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The U.S. Whale Watching Industry of Greater Puget Sound

A Description and Baseline Analysis

March 2014

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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A Description and Baseline Analysis

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Executive Summary

Background

Southern Resident killer whales (SRKWs) were listed as an endangered species in 2005. This triggered the requirement for a recovery plan that was released in 2008. Extensive biological studies are focused on determining the causes for the decline of the killer whales and how to conserve and recover the population.

Being a charismatic megafauna, a focal point of tourism in aquariums and parks such as SeaWorld, as well as the subject of a series of films, killer whales have become a main attraction for marine viewing. SRKW occupy a unique geographic area in Greater Puget Sound for part of the year. As a result, an extensive tourism industry has developed. This industry aims to provide SRKW viewing opportunities to the public.

While the industry provides tourism opportunities to view the whales, evidence indicates some characteristics of the industry may be risk factors for the SRKW. While biological scientists study the biological issues surrounding the SRKW, this study considers the industry and the people who make up the industry in order to gain a better understanding of the ecosystem that surrounds the SRKW.

Overview of the Industry

The whale watching industry is diverse and well organized. The Pacific Whale Watch Association has a range of member companies that abide by association mandates and operate via guidelines. Most companies that are members of this organization are motorized vessel companies. In addition, kayak companies and land-based viewing companies exist in this particular industry. Tourism companies are also distributed between the United States and British Columbia. The industry is highly diverse both geographically and based on its platforms. This research is focused on understanding those companies that operate in the U.S. portion of the industry. During the study year, 18 U.S. motorized vessel companies operated 23 vessels out of multiple ports in the San Juan Islands, the Olympic Peninsula, and Puget Sound coastlines.

Research

Using social science tools, this research aims to create a baseline description of the industry. A survey instrument, distributed primarily in person, and unstructured interviews were the mechanisms for extensive data collection efforts. Information obtained included demographics, individual participation, business characteristics, industry trends, and effects on the community. Data were collected from individuals who participated in the industry either through paid or volunteer positions during the 2006 active whale watching season.

Response rates were complex, but averaged a 61% return, yielding 112 completed surveys. Larger companies with more employees, where there was less one-on-one interaction between employees and researchers, had the lowest response rates. The motorized vessel sector had the highest response rates and the San Juan Island region had slightly higher response rates than the mainland region.

Data were analyzed with various different types of aggregations in an attempt to clarify the results and show the most accurate representation of the data. Overall analysis of all data included representation of all sectors of the industry independent of the type of company, its geographic location, or size. Regional analysis sorted companies based on their geographic locations, as some companies are more remote, located on the San Juan Islands, while others are accessible from the Interstate 5 corridor. Sector analysis sorted the data by sector: motorized vessel, kayak, and land. This allowed for a better understanding of differences between types of companies.

The motorized vessel sector was further aggregated to protect confidentiality and sorted by vessel types. Vessels in the industry were compared to United States Coast Guard (USCG) vessel regulations. The regulations identify different vessel types based on various characteristics such as length and passenger capacity. The companies affiliated with the vessels were sorted into four groups based on the USCG vessel types. Tier 1 companies represent those larger vessels the USCG defines as motor vessels (greater than 65 feet long). Tier 2 companies operated one or more USCG-defined T-type small passenger vessels (under 100 gross tons and carries 150 or less passengers) that participated in the whale watching industry. Tier 3 companies include those operating only a single T-type small passenger vessel. Tier 4 companies operated USGC-defined uninspected passenger vessels (at least 100 gross tons and carries no more than 12 passengers). This analysis allowed for matching companies with similar traits and comparing the differences between the types of vessels operating in the industry.

Results

Findings were extensive. Unique results are discussed here. The type of analysis or analysis aggregation respective to each result is provided for data clarity. Sample results are shown for each section of the survey.

Demographics

Demographic results under the overall analysis of age data show the industry was comprised of a higher percentage of older individuals working, as compared to U.S. Census data for Washington state or the nation. Further regional analysis of this data shows a higher percentage of people over the age of 45 years old working, living, and operating businesses out of the island region.

Overall analysis shows industry members were more highly educated than the average reported in the U.S. Census for both Washington state and the nation. A majority of those individuals with a bachelor's degree or a higher degree were found in the island region per regional analysis. Motorized vessel tier analysis shows them more prominently in Tier 2 and Tier 3 companies.

Overall findings indicate residence was primarily in Western Washington, with a majority of individuals residing in San Juan County, followed by King County and Whatcom County. Regional analysis shows that individuals residing in the island region work close to where they live, primarily in San Juan County, while individuals working in the mainland region reside in a broader range of counties, such as Whatcom, King, and Skagit counties.

Overall income results show most participants earned between \$10,000 and \$30,000. Regional analysis further clarifies that this trend was prominent in the island region. In the mainland region, a majority of the individuals earned between \$31,000 and \$50,000. Analysis also shows a majority of those earning more than \$50,000 a year were owners of companies. When asked what percent of their income came from working in the SRKW industry, overall results indicate a majority received 0–25% of their income from the industry. Of those receiving more than 50% of their income from the industry, the majority were owners. Tier analysis shows they worked on Tier 2 and Tier 3 vessels. Regional analysis shows they primarily operated out of the island region.

Demographic data assisted in a better understanding of age variation by geography. It also provided insight into how to communicate based on the high levels of education. Residency provided an understanding of possible impacts on the communities, where island and smaller communities that are more remote may be less resilient to change than those closer to large metropolitan areas. Income information provided some insight into the importance of the industry to the income and livelihoods of those working in the industry. Together, these indicators can assist in understanding social impacts any regulatory or other changes might have on the industry members.

Individual Participation

Individual participation data expanded on demographic data by asking more extensive and informative questions about the individuals. Some interesting results include entry years into the industry and the number of years worked in the industry. Overall analysis shows the first entry into the industry in 1978, with additional peaks in 1998, 2004, and 2006. Regional analysis indicates a majority entering in 2006 in the mainland region. Peaks in entry in the island region were in 1997 and 2004. Sector analysis shows a prominent peak of entrants in the kayak sector in 2006, contributing to an overall high peak of entrants in 2006.

Considering the number of years individuals had worked, overall analysis shows the majority had worked in the industry for 2–5 years, followed by 6–10 years and up to 26–30 years. Regional analysis reveals a majority of those working 2–5 years were in the mainland, while a slight majority of those working in the island region had worked 6–10 years. Tier analysis provides further clarification, indicating that Tier 1 and Tier 3 companies had a majority with tenure of 2–5 years, while Tier 3 and Tier 4 had high numbers of individuals with tenure of 6–10 years. Of those with the highest tenures, 26–30 years, they worked in the mainland, kayak sector, and Tier 1 and Tier 2 companies.

Various questions were asked regarding work schedules. When asked what months most participants worked, as this industry is primarily a seasonal industry, overall results show a steady increase beginning in March, peaking in July, slowly decreasing into October, and

stabilizing again with a reduced number of people working all year. This trend varied slightly in percent between types of analysis, but the trend is consistent in all other types of analysis. Overall analysis indicates most individuals worked more than 40 hours a week during the season, closely followed by those working 40 hours (full time) or less than 40 hours (part time). Regional analysis shows a majority in both regions worked part-time jobs, more individuals in the mainland region worked more than full-time hours, and full-time workers are comparable between regions.

Results from this section helped understand an individual's investments and dependence on the industry in which they participated. Concepts such as tenure and the link to vessel size helped derive more questions to pursue. For example, is it easier to start a company with a small boat, then expand the operations if successful?

Business Operations

When considering business operations, questions focused on types of tours, the details of the tours offered, and vessel characteristics. Study participants described the types of tours that were provided by motorized vessels on a Likert scale. Overall analysis indicates the highest levels of agreement described the tours as boat-based tours on which the SRKW is a focal point, followed by a description of "wildlife tours" and tours on which the SRKW is the "exclusive intent" of the tour. Kayak results show an overwhelming response, 88.9%, that their tours were "exclusively" kayak tours. The land sector shows a high percent of responses, 75%, as selecting "strongly applies" for the description of land-based whale watching tours.

Tour description data were followed by a question asking what percent of a vessel's activity was dedicated to SRKW viewing. The highest responses in the motorized vessel analysis show that 42.9% said 91–100% of vessel activity was dedicated to SRKW viewing. The highest responses in the regional analysis show that 23.3% of mainland and 44.3% of island respondents said 91–100% of their vessel activity was dedicated to SRKW viewing. The highest responses in the kayak sector analysis had 47.8% selecting a "not applicable" answer, indicating the perspective that their companies did not dedicate tour activities for SRKW viewing. The land sector results show 60% of respondents dedicated 1–20% of the tour activity to SRKW viewing.

When asking questions about the number of tours offered, departure times, and duration in hours, the data returned were very complex and too difficult to condense in a meaningful way. As a result, we turned to secondary data including the Internet and print media to try and determine tour information. From the review of advertised or otherwise communicated tours, we compiled estimates from secondary data to discuss tour information. Our analysis indicated that 17 companies identified (of 18 companies, data were only available from 17 companies for this analysis) offered 37 tours daily in 2006. The ability to offer multiple tours is directly linked to the composition of the business and the associated fleet of vessels and vessel type. Larger, faster vessels may provide either longer tours once a day or shorter tours several times a day. In addition, some companies operated multiple vessels that were dedicated to some level of SRKW viewing activities. Results show that most companies, seven, operated only one tour per day and five companies operated two tours a day. Additional results indicate some other variations; however, only two companies offered five tours per day. Further tier analysis shows all Tier 1,

the largest vessels, operated only one tour per day, where Tier 2 had the most diversity in tour offerings, 1–5 per day. Tier 3 and Tier 4 companies operated 1–3 tours per day. Regional analysis shows all but one of the mainland companies offered one tour per day. The island region offered the greatest range of tour options.

Tour duration results show great diversity as well. They ranged from 2.5 hours to 7 hours. Results shown are aggregated by companies with similar tour durations and reported on the number of combined companies offering specific tour durations. Further tier analysis shows duration time varied across tiers. The majority of 4-hour trips were offered in Tier 2 and Tier 3 companies while 7-hour trips were offered by Tier 1, Tier 2, and Tier 4 companies. Regional data indicate the most variation in the mainland, with tour duration operations from 2.5 to 7 hours. Island region companies offered tours for either 3 or 4 hours.

Tour departure times provided another measurement to describe tours. The motorized vessel analysis shows a small majority of tours departing prior to noon, followed by several departing after noon and even fewer departing in the evening. Tier analysis shows Tier 1 had the greatest percentage of tours departing in the early morning, which supports their long tour durations of 7 hours. Otherwise tour departures prior to noon were very similar across all other tiers. Tier 4 had the majority of tours departing in the late afternoon. Regional analysis shows departure time throughout the day for both regions. A majority of the tours in the mainland region departed before noon, with fewer tours leaving after noon. Island region results show steady departures from midmorning throughout the day. These results align well with the tier analysis.

These tour data can assist in the understanding of how the companies work, vessel size, the number of vessels a company may operate, and the number of tours offered. Data revealed regional variations that may be clearly linked to the vessel characteristics. These same characteristics may be the primary driver for the tour designs. This speaks not only to the experience aboard these vessels, but the tour characteristics as discussed, to include the number of tours offered in a day as well as the tour durations and departure times. It is very important to clarify and reiterate that these tour results are based on secondary data and represent the number of tours offered, not the actual number of tours operated on any given day.

Industry Trends

The industry trends section of the survey provides some information on how the industry had changed. Results here are slightly different from the other sections, as many new or recent entrants into the industry did not feel they had enough background to answer the questions. Consequently, the response rates were lower. However, those who did answer had higher tenures and may represent a more accurate vision of the industry trends. Results in this section are limited to an overall analysis of all survey respondents.

One question asked respondents to describe changes in the vessels in the industry over time. Results indicate a 76.8% response that vessels were now faster and a 75% response that vessels were larger. This was closely followed by a 60.7% response that vessels had increased passenger capacity.

Ownership structure information was also pursued to try to understand whether existing businesses are expanding or new businesses are entering the industry. Responses show that 72% said existing owners are buying new boats, 61% said new owners are entering the industry with new boats, and 50% said new owners are entering the industry and purchasing boats that were already operating in the industry.

A series of Likert scale responses from strongly disagree to strongly agree were asked in relation to the state of the U.S. vessels in the SRKW industry, tourists in the U.S. industry, vessels in the non-U.S. industry, and recreational vessels. Regarding vessels in the U.S. SRKW industry, in an aggregate of the positive responses of strongly agree and agree, a majority of responses indicate that the number of U.S. vessels in the industry was either growing, 45.2%, or saturated, 45%. A close response indicates that 38.6% felt the number of U.S. vessels in the industry was stable. Additional results show that an aggregate of the disagree responses, 62.3%, did not agree that the number of U.S. vessels operating in the SKRW industry was declining.

A second question asked participants to rate descriptions about the state of the tourists in the U.S. SRKW industry. Aggregate agree responses show 52.5% said the number of tourists was growing. Aggregate disagree responses show 71% said the number of tourists in the industry was not declining, and 67% said they disagree that the number of tourists was saturated. As a result, an interpretation of this question suggests that there was room for more growth in tourist numbers, and as of the study year of 2006, there was no decline in the number of tourists.

Another line of questioning asked about the non-U.S. SRKW vessels, more specifically those Canadian vessels participating in the industry. When asked whether the number of Canadian vessels was declining, stable, growing, or saturated, 62% of positive aggregate responses agreed that the number of vessels was growing and 40% said they were saturated. This is supported by the aggregation of the disagree responses; 66% disagreed the number of vessels is declining and 51.5% disagreed the number of vessels is stable.

The final Likert scale questions asked participants to rate the number of recreational vessels around the SRKW. The aggregate agree responses show 55% said the number of recreational vessels was growing, which was further supported by a 66% disagree aggregate response that the number of vessels was declining.

Information gathered in this line of questioning helps us understand the trends within the industry from the perceptions of the study participants. Insight into the vessel activity in the U.S. and Canadian fleets is useful information in projecting where the industry may move in the future. It provides a glance at industry member perceptions of tourists and recreational vessels, and the possible future capacity of tourism in this industry. Gaining perspectives on recreational vessels helps with the larger question of presence of other vessels on the water, which may have their own impacts to the SRKW.

Effects on the Community

The whale watching industry and its effects are not limited to the vessels and land businesses, but may be connected to the local communities in which the businesses operate. Connections to other tourism entities was acknowledged, where 47.5% held a membership in the

chamber of commerce, 37.6% had partnerships with vacation resorts, and 35.6% had partnerships with other tourism companies. The location of these partnerships also contributed to understanding the connection between the industry and their communities. Results show that 75% of these partnerships were local and 66.2% were in the Greater Puget Sound region.

Shore support services are another way to see the connection between industry businesses and the local community. Shore support services results indicate a majority of respondents, 84.8%, obtained fuel, while 73.7% used graphics/printing services, and 70.7% used Web and office rental services. Other services obtained included marketing, ticketing kiosks, vessel maintenance, and food services. When asked to distinguish where these support services were obtained, a distinction was made between the home port, where the vessel was permanently moored, or the operational port, where the vessel docked for tours, but was not permanently moored. Results indicate that 48.2% of participants used the services in their home port 76–100% of the time. Fewer companies had operational ports and most said operational ports were not applicable to them. However, for those with operational ports, 23.2% used the support services 76–100% of the time.

When asked to describe the significance of the industry to the local community in which the business operated, qualitative analysis identified several themes. The themes include tourism, education, and local community perspectives. The majority of responses, 119, fell within a theme of tourism. This is where the industry provides an economic benefit to the local community, draws visitors/customers, provides direct and indirect jobs, provides entertainment, and serves as a tourism draw to the local community. An exemplary response follows.

I think a substantial amount of visitation to San Juan Island is generated by the presence of SRKW. Many, many day visitors come to the island to go whale watching or kayaking, and spend money on ferries, food, gifts, and lodging, providing many jobs and lots of tax revenue. Many ... businesses can stay open year-round to provide services to residents because of the influx of visitors in season—many hoping to experience the SRKW.

Another question asked participants to comment on the significance of the industry to the general public. Again, qualitative analysis identified themes. Those themes include the SRKW, education, tourism, no impact to the general public, nature, and the economy. The majority of respondents, 88, spoke to the theme of education. This included concepts such as the SKRW industry contributing to education of nature/natural history, awareness of the ecosystem, attitudes and personal responsibility, values and the significance of nature and the whales, advocacy, and working with local schools and teachers. An exemplary response follows.

I think the opportunity to view SRKW population from a water platform provides an experience that helps people build bridges between personal values and conservation/environmental ethics. It gives people a real sense of wild animals in their natural habitat. I believe this becomes foundational in a paradigm that helps translate into action ... consumer decisions, votes, conservation, etc.

Results in this section provide some indication of how the businesses are connected to their communities. Many businesses indicated they not only contributed to the local economies through jobs, tourism, attracting tourists, purchasing supplies and services in their local

communities, but also communicated with the general public aiming to foster a higher level of education about nature.

Discussion

This research provides a broad range of sociocultural information regarding the U.S. SRKW whale watching industry in Puget Sound, Washington. Combined, this may help to contribute more information not only to the management of the SRKW, but to those interested in the industry as well. Information on the people of the industry may assist in learning how to best communicate with the industry, understand their level of investment in the industry, and provide insight into their connections with their local communities. Business operations information provides clarification on vessel types, differences between regions, tour type information, schedules, and levels of activity in the industry. Industry trends information from the industry members themselves can be coupled with historical data to contribute local observations. Effects on the community are the first step in gaining some insight into a broader question of the connection of the industry to their local communities. This information may be used to inform single or multiple questions or goals of the SRKW recovery plan. In addition, it provides a baseline for the comparison of similar future data collection, as well as ideas for other areas of future data collection.

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Introduction

Killer whales (*Orcinus orca*), also known as orcas, are cultural icons for the human residents of the Pacific Northwest Puget Sound region. The importance of killer whales is clearly evident in the tribal and nontribal cultures of the area. Whales are represented in past and contemporary tribal art as well as Pacific Northwest promotional materials. In 2005 Governor Christine Gregoire signed legislation designating the killer whale as the official marine mammal of Washington.

The presence of killer whales in the Puget Sound basin brings these animals in close proximity to humans, fostering development of a whale watching industry that provides opportunities to observe the whales. These opportunities are not only sought out by out-of-state and in-state tourists, but also embraced by local residents as well. This industry is dependent on the healthy existence of the whales and their continued return to Puget Sound.

In 2003 the National Marine Fisheries Service (NMFS) listed the Southern Resident Killer Whale (SRKW) population, which spends much of its time in the Puget Sound region, as depleted under the Marine Mammal Protection Act of 1972. This listing resulted in the development of a proposed conservation plan that outlined steps to conserve and restore the species. In 2005 the agency also listed SRKWs as endangered under the Endangered Species Act of 1973 (ESA). The NMFS Northwest Regional Office (NRO) took the proposed Marine Mammal Protection Act conservation plan, addressed comments on it, and incorporated ESA elements into a proposed ESA recovery plan, which was released for comment in November 2006. The agency incorporated comments and new research results and references, then finalized and released an ESA Recovery Plan for Puget Sound killer whales in January 2008 (NMFS 2008).

Ongoing biological studies related to the SRKW seek to better understand the animals and their ecosystem. These studies focus on issues surrounding the SRKW such as their diet, behavior, and habitat. Social science considers the human components of the ecosystem. Studies from this discipline focus on tourists, local residents, and industry members to better understand issues such as the values of the resource and dependence on it. Together, the biological and social sciences can complement one another, leading to a more integrated understanding of the entire ecosystem. The link between the SRKW and the whale watching industry in Greater Puget Sound provides a unique opportunity for conducting studies in both the biological and social sciences. This specific study is sociocultural, noneconomic in nature, and seeks to provide information about the people who work in the U.S. SRKW watching industry and describe the members that comprise it.

This technical memorandum is organized in several sections. The next section on humans and ecosystems discusses background information related to the study. Topics include biological information on the whales and how their unique characteristics contribute to human

interest. The section also provides a short history of the whales from a human perspective and a review of the industry and its organization, followed by an overview of the regulations that surround the actions being taken to restore the killer whales. The following section discusses the study's background and development, touching on methods and materials, survey development and administration, and survey response. Then the section on results discusses how the data were analyzed, the various aggregations used, how they were determined, and the organization of the results. The next nine sections include the data. Each section contains a summary and tables or figures showing results specific to that section. These data sections are followed by a Concluding Discussion section, which pulls together points for each of the various types of analysis and summarizes them, as well as offers some final remarks.

Context: Humans and Ecosystems

Humans are as intricately woven into ecosystems as any other element. For example, scientists study the biological factors of the health, habitat, abundance, etc., of commercial fisheries; however, the fisheries themselves are driven by humans. Humans can impact the health of a fish stock by negatively altering water quality, damaging or destroying habitat for commercial fish species, or overfishing species. The human impacts are not limited to negative ones. Humans can improve water quality, protect habitat through setting aside protected areas or altering commercial fishing gear that could otherwise damage habitat, and manage the resource in order to recover or retain the abundance of a fish species. All of these aspects of the ecosystem surrounding a marine species are directly related to human interaction.

The same concepts apply when considering marine mammals. Negative impacts such as net entanglements, oil spills, or ship strikes of large marine mammals are all human-driven impacts. These impacts can also be mitigated by human activity. Alterations in net design and vessel operation with nets, modifications to vessels to minimize the release of oil, and altering shipping lanes to minimize strikes with large vessels are all ways humans have altered their interactions with marine ecosystems.

The social sciences can provide information on people, how they use a resource, their behaviors that may harm or benefit the resource, the importance of the resource to the public, and the culture surrounding the resource, among others. Understanding the relationship between people and the resource creates the potential to incorporate the resource users into decision making, models, and projects and to better understand how the resource can be managed. This management has the potential of being more complete with the incorporation of social science.

As scientists embrace the context of management through ecosystem research, the incorporation of people into the equation becomes more apparent. An interdisciplinary approach including researchers in the natural and social sciences makes the ecosystem puzzle fit together nicely. The research conducted by this study seeks to contribute to the understanding of people in the complex ecosystem surrounding the SRKW. This research in conjunction with ongoing biological research can paint a more complete picture of the SRKW ecosystem.

Biological Context: Southern Resident Killer Whales

Killer whales, the world's largest dolphin, are considered to be the most widely distributed cetacean species in the world (Carwadine et al. 1998, Ford 2002, NMFS 2008, 2013). In the northeastern Pacific Ocean, scientists have identified three types of killer whales: residents, transients, and offshores (Ford et al. 2000, NMFS 2008). Resident killer whales, distributed from Russia to California, are further broken down into multiple distinct communities, one of which is the SRKW (Krahn et al. 2002, 2004, NMFS 2008). The SRKW is considered a distinct population consisting of three pods. These pods are identified as the J, K, and L pods (Ford et al. 2000, Krahn et al. 2002, 2004). These whales reside in the inland

waterways of Greater Puget Sound, which includes the Strait of Georgia, Strait of Juan de Fuca, and Puget Sound in Washington state and British Columbia (Ford et al. 2000, Krahn et al. 2002, NMFS 2008). The whales are present in this locality primarily during summer and fall.

Fish, primarily Pacific salmon (*Oncorhynchus* spp.), are thought to be the major source of food for the SRKW (NMFS 2008). Specifically, Chinook salmon (*O. tshawytscha*) are the preferred prey, followed by other salmonid species and nonsalmonids (Ford and Ellis 2006, NMFS 2008, Hanson et al. 2010). Ford and Ellis (2006) reported a small number of nonsalmonid prey species including herring (*Clupea pallasii*), sablefish (*Anoplopoma fimbria*), yelloweye rockfish (*Sebastes ruberrimus*), quillback rockfish (*S. maliger*), and Pacific halibut (*Hippoglossus stenolepis*). Hanson et al. (2010) further identify nonsalmonid summer prey selection to include lingcod (*Ophiodon elongates*), rockfish (*Sebastes* spp.), and Dover sole (*Microstomus pacificus*), as well as the halibut found by Ford and Ellis (2006). Research indicates that SRKWs spend about 50–60% of their time foraging for food (NMFS 2008). Other SRKW activities include traveling, resting, and socializing (Ford 2002, NMFS 2008).

Life expectancy in killer whales varies by gender. Research indicates that the average life expectancy of a female killer is 50 years, but individuals may live up to 90 years. The average life expectancy of males is 30 years, but individuals may live up to 50–60 years (Ford 2002, NMFS 2008). Population estimates for the SRKW indicate there were about 86 whales in 2006 and 87–88 by late fall of 2007 (NMFS 2008, Center for Whale Research¹). More recent updates indicate an estimated population of 86 individuals by the end of 2010 and 84 individuals by the end of 2012 (NMFS 2011, Center for Whale Research²). Some information suggests the population estimates were greater than 200 animals around the mid to late 1800s, suggesting a drop in the current population (NMFS 2008).

Killer whales generally reside in a pod, which is a “group of related matriline that likely share a common maternal ancestor in the recent past” (Ford et al. 2000). A matriline is further defined as a “group of closely related whales linked by maternal descent” (Ford et al. 2000). Killer whales are highly social and may temporarily congregate around sources of food for social interaction or for breeding purposes. Social behavior includes play, where whales exhibit extraordinary activities such as breaching, tail slapping, spyhopping, flipper slapping, and aerial displays (NMFS 2008). In addition, whales have been seen occasionally playing with items such as kelp or in the wake of passing vessels (Ford et al. 2000). Evidence of these social displays has been extensively documented by researchers and whale watching enthusiasts alike.

The coloration of killer whales is black and white with a touch of gray. The animal is primarily black on its dorsal side and white on the ventral region (NMFS 2008, Ford 2002). Several white areas include an oval patch above and behind the eye, a “saddle” patch behind the dorsal fin, and a white belly marking extending from the ventral white coloration up toward the lower rear flank. In infants the white coloration is yellow or orange (Krahn et al. 2002, NMFS 2008). Of importance concerning coloration are variations in the color patterns, specifically the white patches, that are unique to each individual. These variations, in addition to scars and other marks, enable the identification of specific individuals (Ford et al. 2000, NMFS 2008, Center for

¹ Center for Whale Research, online at <http://www.whaleresearch.com/research.html>.

² See footnote 1.

Whale Research³). Along with coloring, development of the dorsal fin and its characteristics contribute not only to the ability to distinguish whales by gender, but also help to distinguish between populations. Resident, transient, and offshore populations have different dorsal fin characteristics with variations in size, curvature, and saddle patch placement (Ford et al. 2000). The ability to identify specific individuals is important not only in terms of management, but also in how people can relate to a specific individual.

Since the early 1970s, photo identification has been used and updated annually to build genealogical maps of the SRKW population (Ford et al. 2000, NMFS 2008, Center for Whale Research^{4, 5}). In addition to using photographs to identify whales, a naming structure was developed using an alphanumeric system, such as J2 and L72 (Ford et al. 2000). This strengthened the ability to identify specific individuals. Further research and understanding of life histories as well as other aspects of the killer whale societies was also facilitated (Ford et al. 2000). To this day, these photo identification records and the ability to identify specific individuals are maintained and provide a key tool in biological research. The usefulness of these identification techniques is not limited to biological research only; they are also a valuable resource in the tourism industry.

These biological aspects of killer whales also play a role in the ability of members of the public to be enthralled by merely seeing the whales. Their sheer size makes them easy to see from a distance. Their longevity allows people to identify the whales year after year, observe how the whales grow and change over time, or just simply hope that a favorite whale returns the following year. The ability to identify individual whales also enables people to develop personal relationships with specific whales. This is simplified in the naming hierarchy. In addition to scientific alphanumeric identifications, individual whales have been given common names with which the public can easily identify. For example J-1's common name was Ruffles and L-55's common name is Nugget. This further personalizes the whales. Their social habits, especially aerial displays and other behaviors, bring the whales out of the water, allowing people to see more of the whales without having to be underwater. The social relationships between whales, such as familial bonds, provide a correlation to human relationships. Other characteristics hint at the personalities of individual whales, further enthraling the public. All these biological features feed into the concept of charismatic megafauna surrounding the killer whales.

Human Context: Humans and Killer Whales

The relationship between people and killer whales has changed over time. Historically the whales were termed “killers” due to eyewitness accounts of killer whale behaviors (NMFS 2008). From a Roman scholar who stated “A killer whale cannot be properly depicted or described except as an enormous mass of flesh armed with savage teeth,” to 18th century Spanish whalers witnessing orcas feeding on larger whales, and descriptions of 20th century fishermen who lost catch to killer whales, they were viewed as savage hunters of the oceans.⁶ Even recent footage portrayed in the Discovery Channel's Blue Planet television series captures

³ Center for Whale Research, online at <http://www.rockisland.com/~orcasurv/identify.htm>.

⁴ Center for Whale Research, online at http://www.whaleresearch.com/orca_ID_pods.html.

⁵ Center for Whale Research, online at <http://www.rockisland.com/~orcasurv/survey.htm>.

⁶ Center for Whale Research, online at <http://www.rockisland.com/~orcasurv/early.htm>.

a pod of killer whales attacking a gray whale calf. Killer whales were typically feared and avoided.

In the 1960s, events began to change public perceptions surrounding killer whales. Live capture events including the efforts of Marineland of the Pacific in California resulted in the death of two killer whales, followed by the capture and death of “Moby Doll” by Samuel Burich, a sculptor commissioned by the Vancouver Aquarium to fashion a life-sized model of the killer whale (Hoyt 1990, Center for Whale Research⁷). Hoyt (1990) states that the events surrounding the capture and death of Moby Doll “reflected the first positive press ever about killer whales.” Live capture events progressed. By 1965 a successful capture of a male who was snared in a fishing net off Namu, British Columbia, resulted in its public display and eventually training in captivity to the point where it performed for 11 months before dying of a bacterial infection.⁸ The success of this public display of the killer whale served two functions. It portrayed killer whales in a different light, one that was not so killer oriented, and it drove the aquarium industry to pursue the capture of additional whales.

By the mid 1970s capture efforts were estimated to have taken 275–307 killer whales from the Pacific Northwest, of which 12–13 died during capture (primarily in nets), 55 were kept, 16 died within the first year of captivity, and 208–240 were thought to have escaped or were released (Hoyt 1990, NMFS 2008). During the capture events, weaned juveniles were targeted as it was thought they “posed less risk during transportation and they still possessed the mental flexibility to adapt to a captive situation.”⁹ Reports indicate approximately 47 or 48 animals were SRKWs, resulting in the reduction of the population and the removal of part of the reproductive population that resulted in a skewed age and sex composition (Hoyt 1990, NMFS 2008). Of the SRKW captures, only one is currently living: Lolita, who is in captivity at the Miami Seaquarium (NMFS 2008). The British Columbia government prohibited live captures in 1975, and the U.S. Government issued a moratorium on the capture of killer whales in 1976.

The public now enjoys viewing the whales in various aquaria displays as well as on whale watching excursions. During tours in the SRKW watching industry, naturalists, guides, captains, and other personnel see the whales often and assist tourists in identifying them, reinforcing a unique link between the public and the whales. Movies such as *Free Willy* (1993) and *Free Willy 2* (1995) portray killer whales in ways that encourage people to relate to them and develop emotional ties. Similar to the “Flipper Effect,” where a generation connected with a television dolphin, another generation has been affected by *Free Willy* (Sepez 2006). Just as the “Flipper Effect” may be attributed to the growth of the “swim with the dolphins” industry, *Free Willy* is thought to have contributed to demand for viewing killer whales. Humans have had increasing contact with killer whales and the resultant experiences and increased exposure have changed the perception of killer whales to that of a less fearsome animal.

⁷ Center for Whale Research, online at <http://www.rockisland.com/~orcaSurv/changing.htm>.

⁸ See footnote 6.

⁹ See footnote 6.

Economic Context: U.S. SRKW Watching Industry

Changing human perceptions created a new atmosphere surrounding killer whales, which provided the proper conditions for the development and growth of a viewing industry. The whale watching industry in Greater Puget Sound began in the mid 1970s. Growth was minimal until the mid 1980s, which began a steady increase in activity until the late 1990s (Osbourne 1991, Koski 2006, NMFS 2008). Activity included both an increase in the number of companies and the number of vessels they used. By the mid to late 1990s, a shift in the composition of the industry resulted in a reduction of the vessels from the United States and an increase in vessels from Canada (Koski 2006). This transition has been fairly consistent and continues today. The U.S. side of the industry has seen a small variation in the number of vessels, which has leveled out in the last few years (Table 1).

In the Puget Sound region, by 1985 the sale of whale watching tickets grossed more than \$10,000 annually, increasing to more than \$1 million by the end of the 1991 season and \$5.7 million in 1997 (including U.S. and Canadian companies) (Koski 2006). The number of passengers on whale watching vessels was 3,793 in 1986, 6,134 in 1987, an estimated 250,000 in 1997, and more than 500,000 in 2006 (Osbourne 1991, Koski 2006, NMFS 2008).

Vessel types have also changed, especially between the U.S. and Canadian fleets. Vessels in the U.S. industry have generally increased in size, with a larger passenger carrying capacity, higher viewing platforms, fewer daily trips, and more tourist amenities. The Canadian fleet has historically been comprised of smaller, outboard engine, rigid hull inflatable boats (RHIBs), with a smaller passenger capacity, faster engines, shorter trip times, and more trips per day. Vessel size in the Canadian fleet has seen a minimal increase and the type of boat is very consistent.

In addition to vessel-based whale watching companies, kayak companies began to increase. From 1979/1980 there was a steady increase until a 2-year plateau in 1983. This was followed by a slight decline and a steady increase into the late 1980s (Osbourne 1991). By 2007 there were approximately six companies that target whale watching and 18 companies that view the whales occasionally (NMFS 2008).

Land viewing opportunities also increased over time. Lime Kiln State Park on San Juan Island is a prime location to view the SRKWs. Since the park opened in 1984, the number of

Table 1. Whale watching company and vessel trends by year (Koski 2006, 2008, 2009, 2010, 2011, 2012, Eisenhardt 2013). No report available with 2006 data.

	2005	2007	2008	2009	2010	2011	2012
Total no. of companies	39	34	37	35	35	33	37
Total no. of vessels	74	76	76	73	76	76	79
No. of U.S. companies	17	15	21	16	16	17	18
No. of U.S. vessels	19	21	22	20	23	22	25
No. of Canadian companies	22	19	18	19	19	16	19
No. of Canadian vessels	55	55	54	53	53	54	54

people viewing the whales has increased through 1996 and has maintained at nearly 200,000 visitors annually (Koski 2006).

The Pacific Whale Watch Association (PWWA), formerly the Whale Watch Operators Association Northwest, was established in 1994 and provided the opportunity for any whale watching companies in the U.S. or Canadian fleets to become members. These commercial operators are “committed ... to responsible wildlife viewing.”¹⁰ They have developed a set of viewing guidelines and seek to improve communication between commercial whale watching companies (NMFS 2008). Membership benefits of the PWWA include a resource listing on its Web site for tourists to locate member companies and the opportunity for members to place the association logo on their vessels signifying “safe, professional, and respectful”¹¹ operators.

Policy Context: U.S. SRKWs and Regulatory Protections

As noted, NMFS listed the SRKW as depleted under the Marine Mammal Protection Act in 2003 and developed a conservation plan. This was followed in 2005 by listing the SRKW as endangered under the ESA. In 2008 a recovery plan was released building on the conservation plan and providing a recovery strategy. NMFS completed an environmental assessment on killer whale vessel regulations in 2010 and adopted those regulations in 2011.¹² In addition to legal requirements to address biological aspects of species preservation and recovery and vessel effects, requirements also address the human element of biological systems. Regulatory requirements have incorporated the consideration of social science information to inform several management processes. Laws such as the National Environmental Policy Act of 1969 (NEPA), Executive Order 12898 of 1994, the Regulatory Flexibility Act of 1980 (RFA), and the ESA all address human, community, and social sciences aspects.

NEPA requires federal agencies to consider the interactions of natural and human environments and the impacts on both systems of any changes due to governmental activities or policies. This consideration is achieved through the use of “a systematic, interdisciplinary approach that will insure the integrated use of the natural and social sciences ... in planning and decision-making which may have an impact on man’s environment” (NEPA Section 102 (2) (A)). Under NEPA, an Environmental Impact Statement or Environmental Assessment is required to consider the impacts on the human environment of any federal activity. NEPA specifies that the term “human environment” shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment (NEPA Section 102 (C)).

Executive Order 12898 of 11 February 1994 on Environmental Justice requires federal agencies to consider the impacts of any action on disadvantaged, at risk, and minority populations. To evaluate these impacts, information about the vulnerability of certain stakeholders must be better understood. Indicators of vulnerability can include but are not limited to income, race and ethnicity, household structure, education levels, and age. Although

¹⁰ PWWA, online at <http://pacificwhalewatch.org>.

¹¹ See footnote 10.

¹² Regulations online at http://www.nwr.noaa.gov/protected_species/marine_mammals/killer_whale/vessel_regulations.html

some general information related to this issue is available through census and other quantitative data, these sources do not disaggregate those individuals or groups that are affected by changes in marine resource management. Therefore, other types of data collection tools must be used to gather information related to this executive order.

In the event regulatory action is deemed necessary in conjunction with the listing of the SRKW, ESA requirements are implemented. The ESA states:

(2) The Secretary shall designate critical habitat, and make revisions thereto, under subsection (a)(3) on the basis of the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned.

While the connection between the results of this study and the ESA are less direct, information in this research will contribute to enhancing the best scientific data available.

The RFA requires federal agencies to prepare an initial and final regulatory flexibility analysis that “shall describe the impact of the proposed rule on small entities.” The initial regulatory flexibility analysis “shall also contain a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities” (RFA Section 603 (b) (5) (c)). In addition, each final regulatory flexibility analysis shall contain “a description of the steps the agency has taken to minimize the significant economic impact on small entities” (RFA Section 604 (a) (5)). As a majority of the businesses operating in the tourist industry surrounding the SRKW are likely to be considered small entities and are likely to be impacted by any regulatory change, this regulation is important. Baseline data obtained through this research will contribute to an understanding of the existing human dimension surrounding the SRKW. This baseline data can then be compared to future research results to obtain a better representation of impacts and changes in the human dimension of the SRKW ecosystem.

The Study: Background and Development

Human interaction with the ecosystem is as prevalent and important as any other element in an ecosystem. Studying the human element and gaining an understanding of these interactions can inform research and policy. This field of study, as it applies to marine resource use, has long been neglected and is still in its infancy. Researchers have pointed this out for years. Hanna (2001) specifically states that “the management of marine ecosystems illustrates the difficulty of making this transition (integration of human and ecological systems) ... fisheries have frequently been cited as examples of the failure to effectively manage the human-ecological interface.” Endter-Wada et al. (1998) state that, “While ecologists recognize that the social-political component of ecosystem management is important, the social scientific contributions to ecosystem management are often ignored or misunderstood.” Stepp et al. (2003) state that “The gap between biological ecology and human ecology is mainly the result of past failures to include relevant information and sociocultural systems in biological system models.” While historically the social sciences have been neglected, they are gradually being incorporated into marine research and management.

For social scientists, the opportunity to conduct this study in such a unique environment is an important one. This study will serve as a foundation to understanding the human element of this ecosystem. In this section, we provide information on the background and development of the research. We review how we approached this study and developed the necessary tools to accomplish the task. The first portion focuses on the details of the background research, while the second speaks to the development and survey administration.

Background

People of Puget Sound are part of the greater ecosystem that is being studied as a result of the current ESA listing of the SRKW. Several issues considered potential threats to the SRKW are being studied by our biological science colleagues, including prey availability, environmental contaminants, and vessel effects and sound, to name a few (NMFS 2008). All of these issues involve interactions with humans at one level or another. Fishermen may be competing for the same fish the SRKWs prey upon. Humans generate pollution and contaminants that impact the whales. Humans operate various types of vessels that generate various sounds and effects such as occupying surface area where whales may be swimming and breaching. These potential threats are largely the result of human activity.

Various groups of people relate to the whales differently. These include people who live in the area, but do not directly associate with the whales. Some local people who live in the San Juan Islands and Greater Puget Sound region have a more knowledgeable and direct relationship with the whales. Then there are those who depend on the whales for all or part of their livelihood. There are also visitors who come to view the whales and participate in tourist activities in the region. It would be very difficult to study all the people who have a connection to this ecosystem at once. As a result, we chose to study a specific group of people: those who

depend on the whales for all or part of their livelihood. Future research can focus on other aspects of the human connections to SRKWs in this ecosystem.

There is considerable completed and ongoing research on tourists and tourist attitudes. Andersen (2004) completed a master's thesis on environmental education in the whale watching industry of the San Juan Islands (Andersen and Miller 2006). Other studies include Meinhold (2003), Orams (2000), Finkler and Higham (2004), Lück (2003), and Milstein (2007). Otis spent more than a decade at Lime Kiln State Park studying whale behavior and surveying tourists.^{13, 14} This wealth of information led us away from conducting additional tourism research.

In light of the research that has been conducted on tourism, it was important to understand the people who work in the whale watching industry. Industry members may be considered as having one of the strongest relationships to the SRKWs. People in the industry provide opportunities for others to view whales. In providing these services, industry members observe the whales on a daily basis, developing a connection or relationship to the whales. Industry members also may be impacted by the listing of the SRKWs. Their actions can either negatively or positively affect the whales. For example, noise generated by engines may negatively impact whales, while the outreach and education provided during tours to clientele may benefit the whales. These issues are just the beginning of the complex relationship between the industry and the SRKWs.

Regulations require an understanding of the human or social aspects of an issue. Similar to focusing on fishermen when a fishing regulation is required, here we focus on whale watching industry members. The associated regulation is the endangered species listing of the SKRW and its required recovery plan. This study chose to focus on those individuals, paid or volunteer, who provide the opportunity to view SRKWs—the whale watching industry. The study was limited to those members of the industry who work for U.S. companies, as limited resources and transborder issues made it difficult to target both Canadian and U.S. industry members. However, the possibility still exists to study the Canadian fleet in the same manner in the future.

The purpose of this study is to obtain sociocultural baseline data to contribute to the generation of a social description and a better understanding of the U.S. SRKW watching industry. This description can then be used by all those interested to contribute to management needs and a greater understanding of the human dimension of the whale watching industry surrounding the SRKWs.

By generating the sociocultural description, this research addresses the following questions:

- Who works in the whale watching industry?
- How long have people who work in the industry participated in it?
- Are people who work in the industry local to the geographic region?
- What are their work patterns during the active whale watching season?

¹³ R. Otis, Ripon College, Ripon, WI. Pers. commun., 20 June 2006.

¹⁴ K. Koski, The Whale Museum, Friday Harbor, WA. Pers. commun., 11 January 2006.

- What types of companies do they work for?
- What are the characteristics of those companies?

The answers to these questions and others can help us understand why people work in the industry and lay the foundation for future research that can answer more questions and inform the human dimension of ecosystem science surrounding the SRKWs.

Literature Review

An extensive literature review was conducted for several purposes. Information gathered directly informed the study and provided for a greater understanding of the biological issues and corresponding science surrounding the SRKWs. In addition we achieved a greater understanding of other wildlife and whale watching activities occurring around the world. A primary focus of the literature review was to locate other research that had been conducted on the human dimension of whale watching.

As part of the literature review, we conducted an extensive review of regulations and guidelines. This effort not only focused on activities in the United States, but also looked at systems worldwide. In addition to understanding the federal regulations that require social science research, as mentioned above, these efforts sought to understand existing regulations or guidelines that are actively managing current whale watching or wildlife watching activities. We were interested in knowing whether management tools were established in other systems that might be applicable to management efforts in the SRKW system.

Meetings

Programs within the Northwest Fisheries Science Center and the NMFS NRO specifically focus research and activity on the SRKWs; therefore, we were interested in meeting with program personnel. We thought it was important to understand the issues from their perspective. We held a focus group meeting with marine mammal personnel to discuss relevant issues. In addition, we were interested in learning what information they might like to see developed from this social science study. We used the information gained to contribute to the questions included in the survey. As a result, some of the questions in the survey were designed, in part or entirely, to answer some of the questions the marine mammal personnel raised during this meeting. In addition, when discussing results in this document, we chose to focus attention on those linked to answering some of the questions raised. This process contributed to the greater goal of this research in providing information to multiple parties working on SRKW issues.

In addition to speaking with NMFS personnel, we visited the Whale Museum at Friday Harbor and held a briefing meeting on our activities. Whale Museum personnel are extensively active in the SRKW viewing activities, thus we were interested in learning from them any information about viewing activities that was pertinent to the research. This was helpful in building background information, understanding who was currently active in viewing activities, and finding where they were located. In addition, we were better able to understand the activities conducted by the museum's Soundwatch Program and the research it conducts in the area.

Secondary Source Research

In an effort to avoid asking questions of research participants where the information was available through other sources, we extensively referred to secondary resources. To avoid duplication of research efforts, secondary sources were also used to identify, clarify, and enhance information obtained through this research. Secondary sources included items such as print media, Web site materials, and directories.

Trip data provide an example of how secondary data were used. A specific question sought to determine how many trips whale watching companies conducted per day, the duration of the trips, and what times the trips are conducted. The results were highly complex. Comparing survey data to secondary research from brochures and Web sites that posted trip information helped to simplify and clarify the data. Where secondary source data were used to clarify research data, a notation is provided in this report.

Survey Development and Administration

A number of social science tools are available to study human populations. In this study two tools were combined: a survey instrument and interviews. This approach was used to increase the understanding of information gained from the study participants and to gain consistent information from each study participant. The survey was the main tool of this research. In this subsection, we describe the development of the survey, its administration to study participants, survey response rates, and a review and summary of the interview activity.

Universe of SRKW Companies

Whale watching companies were identified to determine participants for this research. A four-pronged approach was used to confirm participation in the industry for the study year of 2006. First, membership in the PWWA indicated that a company was active in the industry. Second, the Whale Museum's Soundwatch Boater Education Program provided additional information identifying active companies. Third, NMFS NRO provided a directory of active companies. Fourth, a thorough search of Web sites, phone directories, local chambers of commerce, flyers and brochures, and other media indicating whale watching opportunities confirmed a company's activity in the industry. Cross-referencing the information collected through each of these approaches reduced duplication and resulted in a comprehensive list of active whale watching companies.

Once companies were identified, we divided them into three groups: motorized whale watching vessels and companies, kayak companies, and land-based viewing companies.¹⁵ The largest segment of the industry was motorized vessels, classified by "providing the opportunity" for tourists to participate in whale watching activities aboard their vessel. Kayak companies were identified if their advertisements included the opportunity to see whales or a reference to whale watching. Land-based tours include transportation to whale watching sites on San Juan Island, the most popular being Lime Kiln State Park. If a company advertised land-based whale

¹⁵ In the event where a motorized vessel company had both motorized vessels and kayaks, its data was applied to the motorized vessel analysis where applicable and to the kayak analysis where distinguishable.

watching tours, it was included as a land-based company. All companies surveyed were privately owned except for one land-based entity.

Having determined the companies, we mapped the locations where they operated (Figure 1). Company locations were based on the site of the company office and, in the case of vessel-based companies, their operational port. We labeled these communities “operational communities.” Once the locations were determined, it was easy to see correlations in the concentration of companies. This was important for several reasons, including how to organize our field sessions to conduct in-person surveys. Communities were then distributed into four areas (Table 2). The first was the mainland, including Seattle and Everett. The second was the northern mainland, including La Conner, Anacortes, and Bellingham. Mainland areas were distinguished by their proximity to the Interstate 5 highway corridor and their geographic location in relation to Seattle and the other adjoining operational communities. The third area was the San Juan Islands, including Friday Harbor, Roche Harbor, Snug Harbor, Orcas Landing, and Deer Harbor. The fourth was the Olympic Peninsula, including Port Townsend. When conducting this research, areas were visited by region to increase our efficiency in conducting surveys.



Figure 1. Locations of SRKW motorized vessel viewing companies.

Table 2. Operational communities and related regional assignments. Roche Harbor was included, however, a single company based out of Friday Harbor operated vessels out of Friday Harbor and Roche Harbor.

Location	Area
Seattle	Mainland
Everett	Mainland
La Conner	North mainland
Bellingham	North mainland
Anacortes	North mainland
Port Townsend	Olympic Peninsula
Orcas Landing	San Juan Islands
Deer Harbor	San Juan Islands
Friday Harbor	San Juan Islands
Roche Harbor	San Juan Islands
Snug Harbor	San Juan Islands

Survey Development

Once the background information had been collected, we developed the survey instrument. The purposes of the survey were to collect data from individuals working in the U.S. SRKW watching industry and to use these data to increase our understanding of the industry. The survey was organized into five sections: Demographics, Individual Participation, Business Characteristics, Industry Trends, and Effects on the Community.

The Demographics section elicited information on the respondent, including gender, age, household and marital status, race, ethnicity, level of education, and annual income, among others. The demographic questions were formatted in accordance with U.S. Census Bureau requirements. This information allowed for a comparison of members of the SRKW watching industry to larger communities, counties, Washington state, and the nation. This section also requested information on how income was received and how individuals were paid. This information could be related to specifics of how the industry operates tours and could then be used to better understand impacts on individuals if regulatory actions changed how tours were operated. Residential information was also requested to better understand the movement of individuals between different communities during the SRKW watching seasons, which might then be used to describe attachments to a community, local economic growth or decline, and multiple occupations.

The Individual Participation section of the survey sought to describe participation in the industry, including individual roles, movement throughout the industry, investment in the industry, history of activity, and off-season activities. Information in this section might contribute to an understanding of specific occupations that lead to participation in this industry, career trends, and tenure in the industry. It could also help to determine commitments to the industry through the longevity of employee participation and highlight how individuals maintained the flexibility to participate in a seasonal industry.

The Business Characteristics section elicited information on the respondents' perspectives of the types of businesses that participate in the industry, formal membership in

industry organizations, vessel characteristics, types of tours provided, their frequency of operations, and additional services offered. These data could help determine whether there are similarities or differences between the companies, and could contribute to our understanding of what is required to maintain a viable whale watching business.

The Industry Trends section of the survey asked questions on respondents' knowledge of the industry and how it had changed over time. Questions targeted information regarding changes in vessel type and structure, ownership structure, tourism changes, and the potential for growth in different segments in the industry. Additional questions touched on the external influences on the industry, such as noncommercial recreational vessels and non-U.S. vessels that also provide SRKW watching opportunities. This information combined with historical information obtained through secondary sources could help describe the industry changes over time.

The Effects on the Community section garnered information on the connections SRKW watching industry members have within their communities, for example, business relationships with other boats, tourism agencies, and shore support. This section could assist in understanding social and economic networks within the industry and participating communities, and provide some insight into the dependence of the community on the industry.

