreate; they usually rely on the closest of Oregon's 13 U.S. Coast Guard-regulated bar crossings to access the ocean, although many use bays exclusively and there are several that are popular with boaters, yet don't offer reliable access to the ocean. Most Oregon boaters are using vessels under 16 feet long, but it appears that average boat size is growing, with inboard/outboard motors becoming more popular (OSMB 2002). Larger boats and more powerful engines are more favorable to ocean boating, although no recent data on ocean-boating trends could be found.

Power boaters also pay for launch fees, permits, and other recreation costs that provide income for maintaining facilities required by these users—such as restrooms, ramps, tie-ups, parking, and pump-out facilities. This infrastructure, in addition to the jetties required by boating in Oregon, is also used by other non-consumptive, recreational ocean users, including divers, wildlife viewers, kayakers, and waveriders. In this way, boaters are a sort of a "keystone species" for ocean recreation off Oregon's coast.

Boat-based wildlife viewers

Oregon has spectacular wildlife resources, a fact not lost on Oregonians. Wildlife viewing is a popular and fast-growing type of recreation in the U.S., and is popular in Oregon, where 44 percent of the total state population engages in bird watching or other wildlife viewing. Growing from an estimated 1.5 million to 1.7 million participants statewide between 1999 (NSRE 2000) and 2008, wildlife viewing also grew 170 percent in user occasions between 1987 and 2002 statewide (OPRD 2003).

Boat-based wildlife viewing, such as whale watching, makes economic and cultural contributions to coastal communities.

Charter boats offer tourists and locals alike access to wildlife viewing off Oregon's coast.

The Oregon coast, in particular, is a destination for wildlife watchers, many of whom come to the coast to see marine mammals and birds as well as fishing boats. On the Oregon coast, consumptive recreation such as fishing and crabbing is extremely popular and lucrative. But perhaps overshadowed by such forms of consumptive wildlife-related recreation are the millions of trips annually that involve non-consumptive wildlife viewing in Oregon's coastal travel regions. One study estimated 2.3 million trips to Oregon's coast by wildlife-viewing-related tourism in 2008 (Dean Runyan Associates 2009). The study estimated that local recreation-related expenditures by this group in 2008 (which included shore-based wildlife viewers) totaled $11.1 million (33 percent of total local wildlife-viewing-related expenditures for Oregon) in Oregon's coastal travel regions in 2008. Travel-related expenditures by this group (those traveling 50+ miles one-way) for the same regions in 2008 were estimated at over $159 million (40 percent of all such wildlife-viewing expenditures statewide), which was more than fishing and shellfishing-related travel expenditures in the same regions combined (Dean Runyan Associates 2009).

Clearly, wildlife viewers are making contributions to Oregon's coastal communities. These numbers represent those viewing wildlife both on the ocean and from shore, which is very popular. Shelby and Tokarczyk (2002) found that wildlife (67 percent) and tidepools (65 percent) were the most-common subjects Oregon beachgoers were most interested in learning about on their visits, and our study heard from several people wishing to participate as shore-based wildlife viewers. However, our studywas primarily learning about those participating in boat-based wildlife viewing, whether via charter or private boat (including power boat, sailboat, and kayak).

WHO ARE THE BOAT-BASED WILDLIFE VIEWERS?

We found that wildlife viewing is an important part of each of the modes of ocean recreation we looked at. Wildlife viewing and the enjoyment of nature were consistently listed by waveriders, divers, and boaters alike as major motivations and components to their favored types of recreation. As a result of this overlap, we found that accurately defining boat-based wildlife viewers includes those on power boats, sailboats, charter boats, and kayaks as well as those on the water primarily to view wildlife and those for whom wildlife viewing was complementary to another boat-based pursuit. Here, we present what we learned from those who identified boat-based wildlife viewing as their primary type of ocean recreation, and recognize that this may include charter and personal power boat, sailboat, or kayak.

The ocean is, to many, the last frontier. Existing visible human impacts on the sea are often less conspicuous than those on land, and the ocean represents a wide-open expanse unmatched on terra firma. To many, this expanse is a chance to escape and a chance to explore. Survey respondents from this group described "just being out there" as a motivation, and aesthetics were important to this group's experience overall, an opportunity to spend time in a vastly different environment and to be charmed by its inhabitants. Whether watching swarming seabirds from a surfboard, photographing sea lions from a boat, or inspecting seastars from a kayak, wildlife viewing adds value to many types of recreation. Up to 44 percent of wildlife viewing may indeed be incidental (Dean Runyan Associates 2009). Many do visit the ocean specifically to see wildlife, and charter companies exist because of this market.

Some view nature from their own boat; others rely on charters to access this non-consumptive resource—especially to view those species that are difficult or impossible to see from shore. Regardless, all of our respondents view their recreation as an important part of their lives (59 percent feel it is very important, while 94 percent feel it is at least important). Those using charter services to view wildlife were more likely (67 percent) to rank their recreation as very important; those viewing from their own boat (43 percent) were less likely to rank it as very important, likely because many viewing wildlife from their own boat are doing so as a compliment to their primary boat-based pursuit (fishing, cruising, etc.).

Boat-based wildlife viewers are practicing this form of recreation once a year (36 percent) to several times per year (55 percent)—less frequently than the other groups we researched (Figure 3). Charter-based wildlife viewers are often limited by availability of charters as well as cost, and they recreate less frequently than those who have their own boat. As a group, they are pursuing their recreation for fun and as a chance to spend time with nature, particularly to interact with wildlife. They are less social in their recreation than other groups we looked at, and are more likely to recreate with friends than family—although this may be truer of birders than charter whale-watch patrons. Only 18 percent of survey respondents indicated learning wildlife viewing from a parent; 27 percent taught themselves.

Theirs is a personal pursuit, and the "escape" theme was prevalent in survey and interview responses. Another major motivation for boat-based wildlife viewers' recreation is the sense of achievement and self-improvement gained in practicing their identification skills, adding to their "life lists" of species identified, and learning. Several survey respondents indicated that they enjoyed the mental challenge presented by their recreation.

As a group, boat-based wildlife viewers are using a variety of sources for their recreation-relevant information. Survey respondents indicated using visual observation, friends and family, and an activity-related organization several times per year each. They are using Internet-related sources more frequently, several times per month (50 percent, including charter-company Web pages and online field guides. The clearly favored sources of recreation-relevant information we observed with other recreational groups were not as evident with boat-based wildlife viewers.

The waters off Oregon's coast are home to abundant wildlife, such as Steller's and California sea lions, as seen from a whale-watch charter off Newport.

Most wildlife viewers—both boat-based and shore-based—are coming from non-coastal communities. A study for ODFW and Travel Oregon by Dean Runyan Associates (2009) estimates that Oregon's coastal travel regions see millions of trips annually that involve wildlife viewing in these areas (2.3 million trips in 2008). This study found that the number of wildlife-viewing-related trips to Oregon's coastal travel regions trips is overwhelmingly from visitors traveling from over 50 miles away or staying overnight (73 percent in 2008), vs. locals (those traveling fewer than 50 miles). Our boat-based wildlife-viewing survey respondents indicated traveling a mean round-trip distance of 151 miles to recreate, highest of all groups we surveyed (Figure 4). Forty-eight percent indicated traveling over 150 miles to do so, with another 19 percent traveling between 101 and 150 miles round-trip. This was mostly driven by those using charter boats to view wildlife (173 miles on average); distance traveled by those using their own boat was much lower (98 miles on average).

Wildlife off Oregon's coast attracts visitors from all over, and the Oregon coast is also a destination for out-of-state wildlife watchers (Southwick Associates, Inc. 2007). A north-coast whale-watch company we interviewed stated that customers were mainly coming from Oregon and other western states, but with a fair number from farther away—even overseas. One charter guide interviewed for our study stated that one-third of his customers are newcomers, with another third being out-of-state visitors to Oregon, and the final third being regulars.

WHERE ARE BOAT-BASED WILDLIFE VIEWERS RECREATING?

Proximity was a major driver of use of place for wildlife viewers as a group, although those using their own boat were more likely to list proximity as a reason to use an area and distance as a reason not to, which is consistent with our findings concerning boaters. They are also influenced by availability of facilities/accessibility and conditions. Those using charters were less likely to list proximity as being of primary importance than those using their own boat, although proximity was still rated as influential. Also important to charter wildlife viewers were conditions, including the likelihood of seeing certain wildlife as well as ocean and weather conditions. Accessibility is crucial, as charter-boat wildlife viewers must go where charter boats are available and

are willing to accommodate wildlife viewers. While the number of ports offering wildlife-viewing charter trips is few, companies are adding wildlife trips to their offerings in recognition of this market. Depoe Bay, Newport, and Garibaldi are major whale-watch charter ports, and Brookings, Charleston, and Rockaway all have companies offering such tours as well. Newport and Charleston also accommodate pelagic birding trips, which are growing in demand.