Together, each of the survey sections and their data provided information about the members of the industry, the companies within it, and the dynamics surrounding the industry. Using survey information in combination with interview data and secondary information created the potential to dramatically increase our understanding of the SRKW watching industry.

Survey Administration

Survey participation was voluntary. Anyone who worked or volunteered for a company in the whale watching industry was given the opportunity to participate. The role an individual played was not a factor; neither were the number of hours working nor the tenure of the individual. The only factor taken into consideration was the employment or volunteer status of the individual. Thus surveys were distributed not only to owners, but also to operators, naturalists, guides, engineers, accountants, and office staff. Surveys were distributed from June to November of 2006. Surveys were available in hard copy, via e-mail as a downloadable electronic document, or to be completed and submitted online. Hard copy surveys were primarily distributed in person. Various options were provided for return of hard copy surveys. These included in-person pickups and mail. The mail option was used on few occasions.

Company owners were initially contacted by mail and invited to participate in the study. Two weeks after the letters were mailed, follow-up phone calls were made to the owners to schedule appointments at a location of their choice. Owners were introduced to the project staff, briefed more thoroughly on the project, provided the opportunity to complete the survey, and interviewed. Employee information and the estimation of employee numbers for individual companies were obtained at this time as well. Some owners provided employee contact information directly to us. Other owners preferred to handle the communication with the employees on our behalf. In this event, contact information and surveys were left with the

owners to distribute to staff. Most of the surveys left for distribution were with owners of larger companies that managed more than 10 staff members.

After initial contact with company owners, appointments were scheduled with employees (Table 3). Dates were scheduled for visits to different field locations. Visits ranged from one week at a time for the San Juan Islands to day trips to companies operating in mainland communities. Visits to each location were arranged based on the most efficient use of time and travel resources. On occasion, several employees for a single company met at the same time; however, the majority of meetings were conducted with a single study participant. During the meetings with the employees, they were briefed on the study, provided an opportunity to complete the survey, and interviewed.

Options for how and when to complete the survey were provided for all survey participants. The main goal was to honor the participants' time and maintain flexibility to gain the greatest rate of participation. Most surveys were conducted in person, resulting in the survey administrators being present while the participant completed the survey. Typically, two researchers were involved. The average time to complete the survey was 1 hour and meetings ranged from 30 minutes to 4 hours. This range of time included administering the survey and any interviewing that occurred. If time was limited, typically a study briefing and interviews were conducted and the participant was provided a survey to complete at a later time. Arrangements were made with the survey participant to collect the completed survey in person or return it by mail. Also, it was not uncommon to set a future date and time to pick up surveys from a company office or provide prepaid, preaddressed envelopes for their return.

Interviews

Supplementary to the survey tool, unstructured interviews were conducted with industry members. Interviews were primarily in-person, typically during the survey administration period. Interviews often followed the completion of the survey. There was no specific list of

Table 3. Field schedule to administer surveys.

Trip no.	Location	2006 field dates
1	San Juan Island	19–21 June
	Orcas Island	22 June
	San Juan Island	23 June
2	Seattle	29 June
3	San Juan Island	10–14 July
4	Bellingham	17 July
	Anacortes	18 July
5	La Conner	2 August
6	Everett	3 August
7	Orcas Island	7–8 August
	San Juan Island	9–11 August
8	Port Townsend	23–24 August
9	Anacortes	28–30 August
10	San Juan Island	18–22 September

interview questions; however, when we began seeing trends in issues that arose in interviews, we would ask others their opinion on the issue. Interviews were conducted most often with both researchers present, but on occasion were conducted by one researcher. The duration of the interviews varied from 15 minutes to 4 hours, depending on the participant; most averaged 30 minutes. One purpose of the interviews was to further discuss issues that were important to the industry member. As a result, the interests and concerns of the industry members were represented.

In the event an industry member did not wish to participate in the survey, he or she was provided an option to meet for an interview. An interview without a survey still provided the opportunity to gain some information from the participant. Upon the conclusion of the study, 93 interviews had been conducted with whale watching industry participants. There were six cases that yielded interviews without survey completion. Three were with participants who believed they did not qualify for the study because their companies were not active enough in the industry for the study year. Their participation in the past, however, was considered significant enough to conduct an interview. With this option, a majority of the companies that were considered active were captured, either through survey and interview participation or interview participation alone.

Survey Responses

By the conclusion of the survey period, 184 surveys had been distributed. Of these, 112 completed surveys were received either in hard copy or via the Internet for a 61% response rate. In addition to the overall survey response rate, rates were calculated by company in each industry sector. A company was included if at least one owner or employee participated in any aspect of the study. We determined that the industry was comprised of 18 active motorized vessel whale watching companies, 11 kayak companies, and 2 land-based companies. Two motorized vessel companies that were active in the 2005 season were identified as inactive in the 2006 study year. One kayak company believed its services did not pertain to this study and was not included in the study. Overall 34 companies participated in the research, 97% in the survey and 100% in the interviews. Of the motorized vessel companies, 94% participated in the survey and 100% participated in the interview process. Of the kayak companies, 100% of the companies participated in both the survey and interview process, as did 100% of the land-based companies.

Understanding why surveys were not returned is important. We need to be clear where participant representation is good and where it is not. Trends in nonresponse were evident during the field visits. Of the 184 surveys distributed, 72 were not returned. The majority of the surveys that were not returned (83.3%) were those that were dropped off with owners to distribute to staff for completion, and 64% of the nonresponses were from companies that had more than an estimated 10 employees. Generally these were companies where surveys were dropped off with the owners. A small percent of the surveys (9.7%) distributed in-person after meeting with the study participant were not returned. Reasons provided by participants for their nonresponse included their belief that the survey did not apply to them or their unwillingness to participate in a survey. The high nonresponse rate for dropped off surveys, and the low rate for those in-person scenarios signify to us the importance of personally meeting with participants to clarify the research and encourage participation, which generally yielded a response. Geographically, 57% of the nonresponse were from companies in the San Juan Islands, while 43% were from mainland or Olympic Peninsula companies. Seventy-nine percent of the

nonresponse were in the motorized vessel sector, while 21% were in the kayak sector; there was full participation in the land-based sector.

It appears that people who worked for larger companies in the San Juan Islands and elsewhere were not highly represented in this sample. Smaller companies, kayak companies, and land companies were more highly represented. It is important to consider that many larger companies may be more diversified in the services they provide. As a result, the lack of response from all employees may be a result of the study not being applicable to all the roles played in the larger company.

Results

Various factors came into play when deciding how to analyze the data collected and what information should be presented. Due to the extensive nature of the survey, a large amount of data contributed to extensive analysis. The analysis aimed to provide the most significant information necessary. Consequently, the data were analyzed based on separate organizational parameters, and the results are discussed based both on the goals of the study overall and with some interpretation of information that may support data needs as identified in the SRKW recovery plan.

The organization of this section flows from the methods of data analysis to the selection of the results that were chosen for further discussion. The Data Analysis subsection discusses standard data analysis and development of the tier analysis system. This system aggregates vessel data in order to compare data between tiers while protecting confidentiality. Then the Organization of Results subsection discusses the logic behind the selection of the results to be displayed.

Data Analysis

Survey data were analyzed with Pearson SPSS version 15.0 software (Pearson Education Inc.). Data were entered into SPSS, cleaned, corrected, coded, and analyzed. Tabular and graphic results were generated in SPSS, then data were transferred to Microsoft Excel to customize graphs. Qualitative data from the survey and the interviews were analyzed using Atlas.ti version 5.2 (ATLAS.ti Scientific Software Development GmbH). In addition to Atlas.ti, Microsoft Excel was used to organize the data.

Data were analyzed in several ways. First, the overall data were analyzed inclusive of all the surveys completed. Second, the data were analyzed by sector: motorized vessel, kayak, and land. This level of analysis sought to highlight the difference between the types of companies. Third, we looked at the motorized vessel industry in more depth by comparing companies. Confidentiality concerns arose, resulting in the inability to analyze individual companies for comparison between companies. As a result, we developed two options to analyze the data. The first aggregated the data based on the regional distributions of the companies. The second aggregated companies with similar traits. This aggregation methodology is the tier system.

Regional and Tier Aggregation Development

The first method of aggregation involved sorting the companies by the regions in which they operate. This methodology was based on our identification of regions in which to conduct our field visits for survey distribution (Figure 1, Table 2). We identified four regions: the San Juan Islands, the Olympic Peninsula–Port Townsend area, mainland, and north mainland. We identified differences between the communities on the mainland, specifically those that are easily accessible from Interstate 5 and those that are not. To address confidentiality concerns and

further simplify the analysis yet maintain its integrity, mainland communities were further aggregated into one mainland community region. This resulted in the communities being aggregated into three regions: San Juan Islands, mainland, and Olympic Peninsula. We were unable to include Olympic Peninsula data in the analysis because confidentiality could not be protected. In addition, the Olympic Peninsula data were so unique that it was not appropriate to aggregate them with either of the other two remaining regions. The data from Olympic Peninsula region were removed from the regional analysis entirely. It is important to note that the Olympic Peninsula data are used and represented in all the other methods of analysis. The resulting regional aggregations and analysis are thus based on two regions, the San Juan Islands and the mainland.

The tier system of data analysis relates only to motorized vessel companies. The purpose of the tier analysis is to determine whether the data illustrate trends within or between types of motorized vessel companies. Review of preliminary data and participant observations suggested differences and similarities between companies. It was therefore hypothesized that companies could be grouped or sorted based on a set of similar characteristics, then further analyzed. The tier system is the resultant method to aggregate companies. This aggregation also protected the confidentiality of smaller companies. What is important about these data is that they are from the perspective of the survey participants and how they described the companies they work for.

Development Basis

The tier system was developed based on U.S. Coast Guard (USCG) passenger vessel regulations. The concept here is multifold. First, operating a company in the motorized sector requires a vessel; the type and size is the choice of the vessel owner. Second, motorized vessels are subject to USCG regulations and related requirements to keep the vessel operating within these regulations. Third, the size of the vessel determines the infrastructure required to support it, including USCG inspection requirements. The infrastructure needed to support a vessel directly affects the businesses characteristics and strategy of the owning company. USCG regulations identified in Title 46 of the Code of Federal Regulations on shipping (USCG 46CFR24.10 and 46CFR175.110) were applied to primary and secondary data describing the vessels and their related companies. Categorizations representing large to small vessels were applied as described in the vessel regulations. These included motor vessel (greater than 65 feet long), motorboat (less than 65 feet), small passenger vessel T-type (under 100 gross tons and carries 150 or less passengers), and uninspected passenger vessel (at least 100 gross tons and carries no more than 12 passengers). A decisional flow chart (Figure 2) describes how regulations were applied. Taking each vessel through the flow chart allowed us to categorize each into one of four tier groups (Table 4).

Companies allocated to a particular tier are not identical. Also, the data used to describe the companies within the tier system come from individuals who work for those companies, so the result is a description based on survey respondent perceptions of the companies. The intent here is to posit that boats of similar USCG classifications have to meet the same USCG requirements and have similar pier space requirements, similar passenger capacities, and other infrastructural similarities. How companies with the same types of boats choose to operate makes companies either similar or unique.

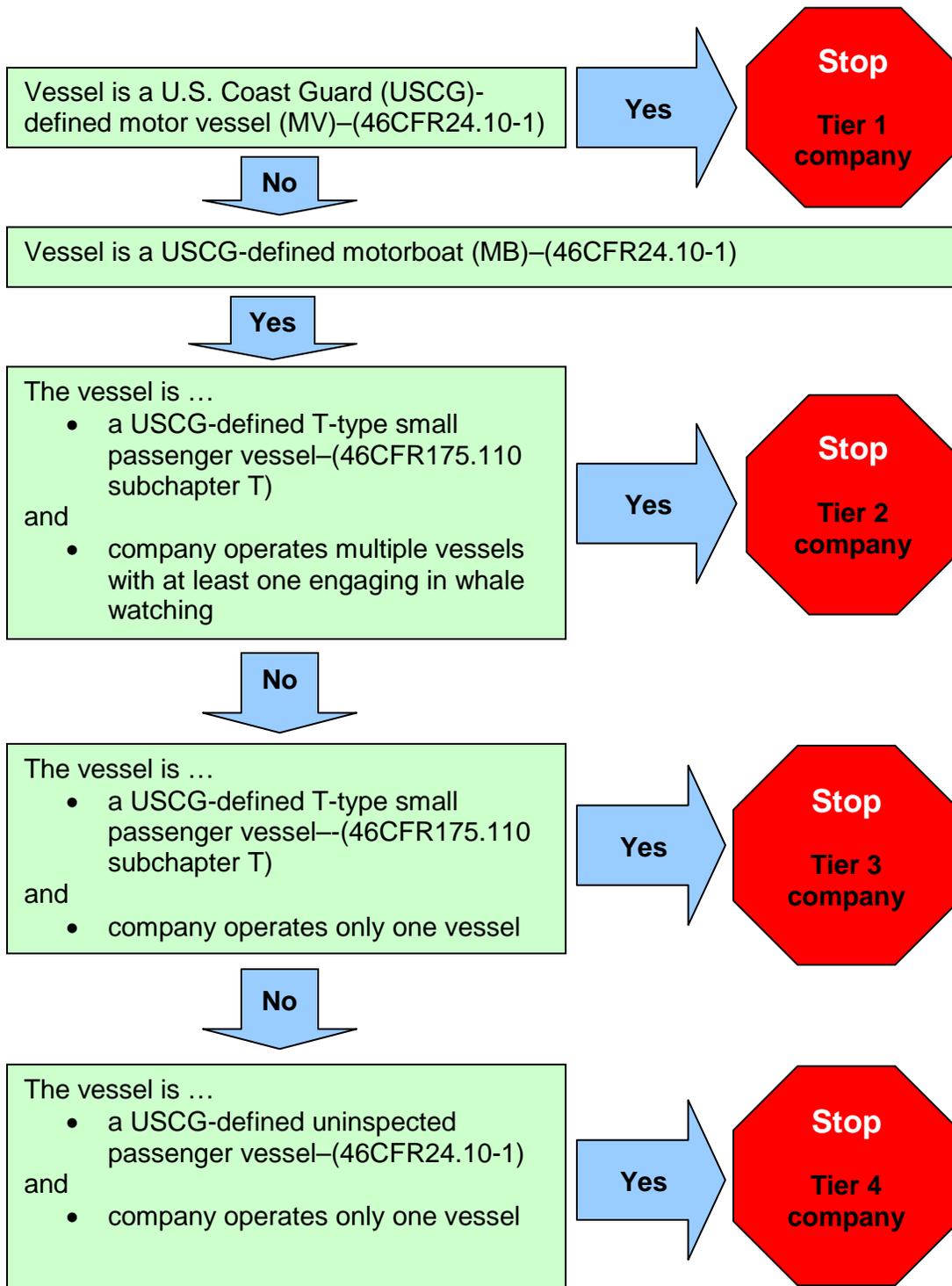


Figure 2. Tier system decisional flow chart illustrating how federal regulations apply to commercial whale watching vessels.

Table 4. Distribution of whale watching companies into tier groups based on the vessels operated by the companies and the application of the tier decisional analysis. N = total number of vessels in tier. Note that all companies identified and tier placements are per data collected in 2006.

Company	Location	N	Respondents
Tier 1			
Clipper Navigation	Seattle	19	20.4%
Mystic Sea	Anacortes		
Island Mariner	Bellingham		
Tier 2			
San Juan Boat Tours	Bellingham	36	38.7%
San Juan Safaris	Friday Harbor		
Island Adventures Inc.	Anacortes		
Deer Harbor Charters	Deer Harbor		
Puget Sound Express	Port Townsend		
Tier 3			
San Juan Excursions	Friday Harbor	33	35.5%
Western Prince Whale and Wildlife Tours	Friday Harbor		
Viking Cruises	La Conner		
Orcas Island Eclipse Charters	Orcas Island		
Salish Sea Charters	Snug Harbor		
Deep Sea Charters	Anacortes		
Tier 4			
Maya Charters	Snug Harbor	5	5.4%
Private whale watching.com	La Conner		
Captain Carli's Charters	Friday Harbor		

Organization of Results

While there are various options to present the results from this study, we chose to narrow our results to nine topics. The topics were determined to contribute to our research goals, reflect what information would be useful to the marine mammal scientists within the agency, and contribute to meeting recovery plan measures. The topics are 1) Description of the people in the SRKW watching industry, 2) Motorized vessel personnel descriptions, 3) Motorized vessel business descriptions, 4) Regional personnel descriptions, 5) Regional business operations, 6) Kayak and land sector personnel descriptions, 7) Kayak and land sector business operations, 8) Industry trends, and 9) Effects on the community.

In the first section, a description of the people, we address the primary goal of this study: to generate a sociocultural description of the whale watching industry. Results shown within this topic include demographic and individual participation results. They are from the overall survey analysis. Secondary information from the U.S. Census Bureau is used for comparison where appropriate. Information such as gender, age distribution, education, training, tenure, and roles in the industry are shown in this section. This analysis is then repeated, yet sorted by motorized vessel responses, regional analysis, and kayak and land sector responses.

In the motorized vessel business description section, we provide baseline information to include vessel information and tour information. The analysis in this section is then repeated and sorted for the regional analysis and the kayak and land sector analysis. Data in these sections may inform several recovery plan measures. For example, under the measure to assess threats to SRKWs, there is a requirement to determine vessel characteristics that affect SRKWs. While extensive biological studies will focus on the specific threats, data in this section can provide the actual characteristics of the fleet. Results may be further analyzed to determine how prevalent specific characteristics are in the fleet. Additional information will provide insight into tour types, departures, and durations. These data can supplement existing knowledge to better understand how many vessels are on the water at any time during the day. These data can serve as a baseline and be measured for change over time.

The regional analysis topic provides results similar to the motorized vessel analysis, however, sorted by regions. To clarify, this is still motorized vessel data, just sorted by region instead of tier or overall analysis. During the study, we observed differences between companies in the San Juan Islands and other regions. As a result, we thought it was important to sort the data by regions to see if our observations were supported in the data. The purpose of this analysis is to highlight any variances between the regions.

In addition to the motorized vessel sector, other sectors offer opportunities to view killer whales that have little or no impact on the whales. Members of both the kayak and land-based sectors were also invited to participate in the study. Response from the land sector was high, while the kayak sector was more difficult to capture. As a result, information from the kayak sector was not as strong as from other sectors, but still provided representative information on this sector. The results provided information similar to that covered for the motorized vessel results sections. This information can serve as a baseline to monitor future changes in the industry specific to the kayak and land-based sectors.

The industry trends analysis focused questions on the history of activity in the SRKW industry from the perspective of the study participants. These questions aimed to understand what the industry looked like historically and what has changed over time. It was expected that those with higher tenures in the industry would have the greatest amount to contribute to this line of questioning.

The effects on the community section aimed to understand how whale watching companies were connected to both their local communities and the larger communities as a whole. Questions were designed to get an understanding of business relationships between whale watch companies and other companies within and outside the industry. Participants were also asked to speak to the industry's significance to the local and larger communities.

These various types of analysis attempt to provide the most accurate and specific results to the larger data set. Unique analysis will highlight the differences in the data and illustrate characteristics of certain sectors, regions, or perspectives as a whole.

People in the SRKW Watching Industry

This section describes the people in the SRKW watching industry through demographics and an examination of their individual participation in the industry. Demographic information, standard to social science, is used here to describe basic characteristics of the people in the industry (e.g., gender, age, education). These characteristics can then be compared to other data sources such as the U.S. Census to gain an understanding of the similarities and differences of individuals in this industry to the state or national population. The following information is from this study and compared where appropriate with the U.S. Census data from 2000.

To further describe the people in the SRKW watching industry, the survey also examined individual participation in it. This includes roles worked in the industry, months worked, hours per week worked, tenure, additional training, past work history, and reasons for participating. These items combine with demographic data to provide an expansive description of individuals in the industry.

Demographics

Demographic Summary

Results shown here reflect the demographics of the personnel in the industry. Generally within the SRKW watching industry there were more men than women, though the gender distribution appeared to be similar to that of Washington state and the United States. Industry members appeared to be older than those employed in Washington state or the nation. Whale watching industry members also appeared to be more highly educated than those in Washington state or nationally, with 60% of respondents indicating they held a bachelor's degree or higher. Residency ranged broadly; however, a majority of participants indicated they maintained a permanent residence in San Juan County, followed by King and Whatcom counties. The majority of industry members made between \$10,000 and \$30,000 per year, followed closely by income up to \$50,000 per year. Further clarifying income sources, 40.4% of participants indicate they derived 0–25% of their income from the SRKW watching industry while obtaining most of their income from some other source. The data also show that 34% of participants received more than half of their income from the industry.

Demographic Figures and Table

The nine figures and one table listed here are sequentially provided below.

Figure 3. Gender distribution in the SRKW watching industry compared to Washington state and the United States.

Figure 4. Age range in the employed labor force for the SRKW watching industry, Washington state, and the United States.

Figure 5. Educational attainment for the SRKW watching industry, Washington state, and the United States.

Figure 6. Location of permanent residency of industry members by county.

Figure 7. Income ranges by percent for industry members.

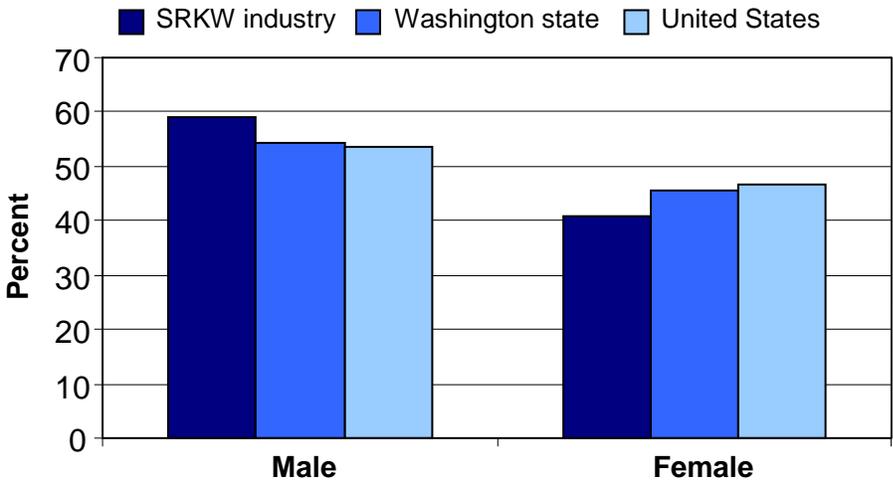
Figure 8. Household income in 1999 for Washington state and United States.

Figure 9. Income ranges by percent for owners and non-owners.

Figure 10. Percent of income derived from the SRKW watching industry.

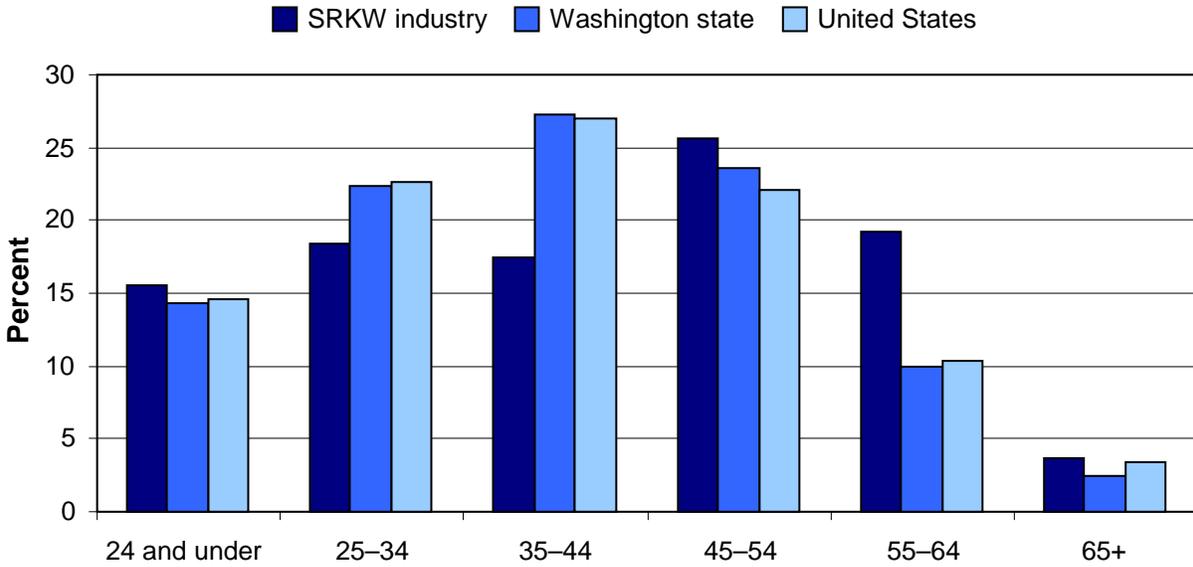
Figure 11. Percent of income derived from the industry sorted by owner and non-owner.

Table 5. Estimated percent of income derived from the SRKW watching industry compared to total household income of surveyed members.



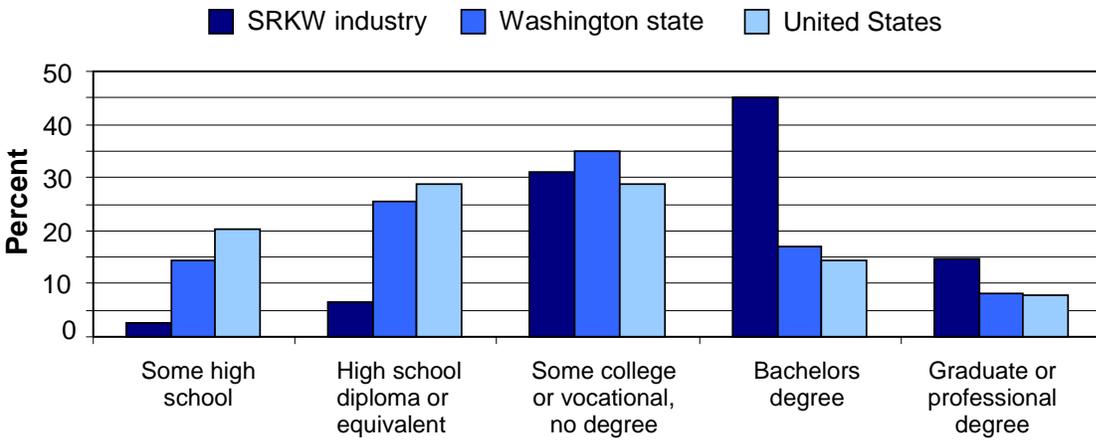
SRKW industry 98.2% response

Figure 3. Gender distribution in the SRKW watching industry compared to Washington state and the United States (data from 2000 U.S. Census). Results show a similar trend in gender distribution between each data set.



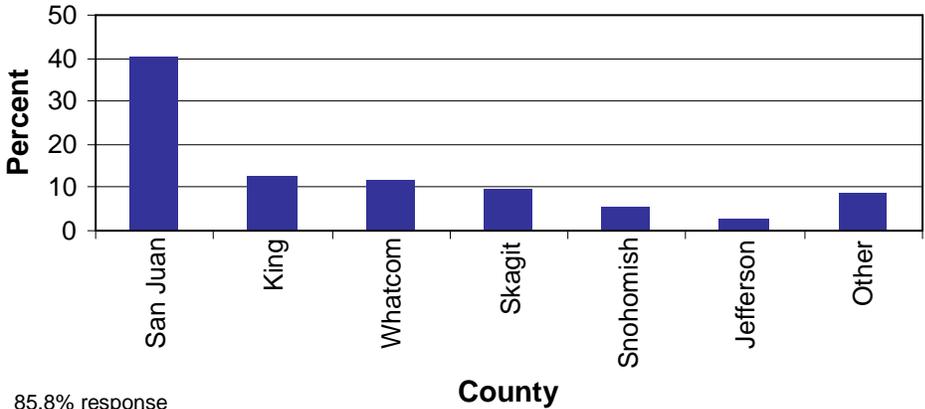
97.3% response

Figure 4. Age range in employed labor force for the SRKW watching industry, Washington state, and the United States. Members of the industry show a trend of being older than those represented by Washington state and U.S. Census labor force data. Washington and U.S. statistics begin count at 16 years of age. The SRKW data begin count at 17 and under.



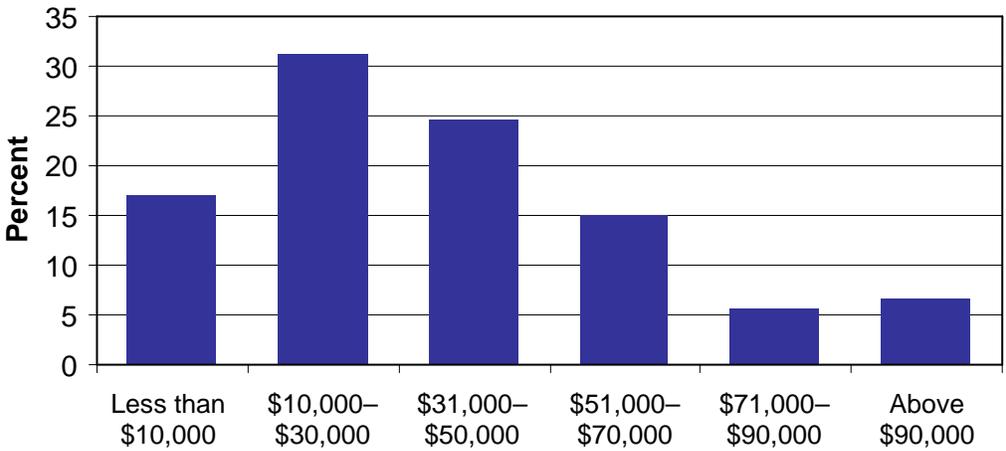
97.3% response

Figure 5. Educational attainment levels for the SRKW watching industry, Washington state, and the United States. Members of the industry show a trend of being more educated than Washington state and U.S. Census respondents. This is especially the case in the attainment of bachelor's degrees and less so with the attainment of graduate or professional degrees.



85.8% response

Figure 6. Location of permanent residency of SRKW watching industry members. Data representing where industry members reside show that most permanent residences occurred where companies were located. Additional analysis of these data follows in other sections of this analysis.



94.6% response

Figure 7. Total annual income. Most respondents, 31.1%, reported income of \$10,000–\$30,000, followed by 24.5% with incomes of \$31,000–\$50,000. Refer to the following graph for comparisons to Washington state and the United States.

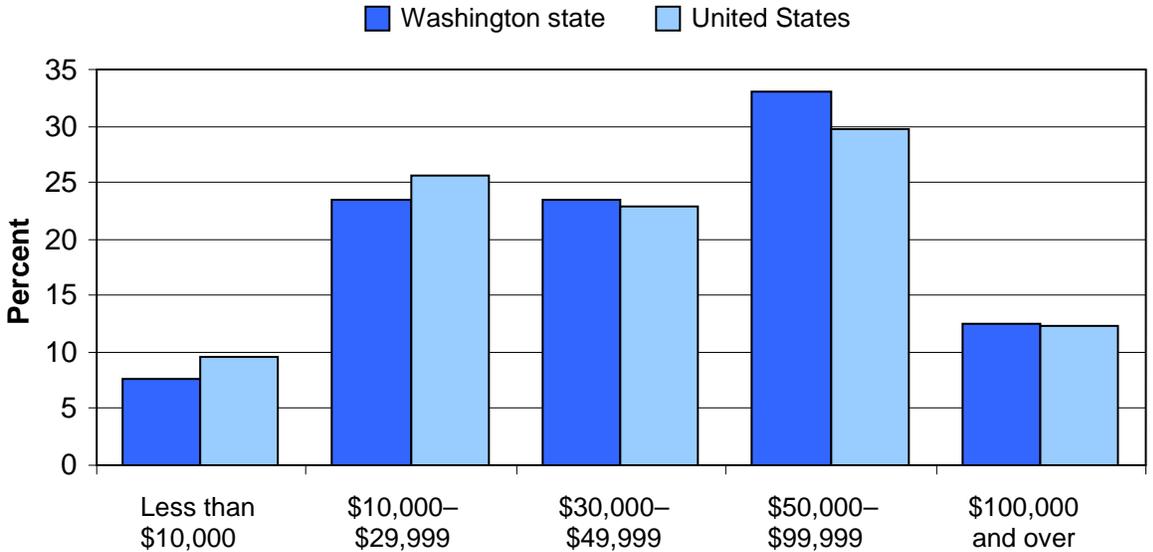


Figure 8. Household income in 1999 is the most recent year covered in the 2000 Census for Washington state and the United States. Scales for the income data reported for Washington state and the U.S. Census were slightly different than those in the survey; therefore, the data are shown in two bars. Washington state and U.S. Census data show the majority of people, 33.0 % and 29.7% respectively, reported incomes of \$50,000–\$99,999 in 1999. This is higher than what was reported by industry members.

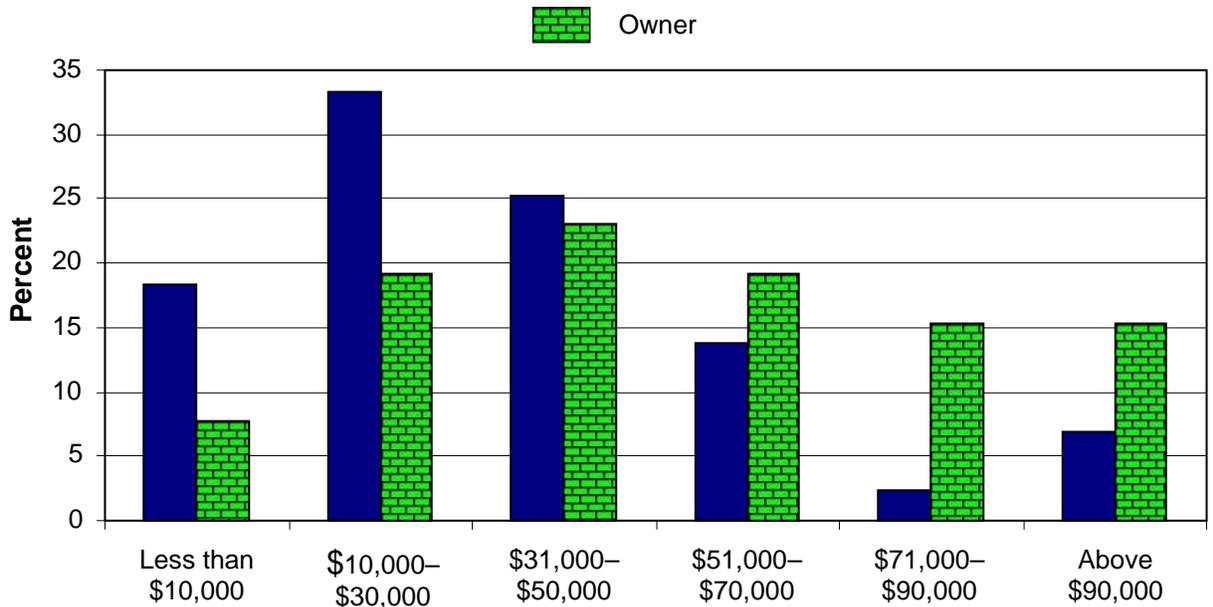
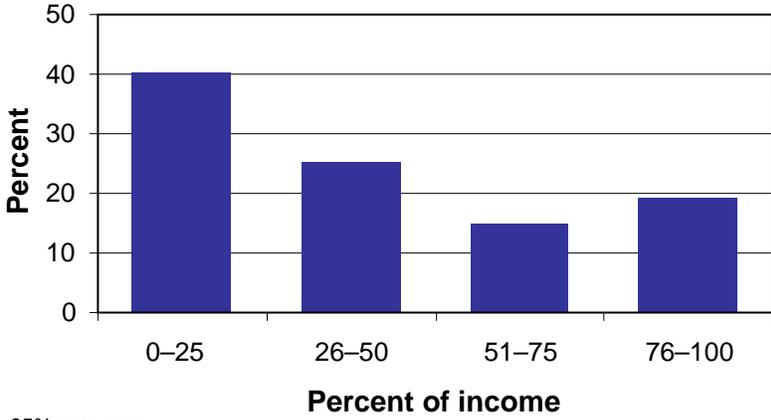


Figure 9. Total annual income by owner and non-owner. Results show that the majority of those earning more than \$50,000 per year were owners.



95% response

Figure 10. Percent of income derived from the SRKW watching industry; 40.4% of participants said 0-25% of their income comes from the industry, followed by 25.4% with 26-50% of their income from the industry.

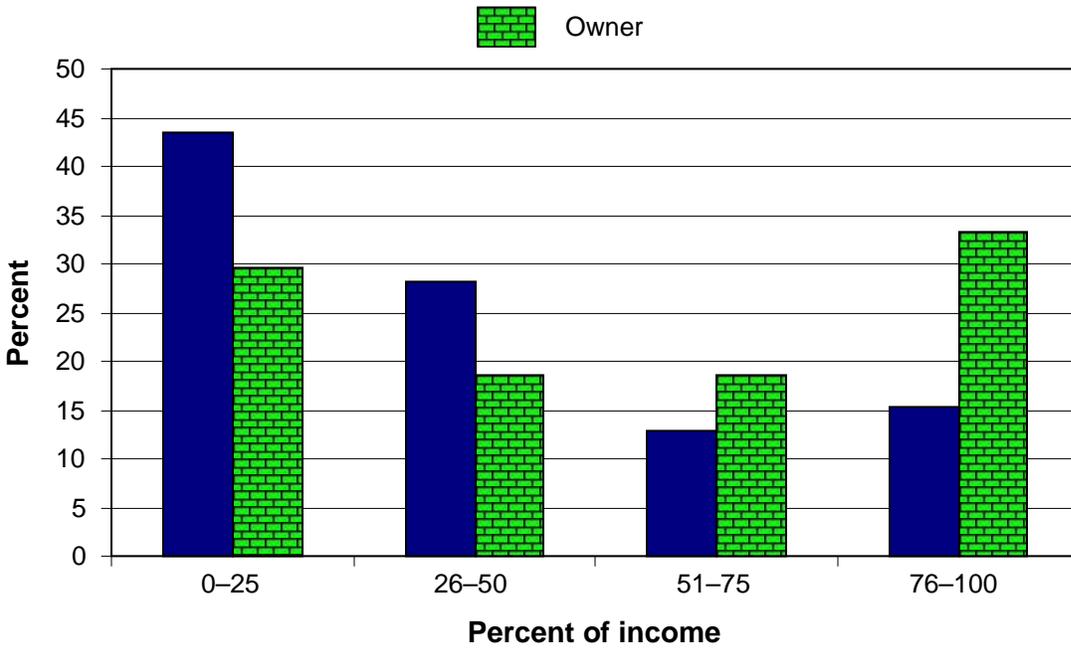


Figure 11. Percent of income derived from the industry sorted by owner and non-owner. Most of the individuals who earned more than 50% of their income from the industry are owners.

Table 5. Estimated percent of income derived from the SRKW watching industry compared to total household income of surveyed members.

Total household income	Percent income				Total
	0–25	26–50	51–75	76–100	
Less than \$10,000	44.4	27.8	11.1	16.7	100.0
\$10,000–\$30,000	25.0	40.6	9.4	25.0	100.0
\$31,000–\$50,000	46.2	19.2	15.4	19.2	100.0
\$51,000–\$70,000	60.0	13.3	6.7	20.0	100.0
\$71,000–\$90,000	33.3	16.7	50.0	0.0	100.0
More than \$90,000	37.5	37.5	0.0	25.0	100.0

Individual Participation

Individual Participation Summary

Information described in this subsection is more in-depth, expanding beyond demographic results and gathering information on the roles that individuals play in the industry. The top three roles participants identified with were naturalist, operator, and working in administration. The majority of the participants in the SRKW watching industry said they held more than one role while working within the industry. Most individuals indicated they worked two roles, followed by a single role, and three roles. Further analysis reveals that common role combinations included naturalist/deck hand, naturalist/operator, and owner/operator/naturalist.

Additional training industry members pursued included the Marine Naturalist Training Program sponsored by the Whale Museum, Friday Harbor; Standards of Training, Certification, and Watchkeeping (STCW); and other maritime training. Answers to questions regarding USCG licensing show that a majority of those who held maritime licenses held a master’s license. Most of those licenses had 100 ton inland certificates, followed by 100 ton near coastal.

The survey also aimed at understanding when participants entered the industry and how long had they worked in the industry. Answers indicate several peak years where many people entered the industry including in 1992, 1998, 2004, and 2006. Tenure results show 36% had worked in the industry for 2–5 years, followed by 25.5% working for 6–10 years. Of the respondents, 21.6% had worked in the industry for more than a decade. To further explore the issue of tenure, data were analyzed by owner/non-owner to see who had been working in the industry for longer periods of time. Results indicate that a majority of the individuals with tenure more than a decade long were owners, where individuals with tenure less than a decade were non-owners.

Additional information was sought regarding seasonal work schedules. Data indicate an increase in people working in the industry starting in April and growing until July, followed by a slow decline until October, with a small number of individuals remaining active from November through March of the following year. A small number worked throughout the entire year. Daily work schedule data reveal that the majority of participants (28.7%) worked more than full time, followed closely by both full-time and part-time schedules, 27.7% each. Data were also sought to determine whether participants worked more than one job while active in the industry. Responses indicate that 41% only worked one full-time job, while 28% worked multiple part-

time jobs. To further clarify this data, participants were asked when they worked multiple positions. Most individuals, 41%, worked multiple jobs during both peak and low seasons, while 34.5% worked during peak season. To understand the participants' distribution within and outside of the industry, we asked where they worked multiple roles during the active watching season. Responses show 50% selected the other option to describe their multiple roles. Examples of other descriptions include volunteering, teaching, and construction. An additional 30.8% of responses indicate they worked in another maritime-related role, followed by 21.2% working in tourism-related jobs. Respondents were asked how many hours a week they worked in each of three categories during the whale watching season. The first category included the number of hours worked in the whale watching industry. Responses indicate that 23.9% worked 31–40 hours/week in the SRKW watching industry, followed by 16.8% working 41–50 hours, and 13.3% working 21–30 hours. Of those that worked in either non-whale watching tourism jobs or in non-tourism-related jobs, 8.8% of participants worked in each category for 1–10 hours/week. When considering off-season activities, results indicate a majority of respondents traveled in both years (i.e., the season prior to the study year in 2005/2006 off-season and the study season of 2006/2007), 29.7% and 33.3% respectively, followed by working in marine tourism jobs in the current location, 28.7%, and 29.4% respectively.

Past work history information was sought. The majority of participants worked in other occupations, 39.1%, followed by 34.5% in education, and 27.3% working in accommodation/food service and recreation/entertainment, respectively. Further information to describe the “other” category included various maritime positions and military positions. Participants were also asked about past maritime involvement. Though fishing was the predominant activity, respondents also had experience in marine ecotourism, shipyard work, cruise ships/charters, and other sailing activities. This past maritime work was based primarily in Greater Puget Sound or Alaska. Most survey respondents participated in additional maritime activities for 1–5 years prior to joining the SRKW watching industry.

When asked their reasons to participate in the industry, in a Likert scale question format, 60.4% of participants strongly agreed that working outside and on the water was their top reason, followed by 59.2% working in the region, and 56.6% educating the public. When the results took into consideration the sum of both the agree and strongly agree responses, the top answers shifted slightly. With the combined positive responses, the top reasons were 98.1% “other,” 86.8% to work outside on the water, and 85.8% educate the public. Descriptors provided to clarify the “other” response included to gain sea time working towards a captain's license, maintain family heritage in the San Juan Islands, and share passions with others.

Individual Participation Figures and Tables

The 19 figures and 1 table listed here are sequentially provided below.

Figure 12. Survey participants' roles within the industry.

Table 6. Number of roles indicated by survey participants.

Figure 13. Types of additional training.

Figure 14. General types of USCG licenses held.

Figure 15. USCG tonnage descriptions.

- Figure 16. Entry year into industry.
- Figure 17. Tenure in the industry.
- Figure 18. Tenure in industry by owner/non-owner.
- Figure 19. Months worked in industry during the study year of 2006.
- Figure 20. Work schedules.
- Figure 21. Involvement in multiple jobs while working in the industry.
- Figure 22. Seasons when multiple jobs are worked.
- Figure 23. Types of jobs held during whale watching season.
- Figure 24. Number of hours worked per week.
- Figure 25. Off-season work descriptions.
- Figure 26. Past work history.
- Figure 27. Maritime industry participation.
- Figure 28. Location of maritime industry participation.
- Figure 29. Number of years participating in maritime positions.
- Figure 30. Reasons to participate in the industry.

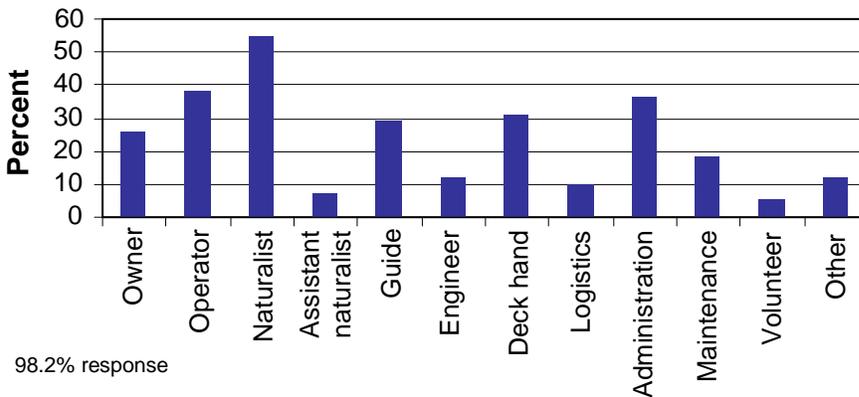


Figure 12. Survey participant's roles within the industry. Respondents reported all roles that applied. Examples of multiple roles are owner/operator and operator/naturalist.

Table 6. Number of roles indicated by survey participants. Participants were encouraged to acknowledge all the roles that they occupy while working in the industry.

No. of roles	Percent of respondents
1	26.4
2	32.1
3	13.2
4	12.3
5	5.7
6	6.6
7 or more	3.8

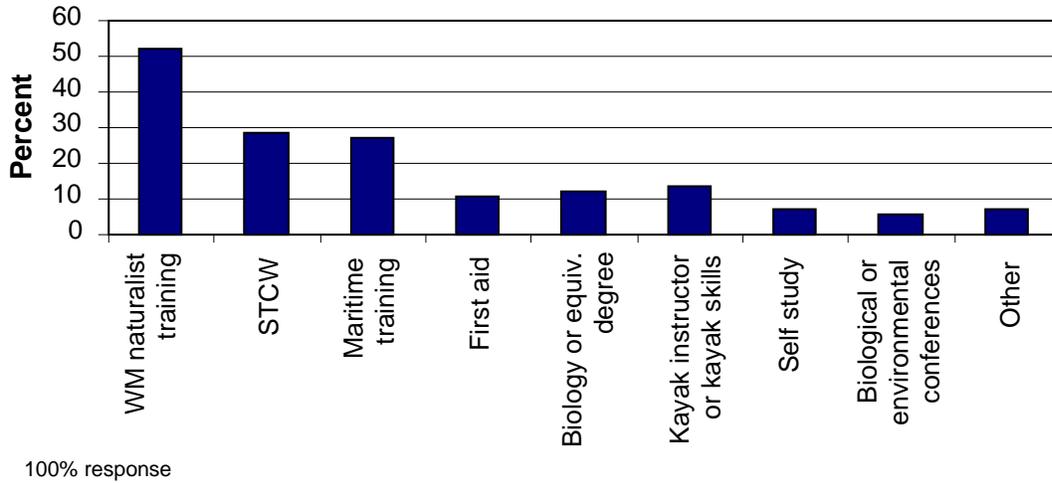


Figure 13. Types of additional training. In addition to formal education, we were interested in additional training opportunities participants may seize during their tenure in the industry. Training opportunities applicable to this industry were readily available in local settings. Such opportunities as the Whale Museum’s Marine Naturalist Training were well attended, as well as STCW training and other maritime opportunities. The 100% response rate is based on 63.6% of respondents who said they engaged in additional training.