One guide mentioned that availability of a charter boat alone was only part of the equation and that the size and capabilities of the boat were also important in reaching wildlife located farther from port and accommodating crowds. The time of year was also a factor, driven by wildlife behavior, ocean conditions, and demand. During summer months, whale-watching trips are offered regularly, with trips scheduled less regularly during spring, fall, and winter. One charter company estimated that they take 100 to 125 people per day (in four to five trips) for whale-watching tours in peak season (June-September); about 40 people per day in spring/fall; and about 25 people per day in winter (presumably on days when conditions allow trips). Pelagic birding trips are generally organized by independent guides or organizations a handful of times per year, on special reservation with charter companies. One guide we spoke to leads about six to eight trips annually, based on demand.

Other requirements include parking, as 82 percent of boat-based wildlife viewers travel to their recreation areas via personal vehicles. Those using their own boat have some of the same requirements as previously outlined for boaters and kayakers, including launch facilities, nearby parking, and safe bar crossing.

Oceanographic and ecological features such as density fronts and upwelling areas are important to all boat-based wildlife viewers, as these areas attract and concentrate wildlife. Pelagic birding trips are focused around offshore banks, such as Perpetua Bank, and they frequent waters beyond Oregon's three-mile territorial sea boundary. Wildlife may gather at river plumes, attracting wildlife viewers. Located onshore of one of the world's great whale migrations, Oregon makes for a good site to view gray whales, which surface close to shore. Boats need not stray far from ports such as those offering charters to view gray whales and other wildlife, though whale watching may occur offshore too, where other species of whales, as well as birds, sharks, and other marine life, may be viewed. Those viewing wildlife from kayaks and power boats may frequent structures such as jetties, emergent rocks, and islands, and Oregon waters offer a network of federal wildlife refuges used by numerous species. These areas, in addition to bottom habitat, are important to birds, marine mammals, and other marine life, and thus, wildlife viewers. It can be said that, like wildlife, wildlife viewers rely on habitat.

Poor conditions, inaccessibility to or lack of charters, lack of facilities, and distance were the most commonly listed reasons for not using certain areas of the coast.

BOAT-BASED WILDLIFE VIEWERS BRING BUSINESS TO THE COAST

Another charter company we spoke with explained that many whale-watch customers spend time and money elsewhere in local communities. In one study, 52 percent of people indicating they were viewing marine mammals at Oregon's coast were staying overnight, and another 27 percent were traveling from more than 50 miles away (Dean Runyan Associates 2008). Our participants also indicated the second-longest multi-day trips on average of all groups we looked at (2.19), the longest day trips on average (7.5 hours; Figure 5), and an equal likelihood to plan day trips and overnight trips when using a charter service for their wildlife-viewing recreation (Table 2). Wildlife viewers were the most likely of the groups we surveyed to indicate that they were traveling from a lodging destination to recreate; they indicated spending the second-most of all groups on lodging ($143 per trip) when using their own boat to view wildlife, although those using charter boats were more likely to spend on lodging. They are also spending more ($51 per trip) at restaurants and bars than our other user groups, and second-most on shopping ($40). Those using their own boats are also paying launch and permit fees, as well as parking fees in some locations, and they share many of the same expenses outlined for boaters.

In addition to economic contributions, wildlife viewing offers cultural contributions. Depoe Bay has branded itself as Oregon's "whale watch capital," and whale-watch operators are fixtures at Newport's Historic Bayfront village. Such tours offer family entertainment, educational opportunities, and jobs. They are also collaborating with universities for research, and are sponsoring charity events. Whale-watch charter operators also participated in marine reserve planning meetings, contributing to community planning processes.

NROU and marine renewable energy

Oregon's NROU community has evolved to take advantage of the state's ocean recreation resources. Changes are on the horizon, however, as Oregon moves toward defined spatial management of its ocean. One emerging ocean use is the development of marine renewable energy, such as wave energy. Identified by the state's renewable energy portfolio as a renewable energy source with the potential to reduce dependence on fossil fuels (Kulongoski and Bradbury 2008) and in an effort to strengthen coastal economies, wave energy in Oregon will be a reality. In addition to seeking baseline information on Oregon's NROU, our study sought to learn about this community's attitudes toward energy policy and their familiarity with its various forms.