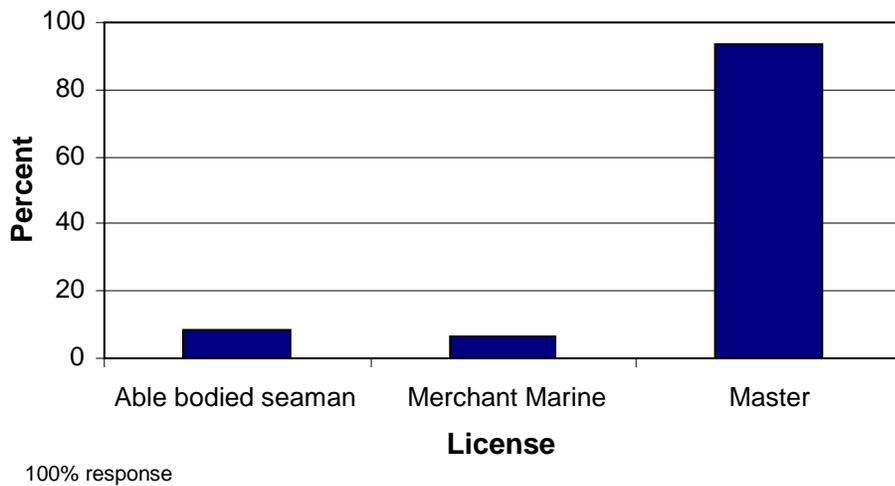
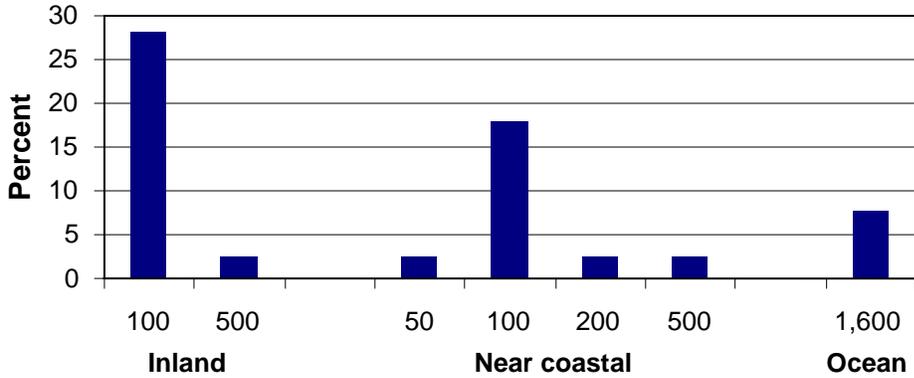
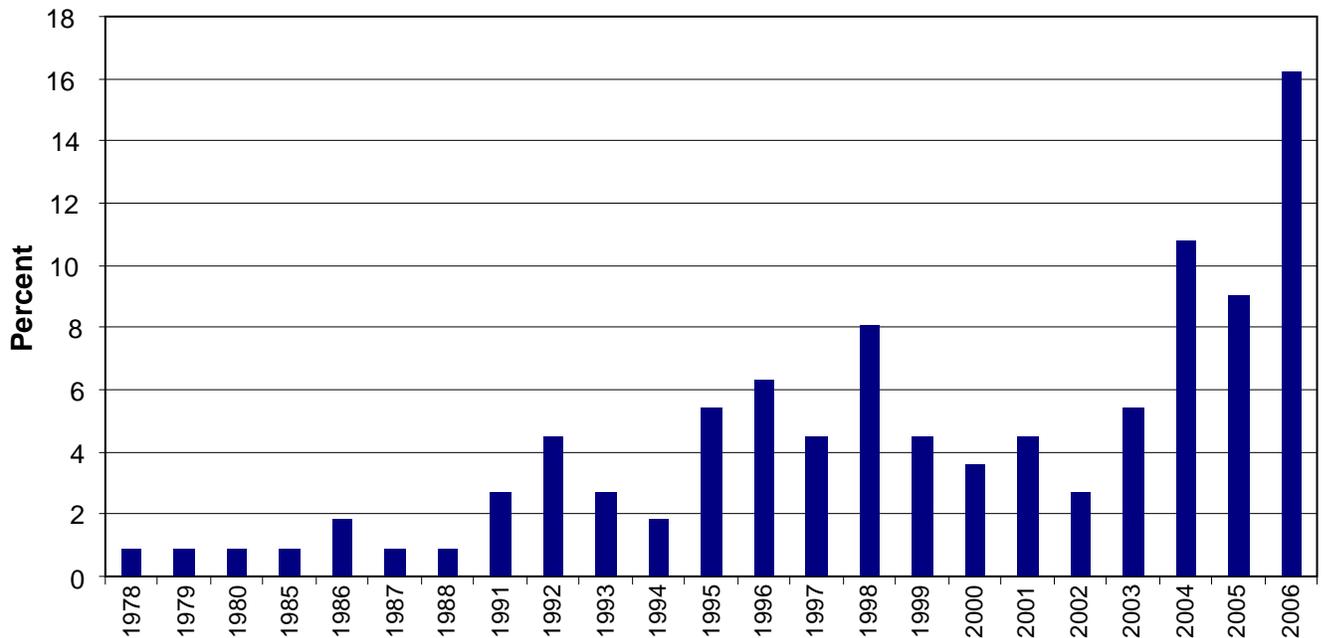


Figure 14. General types of USCG licenses held by those participants using licenses in the industry. The majority of those licenses are master’s licenses, as shown above. A total of 43.2% of respondents said they held a USCG license. Of those who held a USCG license, 83% reported they used this license while working in the industry. Of those who held and used their USCG license, 100% responded to the question above describing the license type.



100% response

Figure 15. USCG tonnage descriptions. Many respondents with licenses held inland 100 ton licenses, followed by near coastal licenses. Participants may hold more than one license, such as a 100 ton inland and 100 ton near coastal. Of the 100% who responded to subsequent licensing questions, 100% who held a license used it and provided further descriptions of their licenses including information on license tonnage.



99.1% response

Figure 16. Entry year in the industry. The majority of participants reported they entered the industry in 2006, followed by 2004, 2005, and 1998.

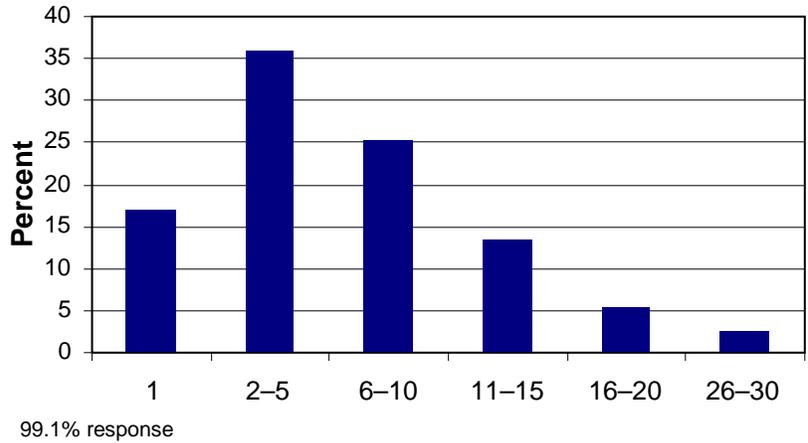


Figure 17. Tenure (number of years) in the industry. Results indicate that most individuals, 36%, have worked in the industry 2–5 years, followed by 25.5% at 6–10 years and 17.1% at 1 year.

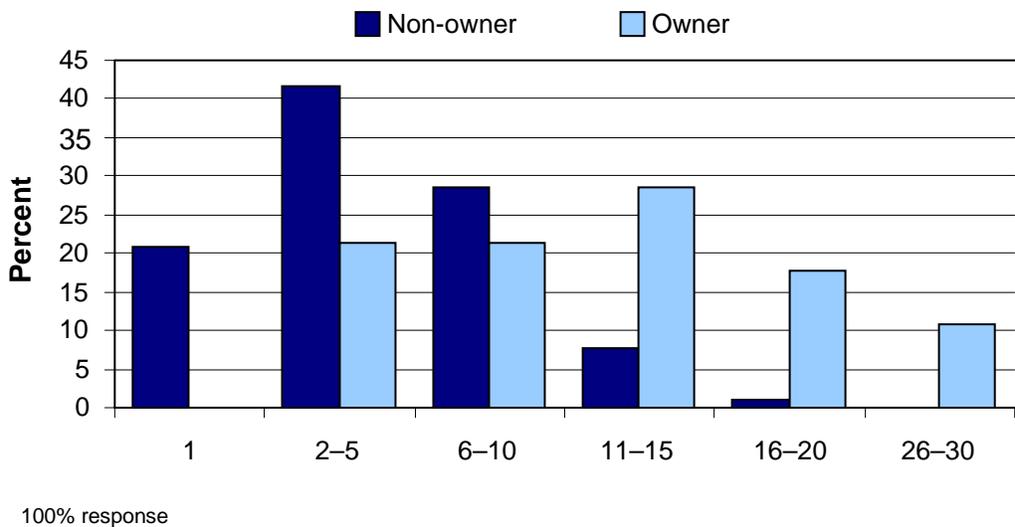
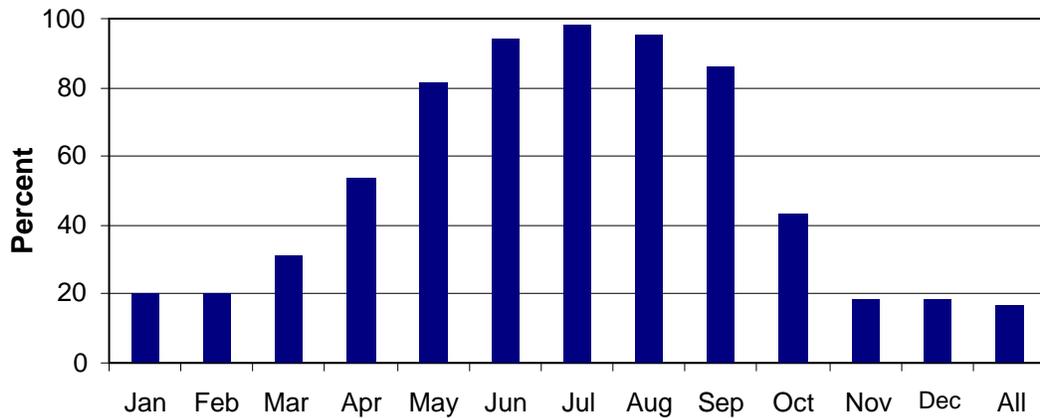
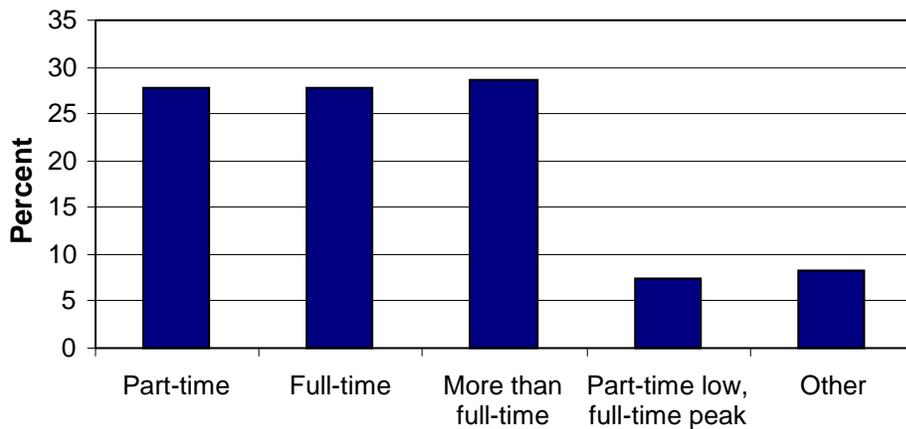


Figure 18. Number of years participants had been working in the industry (tenure) sorted by owner and non-owner responses. Data indicate there may be a difference between those participants who were owners and those who were not. The results support a conclusion that a difference existed between the two parties; therefore, the results here were sorted to highlight the differences. Owners show a longer tenure than non-owners.



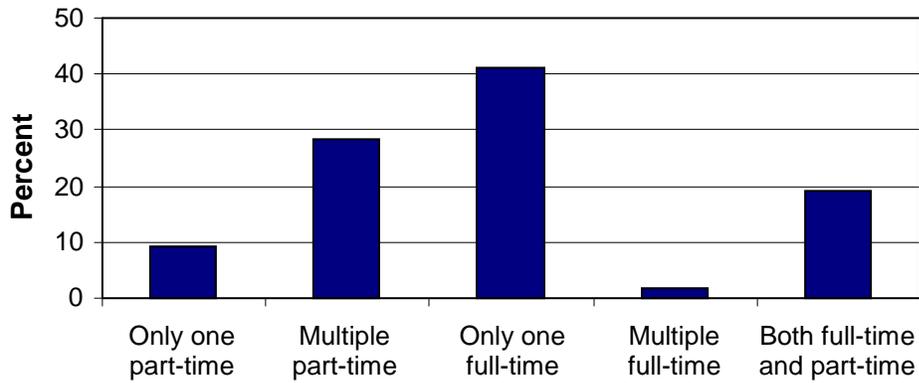
96.4% response

Figure 19. Months respondents worked in the 2006 SRKW watching season. As expected, more people worked in the industry during the peak season months of June through September. A smaller number of individuals worked throughout the year.



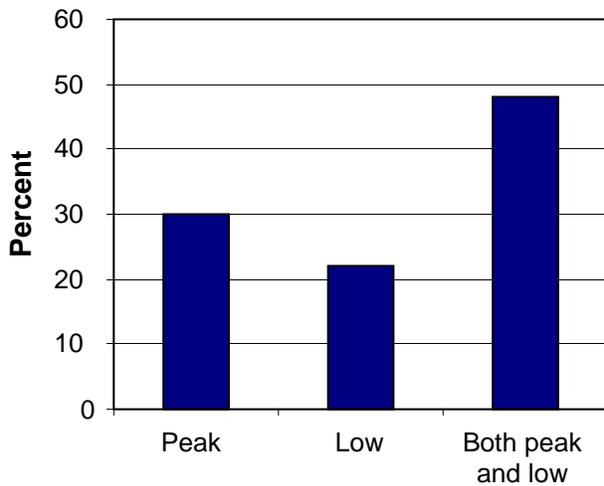
96.4% response

Figure 20. Work schedules of respondents. Respondents were asked what their schedules were during a typical week in the industry. A slight plurality of participants, 28.7%, worked more than full-time positions, while 27.8% worked part-time positions and 27.8% worked full-time positions.



97.3% response

Figure 21. Description of participants' involvement in multiple jobs. Results show that 41.3% of respondents worked only one full-time job, followed by 28.4% working multiple part-time jobs and 19.3% working both full-time and part-time jobs.



92.6% response

Figure 22. Season in which multiple jobs were worked in the SRKW watching industry. The response rate is based on the 97.3% of respondents who indicated they worked multiple jobs.

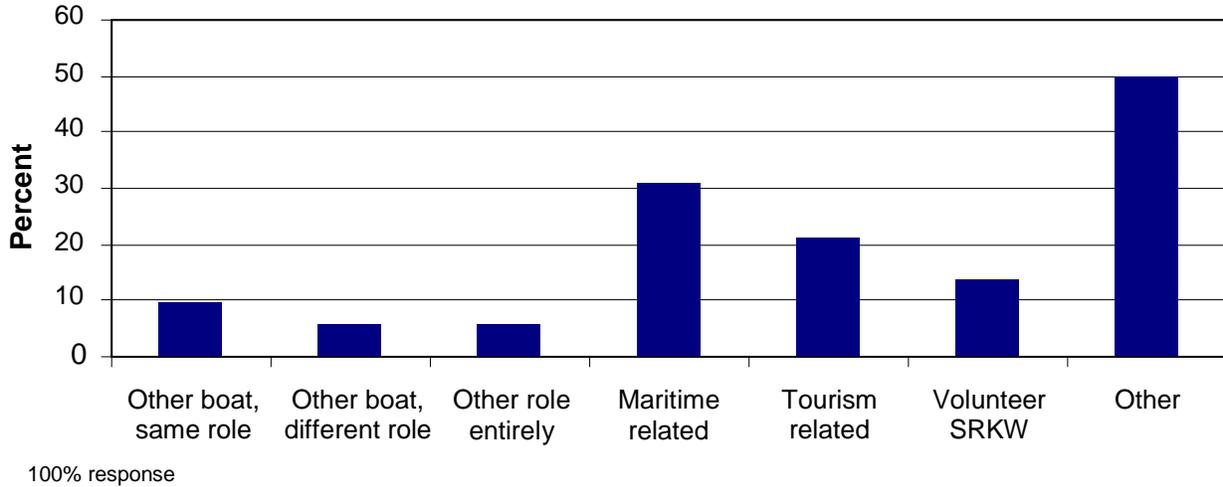


Figure 23. Types of jobs held during the whale watching season. Of those who responded that they work multiple jobs, most participants provided descriptions of other roles not categorized in the questions. Descriptions of other roles include education, construction and maintenance, accounting, and other non-SRKW volunteer activities.

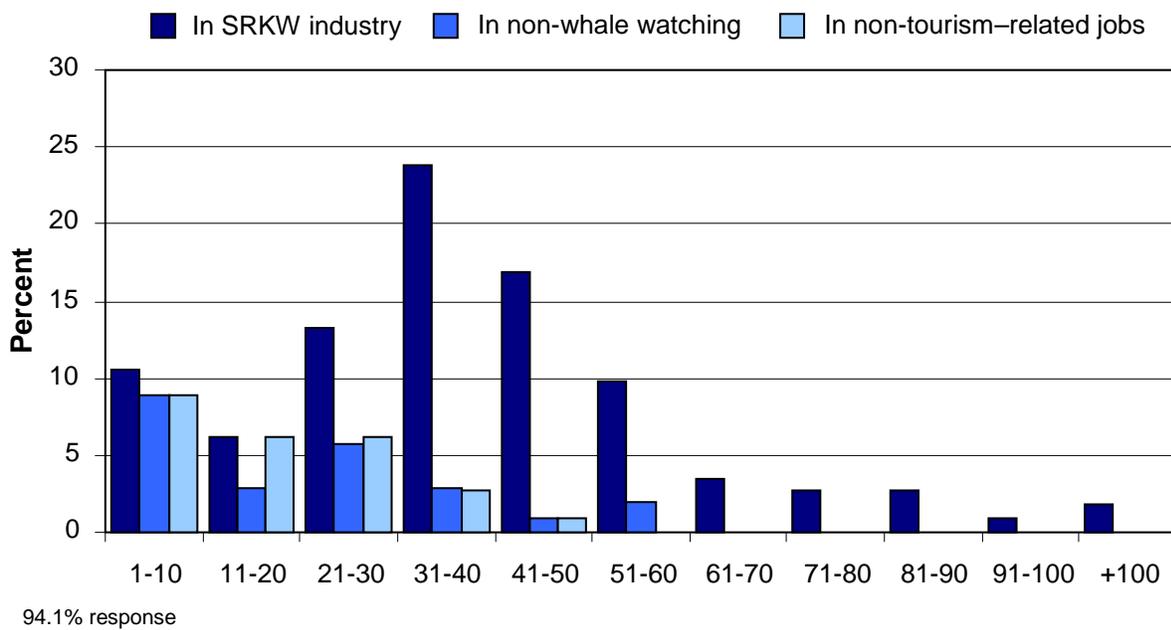


Figure 24. Number of hours individuals worked per week in the SRKW watching industry, non-whale watching tourism, and non-tourism-related jobs. Most respondents reported that they worked 31–40 hours per week in the industry, followed by 41–50 hours and 21–30 hours.

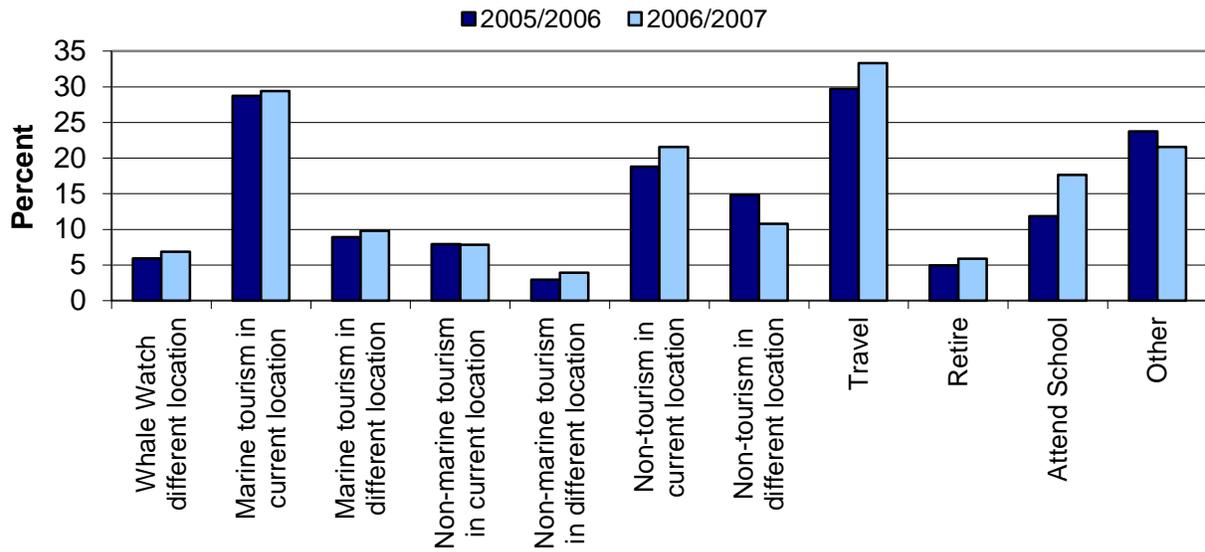
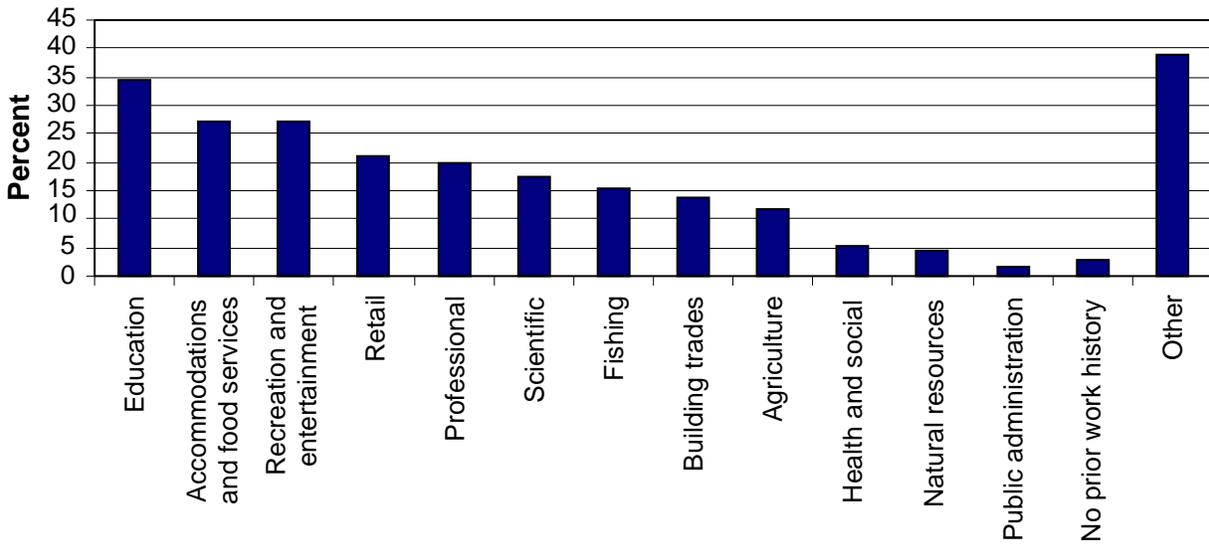
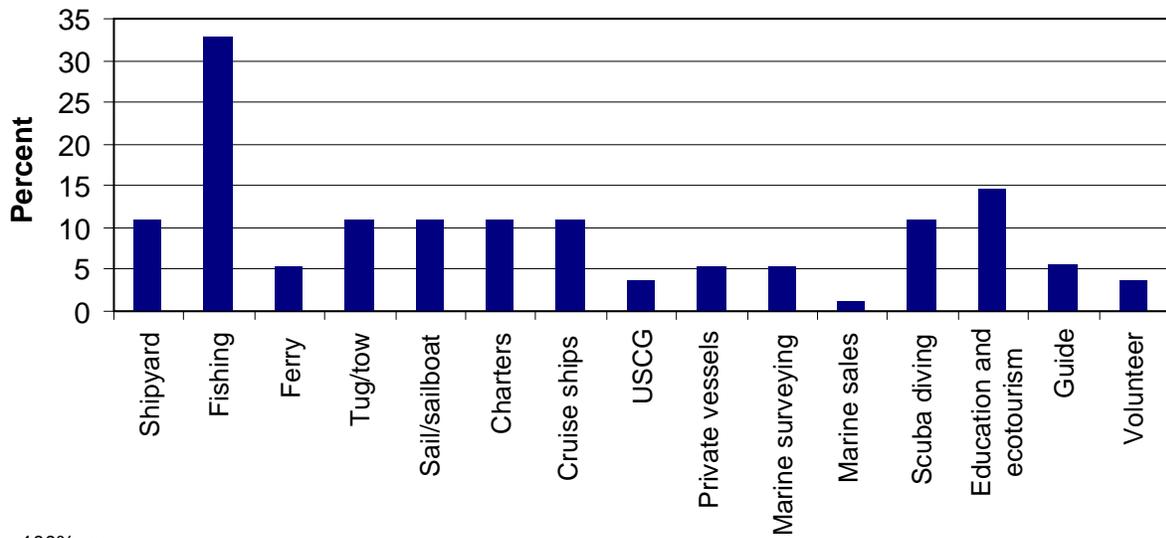


Figure 25. Off-season work descriptions. Results show that travel and marine tourism in a current location were the most common activities conducted during the off-season for both years.



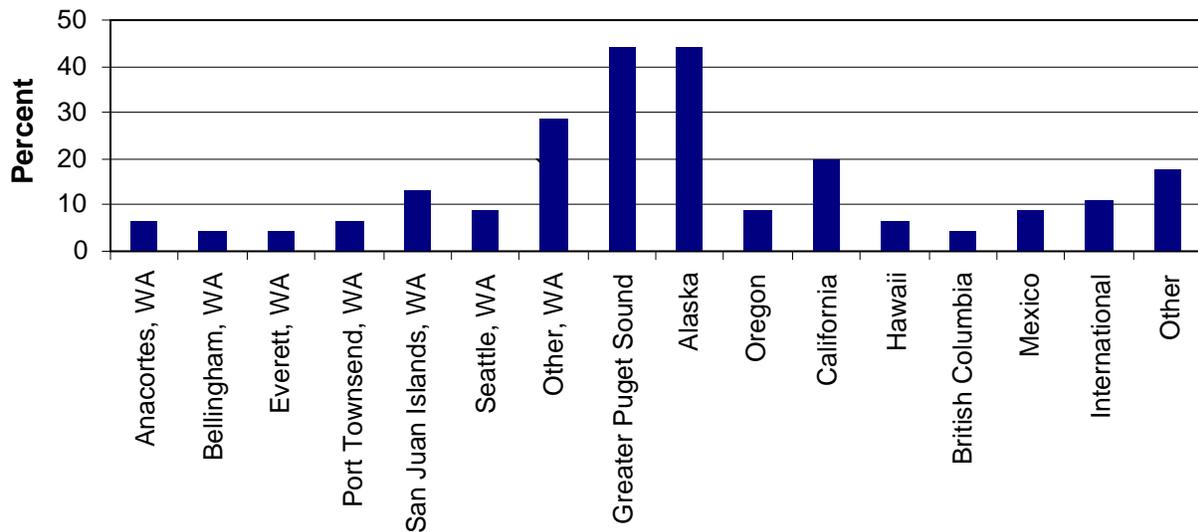
98.2 % response

Figure 26. Past work history. In describing past work history, common U.S. Census categories were used. While the response for education was high, the “other” category yielded the greatest response. Descriptions of other categories include various maritime occupations such as cruise boats, oil spill response, and tug boats among others. Other descriptions include computer technology, real estate, environmental policy, environmental education, and environmental management.



100% response

Figure 27. Types of maritime industry positions participants worked prior to participating in the SRKW watching industry. Individuals may have participated in more than one maritime position type. The response rate is based on the 99.1% of respondents who had prior maritime experience.



81.8% response

Figure 28. Locations where respondents participated in maritime industries. Participants could list multiple locations. The values represented as Greater Puget Sound are aggregate values of those communities that are part of Puget Sound. The response rate is based on the 99.1% of respondents who said they had prior maritime experience.

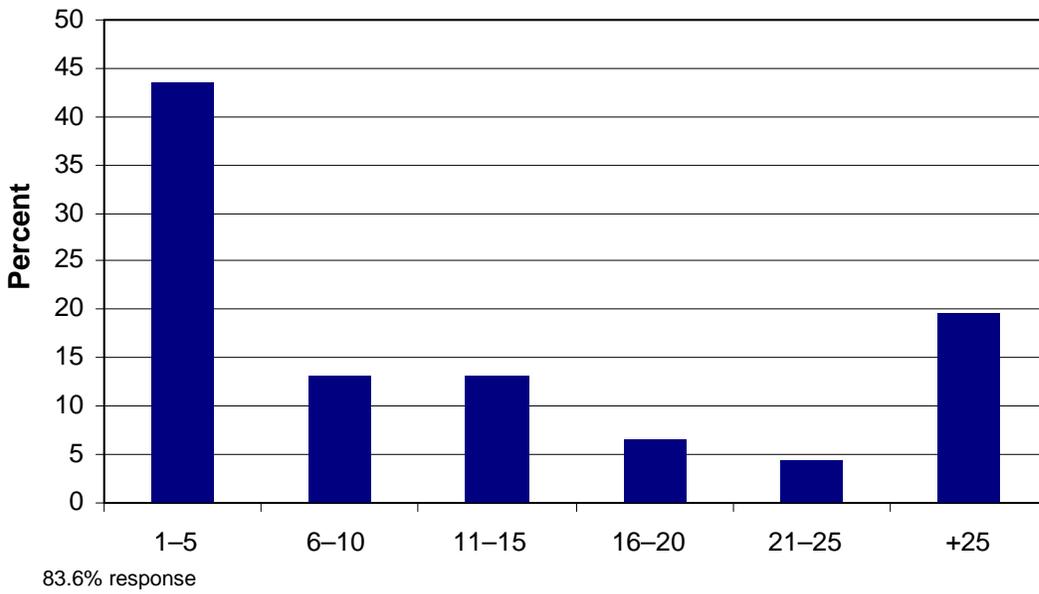
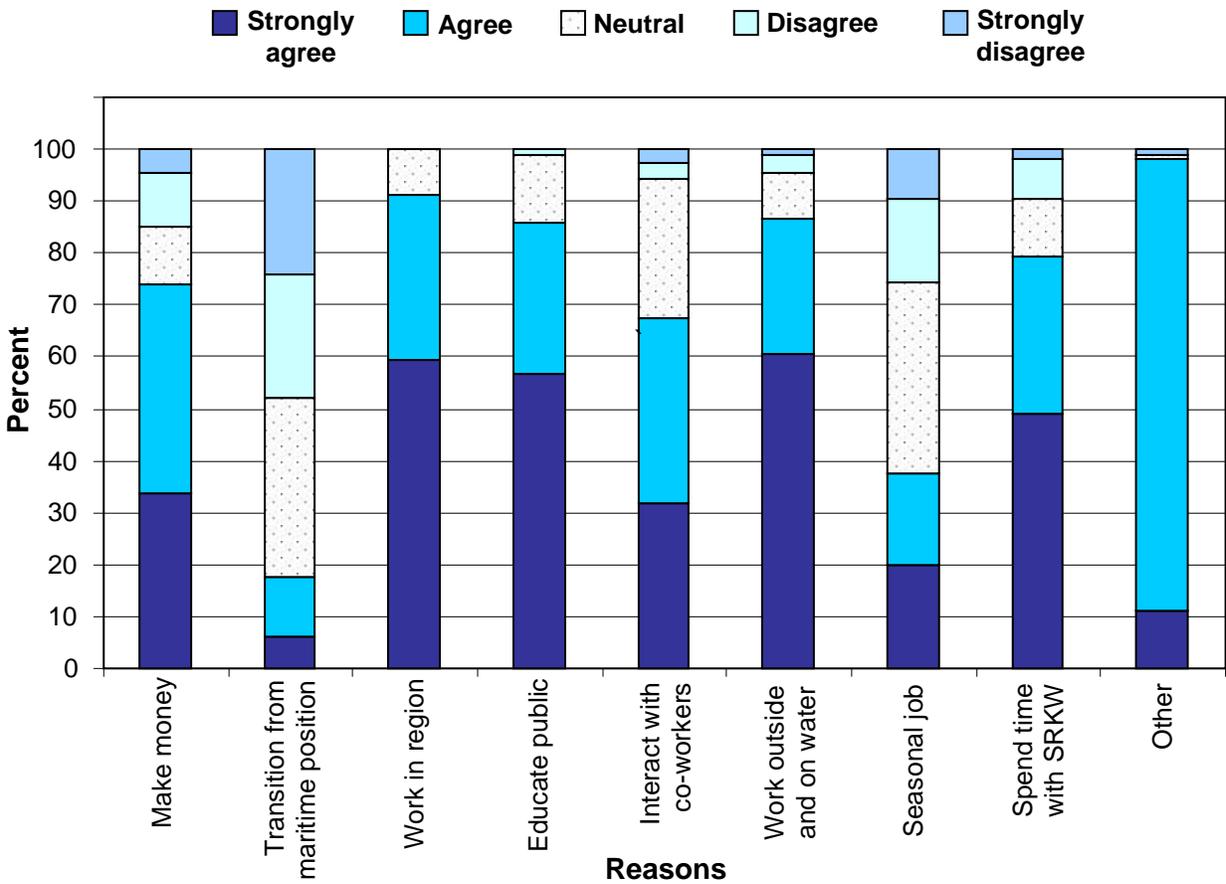


Figure 29. Number of years participants had worked in previously identified maritime positions. The response rate is based on the 99.1% of respondents who said they had prior maritime experience.



93.7% mean response rate

Figure 30. Likert scale responses on why respondents participated in the industry. The scale ranges from strongly agree to strongly disagree. The mean response rate is provided due to the nature of a multiple response question. Reasons provided by the participants to describe their “other” response include to maintain maritime licenses and accrue sea time, operate a business in the San Juan Islands, share passions with other people, and educate people other than the public.

Motorized Vessel Personnel

Results in this section present a more in-depth look at the data, based on tier analysis. Tier 1 consists of companies with large boats of more than 65 feet in length, Tier 2 represents more than one boat, Tier 3 consists of smaller boats less than 65 feet, and Tier 4 represents six pack or small passenger boats.

Demographics

Demographic Summary

Gender analysis shows more males than females participated in Tier 1 and Tier 4 companies, whereas the genders were more evenly balanced in Tier 2 and Tier 3 companies. Age distribution results show a larger number of participants older than 45 years worked in Tier 3 and Tier 4 companies. Tier 2 and Tier 1 companies employed the highest number of participants younger than 24. Tier 2 had the highest number of employees with postgraduate education, followed by Tier 3 and Tier 1. Residence data show the majority of individuals in Tier 3 and Tier 4 companies lived in the San Juan Islands, while residency for those in Tier 1 and Tier 2 companies varied, including San Juan Island, King, and Whatcom counties.

Income data vary greatly between tiers. Income data show 31 % of Tier 1 participants earned \$51,000–\$70,000, followed by 25% who earned \$10,000–\$30,000. Tier 2 results indicate 34% earned \$10,000–\$30,000, followed by 26% who earned \$31,000–50,000. Tier 3 responses show 24% earned \$31,000–\$50,000, while 21% earned \$10,000–\$30,000. Tier 4 results indicate 50% of respondents earned \$31,000–\$50,000 a year. An additional question asked how much annual income was derived from the SRKW watching industry and again the responses varied between tiers. Tier 1 responses indicate 44% derived up to 25% of their income from the industry, followed closely by 39% deriving 26–50% of their income from the industry. The top two results for Tier 2 are 26% of individuals deriving 26–50% of their income from the industry and 27% deriving 76–100%. Tier 3 responses indicate 52% derived up to 25% of their income from the industry, followed by 21% deriving 51–75%. Tier 4 results show 50% of participants derived up to 25% of their income from the industry.

Demographic Figures

The six figures listed below are sequentially provided after the list.

Figure 31. Gender distributions by company tier.

Figure 32. Age distribution by tier.

Figure 33. Educational attainments by tier.

Figure 34. Permanent residence by tier.

Figure 35. Income by tier.

Figure 36. Percent income from industry by tier.

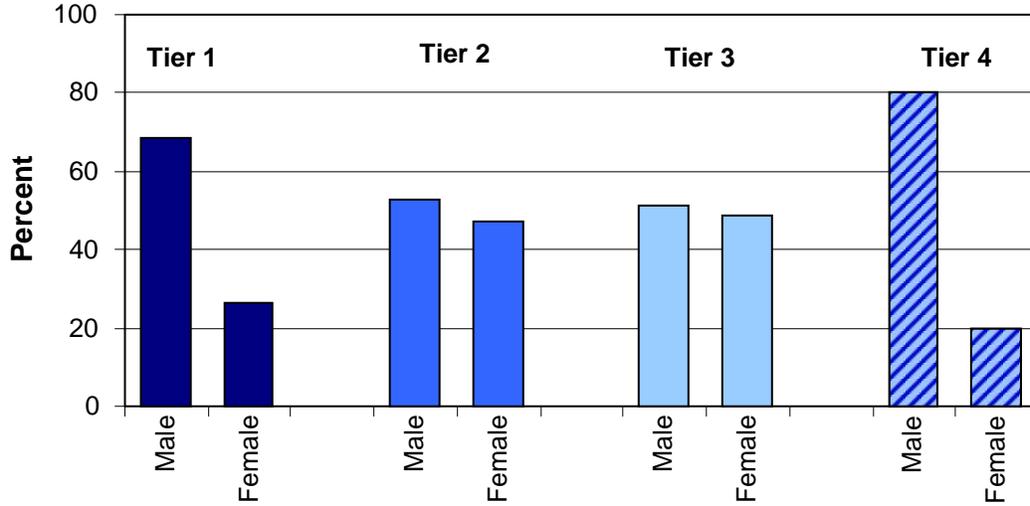


Figure 31. Gender distribution by company tier. Results indicate a higher percent of males than females in Tier 1 (64.8% male, 26.3% female) and Tier 4 (80% male, 20% female) companies. Gender in Tier 2 and Tier 3 companies is more evenly distributed.

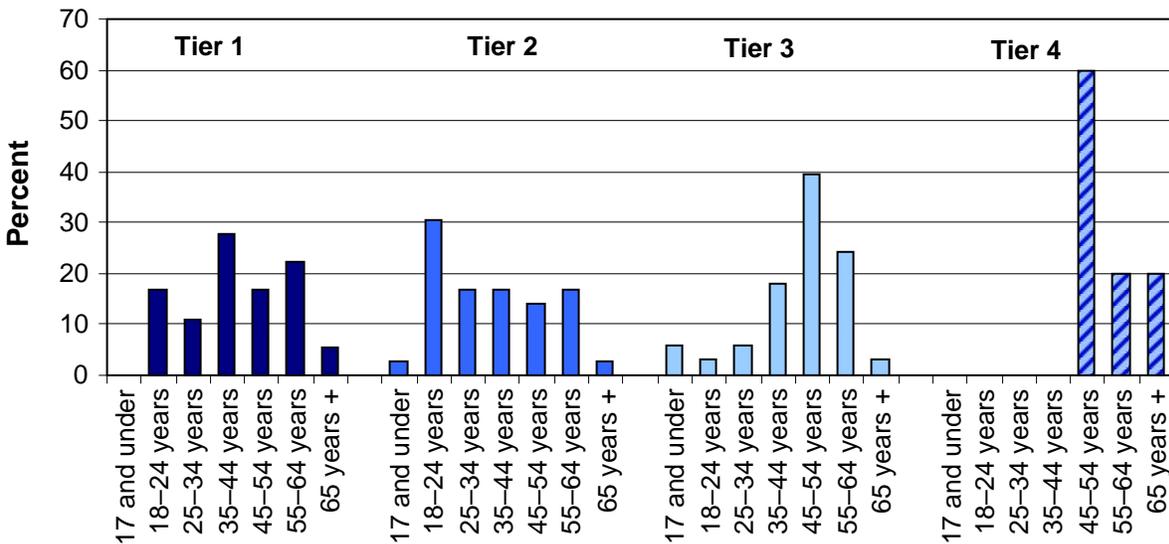


Figure 32. Age distribution by tier. Results indicate a greater variation in age distribution in Tiers 1 through 3, while Tier 4 shows a higher percent of older individuals.

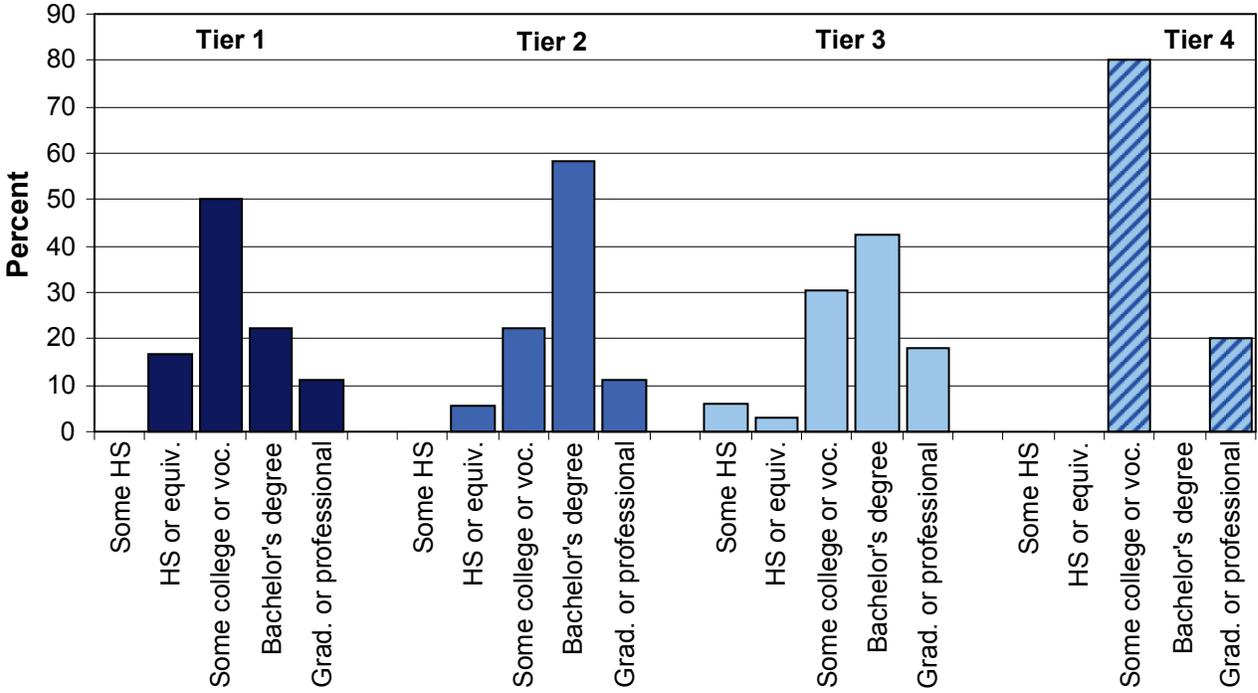


Figure 33. Educational attainment by company tier. HS = high school, Voc. = vocational, Grad. = graduate degree. The majority of Tier 1 participants, 50%, had some college education or vocational school. The majority of Tier 2 and most of Tier 3 participants had bachelor’s degrees, 58.3% and 42.4% respectively. The majority of Tier 4 participants, 80%, had some college or vocational education.

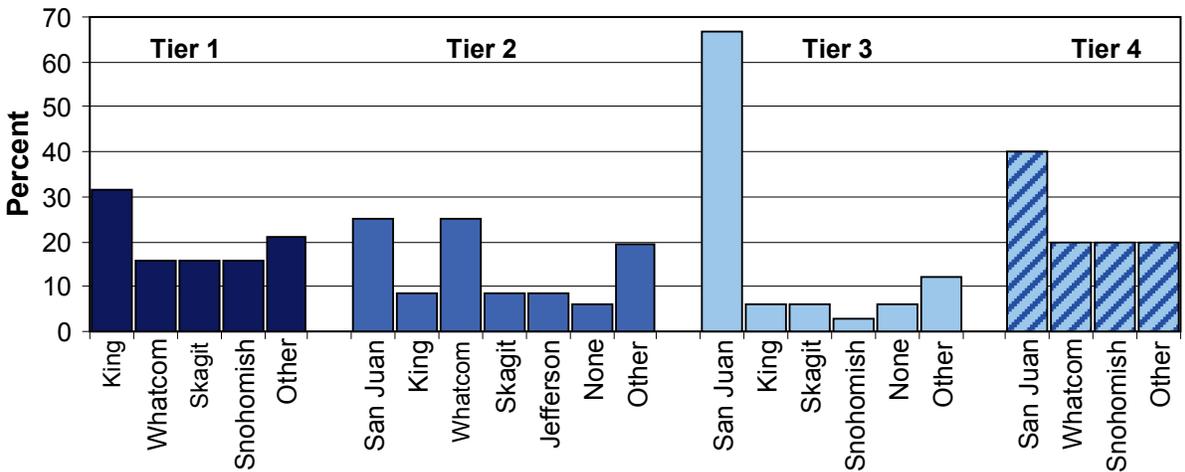


Figure 34. Permanent residence by tier. Most of the individuals who worked in Tier 1 companies, 32%, resided in King County, while many participants in the other tiers resided in San Juan County. Participants in Tier 2 companies show 25% each resided in San Juan County and Whatcom County. Participants in Tier 3 and Tier 4 companies show most, 67%, and 40% respectively, resided in San Juan County.

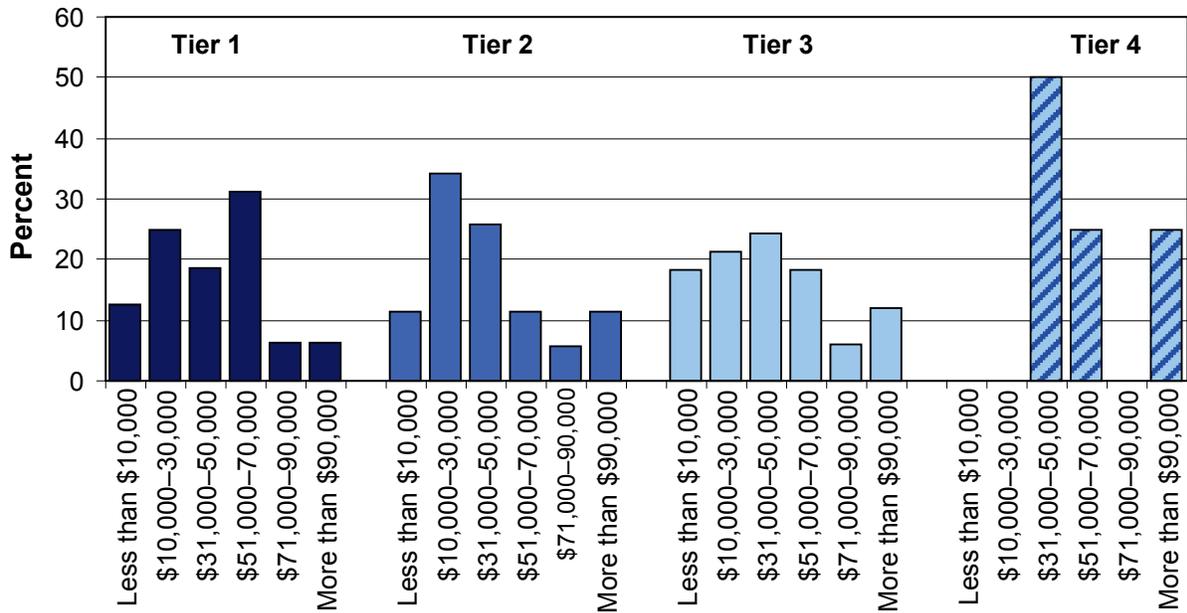


Figure 35. Income by tier. Results show 31% of participants in Tier 1 companies had income of \$51,000–\$70,000, 34% in Tier 2 companies had income of \$10,000–\$30,000, 24% in Tier 3 companies had income of \$31,000–\$50,000, and 50% in Tier 4 companies had income of \$31,000–\$50,000.

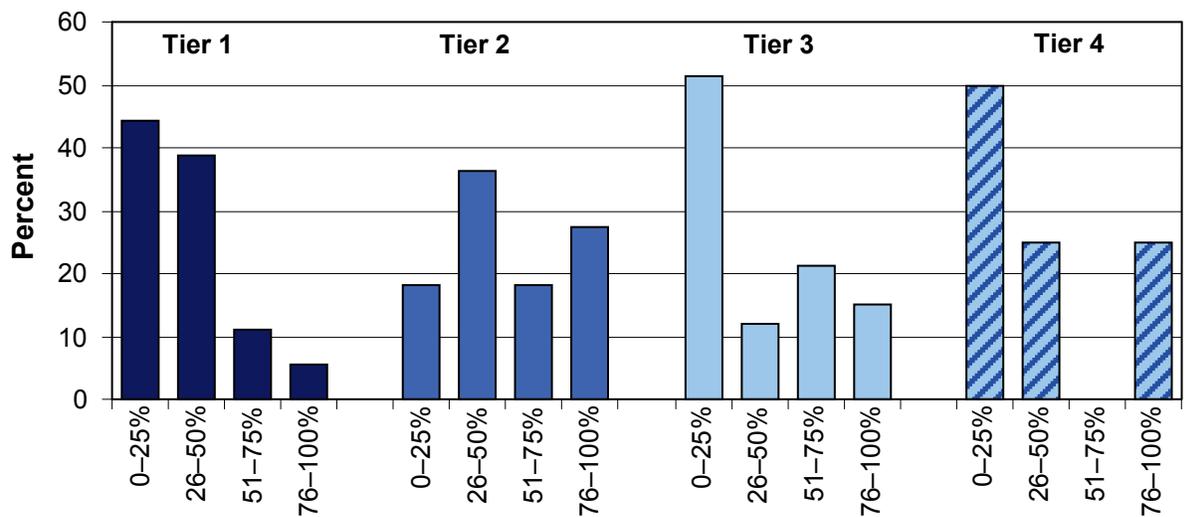


Figure 36. Percent estimated income derived from SRKW watching industry by tier. Results indicate that most participants in Tier 1, Tier 3, and Tier 4 companies derived 0–25% of their income from the industry. Most individuals in Tier 2 companies derived 26–50% of their income from the industry.

Individual Participation

Individual Participation Summary

Results for roles analyzed by tier show some consistency between all tiers. The role of naturalist was prominent in the top two selections across all tiers. Similarly, the role of operator was consistently among the top three roles across all tiers. The majority of people working aboard Tier 1 vessels occupied a single role. A few worked up to three roles and even fewer worked six or more roles. The range in the number of roles that people occupied in Tier 2 and Tier 3 companies varies from one to five or six roles, respectively. Tier 4 companies were similar to Tier 1 companies in that most participants worked one to three roles, with a small percent working six or more roles.

The study asked people working in the industry when they had begun. Tier 1 results show a small percent started in 1978, followed by small percentages between 1991 and 1995. More individuals started working in the industry in Tier 1 companies after 2001, with most individuals entering in 2003. Tier 2 participants entered the industry over a greater time span. A small percent entered in the late 1970s through the 1980s. More entered the industry throughout the 1990s, followed by a break until 2004. The highest number of people in Tier 2 companies began work in the 2006 study year. Tier 3 companies show some entrants in the early 1990s, with more people entering in 1997 and continuing to 2006. In this tier, the greatest percentage entered in 2004. Tier 4 companies show a few entrants in the early 1990s, while the rest entered between 1996 and 1998.

Another question asked how long participants had worked in the industry. For Tier 1 participants, 57.9% reported a tenure of 2–5 years. This result corresponds with findings that most people in Tier 1 companies started in the early to mid 2000s. Tier 2 results show 30.6% worked for 1 year, and 22.2% each worked for 2–5 years and 6–10 years. Again, these findings are in line with the start years that people entered the industry. Tier 3 results indicate the greatest number of people, 42.4%, worked for 2–5 years, closely followed by 39.4% working 6–10 years. Tier 4 results show 40% worked for 6–10 years, and 20% each worked 2–5 years, 11–15 years, and 16–20 years.