As a group, the NROU community strongly agreed (63 percent) that energy independence is important and that it is possible to both increase energy supplies and protect the environment (58 percent). They are slightly concerned that the country does not have enough energy resources (52 percent at least somewhat agree) and about being personally affected by a shortage (51 percent at least somewhat agree). As a group, they appear to be in favor of alternative-energy development, as 76 percent at least somewhat agree (48 percent strongly agree) that not enough money is being spent on alternative energy. Sixty-nine percent expressed confidence in alternative energy sources, at least somewhat agreeing that new energy technology will make energy available to all in the future. There was little variation between recreation types, although waveriders were slightly more likely to believe that energy independence is important and that the country does not have enough energy resources. Also worth noting is that boat-based wildlife viewers are most likely to at least somewhat agree (91 percent) that it is possible to both increase energy supplies and protect the environment. Impacts of renewable-energy development on wildlife are a central concern associated with terrestrial wind installations, for example, and impacts and similar concerns exist for marine-renewable energy (Inger et al. 2009).

Our survey also assessed the familiarity of the NROU community with specific types of renewable energy sources. Overall, there was variability in levels of familiarity with alternative energy sources, with fairly high familiarity with each (Table 12). The highest level of familiarity among all groups was with solar and wind energy, unsurprising since these are the two most globally developed alternative-energy sources included on the list (Blaabjerg et al. 2006). The lowest overall familiarity was with offshore wind power—perhaps due to confusion over the difference between offshore wind

Table 12. *Familiarity with renewable energy sources by recreation type.*

Renewable energy	Recreation group[1]			
	Waveriders	Divers	Boaters	Widlife viewers
Biofuels	2.83	2.87	2.55	2.73
Wind	3.05	2.87	2.89	3.05
Solar	3.08	3.03	2.98	3.05
Wave	2.83	2.56	2.46	2.59
Off-shore wind	2.40	2.21	2.15	2.32

[1]Cell entries are mean familiarity values on a 1-4 scale where 1="Not familiar" and 4="Very familiar."

and terrestrial wind energy—and wave energy. With both offshore wind energy and wave energy in contemporary planning conversations, improving familiarity amongst other ocean stakeholders may be prudent in the interest of sound decision making.

Waveriders, out of all of our respondents, had the most familiarity with wave energy. In the interview portion of our study, waveriders were the most likely group to mention wave-energy development in answers to questions about concerns with current ocean issues in Oregon. Hunter (2009) found concern among surfers regarding potential negative impacts of wave energy on their ability to recreate. Ideal wave breaks are relatively rare, relative to the size of the Oregon coast, and indeed much needs to go right for a wave to break perfectly for surfing (Henriquez 2004). Ocean and coastal development has the ability to alter oceanographic characteristics important to waveriders. Surfers are traditionally defensive about any activity in the vicinity of their favorite surf break—and for good reason, as their rights have at times been ignored and surf breaks have been destroyed by coastal modification (Scarfe et al. 2003). Wave energy specifically may cause a 3 to 30 percent reduction in wave height shoreward of wave-energy devices (Halcrow Group Limited 2006, ASR 2007) and may also influence sediment-transport patterns important to the provision of breaking waves. Cases of coastal development having detrimental impacts on waveriding are plentiful, and in some cases developers have been found liable for the resulting loss of recreational amenity (Henriquez 2004).

Waveriders are not alone in their concern and for their potential to be impacted by wave-energy development in Oregon. Divers and boat-based wildlife viewers may object to negative impacts of wave energy or other development on biological communities or habitat, or in a resultant limit in access to certain areas (both land and sea). Boaters may be impacted by being forced to use alternative transit routes, which may have economic and safety consequences. Where proximity is the primary driver in preferring a place of recreation, the NROU community will likely object to being displaced and forced to travel farther. Displacement may cause resentment by regular users of locations receiving the displaced as well as crowding, potentially leading to a diminished recreational experience and conflict. Individuals may also feel an attachment to a particular place, whether for functional reasons or for nostalgic ones, as has been demonstrated in recreation literature (Moore and Graefe 1994). While subordinate to proximity and conditions, our survey respondents frequently (45 percent somewhat or strongly agree) enjoy their recreation because it is done near a place loved ones like to frequent. Sentimentality and the presence of friends or family nearby were themes identified as reasons why a place is used, and one interviewee spoke of enjoying visits to where they had first learned to surf.

All phases of wave energy installation may have the potential to impact non-consumptive marine recreation—from installation to operation to maintenance, and from the wave energy parks themselves to the ports servicing them (construction, dredging, engineering). Recreationalists may rely on a combination of access, facilities, and proximity—in addition to conditions—for a place to be suitable for recreation. This means that wave energy or other development has the potential to negatively impact ocean recreation via different pathways. Members of the NROU community are concerned about restricted access due to wave energy development, whether on ocean space or as impediments to access points on land. Displacement to an area with inferior conditions, less-supportive infrastructure, and a lower level of familiarity will likely be greeted with objections. All groups value aesthetics in their recreation, and any perceived blight on the visual environment may impact another theme identified as important to the NROU community.

Coastal communities losing recreation areas and the benefits brought by the NROU community will suf-

fer. Examples of negative impacts of coastal development on waves and thus, waveriders, are not in short supply (see Scarfe et al. 2003, Henriquez 2004, Lazarow 2007, and Lazarow 2009). Nelson et al. (2007) describe that many surf breaks in California have been degraded by coastal development, with three "world famous" breaks being completely destroyed. Here in Oregon, a surf break in Lincoln City was found to have declined in quality after the construction of a coastal engineering structure (riprap) interfered with sand flow (Corne 2009). Lazarow (2008) remarks that negative impacts to a surfing amenity in important surfing areas may have "serious consequences" for local communities and suggests that this may have already occurred in at least one popular (and well-studied) surfing location in Australia. Examples of how wave-energy development specifically might negatively impact waveriding exist too: a study of wave farms in England found a 13 percent reduction in wave height of typical surfing waves on the landward side of wave farms (Halcrow Group Limited 2006).

On the other hand, ocean and coastal development is not always detrimental to ocean recreation. At least nine Oregon surf breaks improved after the installation of jetties that altered sand movement (Corne 2009). Several of the same structures are now important diving areas, due to improved access and habitat creation for marine wildlife; they also facilitate boating and boat-based wildlife viewing. Docks have also become important diving areas in several locations in Oregon. A 2008 report on wave-energy development in neighboring California suggests that wave energy sites may benefit diving, as they may create fish aggregating structure (H. T. Harvey and Associates 2008). There is evidence of marine-renewable energy structures benefiting local fish abundance (Wilhelmsson 2006) and serving as artificial reefs (Linley et al. 2007)—including wave-energy devices specifically (Langhamer and Wilhelmsson 2007). However, the impacts—negative or positive—of marine-renewable energy on wildlife are unclear (Inger 2009). Further, benefits of marine-renewable energy to marine life may be useless to recreation if it is ultimately restricted in energy-development areas, and the literature concerning impacts on ocean recreation seems sparse and frequently speculative.

Wave energy is an emerging stakeholder in the ocean off Oregon's coast.

Due to the potential impacts of wave-energy development on the nonconsumptive recreational ocean users of Oregon, stakeholder understanding and inclusion in planning will be important for the long-term success of wave energy and other planning challenges in Oregon.

Conclusions

Oregon is home to a hardy crowd of ocean recreationalists undeterred by wet, windy weather and unforgiving ocean conditions. Their pursuits are important to them for exercise, challenge, social interaction, connecting with nature, and escape. Whether they are recreating multiple times weekly or once a year, they value their recreation highly—even altering parts of their lives to accommodate their recreation. They are coming from communities all over the state of Oregon, and Oregon's ocean and coastal places are also enjoyed by visitors from out of state and farther abroad, some of whom are seasonal residents. All are bringing money to Oregon's coastal communities. Hotels and RV parks, restaurants and bars, and scores of local shops are just some of the beneficiaries of their economic contributions. They also open businesses and pay local taxes and recreation-related fees that help support facilities and services used by many. Non-consumptive recreation has been important to the culture of Oregon's coastal communities as well. Some locations have built their identities around such recreation, and many more benefit from community events and organizations related to such activities.

Nationally, beach visitation is expected to increase, and so too are snorkeling, diving, surfing, windsurfing, sailing, power boating, jet skiing, rowing, kayaking, and wildlife viewing (NOAA 2005). Surely, this will also occur in Oregon, as the Pacific Northwest recreates at a higher per-capita rate than the national average. Further, Oregon's population continues to grow, meaning more people will potentially be pursuing ocean recreation, increasing their importance to coastal communities and increasing demand on ocean and coastal resources. As the U.S. and Oregon population ages and more retirees move to the Oregon coast, a higher dependence on facilities aiding access to recreational resources may be needed. A shift toward more-passive activities, such as wildlife viewing (which is already the fastest-growing form of non-consumptive recreation in the U.S. and Oregon), may also occur (OPRD 2008, Hall et al. 2009).