The top three responses across all tiers for additional training were: STCW, the Whale Museum's marine naturalist training, and other maritime training. The top three varied in their order between tiers, but were consistently the top three across all tiers. Questions regarding USCG licenses provided insight into maritime training pursued to work in the industry. Tier 1 and Tier 4 companies show that the majority of individuals held a USCG license, while Tier 2 and Tier 3 companies had a slight majority who did not hold licenses. Of those who did hold a license, a majority across tier groups used their license as part of their jobs in the industry. Data also show that across tiers, master's licenses accounted for the majority held. Tier 1 licenses held include 1,600 ton ocean endorsements, 100 ton inland endorsements, and 100 and 1,600 ton licenses with no endorsements clarified (referred to as general tonnage). Tier 2 licenses include 100 and 500 ton near coastal endorsements, inland endorsements, and general tonnage. Tier 3 licenses include 500 and 100 ton near coastal endorsements, 100 ton inland endorsements, and 50 and 100 general tonnage. Tier 4 licenses include 100 and 200 near coastal endorsements, 100 ton inland endorsements, and 25, 100, and 200 general tonnage.

Survey questions requested information on work schedules. Most participants across tiers worked in the industry from May through September. The number of people working varied slightly between tiers, but results show a climb to peaks in June and July. Generally, numbers started to decline in August and continued into the fall months. A small number of participants in each tier worked year-round. Most individuals in Tier 1 worked more than full-time hours (>40 hours per week), followed by full time and part time. Tier 2 participants worked primarily a full-time week, followed by more than 40 hours per week and part time. Most Tier 3 individuals worked part time, followed by full time and other combinations. A majority in Tier 4 worked a part-time schedule.

Given the option to work part time, we asked whether participants worked more than one job. Responses indicate that the majority of employees in Tier 1 companies worked only one full-time job, followed by multiple part-time positions, and both a full- and part-time position. Tier 2 companies show a majority worked only one full-time position, followed by multiple part-time positions and only one part time. Tier 3 results show an overwhelming number of employees worked multiple part-time positions, followed by both full time and part time and only one part time. Tier 4 results indicate most participants worked multiple part-time positions, with the same number of participants working in each of the other work hour categories.

A supplemental question asked when people worked multiple jobs. Tier 1 respondents worked multiple jobs mostly during the peak season and during peak and low seasons. Tier 2 participants worked multiple jobs primarily in low season, followed by a combination of low and peak seasons. Tier 3 participants worked multiple jobs during peak and low seasons, followed by peak seasons. Tier 4 participants worked multiple jobs during peak and low seasons.

To better understand where the opportunities lie to work multiple jobs, we asked what other jobs individuals worked during the active whale watching season. Across all tiers, results indicate that some participants worked in other maritime-related positions. The majority of Tier 1 participants selected the “other” category. Examples include teaching and various construction positions. Most Tier 2 participants worked in tourism-related jobs. Tier 3 had the greatest diversity, with many participants working in tourism, as volunteers, and on other whale watching boats in the same role that they occupied on their primary vessels. Tier 4 respondents also reported volunteer activities and other positions.

The survey provided three options to indicate the number of hours worked by participants: number of hours within the SRKW watching industry, hours worked in a non-whale watching tourism positions, and hours worked in non-tourism-related jobs. Results across tiers indicate most of the hours were worked in the SRKW industry. Many Tier 1 participants, 36.8%, worked 41–50 hours per week, followed by 15.8% each working 31–40 and 21–30 hours per week. Tier 2 responses show 45.5% worked 31–40 hours and 18.2% worked 41–50 hours, all within the SRKW industry. Tier 3 results indicate 24.2% each worked 31–40 hours per week and 1–10 hours per week. Tier 4 results vary slightly, with 20% of participants working 1–20 hours per week in both the SRKW industry and non-tourism-related jobs.

Additionally, understanding off-season activities contributes more information on the annual activities of those in the industry. Tier 1 results indicate a majority of individuals continued working in marine tourism positions in the current location where they were employed

for both years (i.e., the season prior to the study year in 2005/2006 off-season and the study season of 2006/2007). This was followed by “other” responses, including year-round employment. Tier 2 responses show more individuals participated in marine tourism jobs in the current location in 2005/2006 with slightly fewer in 2006/2007, while many traveled in 2005/2006 and an increase in travel was anticipated for 2006/2007. Tier 3 results indicate a majority of individuals worked both years in a non-tourism job in the current location, followed by other, and a marine tourism job in the current location. Tier 4 shows equal participation in non-marine tourism jobs in the current location, a non-tourism job in a different location, and travel for the 2005/2006 year. Responses for the 2006/2007 year show equal participation in a non-marine tourism job in the current location, a non-tourism job in the current and different locations, travel, and to attend school.

Participants were asked to describe past work history. Tier 1 results indicate 84% had past work history in the “other” category, including high participation in various maritime occupations such as the cruise ship industry and commercial diving. Additionally in Tier 1, 32% worked in building trades, while 21% worked in education, fishing, and recreation and entertainment, respectively (respondents were able to select all options that applied to their situations). Tier 2 results show 44% worked in the accommodation and food industry, 32% in retail, and 29% in both education and scientific positions. Tier 3 reported 50% worked in education, and 31% worked in both accommodation and food, and recreational and entertainment industries. Tier 4 had the greatest participation in the “other” category, 80%, including occupations in other maritime industries. Both the education and accommodation and food industries were selected by 50% of respondents.

A focus on experience in the maritime industry provided insight into other maritime jobs held. Of those who acknowledged prior participation in any maritime industry, participants in Tier 1 and Tier 4 companies possessed the greatest background. Across all tiers, at least some level of participation in fishing activities was identified. Tier 1 participants reported experience in the cruise ship industry as well as ferries, tug boats, and USCG. Tier 2 and Tier 3 participants had backgrounds in scuba diving and education/ecotourism. Tier 4 participants had experience in multiple categories, with the percent of participants working in each being equal. Complementing the types of maritime jobs, the location of positions was also determined. The highest emphasis across tiers was in Greater Puget Sound and Alaska. In addition to these locations, Tier 3 participants worked in areas classified as “other” from those described, and additional locations for Tier 4 participants included Mexico, California, Oregon, and Anacortes, Washington.

A final question asked participants the number of years they had worked in maritime industries. Tier 1 results indicate 50% of participants had worked 1–5 years in maritime industries and 25% had more than 25 years of experience. Tier 2 responses indicate 43% had worked for 1–5 years, while an equivalent number of individuals, 14.3%, had worked for 11–15 years, 21–25 years, and more than 25 years, respectively. Tier 3 results show 41.7% of participants had worked 1–5 years, 25% had worked 6–10 years, and 16.7% each had worked 16–20 years and more than 25 years. Tier 4 results are split with 66.7% of participants having worked in the maritime industries for 1–5 years and 33.3% for more than 25 years.

In response to the Likert scale question of why people work in the industry, reasons varied only slightly between tiers. Tier 1 results show the top three reasons participants strongly agreed with were 50% to work outside on the water, 44.4% to work in the region, and 38.9% to make money. When the agree and strongly agree responses were combined to provide an overall agreement response, the reasons changed slightly for Tier 1 results. The top three reasons changed to 94% “other”, 90.3% to work in the region, and 88% to educate the public. The top three reasons with a strongly agree response for Tier 2 participants were 48.5% to work outside on the water, 48.5% to spend time with the SRKWs, and 45.4% to educate the public. When agreement responses were combined, the results shifted slightly to 94% selecting “other” reasons, 90.3% to work in the region, and 87.9% to educate the public. Tier 3 participants reported their strongest agreement was for both educating the public and working outside on the water, 68.8% each, followed by 59.4% to spend time with the SRKWs. Aggregated agreement responses slightly shifted results with 100% indicating “other,” 90.6% to work outside on the water, and 87.5% to educate the public. The Tier 4 results for strongly agree are 100% to work outside on the water, with 80% of participants selecting all of the following reasons: to work in the region, educate the public, and spend time with the SRKWs. Aggregated agreement responses slightly altered the responses to show 100% want to work in the region, educate the public, work outside on the water, and spend time with the SRKWs.

Individual Participation Figures and Tables

The 16 figures and 9 tables listed here are sequentially provided below.

Figure 37. Role by company tier.

Table 7. Number of roles occupied by tier.

Figure 38. Professional training by tier.

Table 8. USCG licenses held by tier.

Table 9. USCG license use by tier.

Table 10. USCG license type by tier.

Table 11. USCG license description by tonnage by tier.

Table 12. Entry year by tier.

Figure 39. Tenure by tier.

Figure 40. Months worked by tier.

Figure 41. Work schedules by tier.

Figure 42. Multiple work positions by tier.

Figure 43. Seasons when participants work multiple jobs.

Figure 44. Types of jobs held during the whale watching season by tier.

Figure 45. Number of hours worked by job category for Tier 1 companies.

Figure 46. Number of hours worked by job category by Tier 2 companies.

Figure 47. Number of hours worked by job category by Tier 3 companies.

Figure 48. Number of hours worked by job category by Tier 4 companies.

Table 13. Work conducted in the off-season.

Figure 49. Past work history by tier.

Table 14. Historical participation in the maritime industry by tier.

Figure 50. Maritime positions by tier.

Figure 51. Location of maritime industry experience by tier.

Figure 52. Number of years worked in the maritime industry by tier.

Table 15. Reasons to participate by tier.

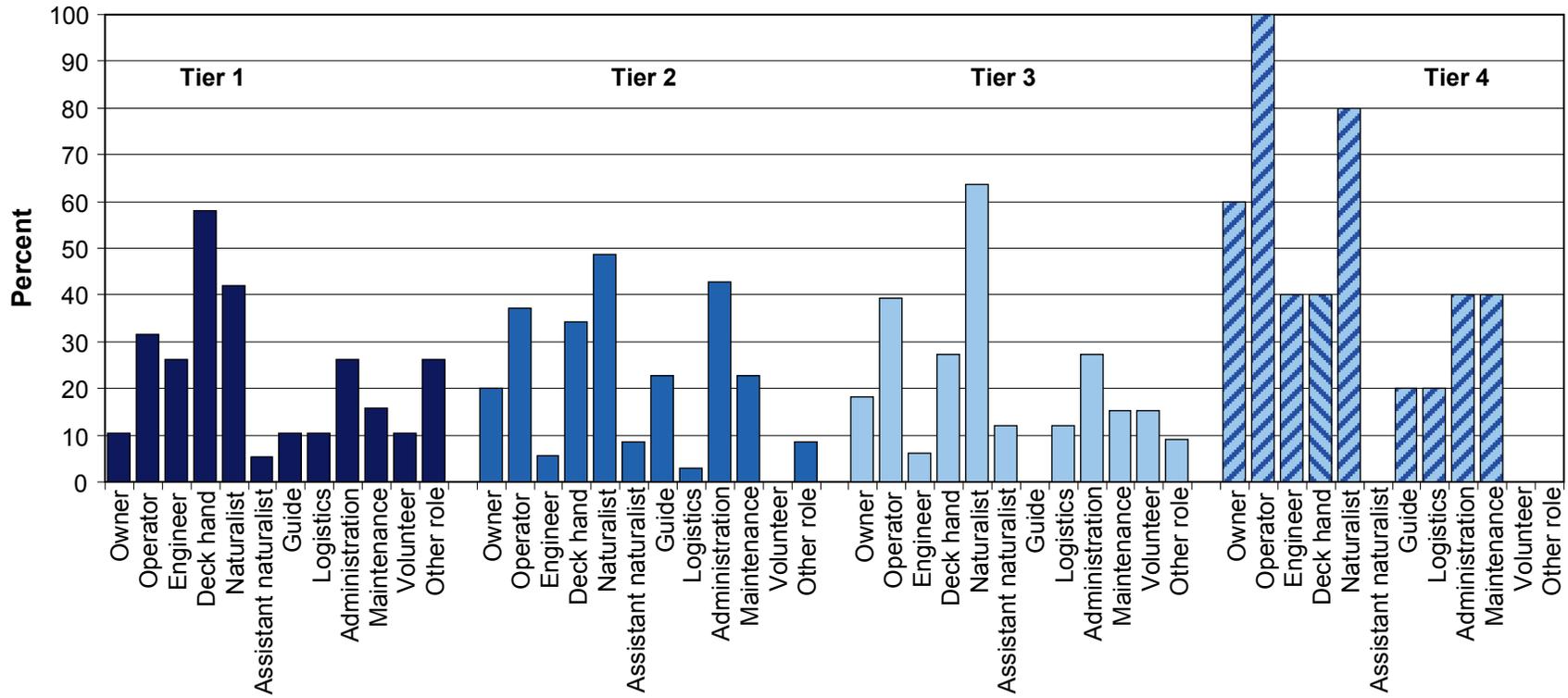


Figure 37. Roles held by participants by company tier. In this question, since participants were able to mark all roles that apply, several acknowledged that more than one role applied to their situation.

Table 7. Number of roles held by participants by company tier.

No. of roles	Percent of respondents			
	Tier 1	Tier 2	Tier 3	Tier 4
1	55.6	28.6	22.6	20.0
2	16.7	28.6	41.9	20.0
3	5.6	14.3	16.1	20.0
4	—	11.4	9.7	—
5	—	8.6	9.7	—
6	11.1	5.7	—	20.0
7 or more	11.1	—	—	20.0

54

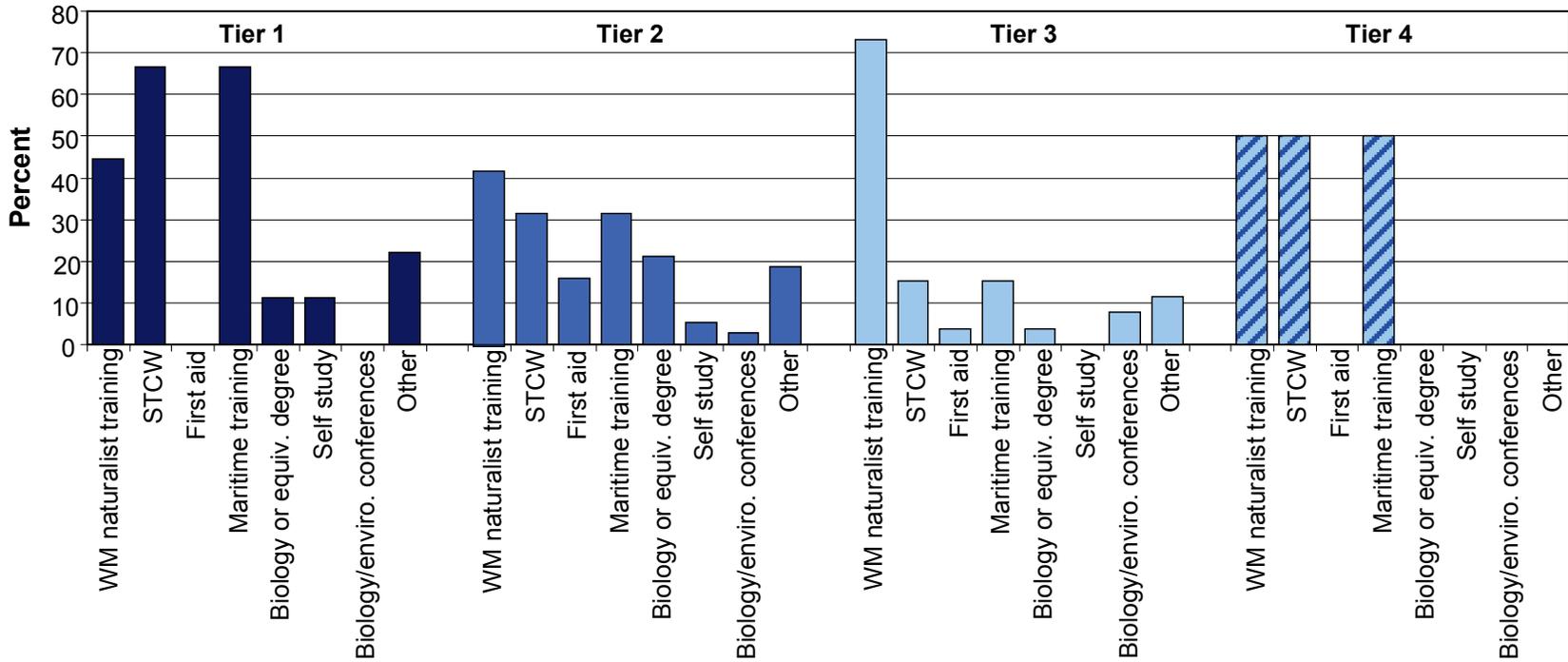


Figure 38. Description of additional professional training by company tier.

Table 8. Percent of participants who held a USCG license by company tier.

Tier	Yes	No
1	52.6	47.4
2	41.7	58.3
3	45.5	54.5
4	100.0	—

Table 9. Percent of participants who held a USCG license and used it in the SRKW watching industry by tier.

Tier	Yes	No	N/A
1	36.8	21.1	42.1
2	38.9	8.3	52.8
3	37.5	12.5	50.0
4	100.0	—	—

Table 10. Percent of types of USCG licenses held and used in the industry by company tier.

Tier	Able bodied seaman	Merchant Marine	Master
1	30	30	70
2	—	—	100
3	—	—	100
4	—	—	100

Table 11. Percent description of USCG license tonnage used in the industry by tier. General tonnage is the category description where responses provided no additional detail information or tonnage listing.

Tier	General tonnage						Inland		Near coastal				Ocean
	25	50	100	200	500	1,600	100	500	50	100	200	500	1,600
1	—	—	57.1	—	—	42.9	100.0	—	—	—	—	—	100.0
2	—	—	86.7	—	13.2	—	80.0	20.0	—	75.0	—	25.0	—
3	—	13.3	86.7	—	—	—	100.0	—	14.3	85.7	—	—	—
4	20.0	—	60.0	20.0	—	—	100.0	—	—	50.0	50.0	—	—

Table 12. Entry year into industry by tier (values in percent).

Entry Year	Tier 1	Tier 2	Tier 3	Tier 4
1978	5.26	—	—	—
1979	—	2.78	—	—
1985	—	2.78	—	—
1988	—	2.78	—	—
1991	5.26	—	—	20.00
1992	—	5.56	6.06	20.00
1993	5.26	—	3.03	—
1994	—	2.78	—	—
1995	15.79	2.78	6.06	—
1996	—	13.89	—	20.00
1997	—	5.56	15.15	20.00
1998	—	2.78	12.12	20.00
1999	—	8.33	3.03	—
2000	—	—	12.12	—
2001	10.53	—	3.03	—
2002	10.53	—	6.06	—
2003	15.79	—	9.09	—
2004	10.53	5.56	18.18	—
2005	10.53	13.89	3.03	—
2006	10.53	30.56	3.03	—

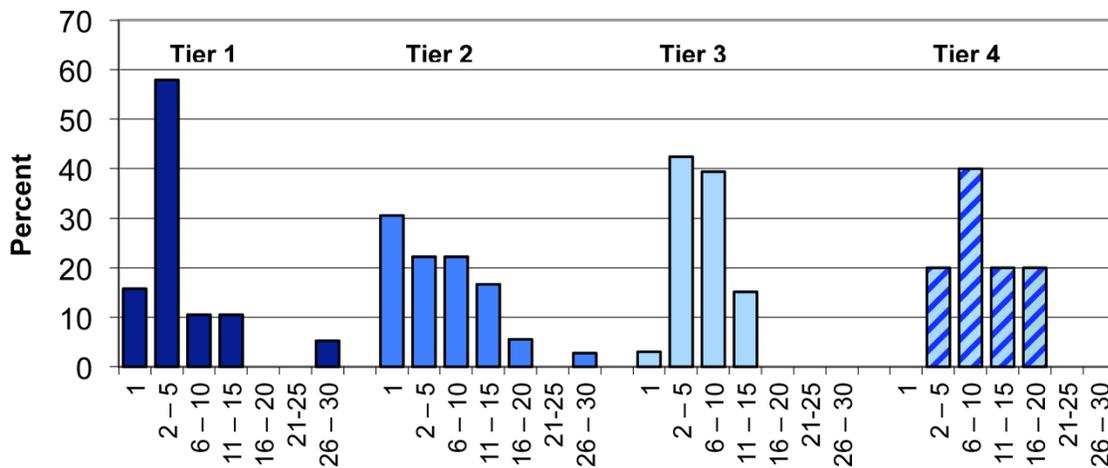


Figure 39. Tenure by company tier. This survey question asked participants how many years they had participated in the industry. It also allowed individuals to account for intermittent time, where a participant may have left the industry for a few years and returned. Overall, many participants in each tier had worked in the industry for 2–5 years. The longest tenures fell in the Tier 1 and Tier 2 companies. Previous analysis of this question shown in Figure 18 indicates that those with the longest tenures were primarily company owners.

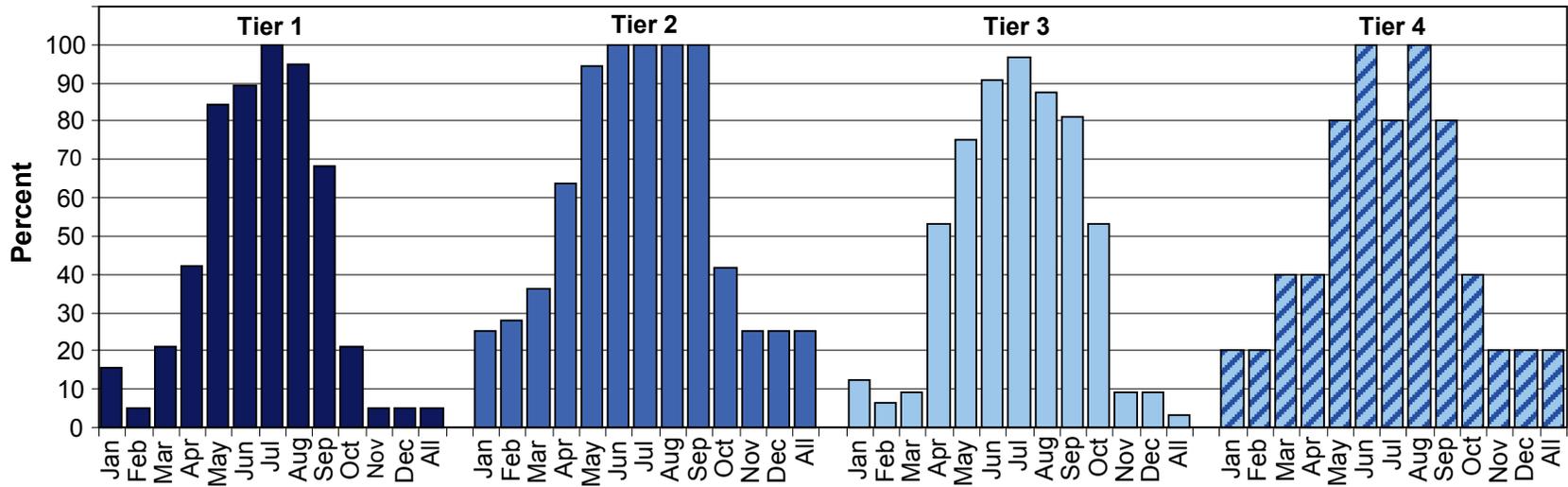


Figure 40. Months worked in the SRKW watching industry by company tier. In addition to individual months, there was an opportunity to select “all” to indicate working all year-round in the industry. As expected due to the seasonal nature of the industry, there was a peak in participation in the industry during the summer months.

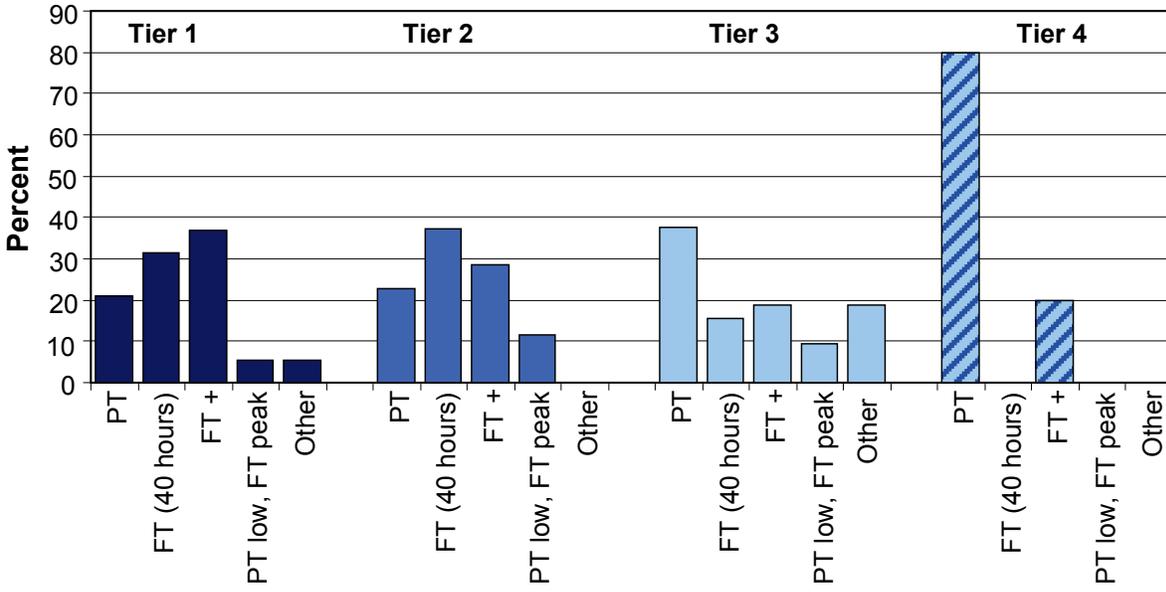


Figure 41. Work schedules by company tier. The largest proportion of Tier 1 company employees, 36.8%, worked more than full-time (FT), 37.1% in Tier 2 companies worked full-time, and the greatest proportion of respondents in Tier 3 and Tier 4 companies worked part-time (PT) positions, 37.5% and 80%, respectively.

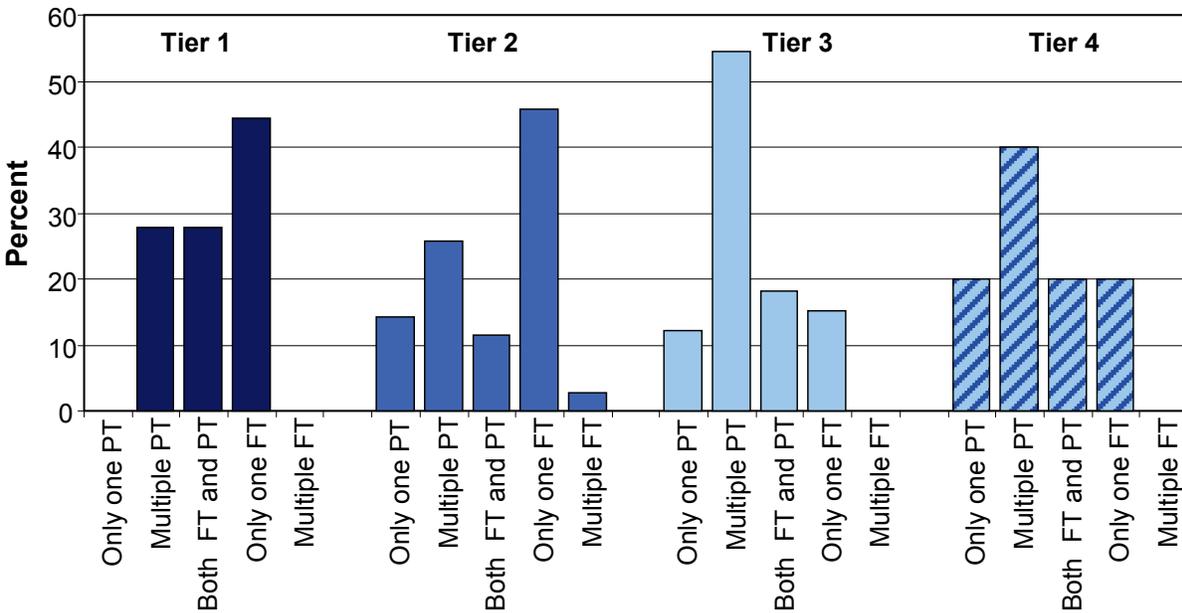


Figure 42. Description of work schedules and multiple work positions held by participants sorted by tier. Employees of Tier 1 and Tier 2 companies worked primarily only one full-time (FT) position. Employees of Tier 3 and Tier 4 companies who primarily worked part-time (PT) positions show in these results that they worked multiple part-time positions.

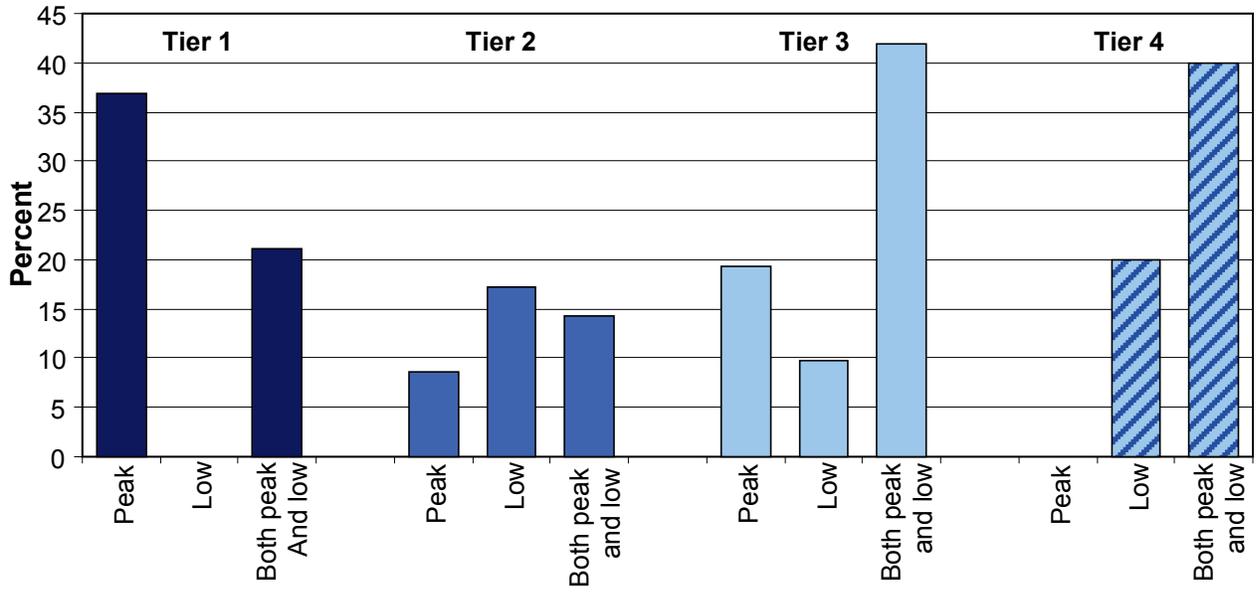


Figure 43. Seasons when participants work multiple jobs. These vary greatly between tiers.

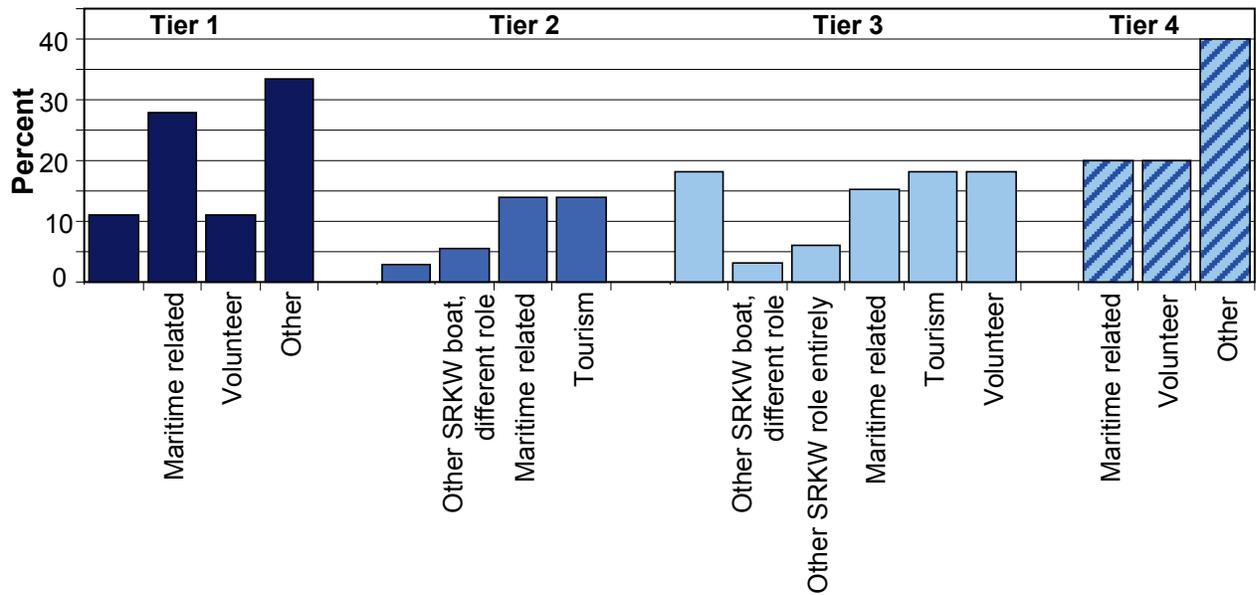


Figure 44. Types of additional jobs held during the whale watching season by tier. Participants in each tier show variation in the types of jobs held and each tier has some level of participation in maritime-related positions.

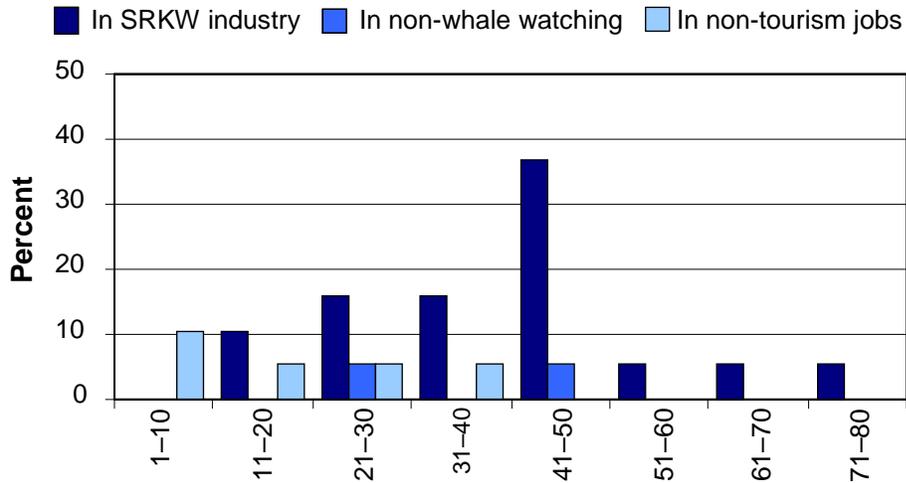


Figure 45. Number of hours worked per week in three job categories by Tier 1 companies: the SKRW watching industry, non-whale watching tourism jobs, and non-tourism-related jobs. The majority of hours worked in multiple jobs are in the SRKW industry.

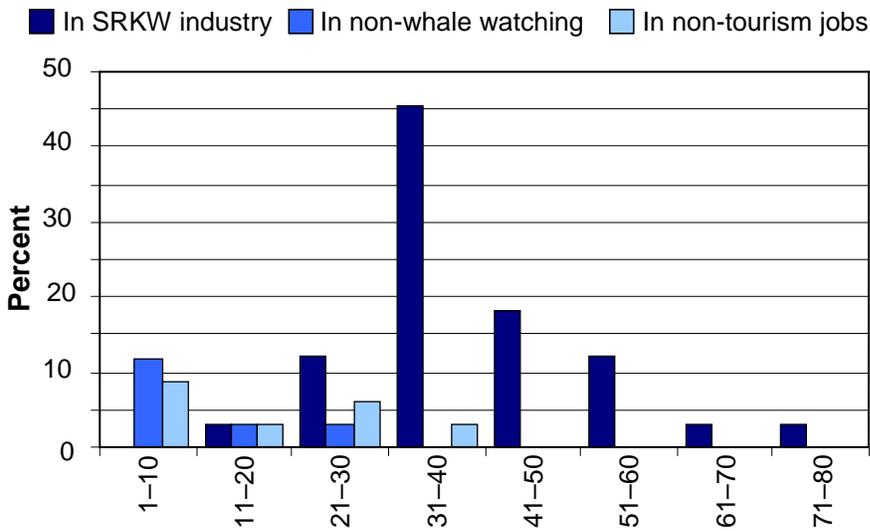


Figure 46. Number of hours worked per week in three job categories by Tier 2 companies: the SKRW watching industry, non-whale watching tourism jobs, and non-tourism-related jobs. The majority of hours worked in multiple jobs are in the SRKW industry.

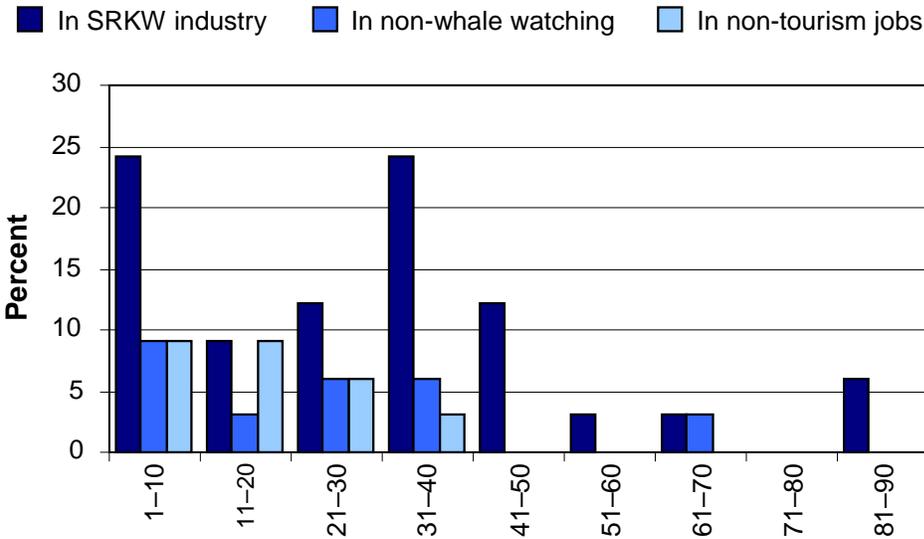


Figure 47. Number of hours worked per week in three job categories by Tier 3 companies: the SKRW watching industry, non-whale watching tourism jobs, and non-tourism-related jobs. Results indicate a greater distribution of hours between all categories with the majority occurring in the SRKW industry.

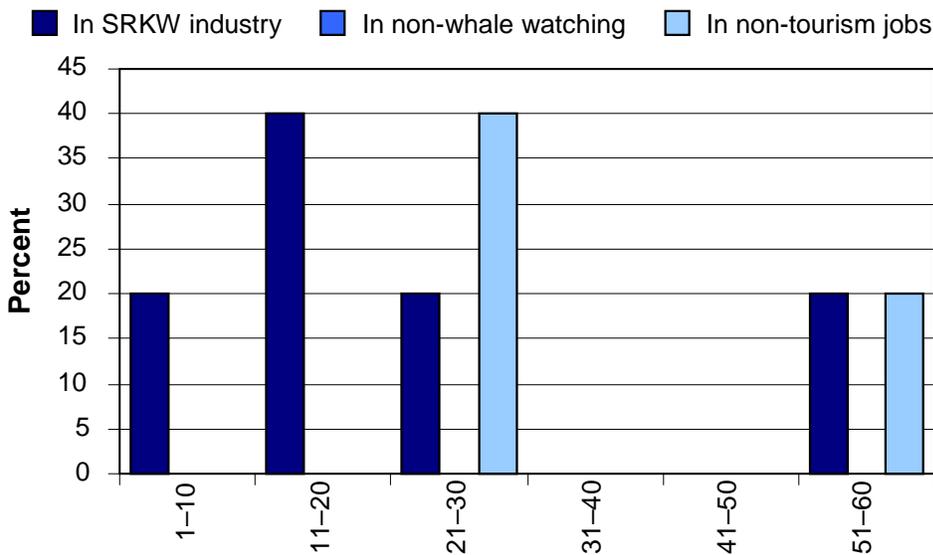


Figure 48. Number of hours worked per week in three job categories by Tier 4 companies: the SKRW watching industry, non-whale watching tourism jobs, and non-tourism-related jobs. The majority of hours worked are in the SRKW watching industry, with a significant number of hours worked in non-tourism jobs as well.

Table 13. Work conducted in the off-season years prior to and after the study years of 2005/2006 and 2006/2007. The first three tiers have high responses in working in marine tourism in the current location during both years selected. Tiers 2 and 4 have high responses in travel as an off-season activity. Other areas of high response are in the “other” category, non-marine tourism in a different location, non-tourism in the current location, and non-tourism job in a different location.

	<u>Tier 1</u>		<u>Tier 2</u>		<u>Tier 3</u>		<u>Tier 4</u>	
	05/06	06/07	05/06	06/07	05/06	06/07	05/06	06/07
Whale watch different location	—	13.0	6.5	6.3	4	4	—	—
Marine tourism current location	41.0	44.0	29.0	28.0	28	28	—	—
Marine tourism different location	17.6	18.8	9.7	6.3	8	8	—	—
Non-marine tourism current location	—	—	6.5	3.1	16	20	33	25
Non-marine tourism different location	—	—	3.2	6.3	4	4	—	—
Non-tourism current location	17.6	12.5	12.9	18.8	32	40	—	25
Non-tourism different location	5.9	6.3	19.4	12.5	16	16	33	25
Travel	17.6	12.5	25.8	34.4	20	28	33	25
Retired	5.9	6.3	6.5	9.4	—	—	—	—
Attend school	17.6	12.5	16.1	21.9	12	16	—	25
Other	29.4	25.0	22.6	21.9	28	28	—	—

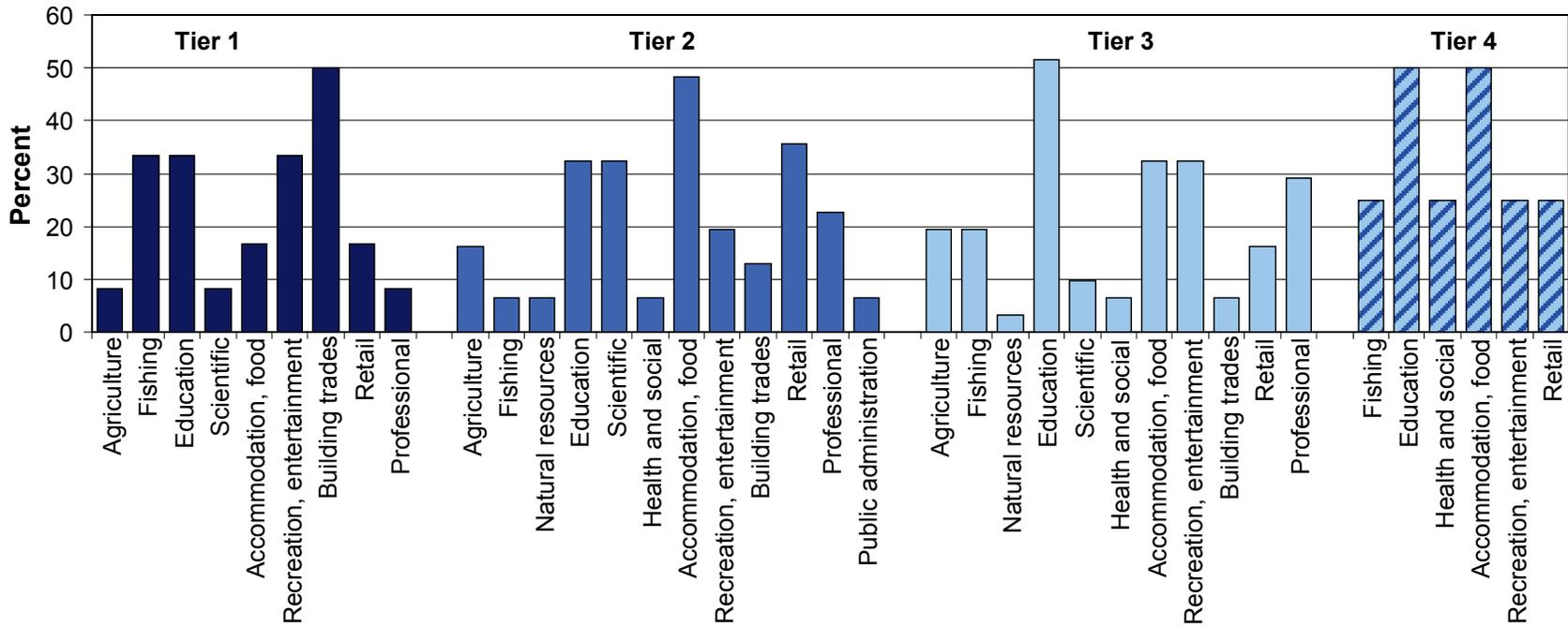


Figure 49. Description of past work history using U.S. Census categories by company tier.

Table 14. Historical participation in maritime industry by tier by percent.

Tier	Yes	No
1	78.95	21.05
2	44.44	55.56
3	42.42	57.58
4	80.00	20.00

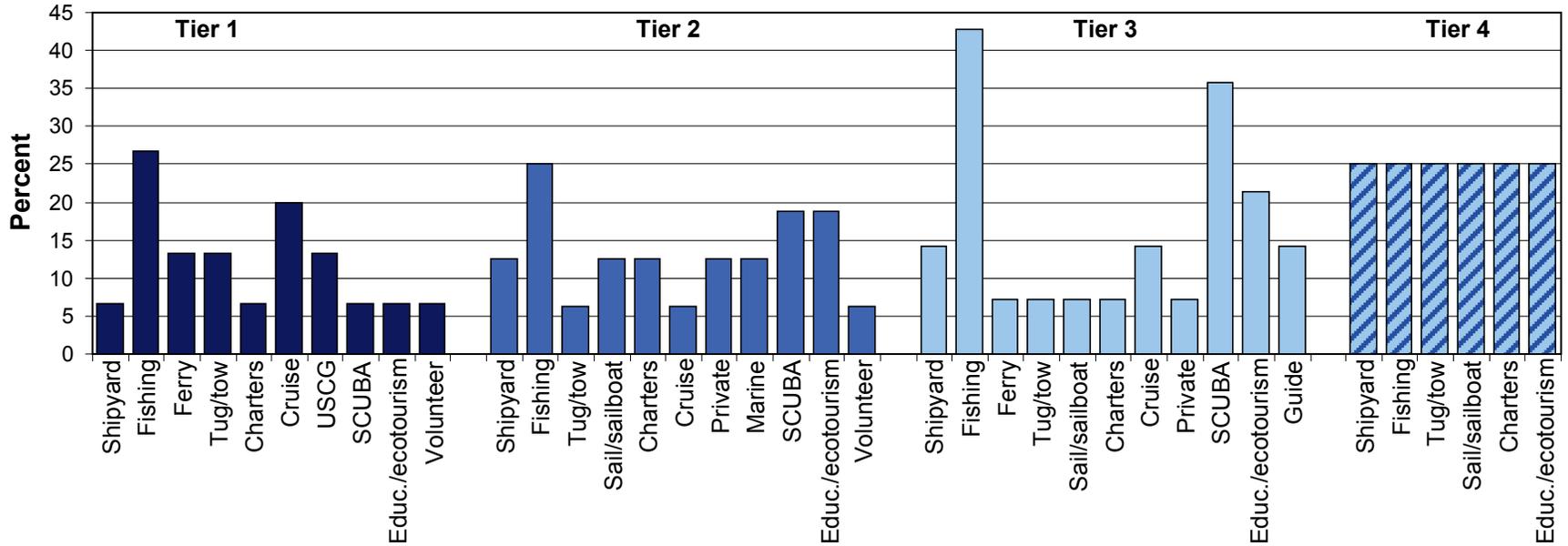


Figure 50. Description of past maritime positions held by participants by company tier.

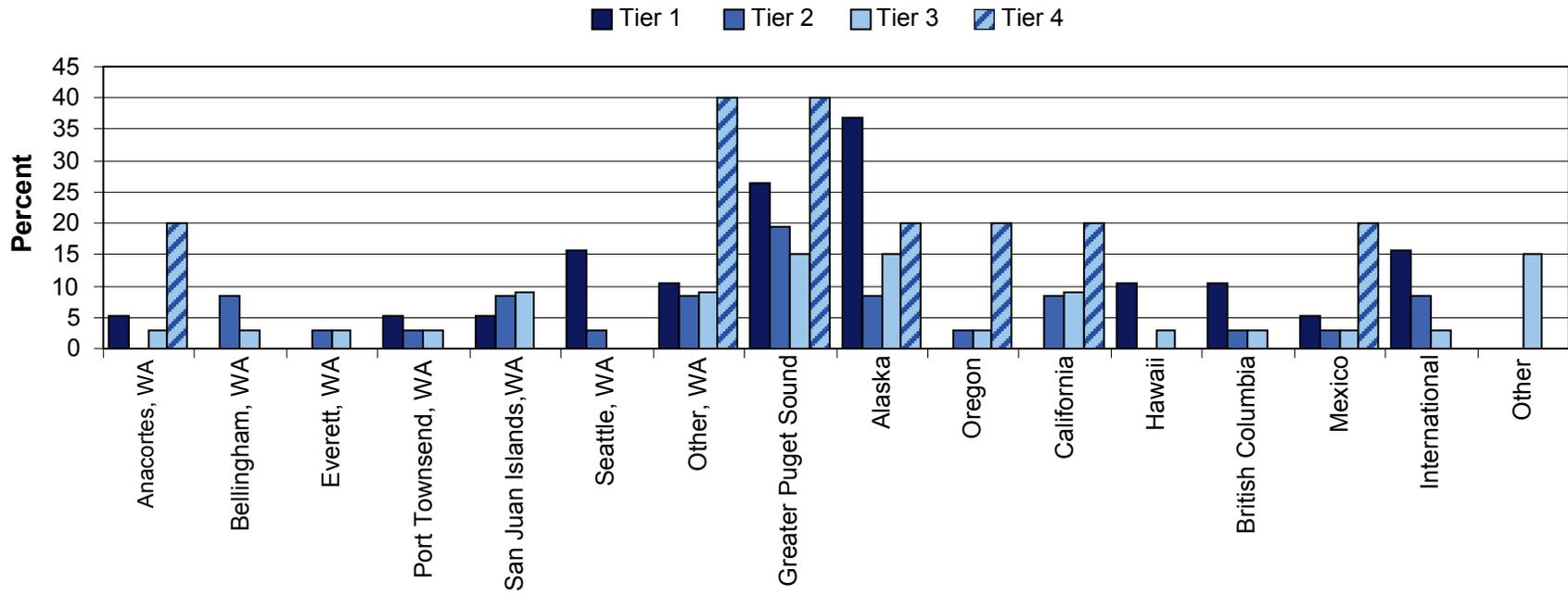


Figure 51. Location of maritime industry experience by tier.

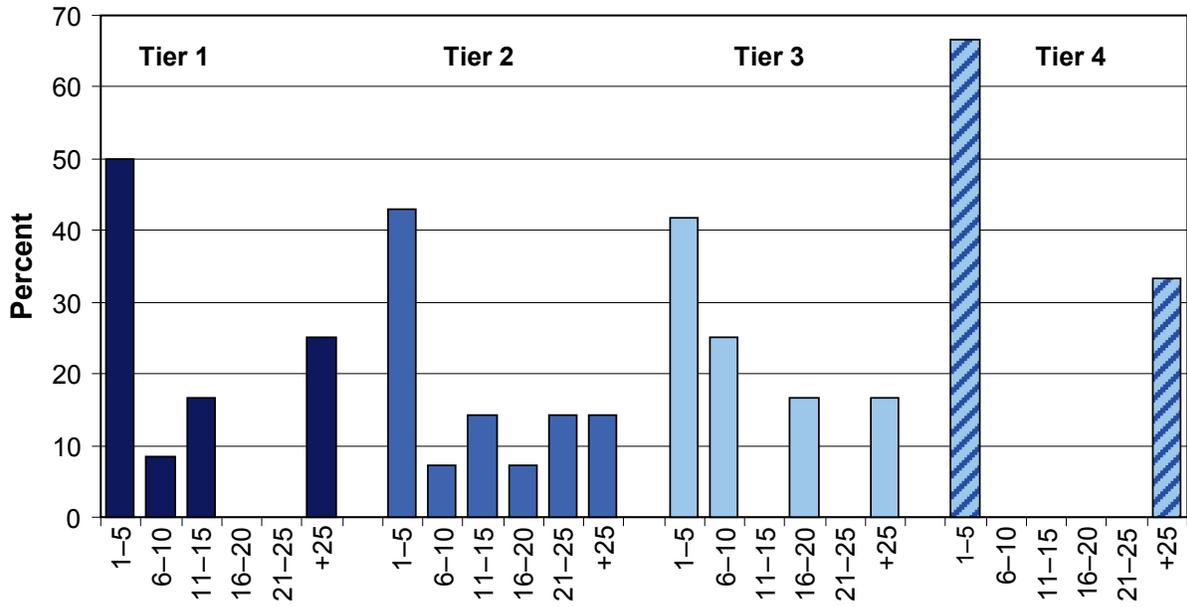


Figure 52. Number of years worked in maritime industry by tier. Most tiers show a distribution of experience in maritime industries.

Table 15. Likert scale description of reasons to participate in the industry by company tier (values in percent).

Tier	Response	Make money	Transition to maritime	Work in region	Educate public	Interact with co-workers	Work outside on the water	Seasonal job	Spend time with SRKWs	Other
1	Strongly agree	38.9	5.6	44.4	44.4	22.2	50.0	16.7	22.2	5.3
	Agree	38.9	27.8	55.6	27.8	38.9	44.4	22.2	66.7	94.7
	Neutral	5.6	38.9	—	27.8	38.9	—	16.7	5.6	—
	Disagree	11.1	16.7	—	—	—	—	22.2	—	—
	Strongly disagree	5.6	11.1	—	—	—	5.6	22.2	5.6	—
2	Strongly agree	38.2	—	64.5	45.5	26.5	48.5	29.4	48.5	9.1
	Agree	44.1	10.3	25.8	42.4	41.2	30.3	17.6	—	84.8
	Neutral	5.9	34.5	9.7	9.1	26.5	15.2	23.5	—	3.0
	Disagree	11.8	27.6	—	3.0	2.9	6.1	20.6	—	—
	Strongly disagree	—	27.6	—	—	2.9	—	8.8	—	3.0
3	Strongly agree	28.1	7.4	46.9	68.8	34.4	68.8	15.6	59.4	9.4
	Agree	34.4	7.4	34.4	15.6	34.4	21.9	18.8	28.1	90.6
	Neutral	3.1	40.7	18.8	15.6	25.0	9.4	59.4	12.5	—
	Disagree	18.8	18.5	—	—	3.1	—	—	—	—
	Strongly disagree	15.6	25.9	—	—	3.1	—	—	—	—
4	Strongly agree	20.0	—	80.0	80.0	20.0	100.0	25.0	80.0	20.0
	Agree	40.0	—	20.0	20.0	40.0	—	25.0	20.0	80.0
	Neutral	20.0	40.0	—	—	40.0	—	25.0	—	—
	Disagree	20.0	40.0	—	—	—	—	25.0	—	—
	Strongly disagree	—	20.0	—	—	—	—	—	—	—

Motorized Vessel Business

Business Information

Business Information Summary

Results in this subsection describe businesses in the SRKW watching industry through the vessels that they operate and their home ports. We sought a better understanding of specific vessel characteristics such as inside seating, outside seating, restrooms, binoculars, hydrophones, food sales, the Orca Spotting Network, and a galley. Data were analyzed by company tiers. Primary characteristics shared by all Tier 1 companies include inside seating, outside seating, restrooms, and a galley. In Tier 2, 97.2% of the vessels had restrooms and 94.4% had indoor/outdoor seating. In Tier 3, 100% of the vessels had indoor/outdoor seating and restrooms and 97% had binoculars, a hydrophone, and food sales. In Tier 4, 100% of the vessels had outdoor seating, restrooms, and binoculars.

Vessel advantages were aggregated into several categories including vessel characteristics, environment, and additional amenities. Both large and small vessels had advantages. Large vessels were described as being more stable and safer. Small vessels were described as providing a more personal experience for their clients, with fewer passengers and operating close to shore. Both fast and slow vessels had advantages. Fast vessels were described as having greater range and more access to whale viewing, as well as more flexible schedules and less travel time to see wildlife. Slow vessels were described as having greater stability and opportunities to view other wildlife up close.

Participants also indicated environmental advantages in subcategories of education, engines, and impact on whales. The education provided by naturalists and others in the industry was considered an advantage. Engine advantages included the use of biofuel, fuel efficiency, reduced noise, and contained exhaust emissions. Advantages specific to impact on whales included the fact that large vessels had higher decks that enable viewing at a greater distance from the whales. Large vessels also meant more passengers and fewer boats on the water, therefore, less acoustic and spatial impacts on the whales.

Additional amenities listed as advantages included inside seating, which provided viewing in a protected, heated climate, and outer decks, which provided the advantage of better and wraparound viewing. Accommodation advantages for senior citizens and families included wheelhouse access and snack bar availability. Safety was also mentioned as an advantage, where items like high handrails and larger, more stable vessels make the trips safer.

Disadvantages were also described; categories were the same as for advantages. Slow speeds may result in missing whales and other wildlife. Large vessels were decried as less comfortable, often with too many passengers, despite passenger capacity ratings. Small vessels

often had tight spaces on walkways and vessel decks. Large vessels with many passengers made it difficult to pass on an educational message, especially when the public address system had the naturalist's back to the clients. Engine disadvantages included the amount and type (non-biodiesel) of fuel used. Some engines were loud and propellers created jets of water. Poor engine maintenance can result in smoke, fuel, and sewage leaks that may negatively impact the environment.

Respondents repeated that sometimes reaching the full vessel capacity reduced the comfort of the passengers; insufficient indoor seating during bad weather also was a disadvantage. Weather-related disadvantages included instability in high seas, the cold and wind penetrating the cabin, and movement of the vessel in high seas, specifically rolling, which drastically reduced the comfort of passengers and employees.

Business Information Tables and Figures

The one table and four figures listed here are sequentially provided below.

Table 16. Vessel characteristics.

Figure 53. SRKW watching vessel characteristics.

Figure 54. SRKW watching vessel characteristics by tier.

Figure 55. Advantages of vessels.

Figure 56. Disadvantages of vessels.

Table 16. Vessel characteristics.*

Vessel ID number	1	2	3	4	5	6
Operational port	Anacortes	Anacortes	Anacortes	Bellingham	Bellingham	Deer Harbor
Home port	Anacortes	Anacortes	Homer	Bellingham	Bellingham	Deer Harbor
Length (feet)	46	65	100	110	50	36
Beam (feet)	15	23	22	21	15	12
Draft (feet)	4	5	5	6	5	3
Height (feet)	15	25	18	13	12	—
No. viewing decks	2	2	1	2	2	1
Height of view decks (feet)	10	0	5	18	5, 12	15
Inboard/outboard	Inboard	Inboard	Inboard	Inboard	Inboard	Inboard
Engine description	Caterpillar 330 b 355 hp	2406 × 3, 535hp × 3 Diesel Prop/Cat	Detroit Diesel 16v71 600 hp (2)	Detroit Diesel 16v71 600 hp (2)	Detroit Diesel 671	Volvo 480
Fuel capacity (gal.)	400	—	2,400	8,600	—	200
Tonnage	26	77	99	97	37	25
Hull type	Mono	Mono	Mono	Mono	Mono	Mono
Average operating speed (knots)	10	17	12	13	12	19
Passenger capacity	40	102	77	149	66	20
Operational passenger capacity	30	75	77	100	42	20
No. crew required	2	2	2	3	2	2
No. operating crew	2–3	3	2	4	2	2

Table 16 continued horizontally. Vessel characteristics.*

Vessel ID number	7	8	9	10	11	12
Operational port	Deer Harbor	Everett	Friday Harbor	Friday Harbor	Friday Harbor	Friday Harbor
Home port	Deer Harbor	Everett	Friday Harbor	Friday Harbor	Friday Harbor	Friday Harbor
Length (feet)	43	70	67	55	46	25
Beam (feet)	16	20	18	16	14	8
Draft (feet)	4	4	5	5	5	2
Height (feet)	10	18	16	20	15	6
No. viewing decks	2	2	2	1	1	2
Height of view decks (feet)	15	12	10	4	3	9
Inboard/outboard	Inboard	Inboard	Inboard	Inboard	Inboard	Outboard
Engine description	Detroit Diesel 671 360 (2)	Luggers 600 hp (3)	Volvo Diesel T-120-A 400 hp		Cummins	Honda 4- stroke 135 hp
Fuel capacity (gal.)	250	1,800	1,100	250	350	100
Tonnage	25	65	58	—	36	2
Hull type	Mono	Mono	Mono	Mono	Mono	Mono
Average operating speed (knots)	13	20	11	0	21	18
Passenger capacity	49	110	97	49	35	6
Operational passenger capacity	32	101	80	44	30	6
No. crew required	2	4	3	2	2	1
No. operating crew	2	4	—	3	—	1

Table 16 continued horizontally. Vessel characteristics.*

Vessel ID number	13	14	15	16	17	18
Operational port	LaConner/Everett	LaConner	Orcas	Port Townsend	Port Townsend	Roche Harbor
Home port	Everett	LaConner	Orcas	Port Townsend	Port Townsend	Roche Harbor
Length (feet)	25	58	56	65	42	31
Beam (feet)	8	18	17	15	14	12
Draft (feet)	2	6	5	6	3	4
Height (feet)	4	8	4	15	12	4
No. viewing decks	1	1	2	1	2	1
Height of view decks (feet)	2	8	—	0	3, 7	2
Inboard/outboard	Outboard	Inboard	Inboard	Inboard	Inboard	Inboard
Engine description	Suzuki 4-stroke 115 hp	Detroit Diesel 400 hp (2)	Detroit Diesel 734 hp (2)	Detroit Diesel 8V92 TI 600 hp (2)	Volvo 235 hp (3)	Caterpillar 320 hp
Fuel capacity (gal.)	130	900	700	1,500	250	200
Tonnage	3	48	59	65	20	12
Hull type	Dual	Mono	Mono	Mono	Dual	Mono
Average operating speed (knots)	26	10	18	17	22	17
Passenger capacity	7	49	48	72	49	24
Operational passenger capacity	6	51	48	72	25	16
No. crew required	1	2	3	2	2	2
No. operating crew	1	2–3	2–3	15–45 passengers, 2 crew; 45–72 passengers, 3 crew	2	2

Table 16 continued horizontally. Vessel characteristics.*

Vessel ID number	19	20	21	22	23
Operational port	Roche Harbor	Seattle	Skyline Marina	Snug Harbor	Snug Harbor
Home port	Roche Harbor	Seattle	Anacortes	Snug Harbor	Snug Harbor
Length (feet)	42	114	37	40	22
Beam (feet)	14	29	14	14	8
Draft (feet)	5	6	3	4	3
Height (feet)	20	44	10	13	—
No. viewing decks	1	3	1	1	2
Height of view decks (feet)	4	—	2	5	6
Inboard/outboard	Inboard	Inboard	Inboard	Inboard	Outboard
Engine description	Detroit Diesel 6V92 375 hp	Detroit Diesel V16 149 1,600 hp	Diesel jet pump	John Deere diesel 235 hp (2)	Yamaha 90 4-stroke
Fuel capacity (gal.)	300	1,300	—	300	104
Tonnage	18	98	—	15	25
Hull type	Mono	Dual	Dual	Mono	Mono
Average operating speed (knots)	11	25	32	14	18
Passenger capacity	28	237	37	20	10
Operational passenger capacity	24	200	32	20	8
No. crew required	2	4	2	2	1
No. operating crew	2	6	2	2	1

* The table describes 23 of the 24 commercial vessels identified as active in the U.S. SRKW watching industry during the 2006 season. Since data for one of the vessels were not accessible (not reported in the survey, not given verbally, nor published in marketing materials), that vessel was excluded from the table. All respondents were asked to provide vessel descriptive information to the best of their ability. To create what was thought to be the most accurate and complete description of the vessels, owner responses were prioritized. In addition, some secondary source data from company Web sites and brochures were used to complete the descriptions. Vessel and company names were replaced with an arbitrary vessel ID number.

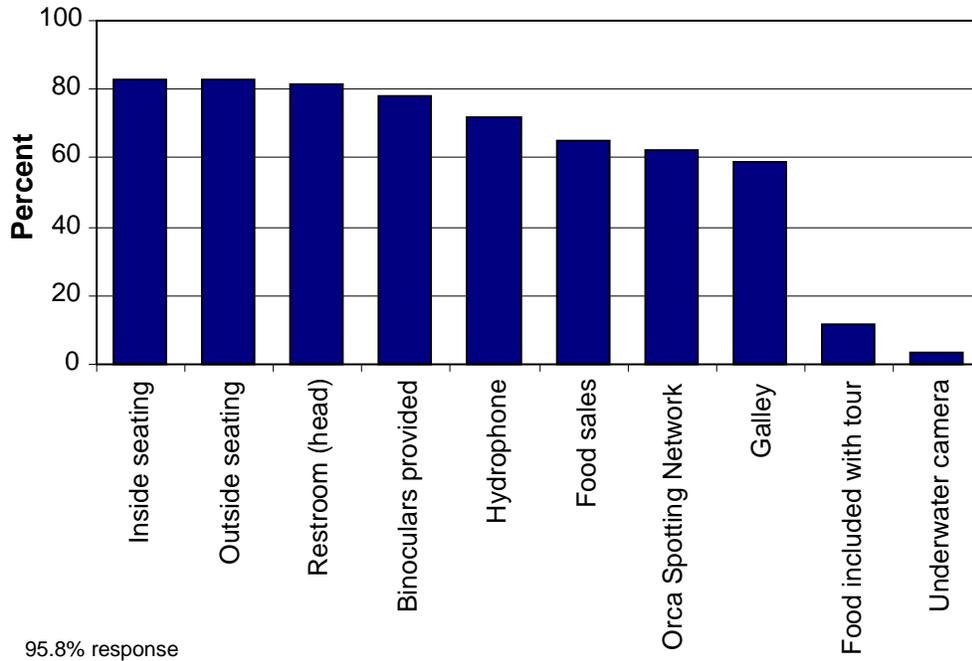


Figure 53. SRKW watching vessel characteristics.

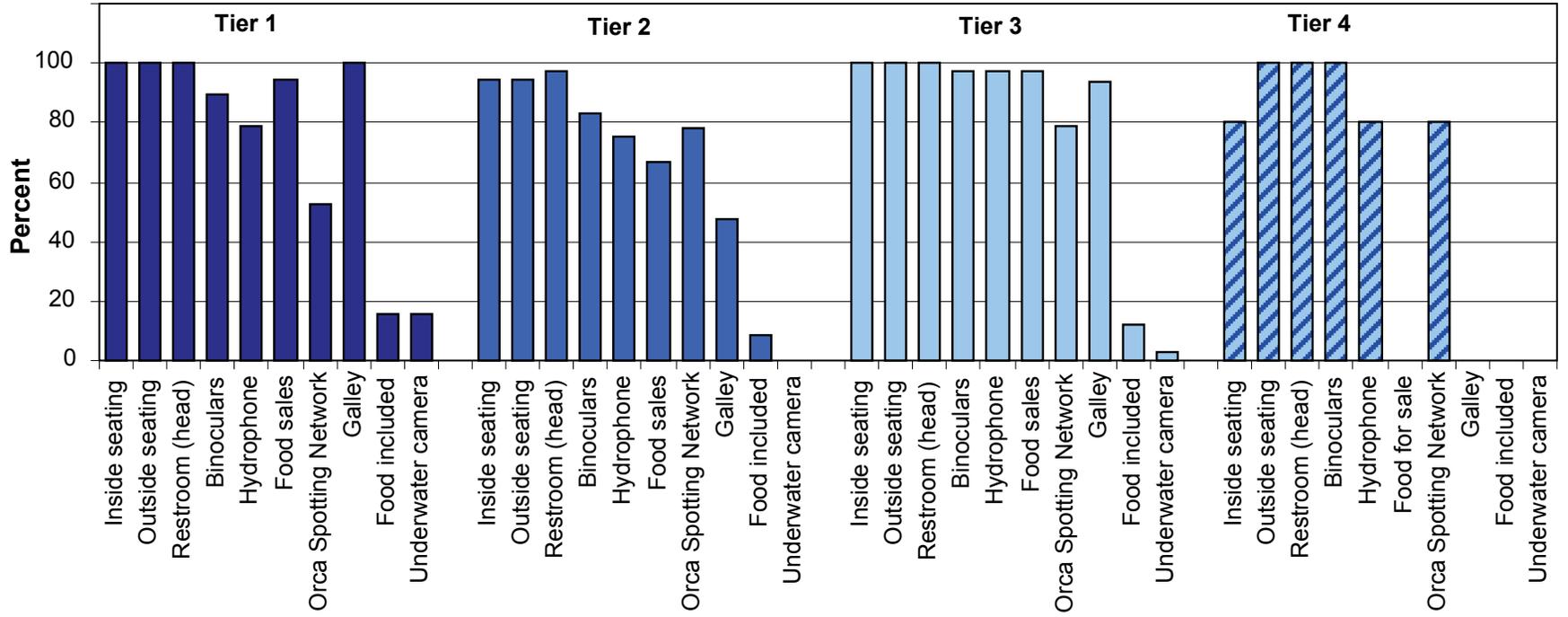


Figure 54. SRKW watching vessel characteristics by tier.

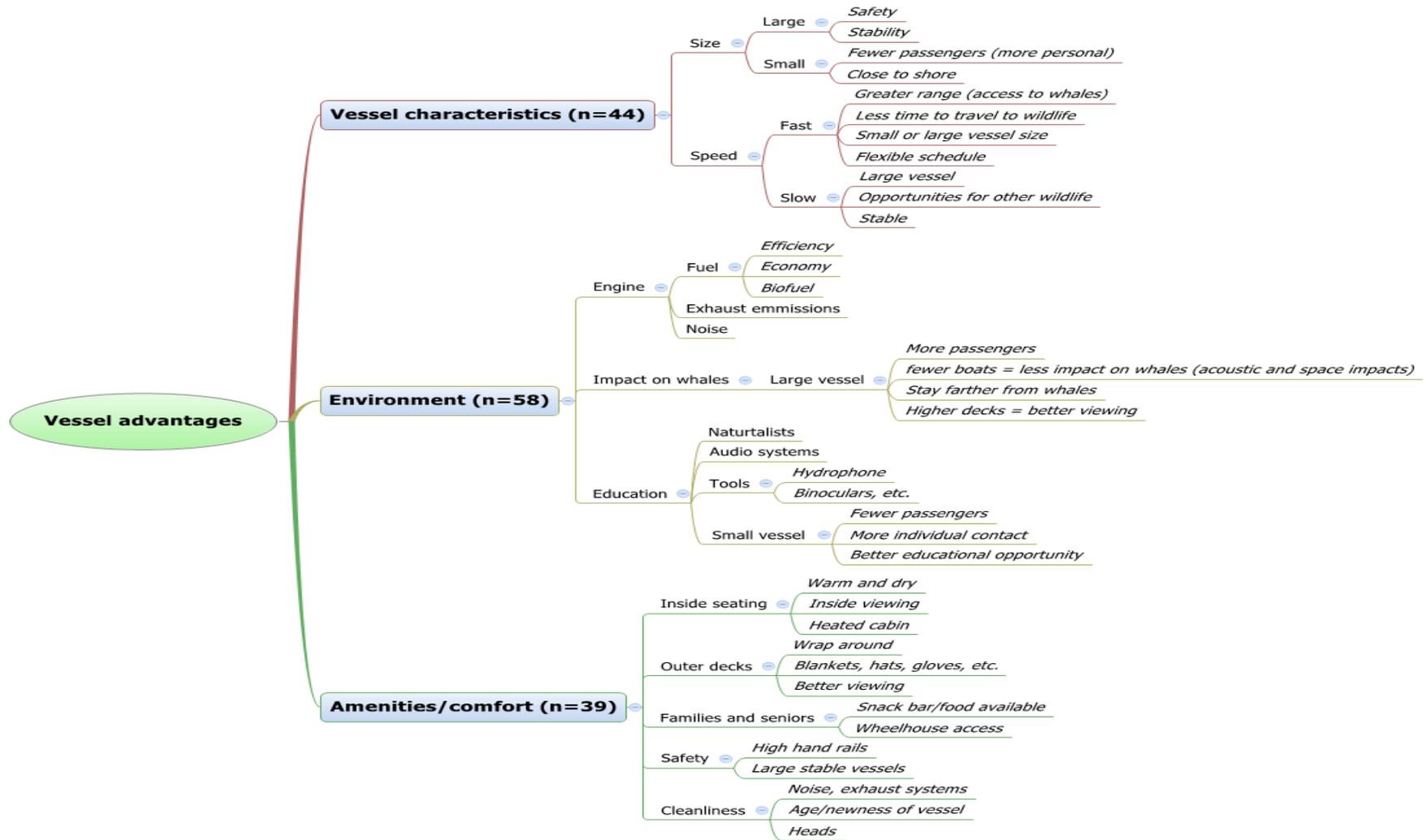


Figure 55. Qualitative responses to a question asking participants to list advantages of the type of vessel they worked on or owned. The qualitative analysis begins on the left, indicating that these responses are directly tied to vessel advantages, followed by three overarching themes with sample size parenthetically provided. Following the three themes, several subthemes further clarify the analysis. The final branches of the figure, indicated in italics, are detailed data representing actual responses to the question.

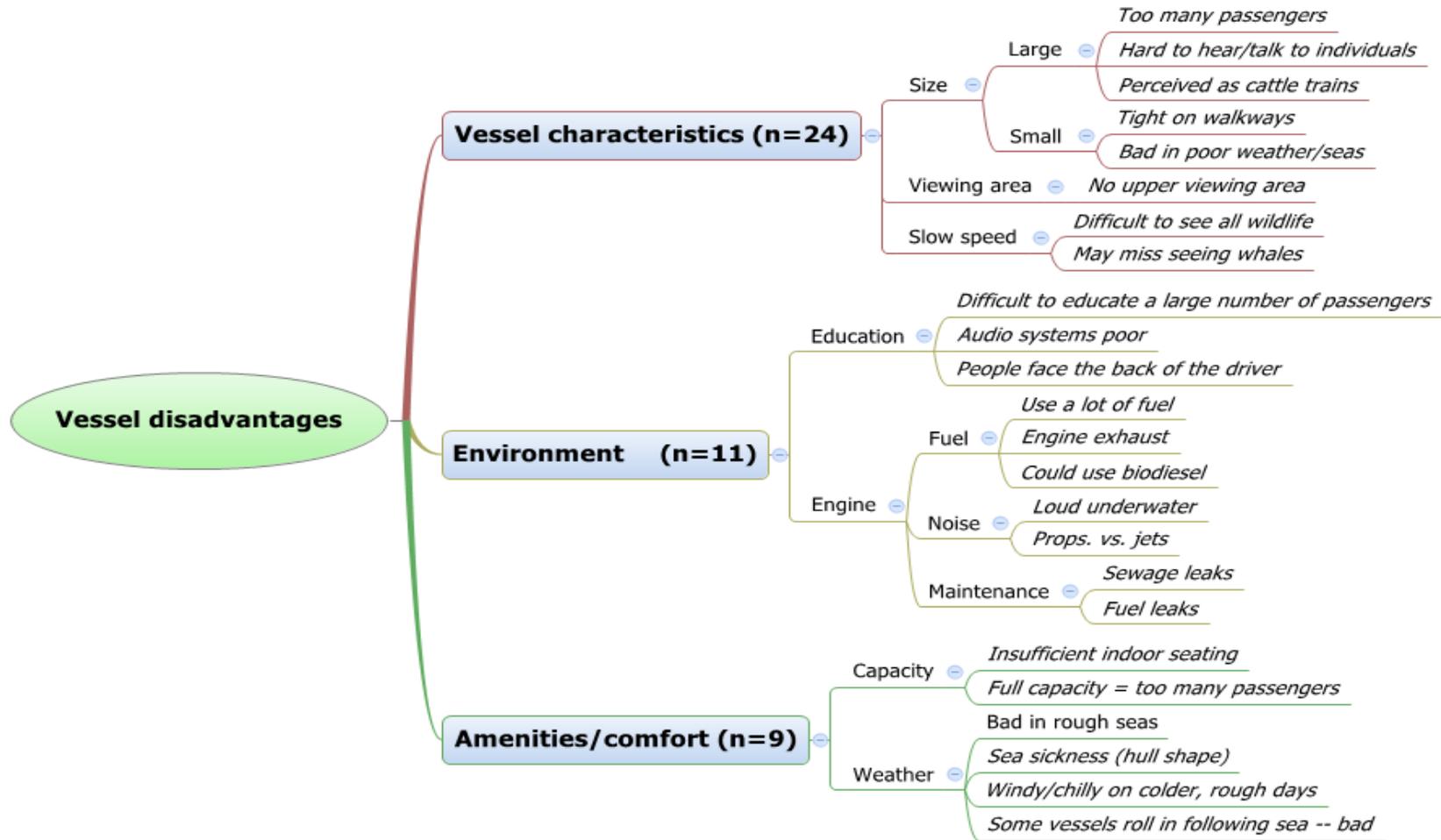


Figure 56. Qualitative responses to a question asking participants to list disadvantages of the type of vessel they worked on or owned. The qualitative analysis begins on the left, indicating that these responses are directly tied to vessel disadvantages, followed by three overarching themes with sample size parenthetically provided. Following the three themes, several subthemes further clarify the analysis. The final branches of the figure, indicated in italics, are detailed data representing actual responses to the question.

Business Operations

Business Operations Summary

The data in this subsection present results of questions concerning business operations. First we sought to better understand the types of tours different companies offered and did so using a Likert scale format question. The scale ranged from strongly applies to not applicable. The responses indicate that boat-based tours where SRKW's are the focal point amidst other wildlife were the most commonly offered tours, 58%, followed by boat-based wildlife tours, 32.1%, and boat-based tours where viewing SKRW's is the exclusive intent, 19.1%.

Respondents were asked what percent of the vessel's activity was dedicated to SRKW watching trips. As some companies operate multiple vessels, it was logical to presume that some individuals worked on multiple vessels in one company and even on multiple vessels for different companies. Thus respondents could report their percent of activity on up to three vessels. Results were run based on only the first vessel for which data were provided, as well as on the aggregate of all vessels where data were provided. The trend in the data was similar. Results show that most, 43%, said 91–100% of their vessel's activity was dedicated to SRKW watching. While this is significant, it is not a majority. The range in the results is extensive. Of remaining respondents reporting percent of the vessel's activity dedicated to SRKW viewing, 15% said 81–90% dedicated to SRKW viewing, 12% said 1–10%, 10.5% said 41–50%, and all other responses were below 10%.

Information requested also included the number of tours offered. The responses were highly complex and difficult to summarize succinctly. Therefore, secondary source data were also used to gain a better understanding of the number of tours conducted per day. Results indicate that of the 17 companies identified as active during the 2006 viewing season (of 18 companies identified, data were only available and reported for 17), seven offered one tour per day, five offered two tours per day, two offered three tours per day, one offered four tours per day, and two companies offered five tours per day. Further analysis of the data shows the majority of the single tours per day were in the larger Tier 1 companies, while those companies that provided four and five tours a day were Tier 2 companies with multiple vessels. Tier 3 and Tier 4 companies generally provided one to two tours a day. This analysis indicates that, for any given day in the peak season of 2006, all the whale watching companies collectively offered 37 tours a day. Whether all the offered tours were actually conducted each day is not known.

Duration data show trips lasted from 2.5 hours to 7 hours per day; the most common length was 4 hours. Further analysis shows the duration of trips were spread out across tiers, with all tiers providing a combination of shorter and longer trips. A majority of trips departed during the mid-morning from 10 a.m. to noon, followed by early morning from 8 a.m. to 10 a.m. and midday from noon to 2 p.m. Tier 1 companies show the most departures in the morning, which closely correlates with the longer duration trips they provide. The other tiers show various departure times during the days, which also correlates to the higher frequency of trips offered during a day. Occupancy data indicate how many passengers were on the tours. During the peak viewing season, 26.7% of vessels had an occupancy rate of 71–80%, 20.1% had an occupancy rate of 81–90%, and 16.7% had a rate of 91–100%.

A majority of respondents, 61.9%, said their vessels or the vessels they worked on conducted additional commercial activities outside of whale watching. Of the positive responses, 44.1% said the activities occurred year-round. The majority were described as charter services.

Business Operations Figures and Table

The 11 figures and 1 table listed here are sequentially provided below.

Figure 57. Tour descriptions.

Figure 58. Percent of vessel activity dedicated to SRKW watching.

Figure 59. Number of tours offered by the number of companies.

Figure 60. Number of tours offered per day by company and company tier.

Table 17. Trip information summary.

Figure 61. Duration of whale watching trips and the number of companies that conduct trips.

Figure 62. Duration of whale watching tours by company tier.

Figure 63. Whale watching tour departure times.

Figure 64. Whale watching tour departure times by company by tier.

Figure 65. Percent occupancy for the whale watching industry during peak, low, and off-season.

Figure 66. Percent of additional commercial activities conducted by whale watching vessels.

Figure 67. Seasons in which additional commercial activities occurred.

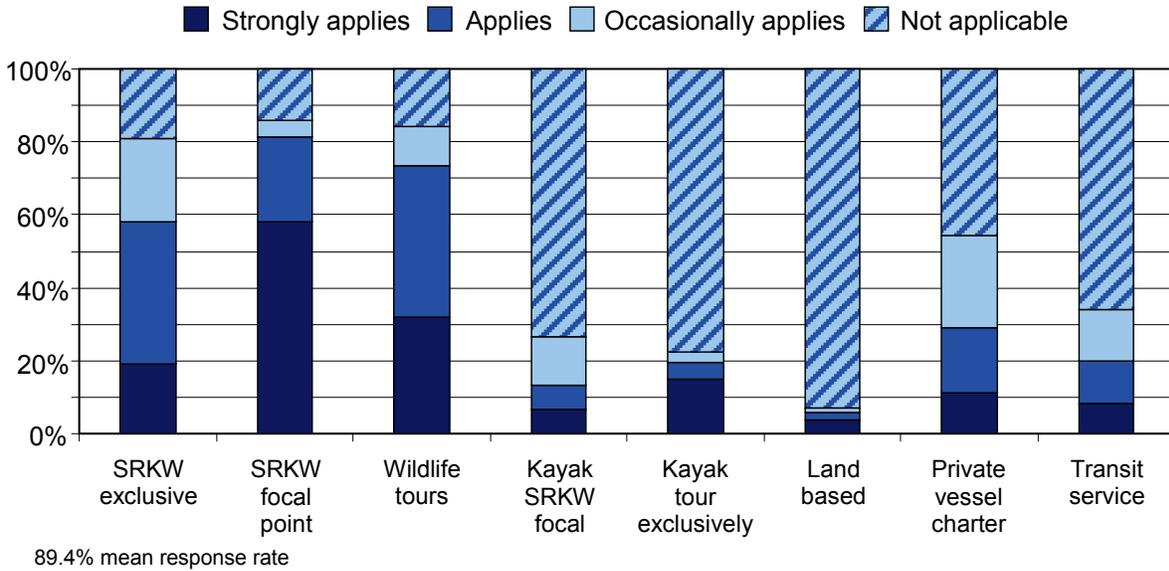


Figure 57. Tour descriptions provided by motorized vessel companies. Types of tours were provided in this Likert scale question and participants were asked to rate their level of agreement. The majority of individuals, 58%, strongly agree that the tours provided by the company they worked for were boat-based wildlife tours where SRKW's are the focal point.

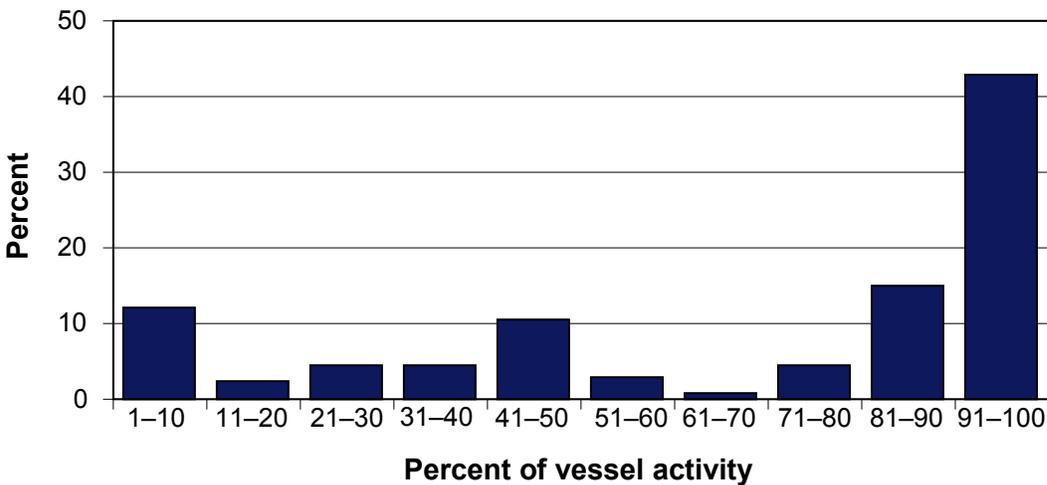
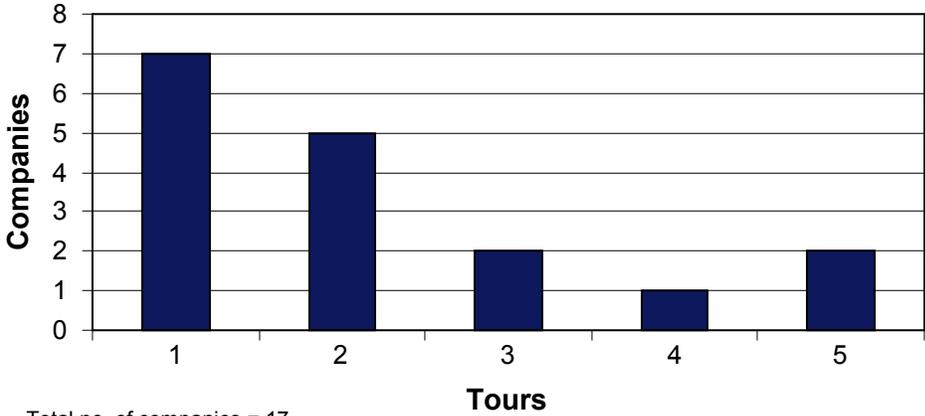


Figure 58. Percent of motorized vessel activity dedicated to SRKW watching. The question allowed participants to indicate the activity levels for up to three vessels of the company they owned or worked for. Data were aggregated to represent all vessels represented in the data set. The majority, 42.9%, indicate that 91–100% of vessel activity was dedicated to SRKW watching.¹⁶

¹⁶ On review of responses for this question, it appeared that some individuals interpreted this question differently. While the question asked to provide the percent of the vessel's activity dedicated to SRKW viewing, some of the low percent responses suggest respondents indicated the number of trips dedicated to SRKW viewing. As a result, the 1–10% responses is more likely representative of the number of trips, not the percent. For clarity, the data are represented as collected.



Total no. of companies = 17

Figure 59. Number of tours offered by the number of companies. The results are based on secondary source information. The data for this question were overly complex and removed due to inconclusive analysis. However, similar data were obtained using secondary source information from Web sites and brochures. All data represent peak season activity.

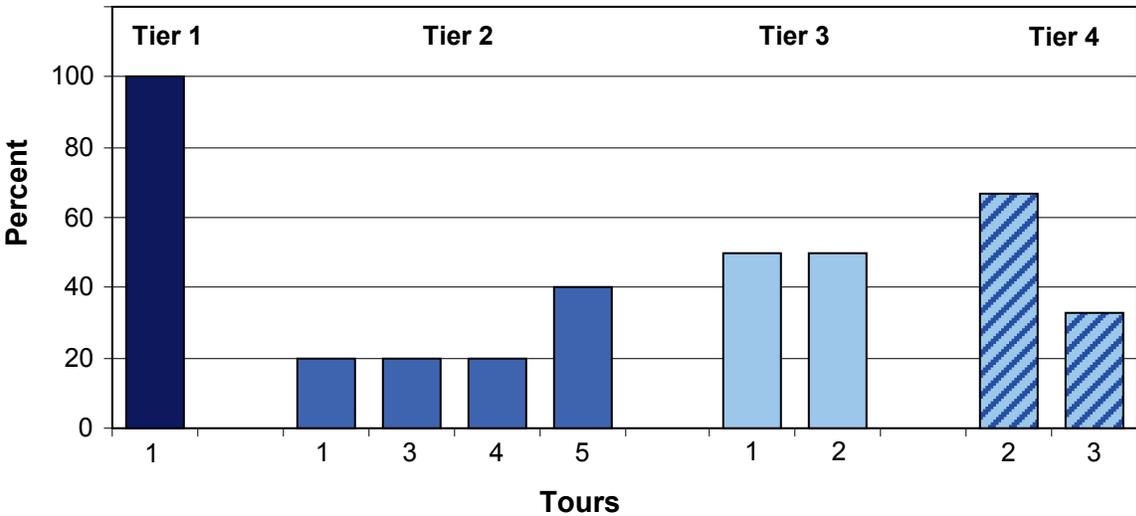


Figure 60. Number of tours offered per day by company and company tier. The results are based on secondary source information. Tier 1 = 3 companies, Tier 2 = 5 companies, Tier 3 = 6 companies, and Tier 4 = 3 companies.

Table 17. Trip information summary. Information is based on secondary source data and based on the number of trips or tours offered by companies, not the actual number of trips that were conducted. The results indicate that 17 companies offer a total of 37 trips daily. Most of the companies that offered multiple trips per day operated multiple vessels that specifically conducted whale watching trips. One company was removed from analysis, as there was no supporting data to determine its activity other than an advertisement that suggested a vessel.

No. of tours (a)	No. of companies offering tours (b)	Total no. of tours (a × b)
1	7	7
2	5	10
3	2	6
4	1	4
5	2	10
Total:	17	37

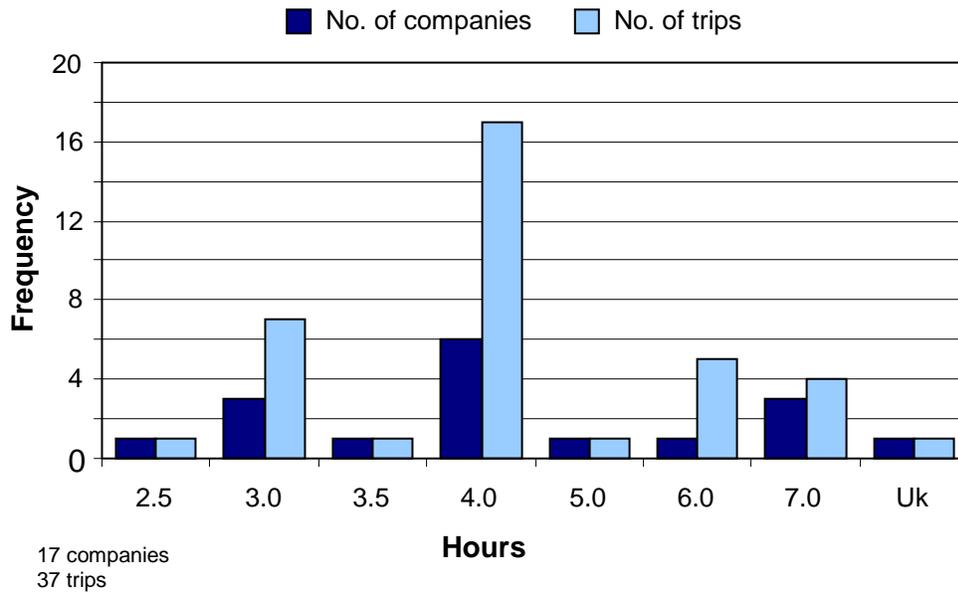


Figure 61. Duration of whale watching trips and number of companies that conduct the trips. Durations range from 2.5 hours to 7 hours. Six companies offer 17 trips daily for 4 hours, three offer 7 trips daily for 3 hours, and three offer 4 trips daily for 7 hours. The data reflect the number of trips offered, not necessarily the number of trips conducted. Uk = unknown.

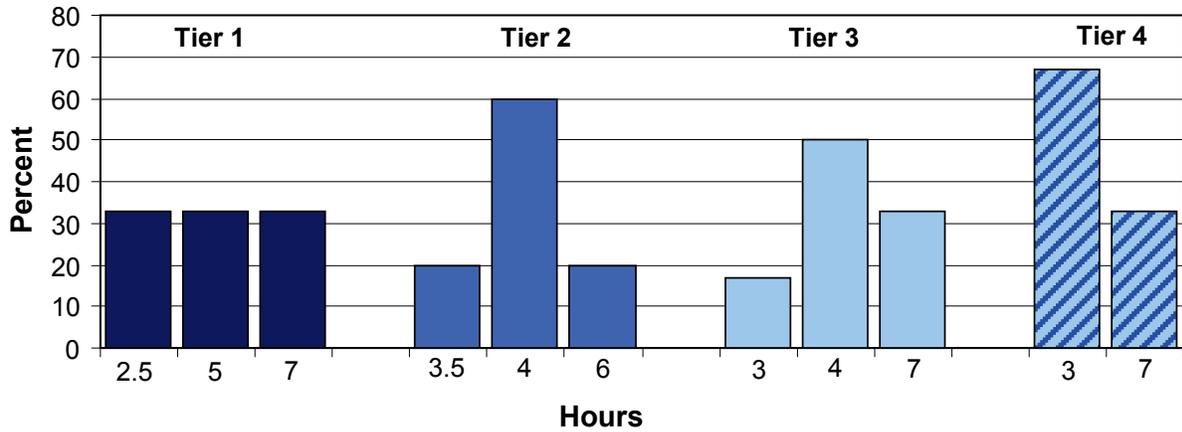


Figure 62. Duration of whale watching tours by company by tier. The results are based on secondary source information. In Tier 1 companies, 33% each offer 2.5-hour, 5-hour, and 7-hour tours. In Tier 2 companies, 20% offer 3.5-hour tours, 60% for 4 hours, and 20% for 6 hours. In Tier 3 companies, 17% offer 3-hour tours, 50% for 4 hours, and 33% for 7 hours. In Tier 4 companies, 67% offer 3-hour tours and 33% for 7 hours. Tier 1 = 3 companies, Tier 2 = 5 companies, Tier 3 = 6 companies, and Tier 4 = 3 companies.

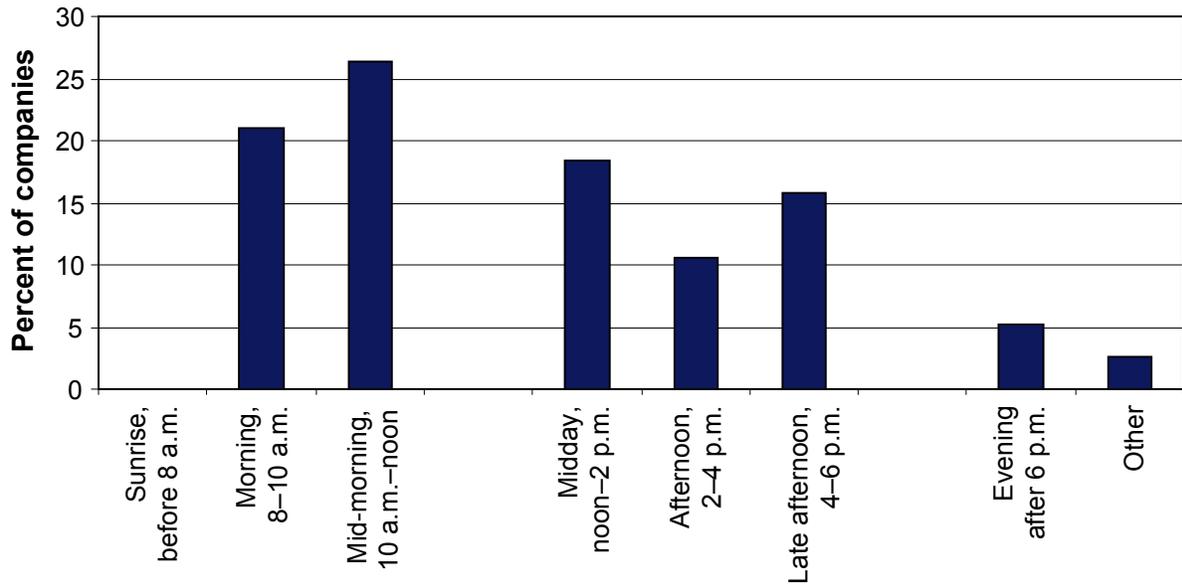


Figure 63. Whale watching tour departure times. The results are based on secondary source information. The data reflect the percent of companies that conduct tours within the designated departure times, thus 26.3% of companies depart between 10 a.m. and noon, 21% depart between 8 a.m. and 10 a.m., and 18.4% between noon and 2 p.m.

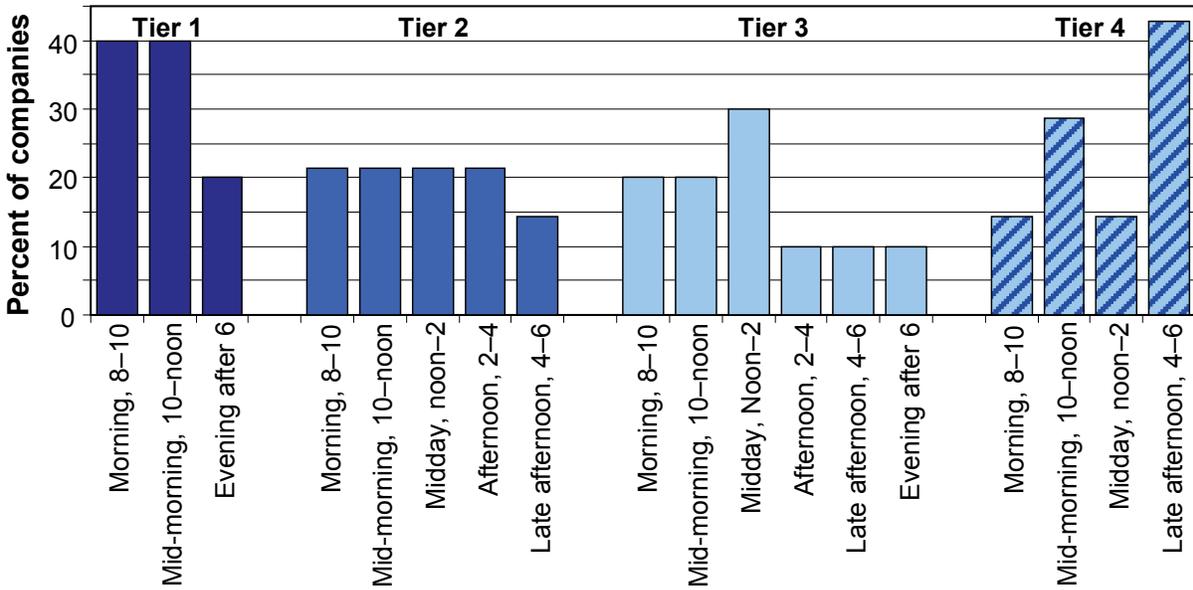


Figure 64. Whale watching tour departure times by company by tier. The results are based on secondary source information. The data reflect the percent of companies that conducted tours within the designated departure times sorted by tiers. Tier 1 = 3 companies, Tier 2 = 5 companies, Tier 3 = 6 companies, and Tier 4 = 3 companies.