The growing and changing NROU community using Oregon's ocean and coastal places should be welcomed because of the "renewable" contributions they make to Oregon's coastal communities. They provide economic, cultural, and other benefits to coastal communities, and they represent existing sources of income to local communities, with minimal conflict or interference with existing ocean uses and users. This group may be sensitive to changes in ocean planning, and negative impacts to this group will have detrimental impacts on the coastal areas and communities they use. The NROU community and the subgroups that comprise it should be further studied to improve understanding of expectations, needs, and contributions, and they should be considered in policy decisions concerning Oregon's ocean and coastal resources.

Current and future ocean and coastal uses have the potential to negatively impact the NROU community using Oregon's ocean. Limiting access to certain spaces—such as with physical or legal barriers—may exclude users from areas important to their recreation. It may make entry difficult, unsafe, or even impossible. Development may alter characteristics about a place important to users, such as interference with sediment transport and waves or displacement of wildlife. Displacement of recreationalists for any of these reasons may force recreationalists to use other areas, which may lead to crowding and conflict with other users as their recreational experiences are indirectly impacted. Diminishment of other important parts of their recreational experience—such as aesthetics, water quality, and escape—is also a concern.

The needs of the non-consumptive recreational ocean user community are simple and definable. Avoiding or minimizing conflict with this integral and established segment of Oregon's coastal community is possible and should be a priority in future ocean and coastal planning.

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Glossary of terms

Accessibility—Refers to the ability to use a certain place, and may be influenced by availability of viable entry and egress as well as infrastructure such as parking, boat availability, crossable bar, etc.

Birder—One who views birds for recreation.

Boaters—An ocean recreation group that recreates through use of a vessel. This group includes power boaters, sailors, and kayakers.

Boat-based wildlife viewers—An ocean recreation group that pursues the passive watching of wildlife from a vessel. This group includes those watching wildlife from private boat, charter boat, and kayak, and may include birders and whale watchers, among others.

Coastal and Marine Spatial Planning (CMSP)—A means of spatially managing the ocean according to management goals, recognizing that not all ocean uses are compatible (Ehler 2008).

Consumptive recreation—Recreation that involves a harvest element, or the removal of resources from the place of recreation by the recreational user. This includes fishing, crabbing, agate hunting, and shell gathering, among others.

Cruising—The use of a boat for traveling about for pleasure, relaxation, or sight-seeing. This may be an aimless jaunt or a planned, multi-day excursion, and may be the central form of boat-based recreation for the user or simply one component of the recreational experience.

Divers—An ocean recreation group that explores the ocean via underwater immersion. This group includes scuba divers, snorkelers, and free divers.

Ecosystem-Based Management (EBM)—An integrated approach to natural-resource management that considers the entire ecosystem, including humans, and seeks to maintain ecosystems in healthy, productive, and resilient conditions for provision of the services humans want and need (McLeod et al. 2005).

Estuary—The interface where a river meets the ocean and freshwater and saltwater mix. In Oregon, most saltwater bays and harbors are located in the estuaries of major rivers. These areas are important as recreation sites and as access points for ocean recreation.

Non-consumptive recreation—Recreation that does not involve a harvest element, or the physical removal of a resource from the place of recreation by the recreational user. This group includes waveriders and boat-based wildlife viewers, as well as some divers and boaters.

NROU—Non-consumptive recreational ocean user.

Slack tide—the period of reversal between incoming (flood) and outgoing (ebb) tidal flow that results in relatively still water.

Pelagic birding—Recreational viewing of birds (and other wildlife) that spend much of their lives at sea and are difficult or impossible to see in nearshore or onshore environments.

Recreation—A pastime or diversion providing personal benefits such as relaxation, exercise, thrill, or enjoyment.

Stakeholder—An individual or group that has an interest in a particular resource, project, organization, or other entity.

Territorial Sea (Oregon)—That portion of the nearshore ocean that lies from the mean-lower low water (MLLW) to three nautical miles offshore and from the Washington-Oregon border to the California-border.

Waveriders—A group relying on breaking waves for their ocean recreation. This group includes surfers, paddle-boarders, body-boarders, kayak surfers, kite surfers, windsurfers, and body surfers.

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