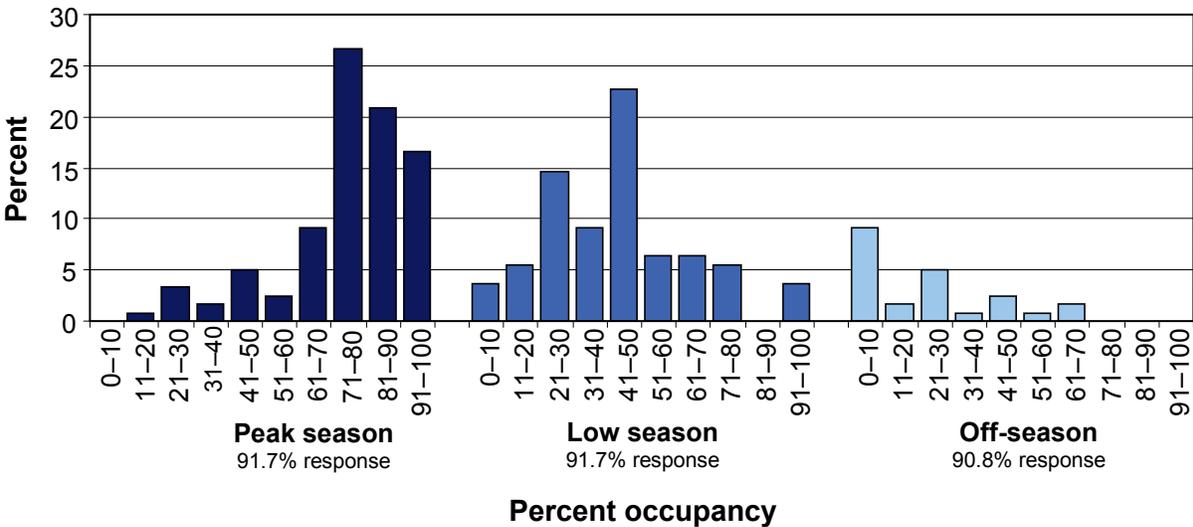
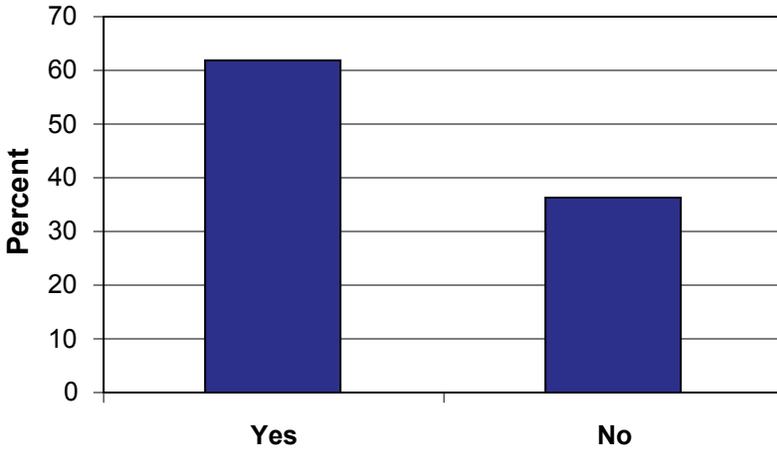
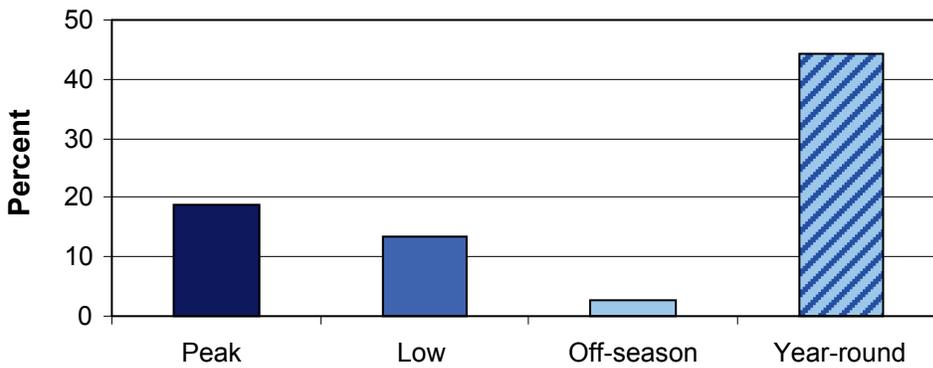


Figure 65. Percent occupancy for the whale watching industry during peak, low, and off-season. Generally during peak season, respondents reported an occupancy rate of 70% or higher, while in the low season occupancy was reported as less than 50%.



94.1% response

Figure 66. Percent of additional commercial activities conducted by whale watching vessels. The results indicate that 61.9% of respondents agree that additional commercial activities were conducted. Additional services were described as private vessel charters, other nature tours, and transportation services such as water taxi and ferry service.



92.5% response

Figure 67. Seasons in which additional commercial activities occurred. Participants were asked, in addition to their whale watching activities, whether the vessels they owned or worked on conducted additional commercial activities, and if so, when these activities occurred. The majority of responses, 44.1%, indicate they occurred year-around.

Regional Personnel

Results in this section reflect the same types of data previously displayed and discussed. Data in this section, however, were sorted into a regional analysis. As previously noted, the mainland is the aggregation of the mainland and north mainland communities that are all accessible via the Interstate 5 corridor. The island region is comprised of the San Juan Islands. The two regions compared are the mainland and the island regions. As noted, the Olympic Peninsula region was removed from analysis to protect confidentiality.

Demographics

Demographic Summary

The male gender was predominant in both regions. Age distribution results show more individuals were older in the island region than the mainland region. That noted, the youngest participants in the industry also worked in the island region. Island region individuals had more bachelor's degrees (53.1%) than in the mainland region (27.5%). However, the mainland had more individuals working with graduate or professional degrees, 17.5% for the mainland region compared to 12.2% for the island region. Income results show some variation between regions. In the mainland, 31.6% earned \$31,000–50,000, 23.7% earned \$10,000–\$31,000, and 15.8% earned less than \$10,000. In the island region, 22% earned \$51,000–\$70,000, 18.4% earned \$31,000–\$50,000, and 26.5% earned \$10,000–\$30,000. When comparing income levels above \$90,000, the regions are similar: the island region reported 12.2% and the mainland region reported 10.5%. The percent of earned income derived from the SRKW watching industry also varies by region. In the mainland region, 42.1% derived 0–25% and 39.5% derived 26–50% of their income from the industry. In the island region, 36.2% derived 0–25%, 23.4% derived 51–75%, and 21.3% derived 76–100% of their income from the industry.

Residency varies greatly. In the mainland, it was greatest in Whatcom County, followed by King and Skagit counties. In the island region, residency was dominated by San Juan County, with small numbers residing in King County and other locations.

Demographic Figures

The six figures listed here are sequentially provided below.

Figure 68. Gender distribution by region.

Figure 69. Age distribution by region.

Figure 70. Education by region.

Figure 71. Income by region.

Figure 72. Percent income derived from SRKW watching industry by region.

Figure 73. Permanent residence by region and county.

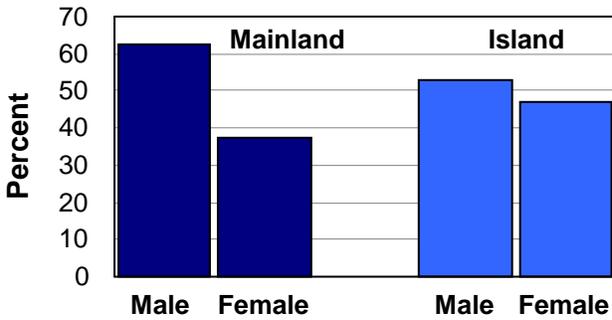


Figure 68. Gender distribution by region. Results indicate a slightly higher percent of the male gender in the mainland than in the island region, 62.5% vs. 53.1%.

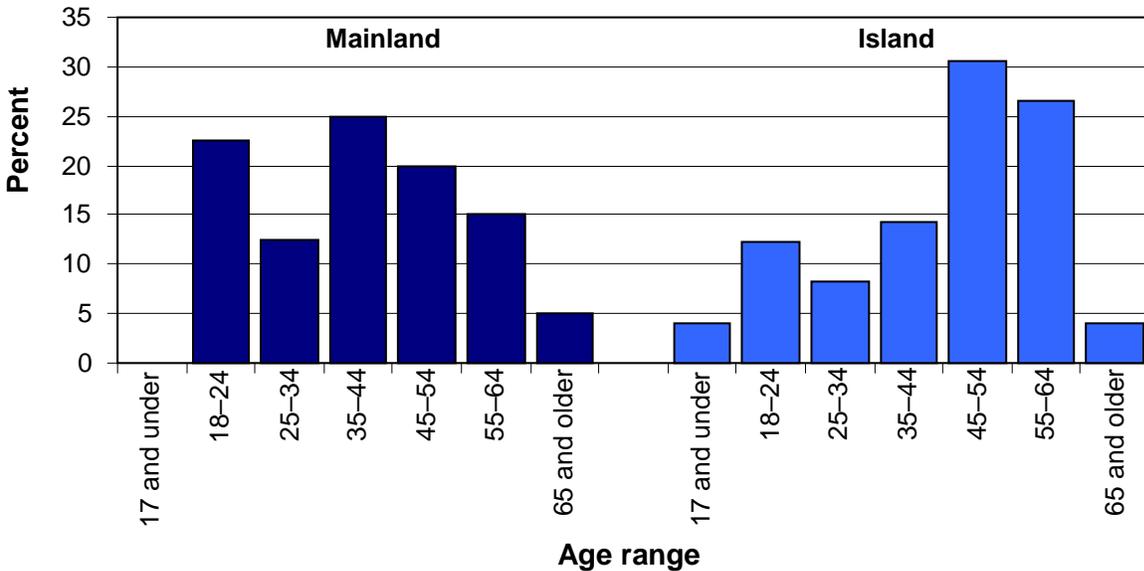


Figure 69. Age distribution by region. Age distribution in the mainland is more diversified, with more younger individuals working in the industry. In contrast, the island region has more individuals who were older and still working in the industry.

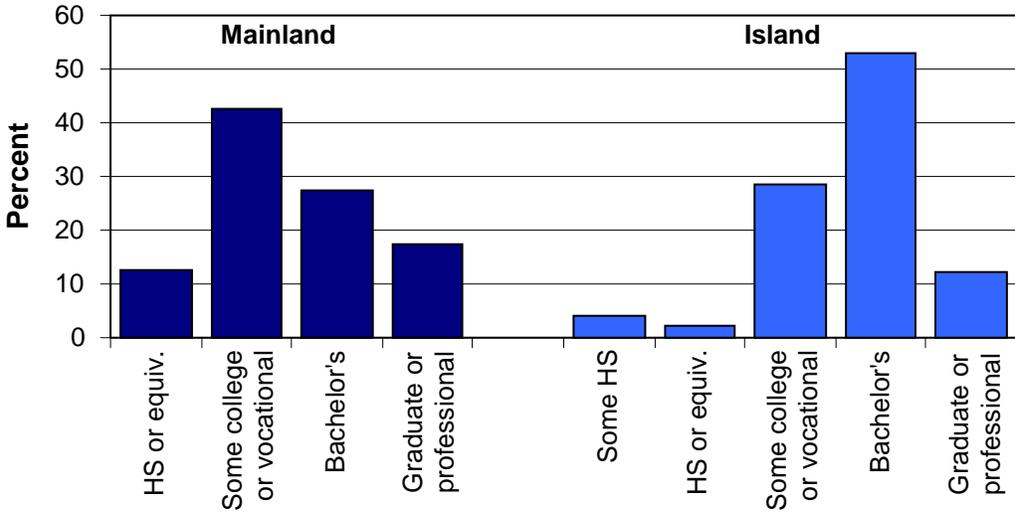


Figure 70. Education level by region. The mainland has more individuals with high school degrees or some college and graduate degrees. The island region has more individuals with some college or bachelor's degrees.

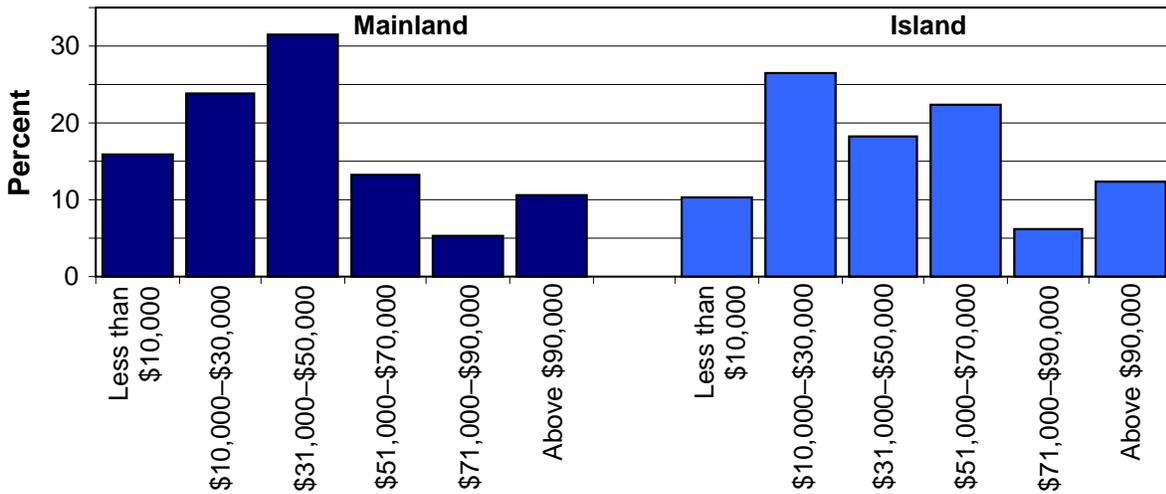


Figure 71. Distribution of income before taxes by region. Income comparisons between regions show similarities for the income category of \$71,000–\$90,000 and clear differences in the income ranges of \$31,000–\$50,000 and \$51,000–\$70,000.

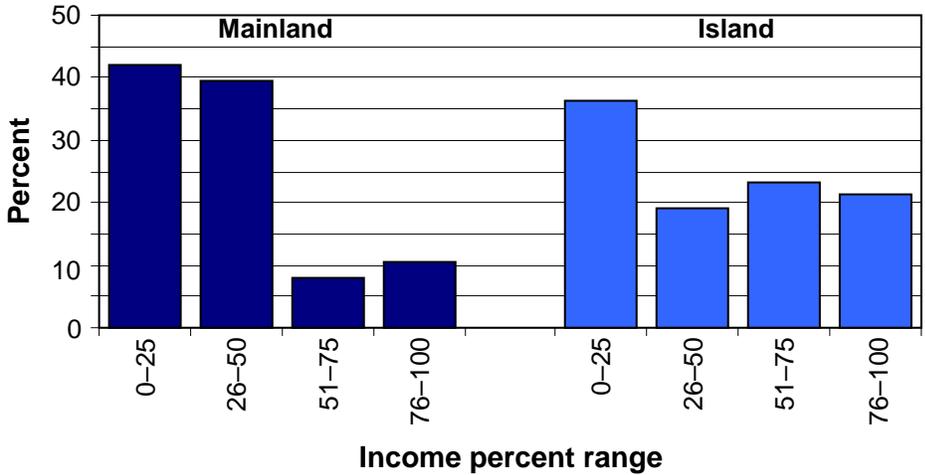


Figure 72. Percent of income derived from working in the SRKW watching industry by region. Island region participants derive a greater percent of their income from the industry; of those who derive more than 50% of their income from the industry, the island region had 44.7% compared to 18.4% for the mainland region.

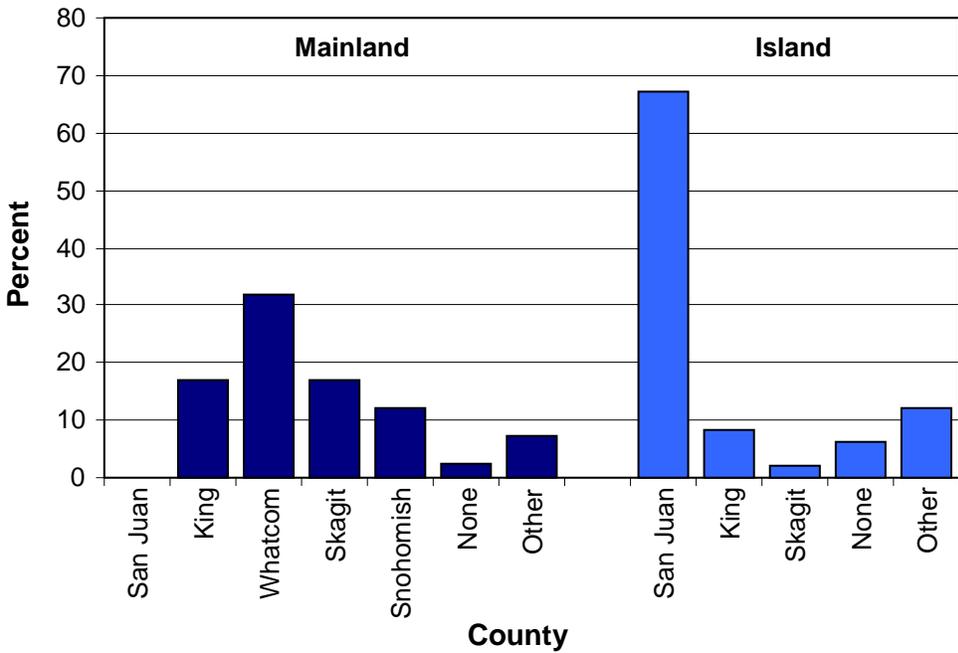


Figure 73. Permanent residence by region and county. Results indicate a greater distribution of participants in the mainland region throughout several counties, while a majority of those working in the island region, 67.3%, reside in San Juan County. Note that the none response indicates having no permanent residence.

Individual Participation

Individual Participation Summary

The results in this section analyze the individual participation questions sorted by mainland and island regions. The top three roles individuals played while working in the industry varied slightly by region. The top three in the mainland region were deck hand, naturalist, and administration; the top three in the island region were naturalist, operator, and administration. The majority of participants in the mainland region worked one role, followed by two roles, while the majority in the island region worked two roles, followed by three roles.

Entry year data show differences between the regions. A majority of individuals in the mainland region, 21.4%, entered the industry in 2006, followed by 14.3% in 2005 and 9.5% in 2003. In the island region, the highest number of entrants were 16.7% in 1997 and 16.7% in 2004, followed by 10.4% in 1998 and 10.4% in 2006. The greatest tenure was reported in the mainland, where 4.8% of individuals acknowledged they had worked in the industry for 26–30 years. The highest tenure in the mainland was 42.9% who had worked in the industry for 2–5 years, followed by 23.8% who had worked for 1 year. In the island region, 39.6% of individuals had worked for 6–10 years, 31.3% for 2–5 years, and 16.7% for 11–15 years.

The months individuals worked is similar between regions. The majority of individuals worked during June, July, and August for both regions. Variations occurred between the start and end months, with more individuals working in March for the mainland region and more working in September for the island region. Work schedules varied slightly between regions. In both regions, most individuals worked part-time schedules: 33.3% mainland and 28.3% island. In the mainland region that was followed by 28.6% working more than full-time schedules and 26.2% working full-time schedules. In the island region that was followed by 26.1% working full time and 23.9% working more than full time. Holding multiple jobs varied by region. In the mainland, 39% worked one full-time position, 29.3% held multiple part-time positions, and 22% held both full-time and part-time positions. In the island region, 44.7% held multiple part-time positions, 27.7% held one full-time position, 12.8% held a single part-time position, and 12.8% held both full-time and part-time positions. Participants were asked what other roles they played in their additional jobs. For both regions, the greatest response was “other,” suggesting something other than the categories provided for the response. Descriptors of other include teaching, volunteering, and construction. Additional results for the mainland show 59% worked “other” positions, 45.5% worked in maritime-related positions, followed by 13.6% each working on other SRKW watching boats as well as in volunteer positions. In the island region, 40% worked in “other” positions, 30% worked in tourism positions, and 20% each worked in volunteer positions and other SRKW watching boats.

The numbers of hours worked in the industry varies by region. Mainland region results show 29.3% of participants worked 31–40 hours, 24.4% worked 41–50 hours, and 17.1% worked 21–30 hours. In the island region, 32.6% worked 21–30 hours and 13% worked either 11–20 hours or 31–40 hours. Off-season activities vary between regions. The majority of mainland respondents worked in a marine tourism job in the current location for both years, while the majority of island region respondents participated in travel opportunities both years.

Past work history data are highly varied between the regions. In the mainland region, the majority (53.7%) chose the “other” category to describe their past work history. That category includes maritime positions, military positions, and computer and information technology positions. After the “other” selection, 24.4% worked in the accommodation and food industry and 22% worked in education. In the island region, 46.8% worked in education, 40.4% worked in accommodation and food, and 34% indicated “other.” Other descriptions followed those indicated in the mainland results and includes maritime positions, military, and various environmental positions.

Maritime participation data in both regions also show the “other” category as receiving the highest responses: 40.7% mainland and 38.1% island. Descriptions provided for other included marine sales, marine surveying, sailing and sailboats, and guide positions. In the mainland, 33.3% participated in fishing and 18.5% participated in education or ecotourism activities. In the island region, 33.3% participated in scuba diving and 28.6% participated in commercial fishing. Individuals working in the mainland region participated in maritime positions primarily located in Anacortes, followed by Port Townsend and other Washington areas. Locations where individuals participated in maritime jobs vary more greatly for the island region, where the San Juan Islands were slightly higher than other locations, followed by other Washington locations and Alaska. The number of years respondents worked in maritime positions vary between regions, with the exception that a majority of individuals in each region worked for 1–5 years (42.9% mainland and 47.4% island). Additional mainland data show that 28.6% worked in maritime positions for more than 25 years and 14.3% for 11–15 years. In the island region, 15.9% worked for 6–10 years, and 10.3% each worked for 16–20 years, 21–25 years, and more than 25 years.

The final section asked the survey participants to indicate on a Likert scale why they were in the industry. In the mainland region, the top three strongly agree reasons were 26.4% to work in the region, 50% to work outside on the water, and 35% to spend time with the SRKWs. Aggregated agree and strongly agree responses altered the reasons slightly. The “other” category received the highest response, followed by to work in the region and work outside on the water. Island results are different. Strong agreement, 66.7%, was given to work outside on the water, 64.4% to educate the public, and 62.2% to spend time with the SRKWs. The sum of the agree responses altered the responses slightly. The “other” category had the highest response, followed by to work outside on the water, with educate the public and spend time with the SRKWs receiving the same response.

Individual Participation Figures and Tables

The 15 figures and 2 tables listed here are sequentially provided below.

Figure 74. Role by region.

Table 18. Number of roles by region.

Figure 75. Additional training by region.

Figure 76. Entry year into industry by region.

Figure 77. Tenure in industry by region.

Figure 78. Months worked in the industry by region.

Figure 79. Work schedules by region.

Figure 80. Percent of multiple jobs being worked by region.

Figure 81. Seasons when multiple jobs are worked by region.

Figure 82. Other types of roles occupied during the active SRKW viewing season by region.

Figure 83. Hours worked during the active SRKW viewing season by region.

Figure 84. Off-season work descriptions.

Figure 85. Past work history by region.

Figure 86. Maritime position descriptions held by region.

Figure 87. Locations where the maritime positions were held by region.

Figure 88. Number of years worked in maritime positions by region.

Table 19. Reasons to participate in industry by region.

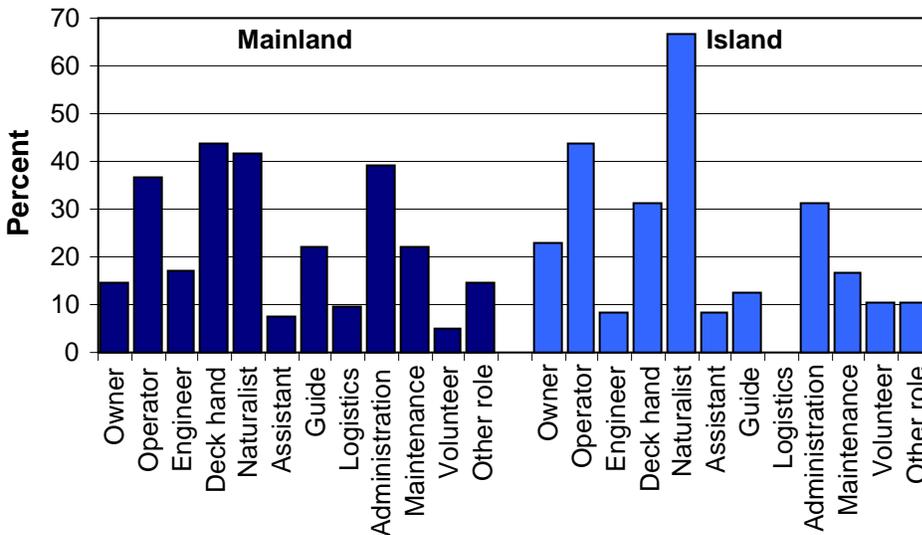


Figure 74. Role by region. This question allowed participants to mark all roles that applied. Island region participants show a greater association with the naturalist role, while the mainland region indicates a greater association with the roles of deck hand, administration, and engineer.

Table 18. Number of roles by region. Participants working in the island region identify with more roles than those working in the mainland region. In addition, a few individuals in the mainland region identify with more than seven roles.

No. roles	Mainland	Island
1	18	8
2	10	17
3	1	10
4	1	8
5	3	8
6	3	1
7	1	—
8	1	—
9	1	—

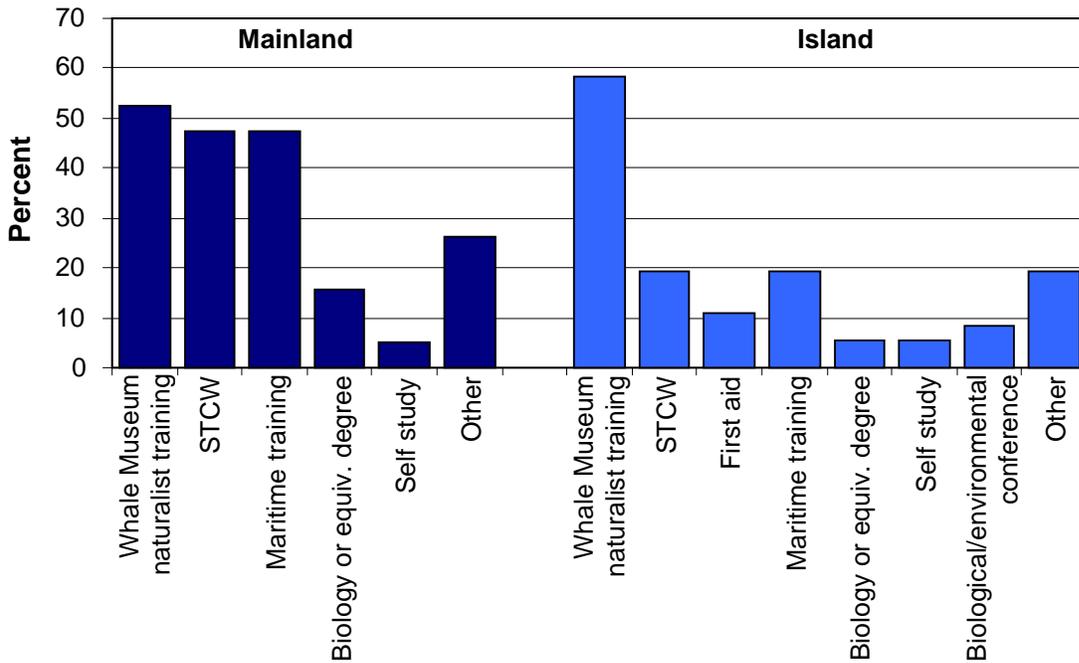


Figure 75. Additional training by region. Participants in both regions pursue additional training from the Whale Museum and in other maritime skill areas. STCW = Standards of Training, Certification, and Watchkeeping.

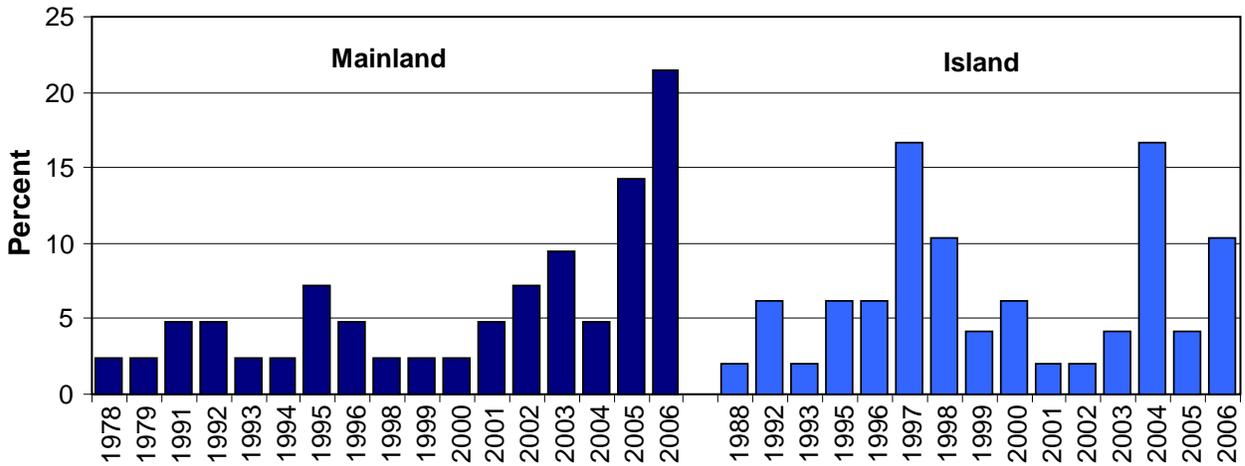


Figure 76. Entry year into the industry by region. Mainland region results show increased entrance in the last 6 years. Island region results indicate increased entrance in the mid to late 1990s and again in 2004 and 2006.

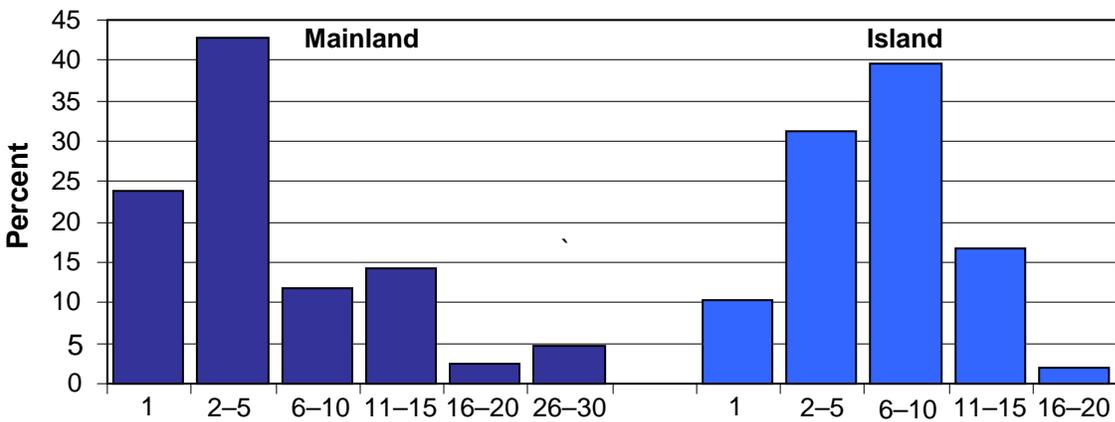


Figure 77. Tenure (years) in industry by region. Most participants in the mainland region had worked in the industry for 2–5 years (42.9%), while in the island region, most (39.6%) had worked for 6–10 years. The longest tenure in the mainland industry is 26–30 years, while in the island region it is 16–20 years.

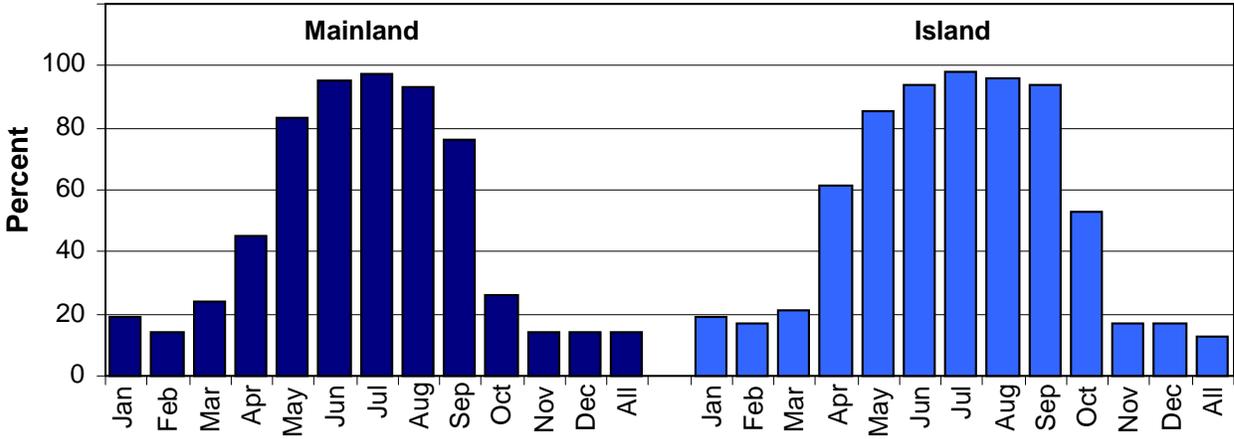


Figure 78. Months worked in the industry by region. The results indicate in both regions that most participants worked the core seasonal months of May through September. Island results indicate more individuals working the side months of April and October, as well as more working off-season months.

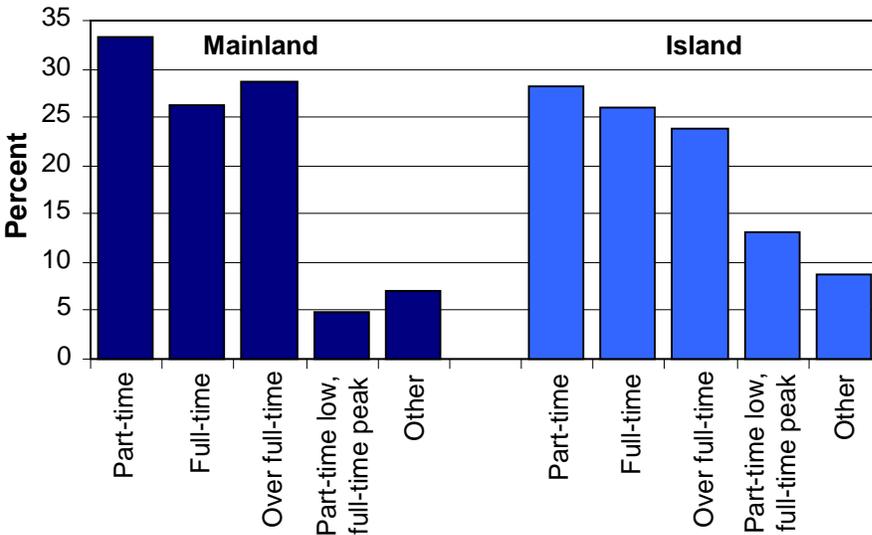


Figure 79. Work schedules by region. In addition to the months that participants worked, information on work schedules was sought. More mainland individuals worked part-time positions and positions over 40 hours per week. More island participants worked a mixed schedule of part-time during the low season and full-time during the peak season.

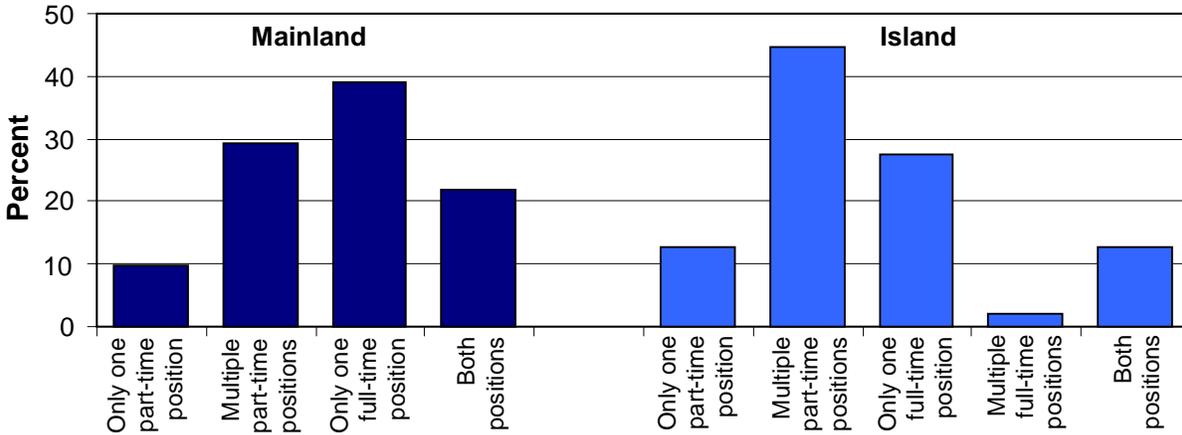


Figure 80. Percent of multiple jobs being worked by region. The results indicate diversity in both regions when working many jobs. Island respondents worked more multiple part-time positions, 44.7%, compared to the mainland region, 29.3%. Mainland respondents worked more single full-time positions, 39%, and both full-time and part-time positions, 22%, compared to the island region.

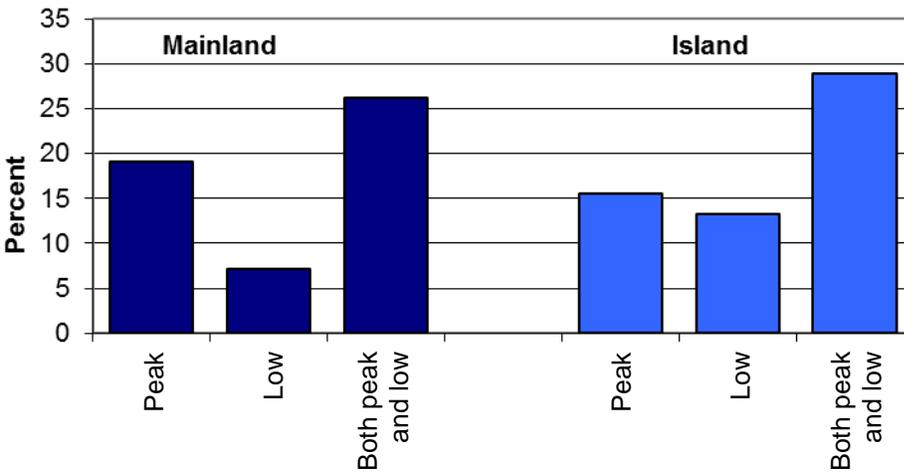


Figure 81. Seasons when multiple jobs are worked by region. The island region and the mainland region show a majority of individuals, 29% and 26%, respectively, worked multiple jobs all year long.

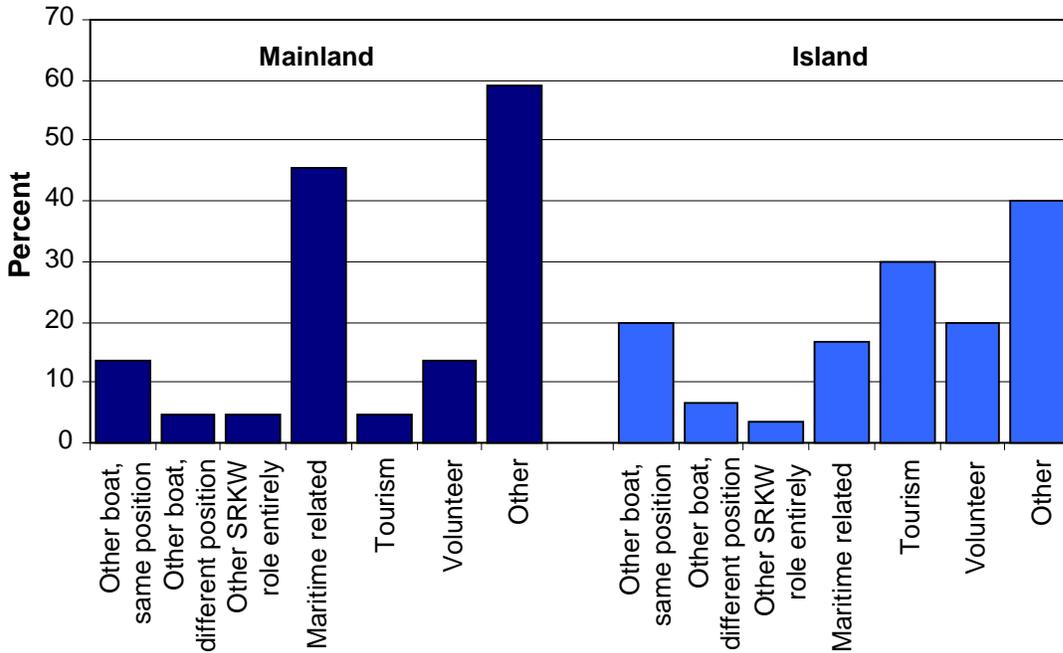


Figure 82. Other types of roles occupied during the active SRKW viewing season. The majority of individuals in the mainland region worked other jobs in maritime-related or other positions. In the island region, individuals worked in other positions, tourism positions, and volunteer or other SRKW watching boat/same role positions. The “other” category includes teaching, contractors, construction, and clarification of other volunteer activities.

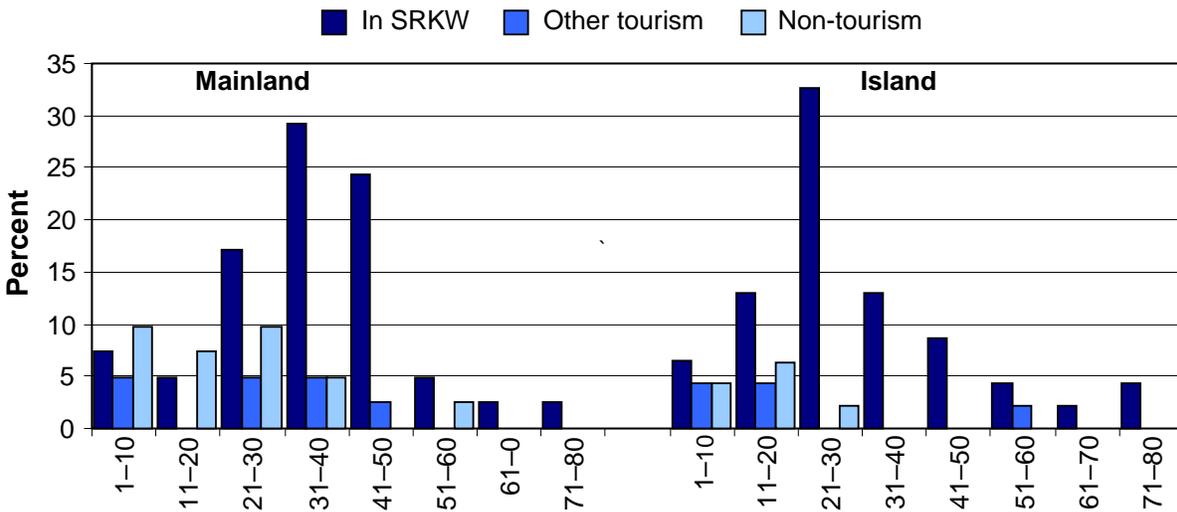


Figure 83. Hours worked during the active SRKW viewing season by region. Data were sorted into three categories: hours worked in the SRKW watching industry, hours worked in other tourist positions, and hours worked in non-tourism positions. The mainland region shows a greater distribution of hours across all three categories, as well as more hours in the SRKW industry.

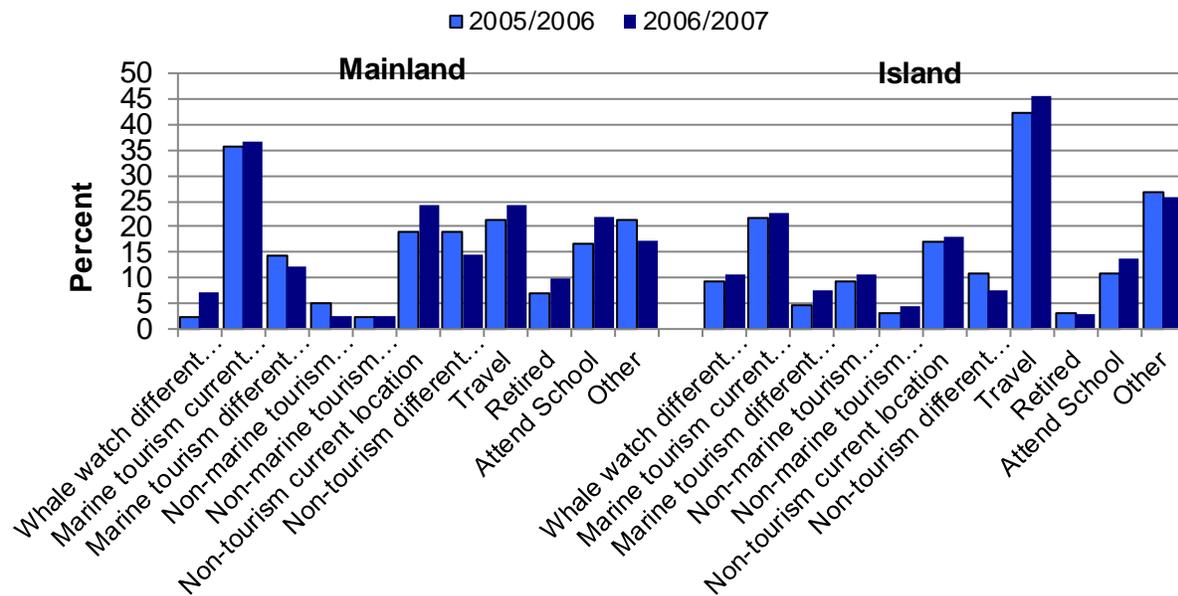


Figure 84. Off-season work descriptions by region. The mainland region shows top activity in marine tourism jobs in the current location for both years, followed by non-tourism jobs in the current location and travel. The island region shows participation in travel, other categories, and a marine tourism job in the same location.

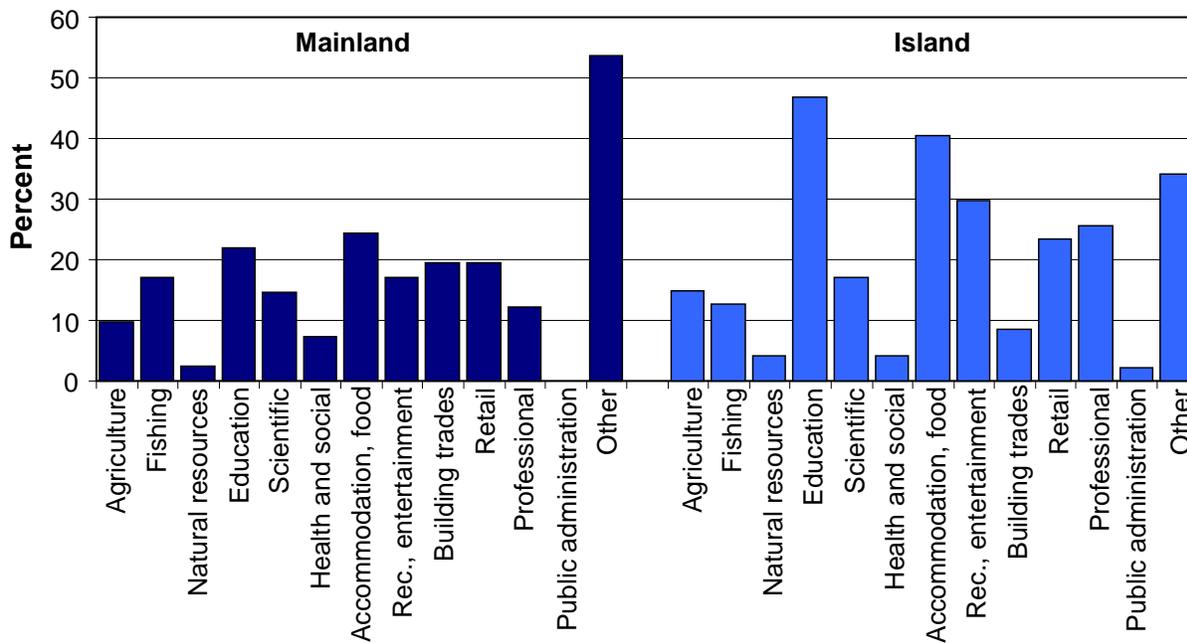


Figure 85. Past work history by region. Categories for past work history descriptions are based on the U.S. Census. The results for the mainland show a peak only in the “other” category. Island region results show peaks in education, accommodation and food services, and recreation and entertainment. Examples in the “other” category include other maritime occupations, military, and real estate.

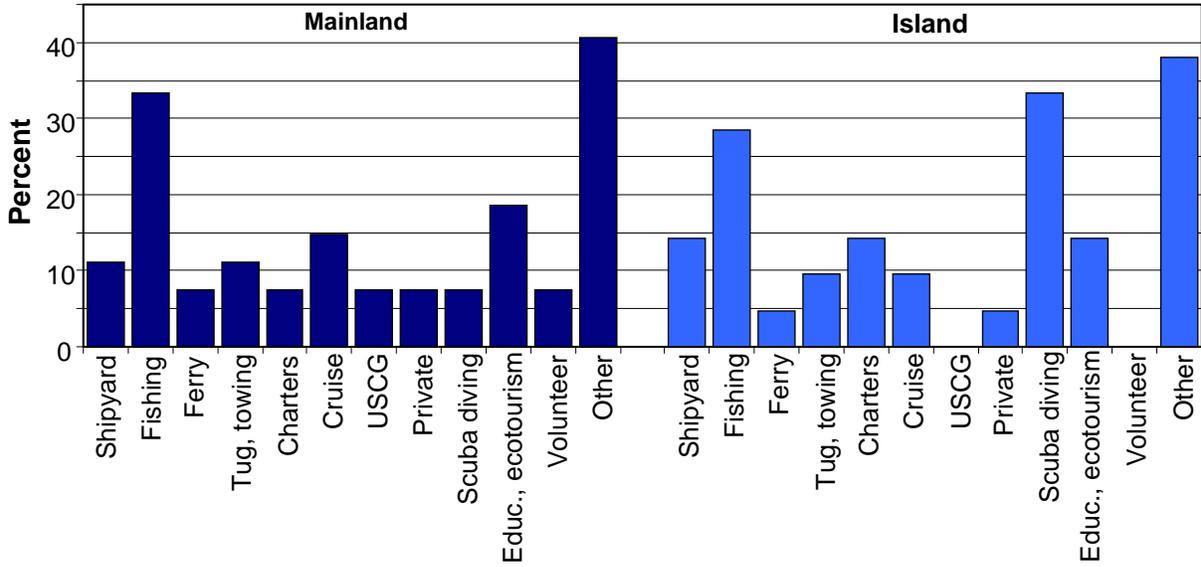


Figure 86. Maritime position descriptions held by region. Mainland results show the top three descriptions as other, fishing, and education/ecotourism. Island region results indicate the top three as other, scuba diving, and fishing.

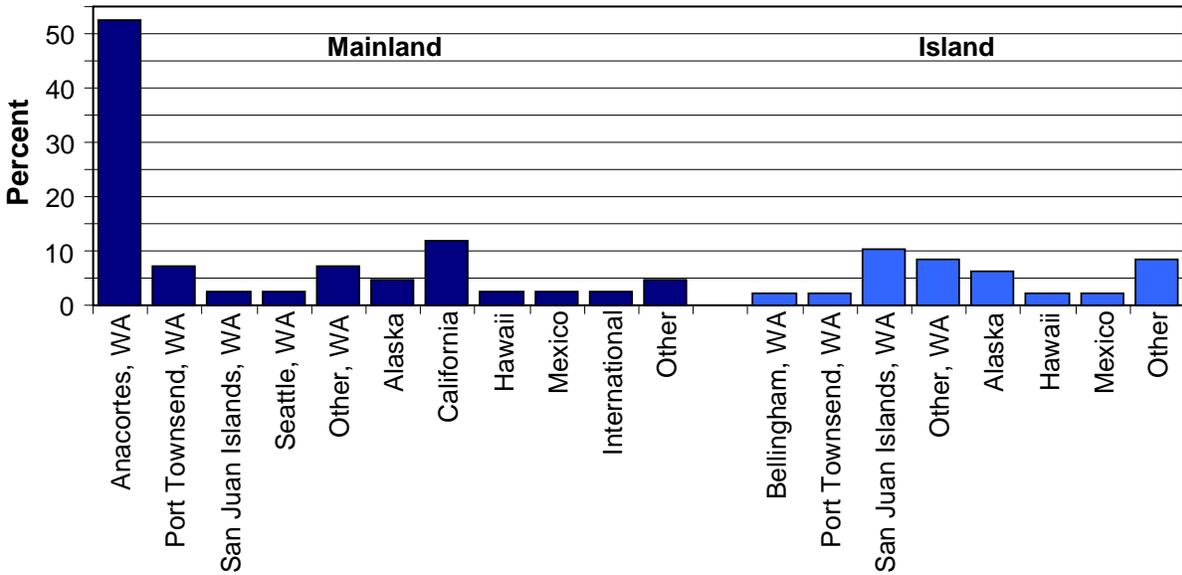


Figure 87. Locations where the maritime positions were held by region. Mainland results show a majority worked in Anacortes. Island region results indicate a slight plurality in the San Juan Islands.

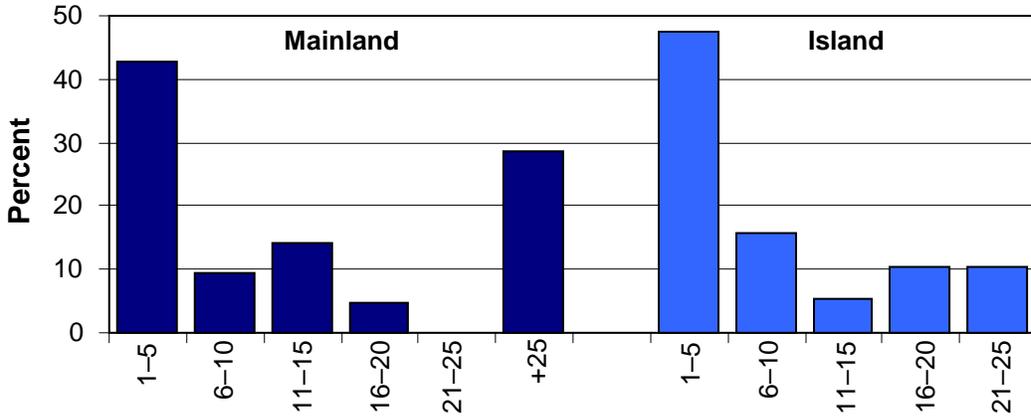


Figure 88. Number of years worked in maritime positions by region. Mainland results show most respondents worked in maritime positions for 1–5 years, followed by more than 25 years. Island results indicate a near majority worked in maritime positions for 1–5 years.

Table 19. Likert scale description of reasons to participate in the industry by region (values in percent). Based on the agree and strongly agree responses, the top three reasons to participate for the mainland region are “other,” work in the region, and work outside on the water. For the island region, the top three responses are “other,” work outside on the water, and educate the public along with spend time with SKRWs, respectively. (Note that some columns do not add up to 100% due to rounding.)

	Make money	Transition to maritime	Work in region	Educate public	Interact with co-workers	Work outside on the water	Seasonal job	Spend time with SRKWs	Other
Mainland									
Strongly agree	34.1	2.6	56.4	47.5	26.8	50.0	17.1	35.0	7.1
Agree	48.8	21.1	41.0	32.5	39.0	35.0	19.5	42.5	92.9
Neutral	2.4	36.8	2.6	20.0	31.7	7.5	26.8	7.5	—
Disagree	9.8	23.7	—	—	2.4	5.0	19.5	12.5	—
Strongly disagree	4.9	15.8	—	—	—	2.5	17.1	2.5	—
Island									
Strongly agree	33.3	5.3	54.5	64.4	31.1	66.7	27.3	62.2	11.4
Agree	28.9	5.3	29.5	24.4	40.0	24.4	18.2	26.7	86.4
Neutral	8.9	36.8	15.9	11.1	24.4	8.9	40.9	8.9	2.3
Disagree	20.0	23.7	—	—	2.2	—	11.4	2.2	—
Strongly disagree	8.9	28.9	—	—	2.2	—	2.3	—	—

Regional Business Operations

Business Operations Summary

Business operations data in this section were sorted by region. The number of trips offered by companies varies between regions. Results are based on secondary data that were summarized and sorted for this regional analysis. In the mainland region, six companies offered one tour per day, one company offered two tours a day, and one company offered five tours a day. In the island region, one company offered one trip per day, four companies offered two trips per day, one company offered three trips per day, one offered four trips per day, and another offered five trips per day. In total—between the two regions and the 16 companies in those regions (after one company was removed from analysis to protect confidentiality)—34 tours were offered per day. Of the 34 tours, 13 were offered out of the mainland region and 21 were offered out of the island region.

The duration of the tours is very different in each region. In the mainland region, one company offered five tours lasting 6 hours each, three companies offered four tours of 7 hours each, and one company offered one tour for 2.5 hours, one for 3.5 hours, and one for 5 hours. In the island region, three companies offered seven tours of 3 hours each, while five companies offered 14 tours for 4 hours each. Departure times for the mainland were primarily from 8 a.m. to 10 a.m. and again from 10 a.m. to noon, with five companies having trips departing at those times. For the island region, five companies had tours departing from noon to 2 p.m., while four companies had tours departing during 10 a.m. to noon, 2 p.m. to 4 p.m., and 4 p.m. to 6 p.m.

Occupancy rate data were categorized by peak, low, and off-season. In the mainland, 43.2% reported an occupancy rate of 76–100% during the peak season, 31.9% had a rate of 51–75% during the low season, and 13.6% had a rate of 26–50% in the off-season. In the island region, 62% reported an occupancy rate of 76–100% during the peak season, 25.4% had a rate of 51–75% during the low season, and 7.9% had a rate of 26–50% during the off-season.

Business Operations Figures and Table

The nine figures and one table listed here are sequentially provided below.

Figure 89. Tier distribution by region.

Figure 90. Tour descriptions by region.

Figure 91. Percent of vessel activity dedicated to SRKW viewing.

Figure 92. Number of tours offered by the number of companies by region.

Table 20. Trip information summary.

Figure 93. Duration of trips and the number of companies that conducted the trips by region.

Figure 94. SRKW watching tour departure times by company by region.

Figure 95. Occupancy rates for the SRKW watching industry during peak, low, and off-season.

Figure 96. Percent of additional commercial activities by region.

Figure 97. Seasons during which additional commercial activities occur.

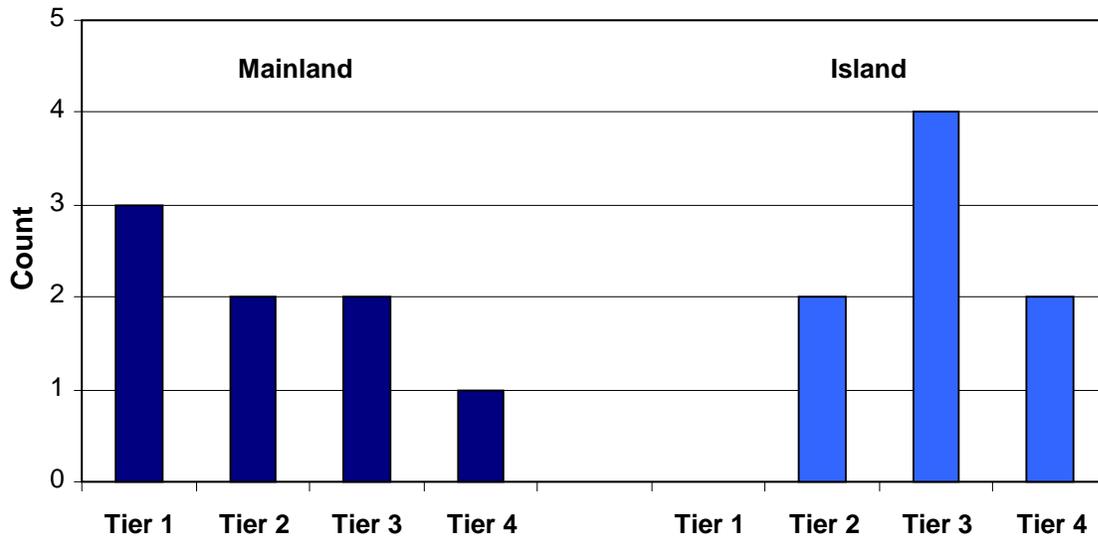


Figure 89. Tier distribution by region. All Tier 1 companies, which have the larger boats, operate out of the mainland region. Most of the Tier 3 and Tier 4 companies operate out of the island region.

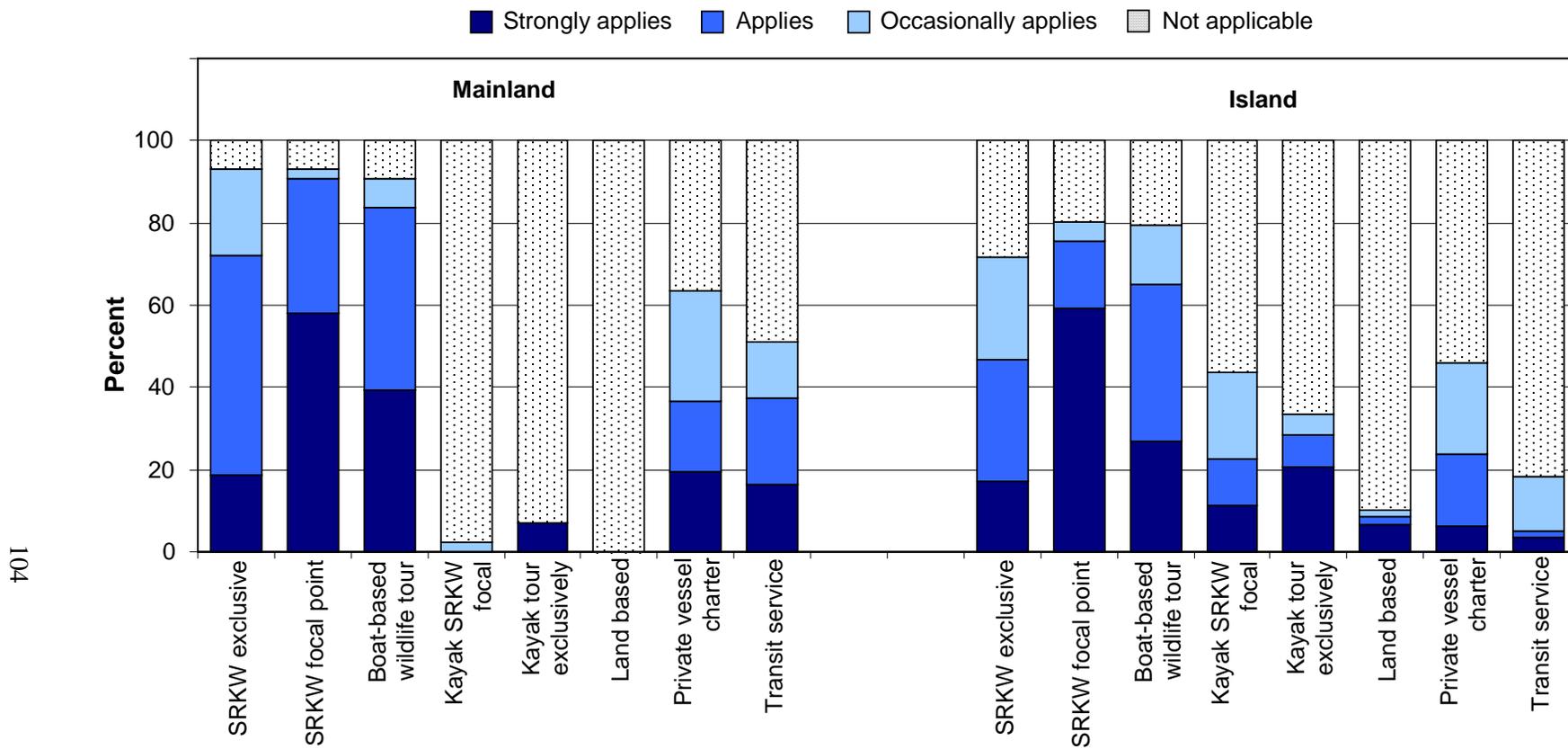


Figure 90. Tour descriptions by region. The results indicate that both regions strongly agree that the types of tours they provided were boat-based tours with SRKWs as the focal point. This is followed by agreement that boat-based wildlife tours were provided and tours where SRKWs were the exclusive purpose of the tour.

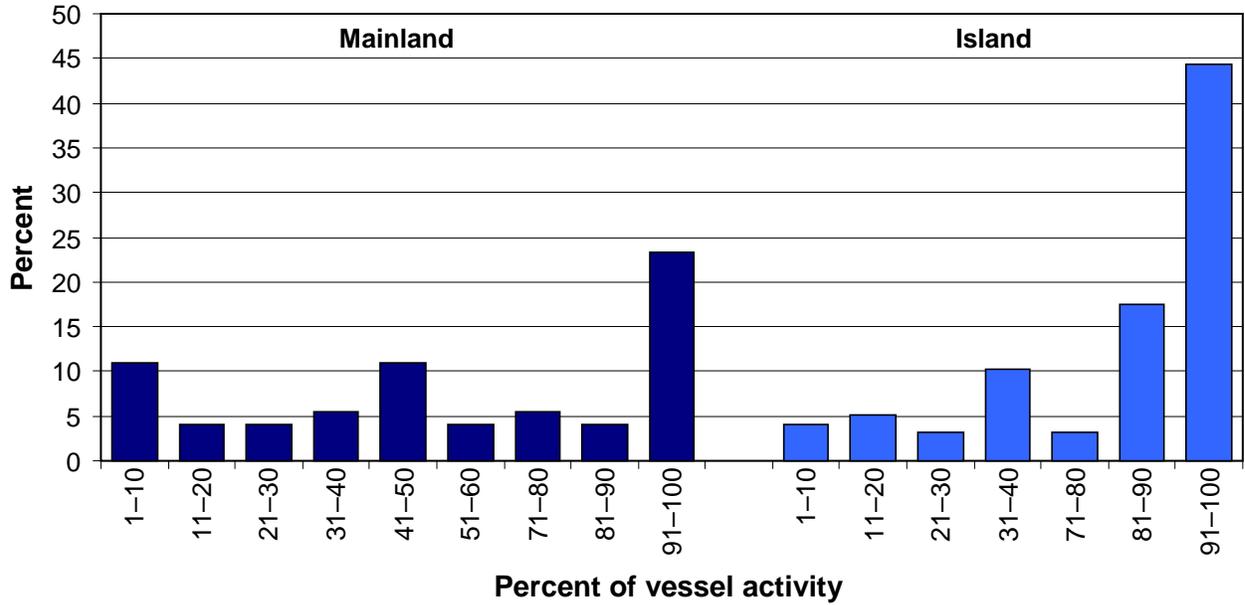


Figure 91. Percent of vessel activity dedicated to SRKW viewing by region. Both regions indicate that most their vessel activity was dedicated to SRKW viewing.

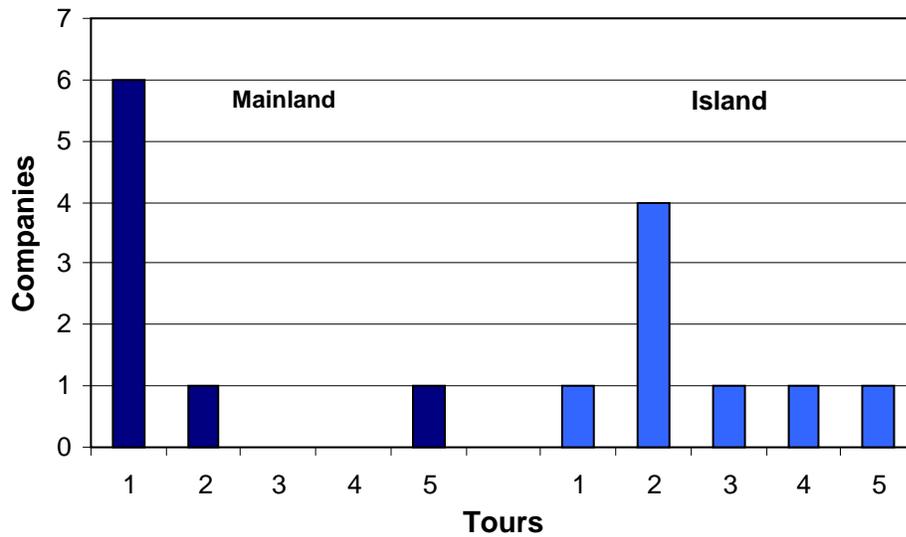


Figure 92. Number of tours offered by the number of companies by region. The data for this question were overly complex and removed due to inconclusive analysis. The results are based on secondary source information from Web sites and brochures.

Table 20. Trip information summary by region. Information is based on secondary source data. The results are based on the number of trips and tours offered by companies, not the actual number of trips conducted. The results indicate that 16 companies offered 34 trips daily (one of 17 companies was removed from analysis due to lack of supporting data to determine its activity). Note that the businesses in the Olympic Peninsula region were removed from this analysis to protect confidentiality. As a result the number of trips represented in the table omits the Olympic Peninsula responses, reducing the total number of trips to those conducted by mainland and island companies only. Most of the companies offering multiple trips per day operated multiple vessels that specifically conducted whale watching trips.

No. of tours (a)	No. of companies offering tours (b)	Total no. of tours (a × b)
Mainland		
1	6	6
2	1	2
3	—	—
4	—	—
5	1	5
Island		
1	1	1
2	4	8
3	1	3
4	1	4
5	1	5
Total:	16	34

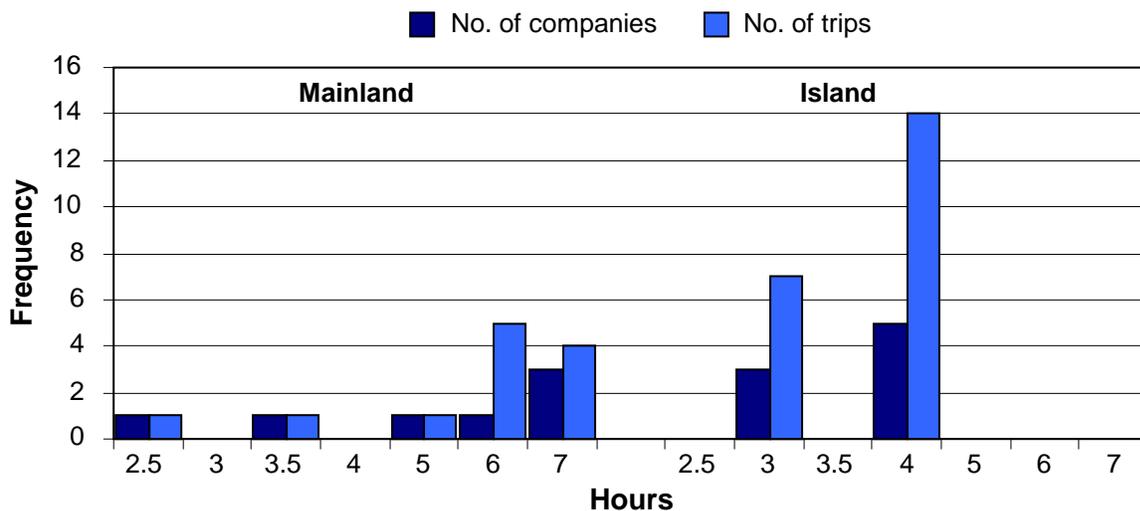


Figure 93. Duration of whale watching trips and number of companies that conducted the trips by region. Note that one mainland company was removed from the analysis, as we were not able to confirm the trip duration.

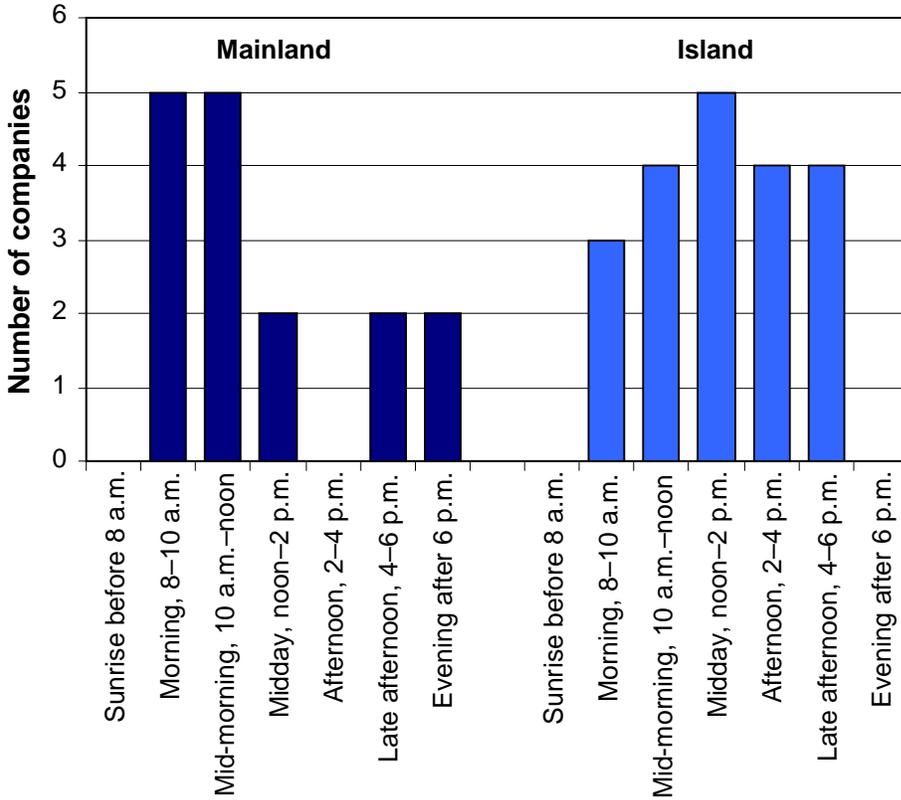


Figure 94. SRKW watching tour departure times by company by region. The results are based on secondary source information. The data reflect the percent of companies that conducted tours within the designated departure times sorted by region.

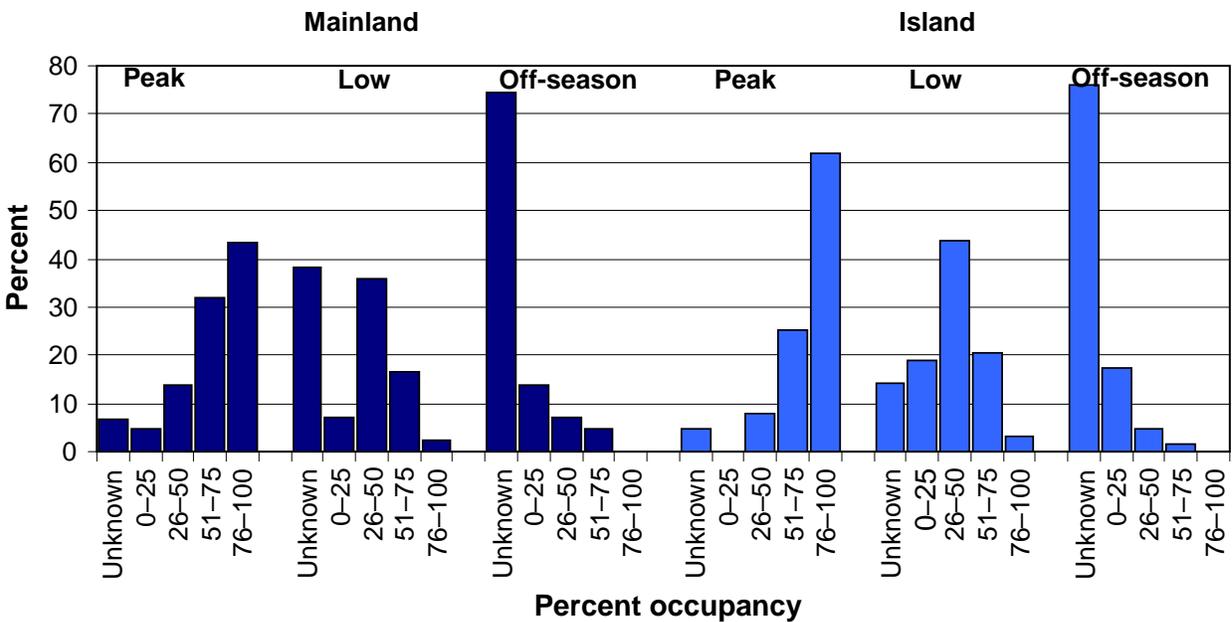


Figure 95. Occupancy rates by region during peak, low, and off-season activities. The “unknown” category reflects the number of survey participants who did not answer the question.

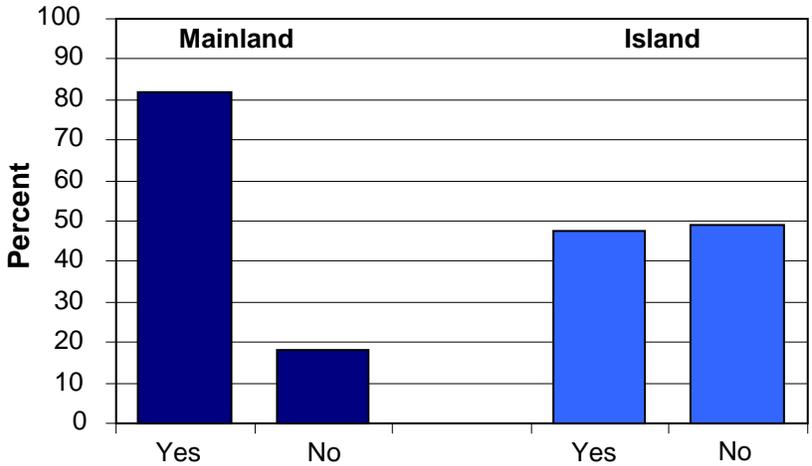


Figure 96. Percent of additional commercial activities by region.

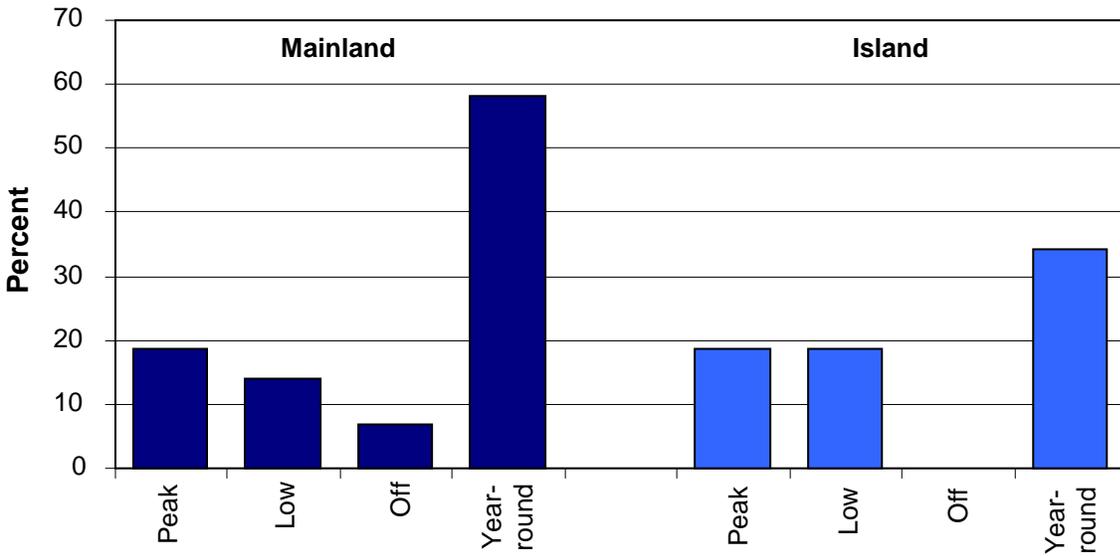


Figure 97. Seasons during which additional commercial activities occur.

Kayak Sector and Land Sector Personnel

Demographics

Demographic Summary

Results shown in this section follow the previous analysis for demographics, but were sorted by the kayak and land sectors. As previously noted, kayak data were more difficult to acquire and have some unique characteristics. Participants in the land sector were more accessible. Gender distribution across sectors indicates a higher percent of males in the kayak sector and an even distribution of genders in the land sector. Age data show a majority of participants in the kayak sector, 55.6%, were younger, ranging 25–34 years old, compared to 75% in the land sector ranging 45–57 years old.

Educational attainment results show 72.2% of the kayak sector participants held a bachelor's degree, while 11.1% held graduate degrees. Further analysis reveals 83.3% in the kayak sector had advanced education. Land sector results show an equal distribution of participants either had some college or vocational education or held a bachelor's degree.

Income results vary. Of kayak sector participants, 42% had an income between \$10,000 and \$30,000, while 75% of land sector participants had income of less than \$10,000. When asked how much of this income was derived from the SRKW industry, the kayak sector reported 43.7% derived 0–25% from the industry and 31.6% derived 76–100% from the industry. Land respondents had an equal number of individuals deriving either 0–25% or 26–50% of their income from the industry. Further analysis sorting owners from non-owners provided some interesting results. Of kayak owners, 27.7% derived 0–25% and 11.1% derived 76–100% from the industry. All owner respondents in the land sector derived 26–50% of their income from the industry.

Permanent residence data show a majority of individuals across both sectors resided in the San Juan Islands. With that said, the kayak sector shows a greater distribution of residences across King, Skagit, and Yakima Counties, with some residing in California. Residency in the land sector was limited to San Juan County and Snohomish County.

Demographic Figures

The seven figures listed here are sequentially provided below.

Figure 98. Gender by kayak and land sectors.

Figure 99. Age by kayak and land sectors.

Figure 100. Educational attainment by kayak and land sectors.

Figure 101. Income by kayak and land sectors.

Figure 102. Income from the SRKW watching industry by kayak and land sectors.

Figure 103. Income from the industry by owner/non-owner by kayak and land sectors.

Figure 104. Permanent residence by kayak and land sectors.

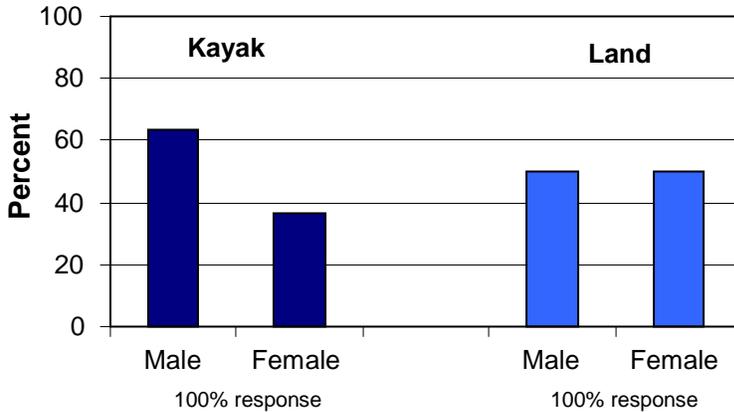


Figure 98. Gender by kayak and land sectors. The kayak sector shows a greater percent of male participants, 62% male to 38% female. The land sector is equally distributed at 50% each.

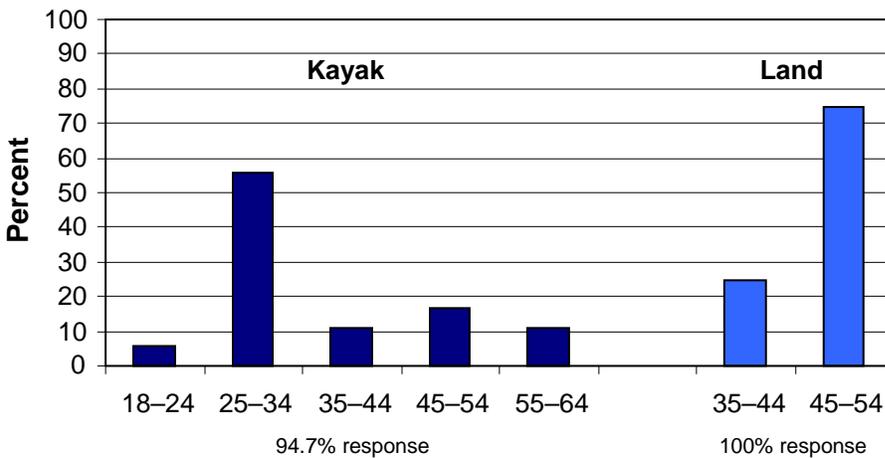


Figure 99. Age by kayak and land sectors. Age ranges within each sector vary greatly. In the kayak sector, 55.6% of participants fall in the age range 25-34 years, while in the land sector, 75% of participants fall in the age range 45-54 years.

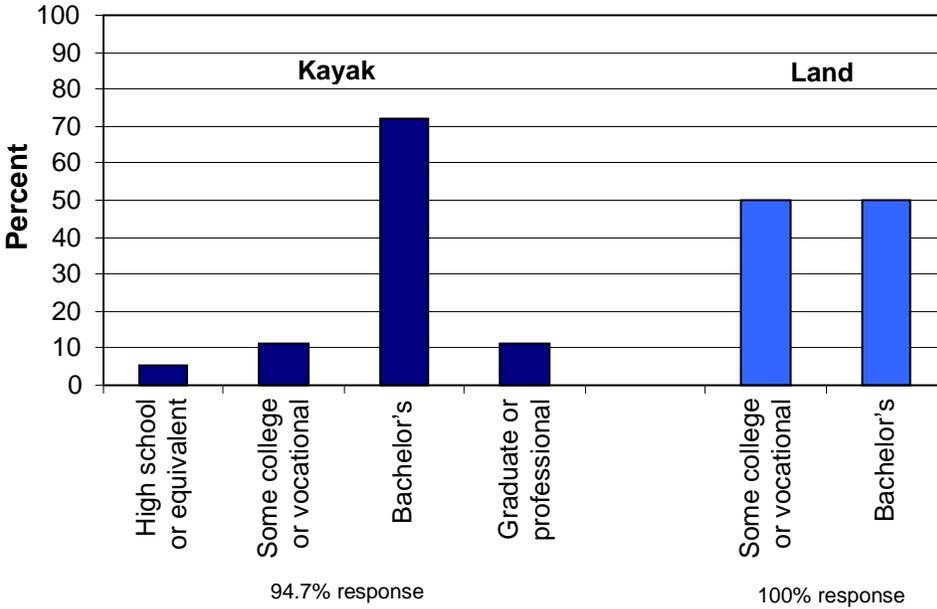


Figure 100. Educational attainment by kayak and land sectors. In the kayak sector, 72% of participants hold bachelor's degrees, while the land sector has an equal distribution between bachelor's degrees and some college or vocational education.

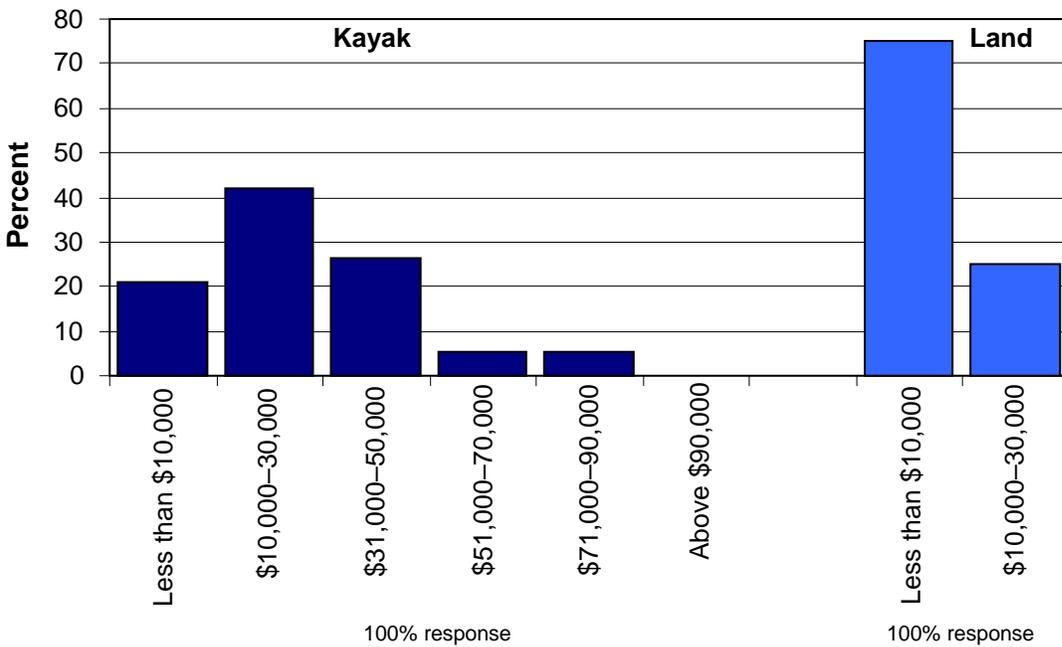


Figure 101. Income by kayak and land sectors. The results for the sectors vary. In the kayak sector, 42% of participants have income between \$10,000 and \$30,000. In the land sector, 75% of participants have income of less than \$10,000.

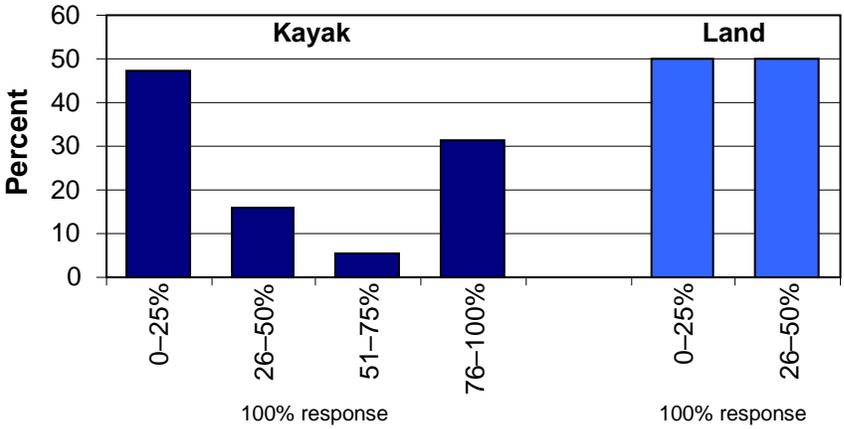


Figure 102. Income from the SRKW watching industry by kayak and land sectors. The kayak sector shows 47.3% of participants derived 0–25% of their income from the industry, while the land sector shows an equal distribution between 0–25% and 26–50% of income derived from the industry.

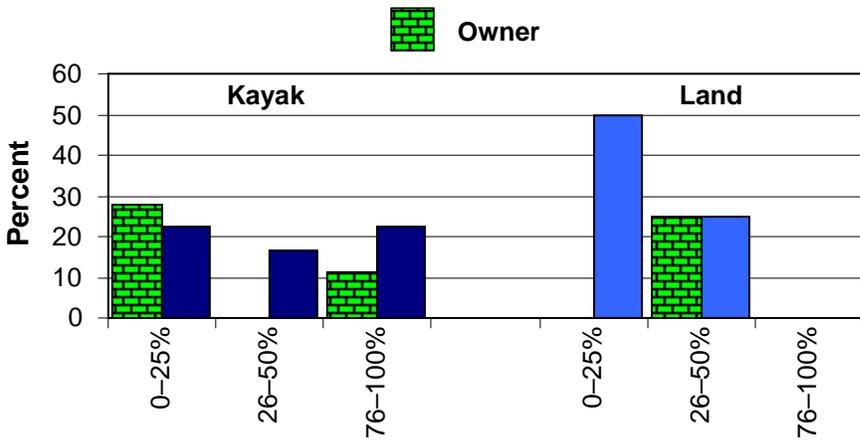


Figure 103. Income from the SRKW watching industry by owner and non-owner by kayak and land sectors. The kayak sector shows 27.7% of owners derived 0–25% of their income from the industry, while 11% of the owners derived 76–100% from the industry. The land sector shows owners derived 26–50% of their income from the industry.

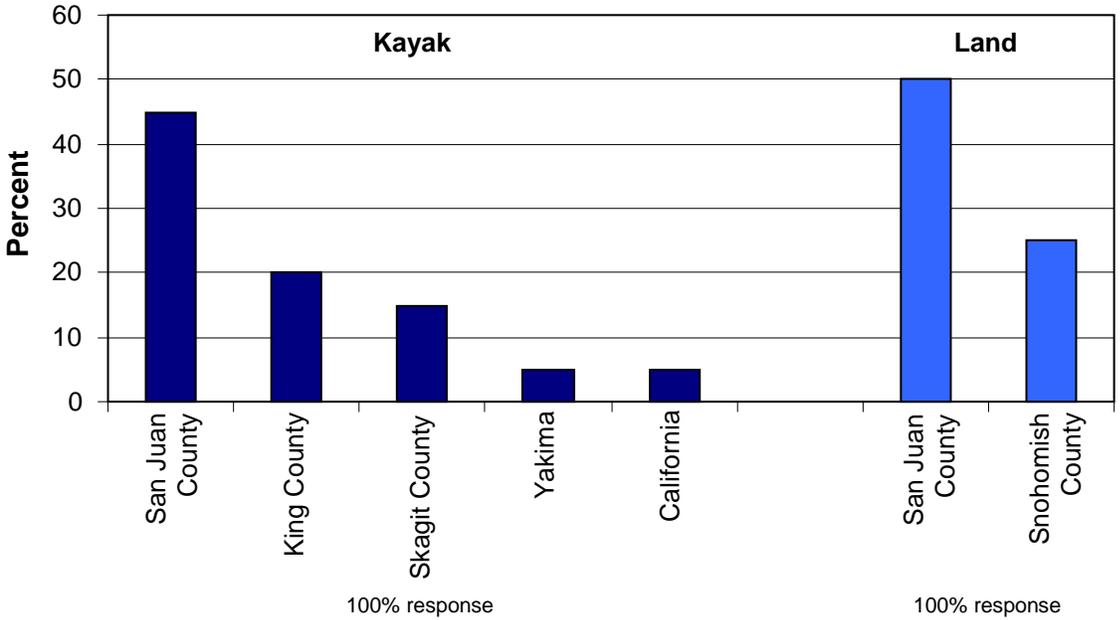


Figure 104. Permanent residence by kayak and land sectors. Both sectors show most participants residing in the San Juan Islands.

Individual Participation

Individual Participation Summary

This subsection sorts individual data by kayak and land sectors. Both sectors reported that the role of a guide was the highest priority. In the kayak sector, this was followed by naturalist and administration. In the land sector, it was followed by an “other” role and a naturalist. The majority of kayak participants said they worked two consecutive roles followed by four roles, up to 10 roles. Land sector participants said they worked either two or three consecutive roles at any given time. Additional types of training sought by kayak participants included kayak skills, the Whale Museum’s marine naturalist training, and first aid training. Land sector responses show equivalent effort in seeking additional training in the areas of the Whale Museum’s marine naturalist training, STCW, biology or other equivalent degrees, or self study.

Kayak sector data indicate the greatest number of individuals entered the SRKW watching industry in 2006, with equal numbers entering in 2005, 2001, and 1998. The first industry entrant did so in 1980. Land sector data show an equal number of entrants in 2004, 2000, 1999, and 1994. Tenure data show most individuals had worked in the kayak industry 2–5 years, followed by 6–10 years, and 1 year. Land sector data show a majority had worked for 2–5 years, and an equal number of participants had worked 6–10 years and 11–15 years. Further analysis of tenure data by owner and non-owner reveals the highest tenures in both sectors were owners.

Work schedule data show kayak participants most likely worked in July and August, followed closely by June and September. Land sector participants worked at their highest levels from May through September. Kayak sector participants worked primarily full-time or more than full-time schedules. Land sector participants worked more than full-time as well. Kayak sector responses show the majority of individuals worked only full-time and those working part-time had more than one job. Land sector responses were split between those working only one full-time position and some working multiple part-time positions. An additional question asked participants to indicate what type of work they performed in multiple positions. Kayak sector responses acknowledged other jobs in different roles in the SRKW watching industry, as well as different jobs in the maritime industry, and “other” jobs altogether. Land sector responses reported jobs in other tourism fields, maritime-related positions, and volunteer positions. In the kayak sector, the majority of individuals worked 51–60 hours in the SRKW watching industry, followed by 0–10 hours and more than 100 hours. In the land sector, the majority worked 0–10 hours in the industry, followed by 21–30 hours and 61–70 hours. Off-season activity responses in the kayak sector show most participated in travel activities, 50% for each year (i.e., the off-season of prior year 2005/2006 and the off-season after the active season of the study year 2006/2007). This was followed by many individuals working in marine tourism in the current location, 33.3% and 38.9% for the 2005/2006 and 2006/2007 years respectively. Land sector results also show a majority, 75%, partook in travel activities during both years indicated. Other activities were equally distributed such as whale watch activities in a different location for both years, marine tourism in a different location for 2006/2007, non-marine tourism work in a different location for 2005/2006, to attend school for 2006/2007, and “other” for both years. Past work history responses show a majority of kayak sector participants had backgrounds in education, followed by recreation and entertainment, and public administration. Land sector participants had backgrounds in categories “other” than those indicated, followed by an equal number of participants with backgrounds in recreation and entertainment, building trades, and retail.

Most strongly agree responses for the kayak sector indicate that participants were in the industry to work outside on the water, work in the region, and educate the public. Aggregated strongly agree and agree responses for the kayak sector show the top three reasons as “other,” to educate the public, and work outside on the water. While the “other” category was heavily selected as an agree response, participants did not offer further description of other reasons, so they cannot be further clarified here. In the land sector, the top three strongly agree responses all had an equivalent percent response, so are weighted equally: to work in the region, educate the public, and spend time with the SRKWs. Aggregate agreement responses altered the reasons slightly. The top two reasons received the same weight, namely, to educate the public and spend time with the SRKWs. Two other reasons also received the same weight, but slightly less than the top two reasons: to work in the region and work outside on the water.

Individual Participation Figures and Tables

The 16 figures and 2 tables listed here are sequentially provided below.

Figure 105. Role by kayak and land sectors.

Table 21. Number of roles.

Figure 106. Additional training by kayak and land sectors.

Figure 107. Entry year into industry.

Figure 108. Tenure by kayak and land sectors.

Figure 109. Tenure by owner/non-owner by kayak and land sectors.

Figure 110. Months worked in the SRKW watching industry.

Figure 111. Work schedules by kayak and land sectors.

Figure 112. Percent of multiple jobs.

Figure 113. Other types of roles.

Figure 114. Hours worked by the kayak sector.

Figure 115. Hours worked by the land sector.

Figure 116. Off-season work descriptions.

Figure 117. Past work history by kayak and land sectors.

Figure 118. Maritime industry positions by kayak and land sectors.

Figure 119. Locations where maritime positions were held by kayak and land sectors.

Figure 120. Number of years worked in maritime positions.

Table 22. Reasons to participate.

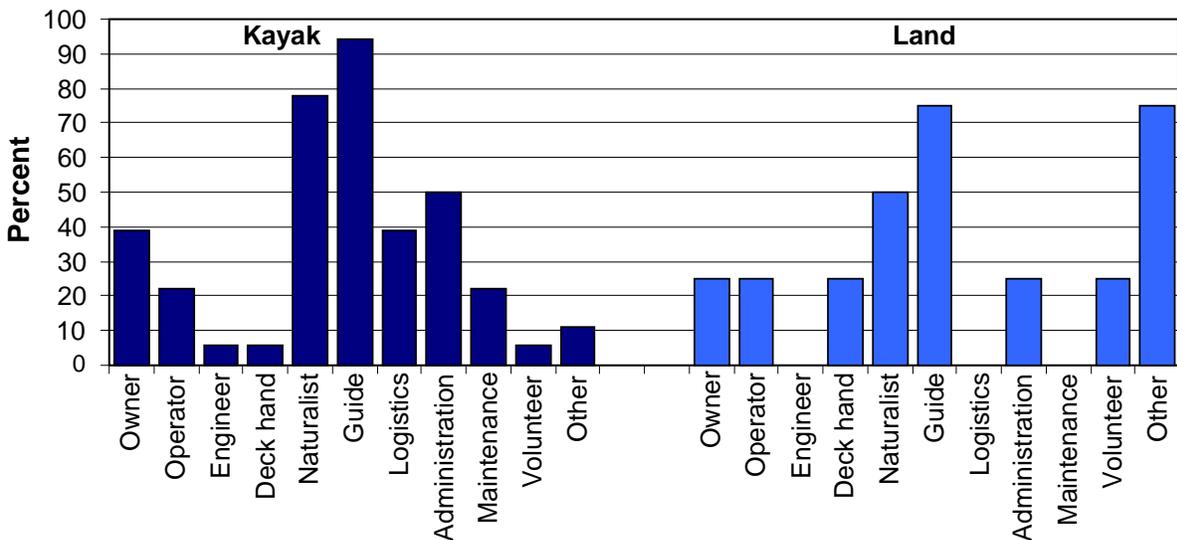


Figure 105. Role by kayak and land sectors. Both sectors highly identify with the role of a guide. In the land sector, the high “other” selection was further described as the role of a driver.

Table 21. Number of roles by sector.

No. roles	Kayak	Land
1	2	—
2	6	2
3	2	2
4	5	—
5	1	—
6	2	—
10	1	—

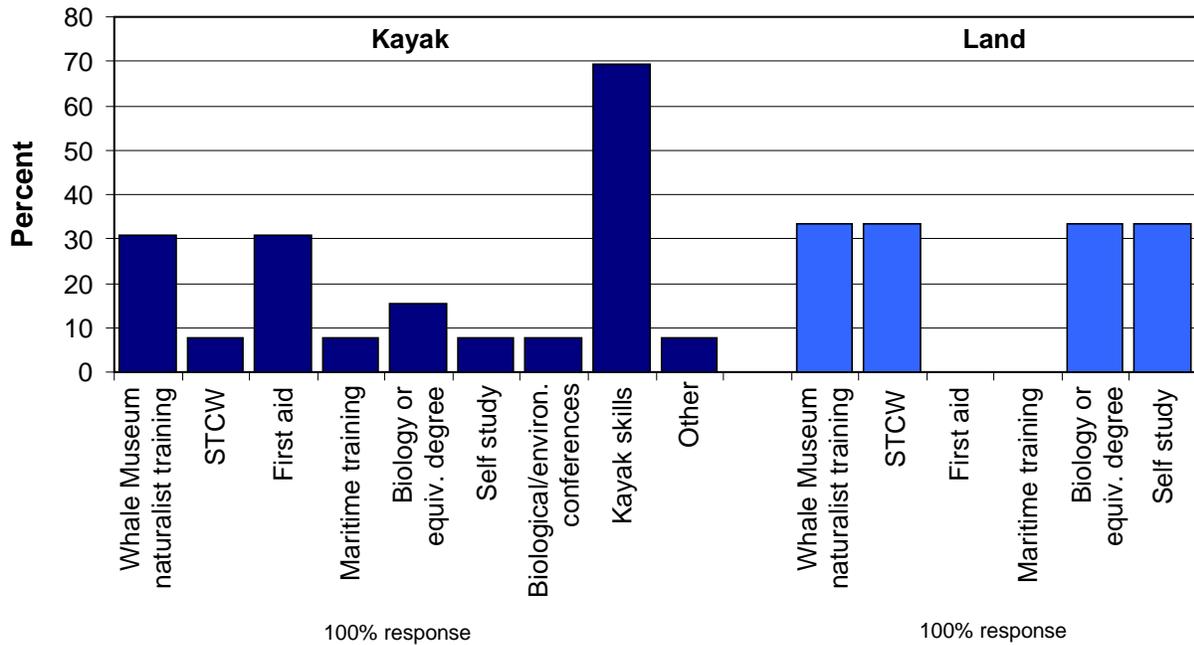


Figure 106. Additional training by kayak and land sectors. Both sectors participate in additional training, specifically the Whale Museum’s marine naturalist training. The kayak sector also specializes in kayak skills training.

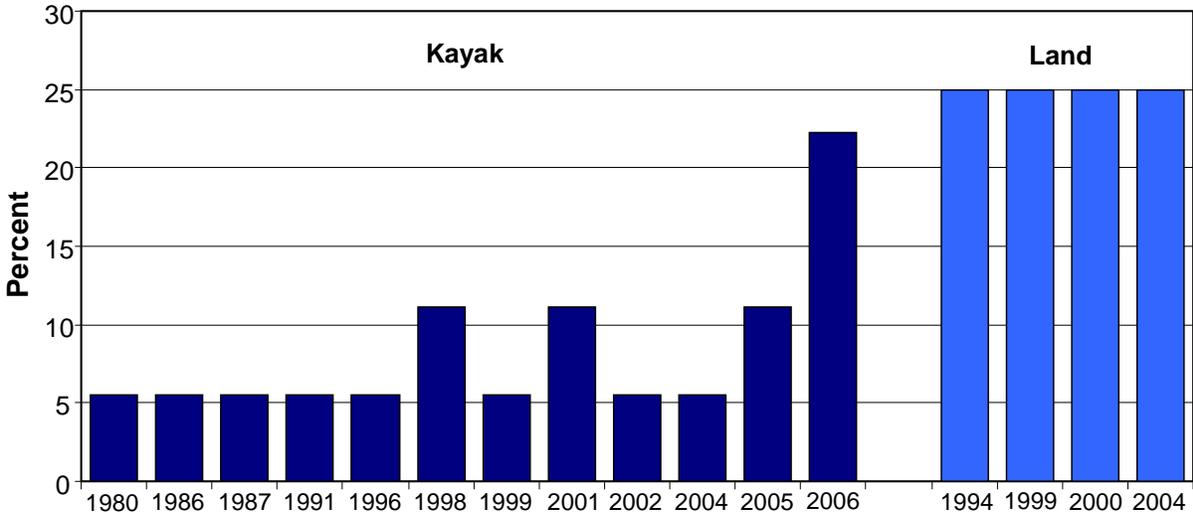


Figure 107. Entry year into industry by sector. The majority in the kayak sector entered in 2006. For the land industry, an equivalent number of individuals entered the industry in 1994, 1999, 2000, and 2004.

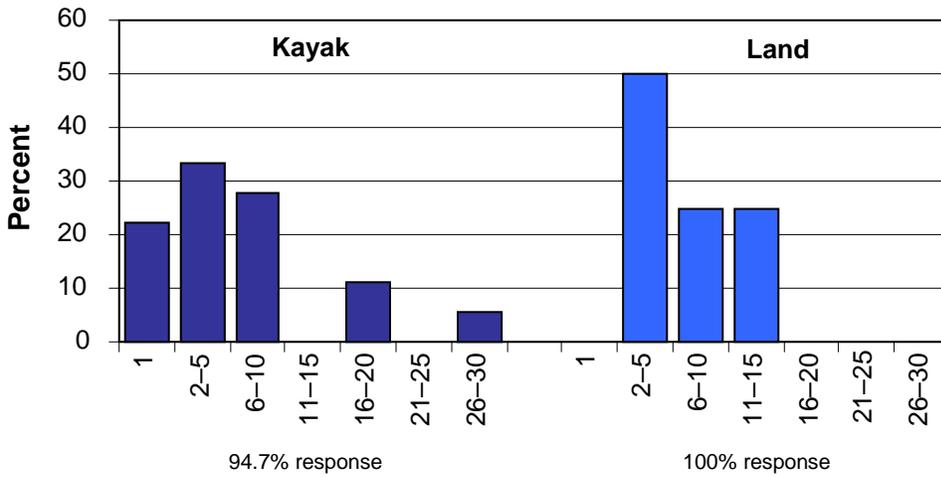


Figure 108. Tenure (years) by kayak and land sectors. Kayak sector results show 33.3% of participants had worked in the industry 2-5 years, followed closely by 27.8% at 6-10 years. Land sector results show 50% had worked in the industry for 2-5 years.

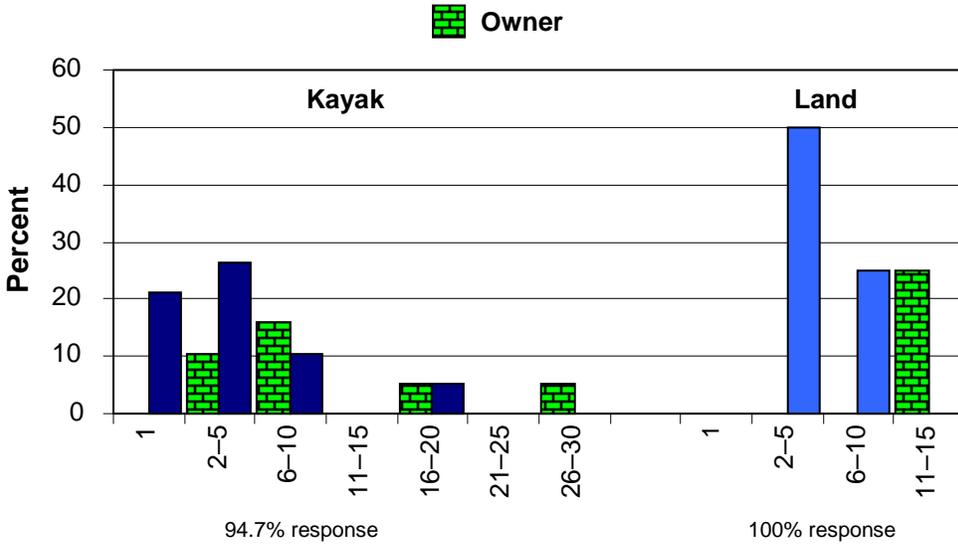


Figure 109. Tenure (years) by owner and non-owner by kayak and land sectors. Most of those with high tenures in both sectors are owners.

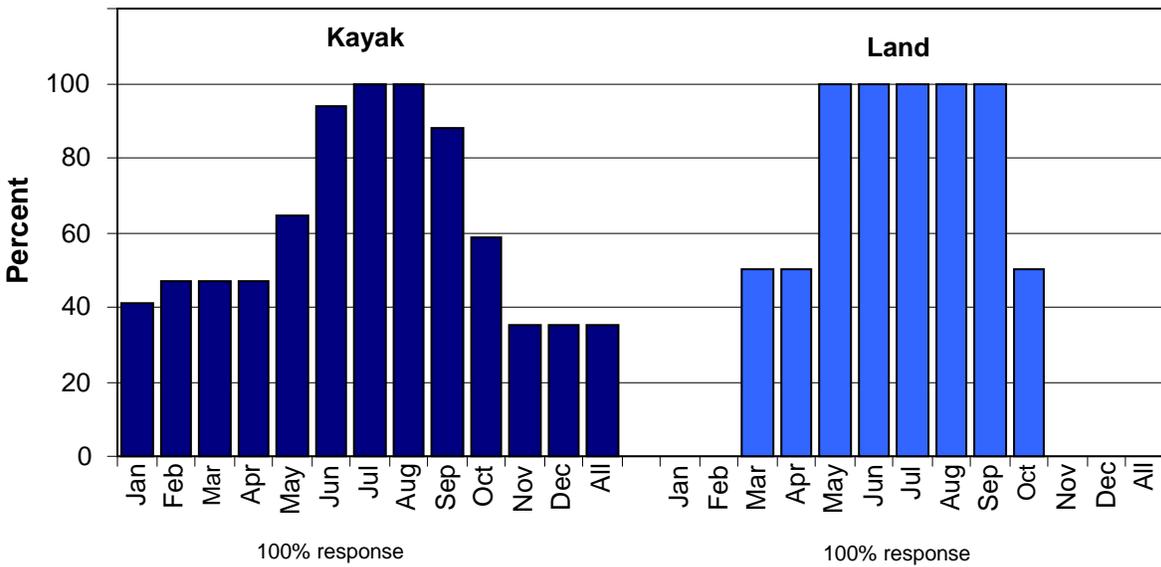


Figure 110. Months worked in the whale watching industry by kayak and land sectors. The results indicate a variation between sectors. The kayak sector shows greater participation June through September, while the land sector shows steady participation May through September.

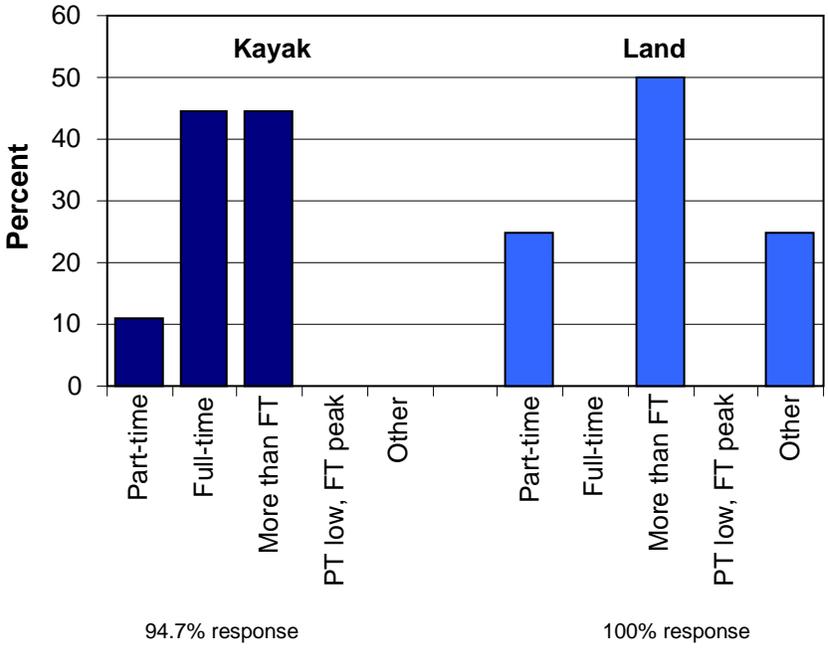


Figure 111. Work schedules by kayak and land sectors. Both show a large number of participants, 44.4% of kayak sector and 50% of land sector, work more than full-time (FT) schedules. Another 44.4% in the kayak sector also work full-time schedules.

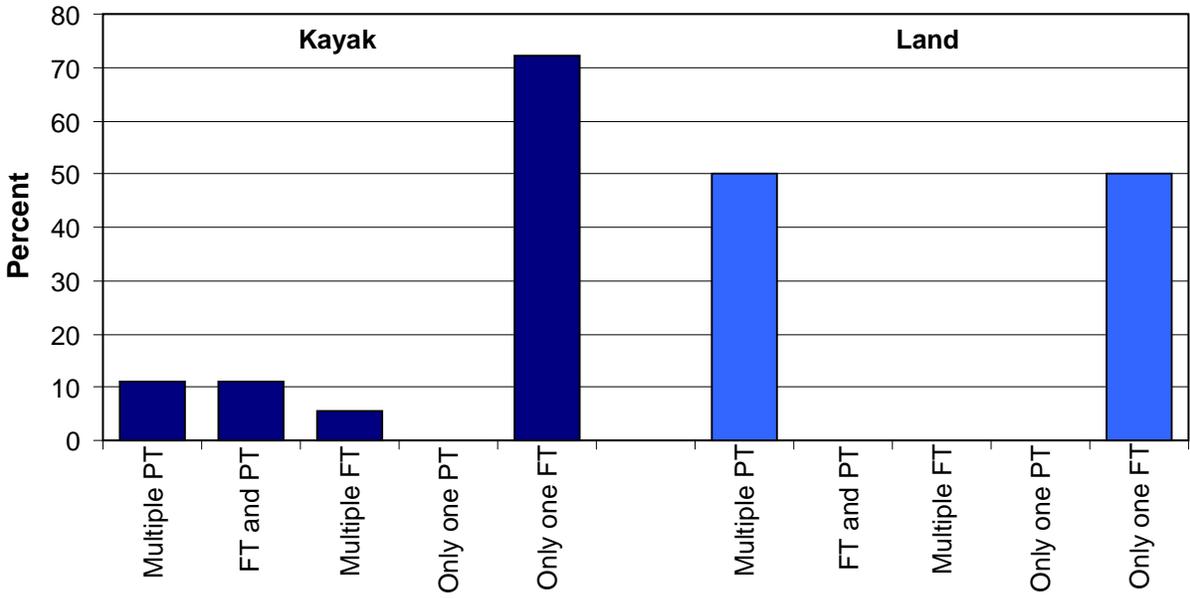


Figure 112. Percent of multiple jobs worked by kayak and land sectors. A majority of individuals in the kayak sector work one full-time (FT) position. Those in the land sector are evenly divided between working one full-time position and working multiple part-time (PT) positions.

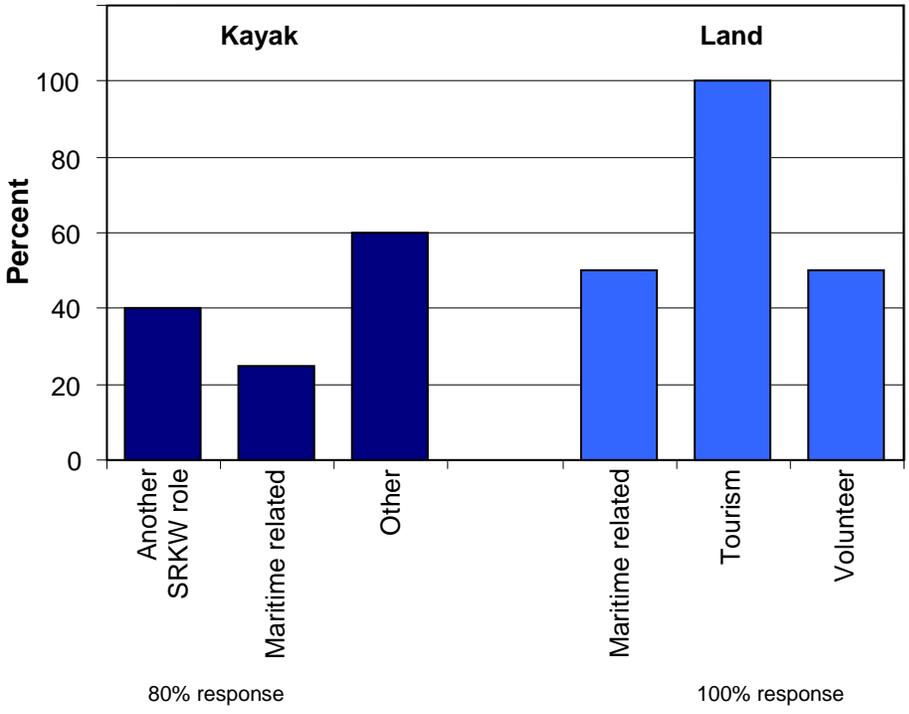


Figure 113. Other roles by kayak and land sectors. The response rate was dependent on those who acknowledged they worked multiple roles.

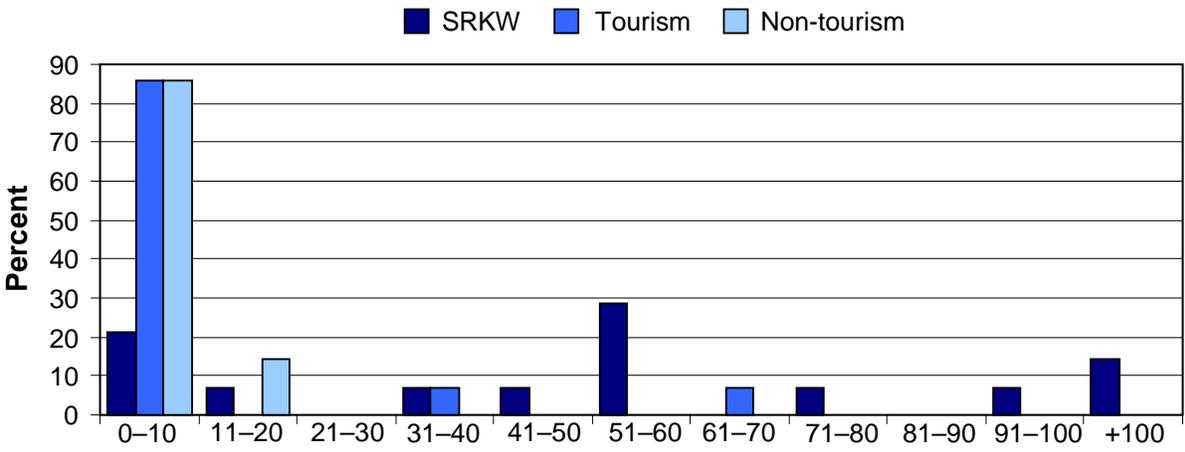


Figure 114. Number of hours worked for the kayak sector. Most individuals in the kayak industry work their hours in the SRKW watching industry with some working hours in tourism. The high number of hours reflects the types of tours that kayak companies provided.

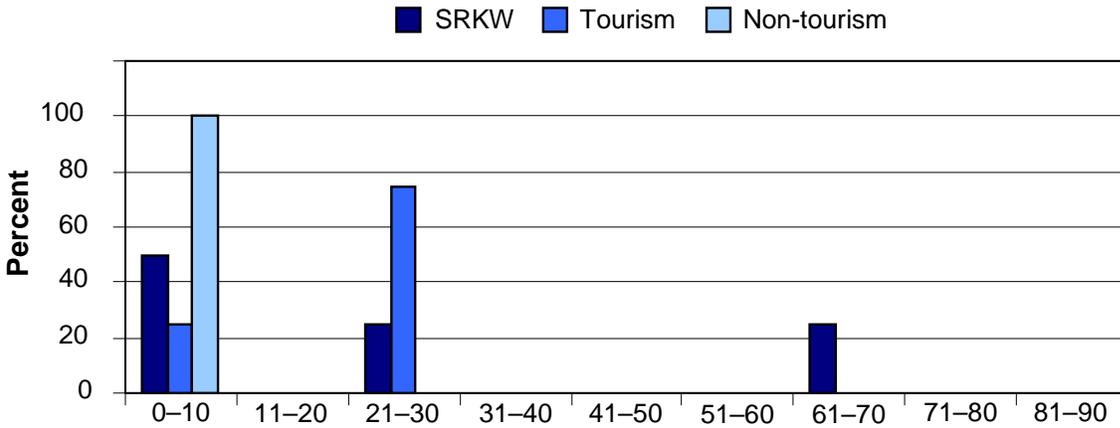


Figure 115. Number of hours worked for the land sector. For those reporting hours worked in the SRKW watching industry, 50% work 0–10 hours, 25% work 21–30 hours, and 25% work 61–70 hours. In addition, 75% of respondents work 21–30 hours per week in tourism positions.

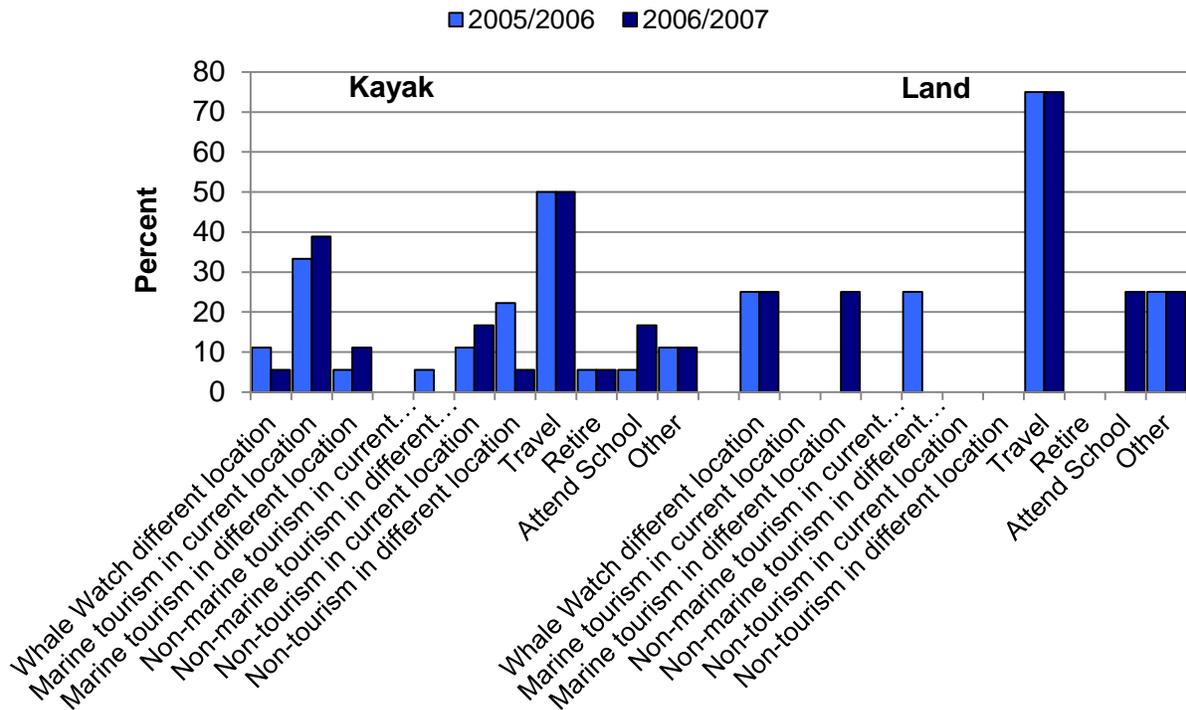


Figure 116. Off-season work by sector. In both sectors, the primary activity during the off-season is travel.

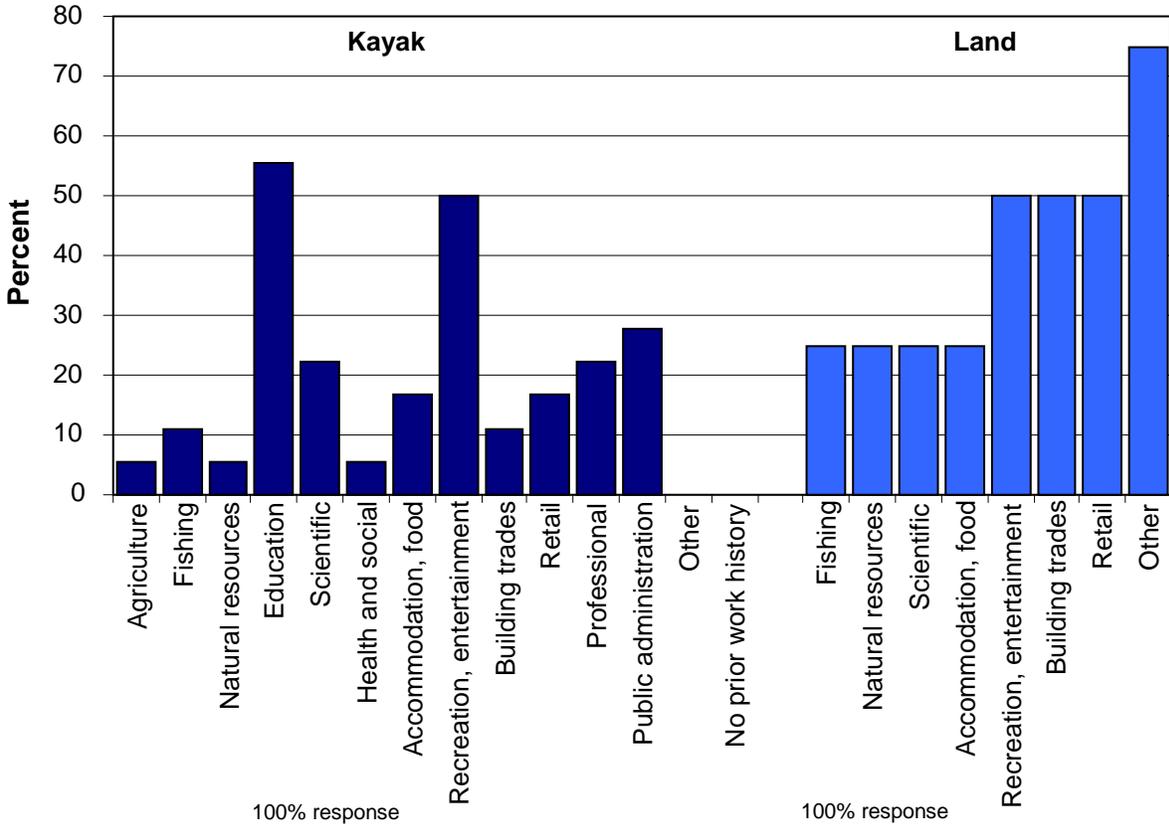


Figure 117. Past work history by kayak and land sectors.

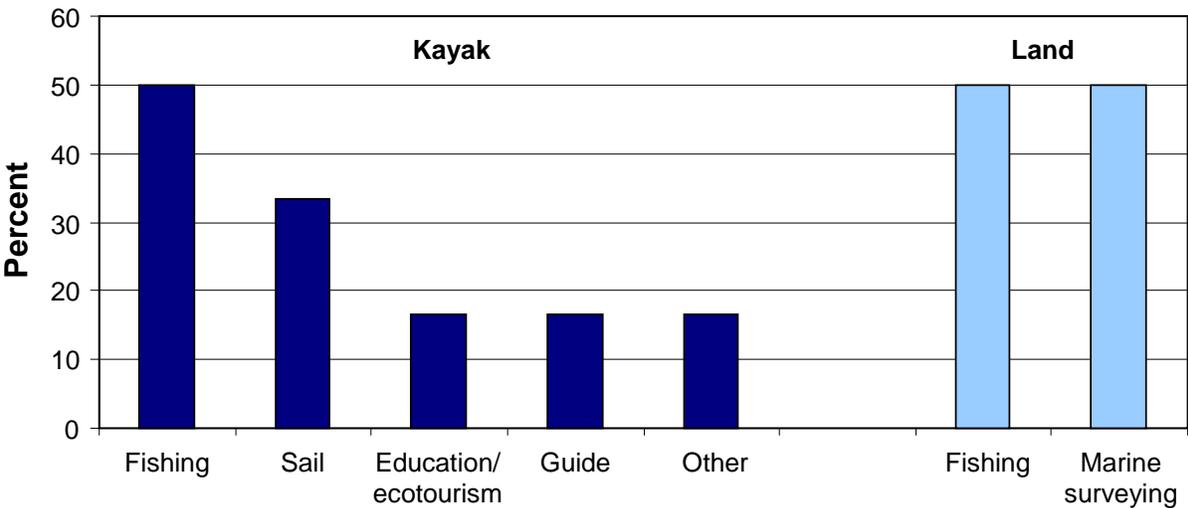


Figure 118. Maritime industry positions by kayak and land sectors.

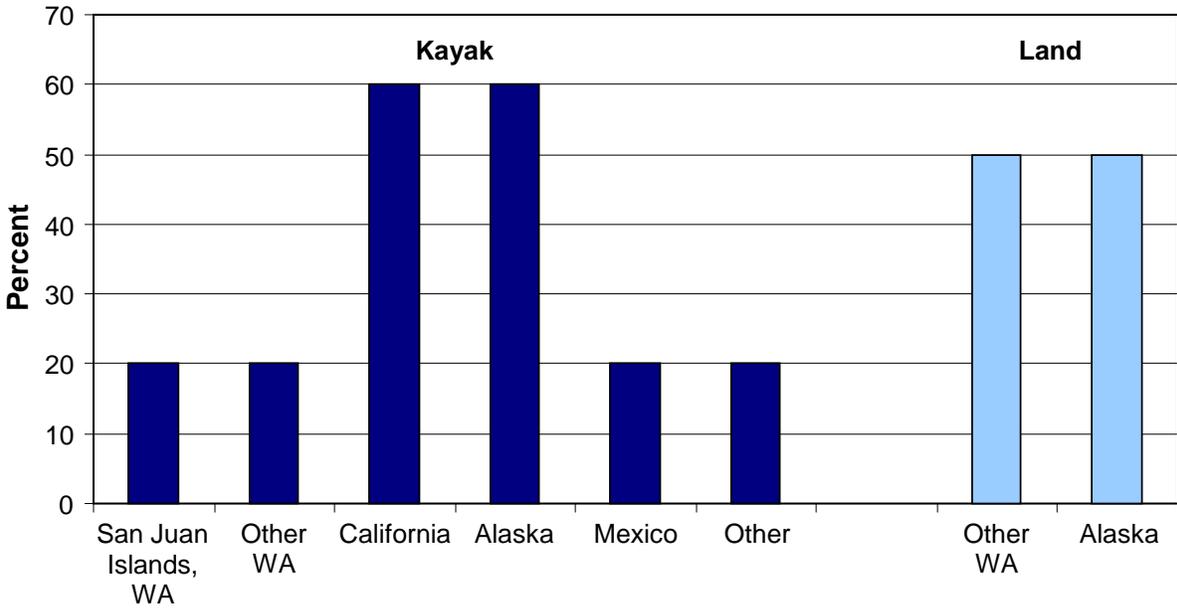


Figure 119. Locations where maritime positions are held by kayak and land sector participants.

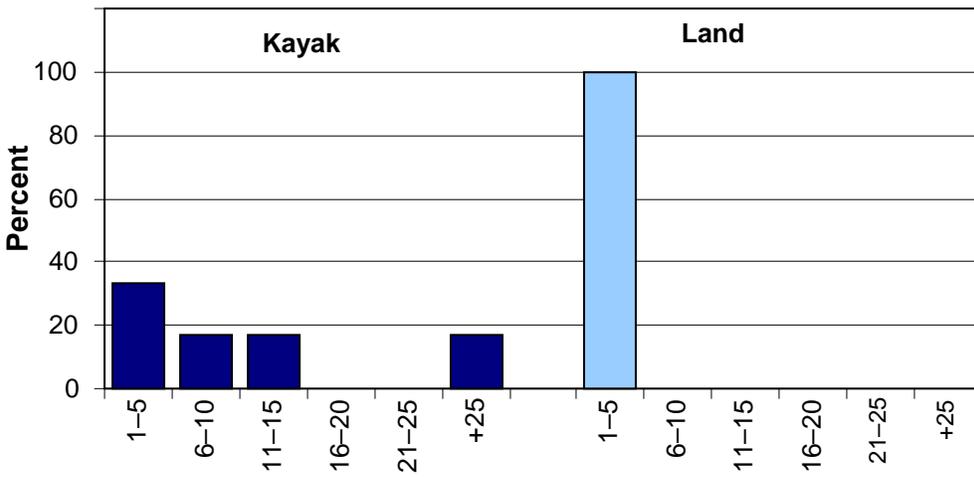


Figure 120. Number of years worked in maritime positions by kayak and land sector participants.

Table 22. Likert scale description of reasons to participate in the industry by kayak and land sectors (values in percent). Kayak sector results show that 77.8% of participants strongly agree they participated in the industry to work outside on the water, 70.6% strongly agree they participated to work in the region, and 66.7% to educate the public. Land sector results show that 50% of participants strongly agree that they participated in the industry to work in the region, educate the public, and spend time with the SRKWs.

	Make money	Transition to maritime	Work in region	Educate public	Interact with co-workers	Work outside on the water	Seasonal job	Spend time with SRKWs	Other
Kayak									
Strongly agree	44.4	12.5	70.6	66.7	44.4	77.8	16.7	38.9	16.7
Agree	27.8	—	17.6	27.8	33.3	11.1	16.7	22.2	83.3
Neutral	27.8	31.3	11.8	5.6	16.7	5.6	38.9	27.8	—
Disagree	—	37.5	—	—	—	5.6	22.2	5.6	—
Strongly disagree	—	18.8	—	—	5.6	—	5.6	5.6	—
Land									
Strongly agree	—	—	50.0	50.0	25.0	25.0	25.0	50.0	—
Agree	50.0	—	25.0	50.0	25.0	50.0	25.0	50.0	—
Neutral	50.0	33.3	25.0	—	25.0	—	25.0	—	—
Disagree	—	33.3	—	—	25.0	25.0	—	—	—
Strongly disagree	—	33.3	—	—	—	—	25.0	—	—

Kayak Sector and Land Sector Business Operations

Data in this section are not as complete as for the motorized vessel sector. Part of the reason for this is the different type of businesses involved. The kayak and land sectors are more flexible than the motorized vessel sector (e.g., trip data). Some companies did not have set schedules for daily trips, offering multiple daily trips with schedules that were on an as needed basis. It was often difficult to narrow down the number of tours offered per day. Therefore, abbreviated results are shown. Results were omitted where data were unavailable, too complex to sort out, or involved confidentiality issues.

Business Operations Summary

When asked to describe what types of tours were offered, participants in both sectors responded by defaulting to the basic tour description for the sector. For example, kayak sector respondents agreed (88% strongly applies) that the types of tours they offered were exclusive kayak tours, and land respondents indicated land-based whale watching tours (75% strongly applies) as the type they provided. In the kayak sector, the next highest agreement was for kayak tours where SRKWs were a focal point of the tour (33%). Land-based participants also described their tours as transit service and private charters (50% and 33% respectively). Trip data were very difficult to clarify using either survey data or secondary information, thus the number of trips offered per day was not provided.

We can confirm that kayak trips were offered in a suite of options including hourly trips, day trips, and multiday trips, but cannot determine the number of those trips offered. Some companies offered multiple hourly trips per day, but not at any given time frames during the day (i.e., more on a first-come, first-served basis). Most companies did set aside dates and times for multiday trips, but these trips could vary by month and were not offered on a consistent basis. We were able to address the duration of trips offered and how many companies provided the trips. The most common duration of trips offered daily was 3 hours; seven companies offered 21 such trips daily. The most common multiday trips were 3-day trips where seven companies offered 12 trips within a week's period of time.

Occupancy rate data vary between sectors. In both sectors, a majority of the respondents reported an occupancy rate of 71–80% during the peak seasons. However, in the kayak sector this was followed by an equivalent number of responses indicating occupancy rates of 81–90% and 91–100%. Land sector respondents had an equivalent number of responses indicating occupancy rates of 31–40% and 51–60%.

Data regarding additional commercial activities conducted outside the SRKW watching industry show a majority of kayak companies did not conduct additional commercial activity.

The land sector shows the reverse, where a majority of respondents acknowledged additional commercial activity. Such additional commercial activity in the kayak sector that did occur happened year-round or during the peak season. In the land sector, the additional activities occurred during the peak and low seasons.

An interesting piece of information learned from the kayak sector interviews is limitations on when participants can operate based on the weather and seasons. Where other sectors have weather and seasonal limitations, they still have a longer season due to the vessels or buses they use, which can safely operate in some rain or other poor weather conditions. This is not the case for the kayak sector, which is unable to extend operating seasons further into the shoulder seasons.

Business Operations Figures

The six figures listed here are sequentially provided below.

Figure 121. Tour description.

Figure 122. Percent of activity dedicated to SRKW viewing.

Figure 123. Estimated number and duration of trips for the kayak sector.

Figure 124. Percent occupancy.

Figure 125. Percent of additional commercial activities conducted by sector.

Figure 126. Seasons in which additional commercial activities occurred.

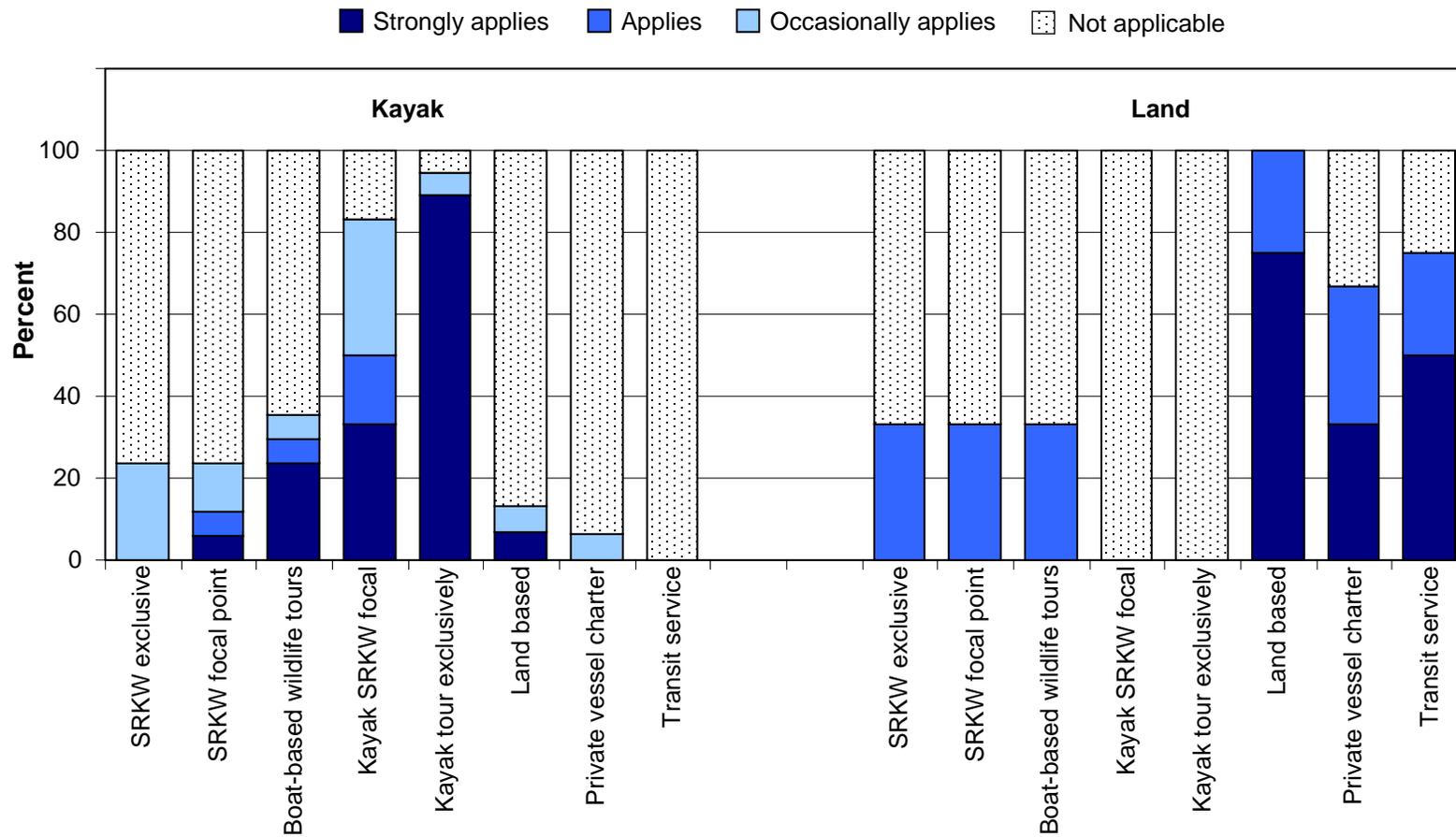


Figure 121. Description of whale watching tours provided by kayak and land sectors. Several kayak companies used motorized vessels to transport their kayakers to more remote areas for tours. Therefore, the selection of boat tours is reflected in the data. As the question did not provide the option to select a private vehicle charter or a more specific description for the land companies, the selection of the private vessel charter referred to chartering a bus for a tour. Responses indicate the highest levels of agreement with tour types reflecting the sector. In the kayak sector, 88.9% of responses (strongly applies) described tours as kayak tours exclusively. Similarly in the land sector, 75% selected strongly applies while the remaining 25% selected applies when describing their tours and land-based whale watching tours.

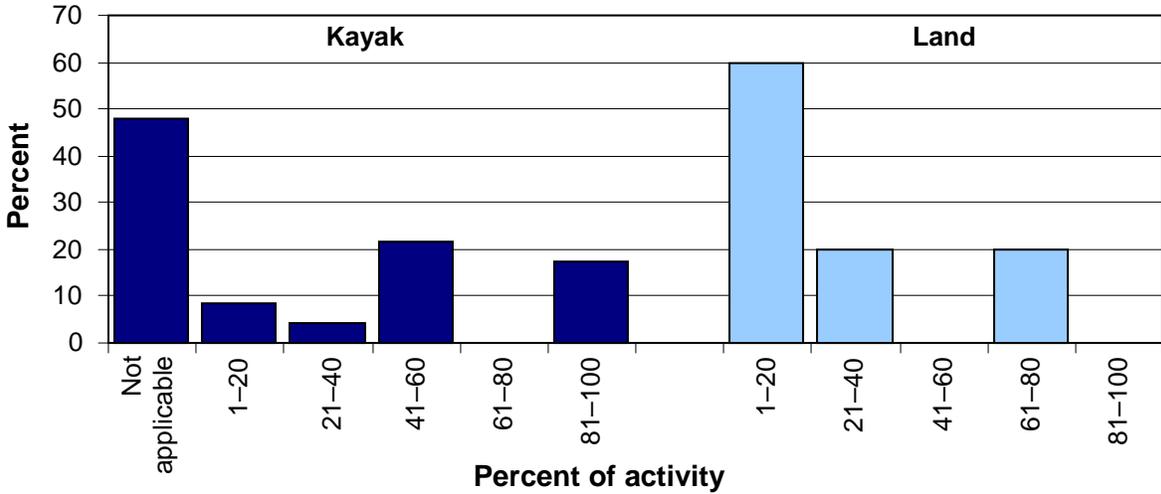


Figure 122. Percent of company tour activity dedicated to SRKW viewing by sector. Kayak sector results show a majority, 47.8%, did not associate their tours with dedicating time to SRKW viewing. Land sector results show 60% of responses dedicated 1-20% of their tour activity to SRKW viewing.

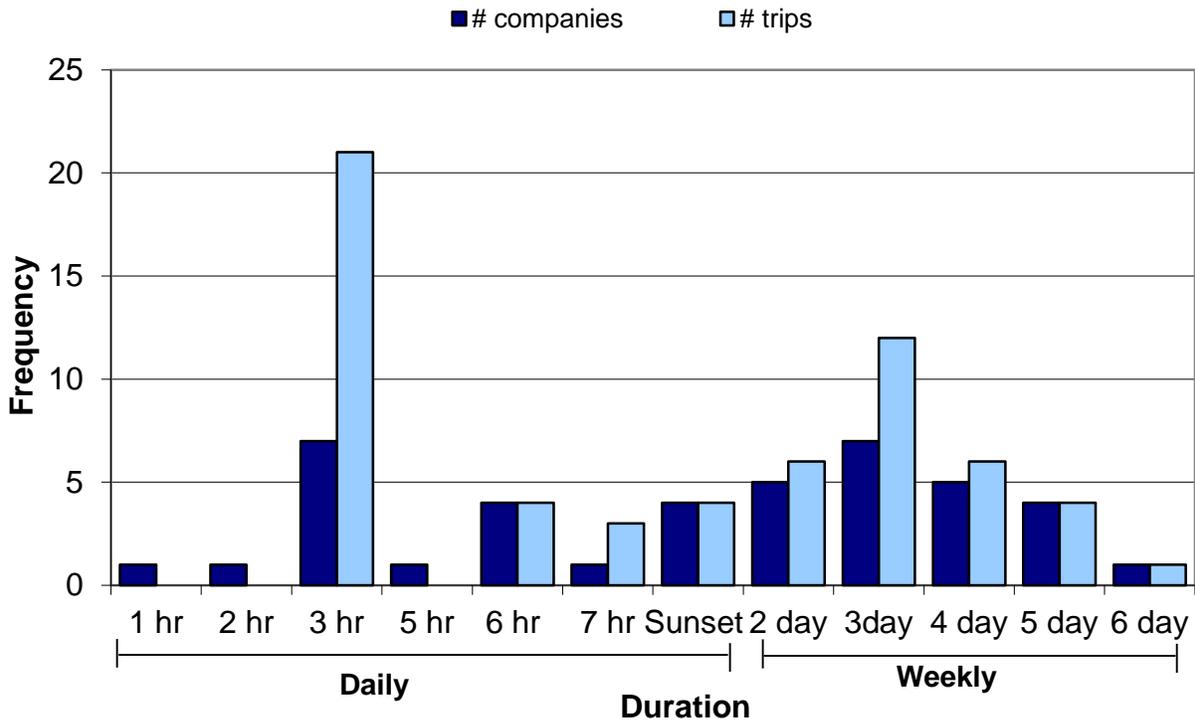


Figure 123. Estimated number and duration of trips for the kayak sector based on secondary data. Kayak trip data are very complex and variable. These data reflect the best estimate for the number of trips offered by the kayak companies both in the San Juan Islands and the mainland. In addition, the hourly trips were daily and the multiday trips were weekly. The majority indicates seven companies offered 21 each 3-hour daily trips and the next closest majority indicates seven companies offered 12 each 3-day trips weekly.

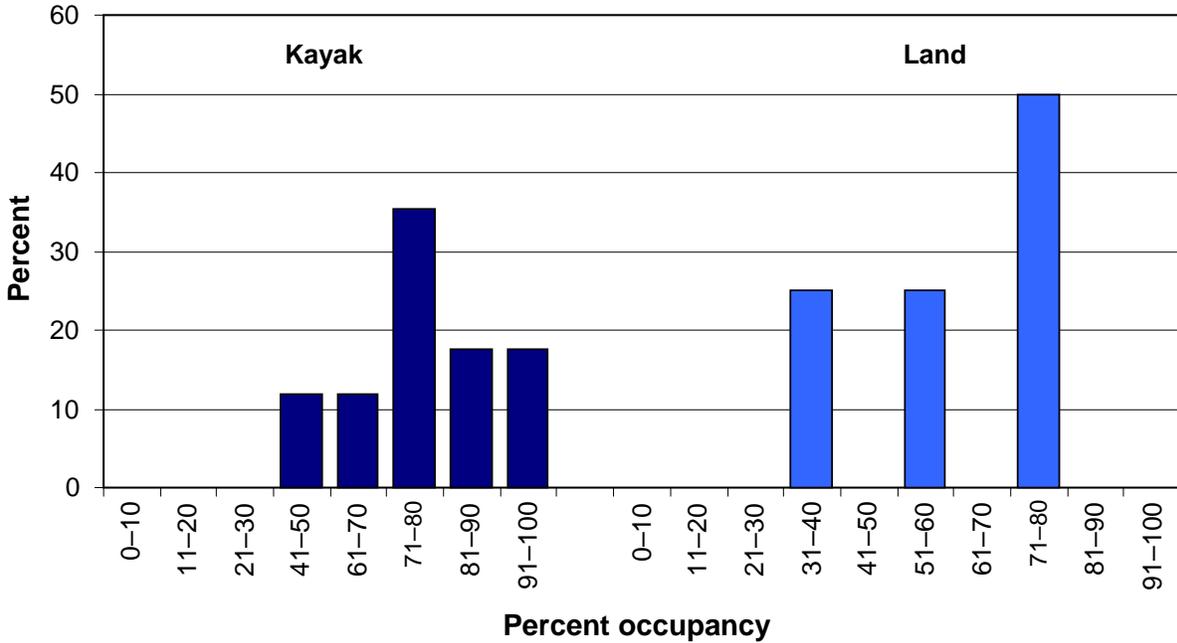


Figure 124. Percent occupancy for the peak season by kayak and land sectors. The results show that 35.3% of kayak sector respondents reported a 71–80% occupancy rate and 50% of land sector respondents reported a 70–80% occupancy rate.

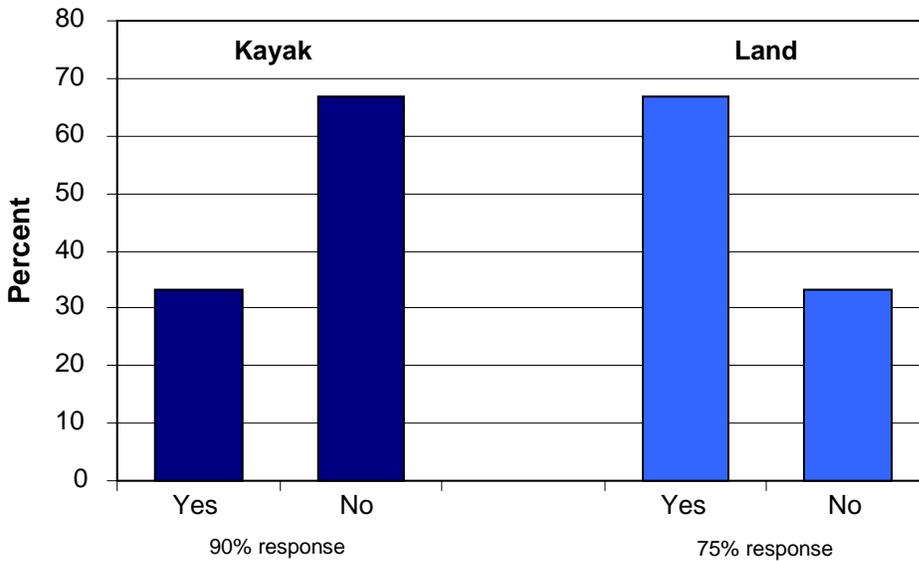


Figure 125. Percent of additional commercial activities by sector. The kayak sector results show 66.6% did not use the vessels (kayaks) for additional commercial activities, while the land sector was the reverse, reporting 66.6% did use their vessels (vans) for other commercial activities. In the kayak sector, additional activities were described as kayak lessons/instruction and other non-SRKW-related tours. For the land sector, other commercial activities were described as transit services, charters, and other tours.

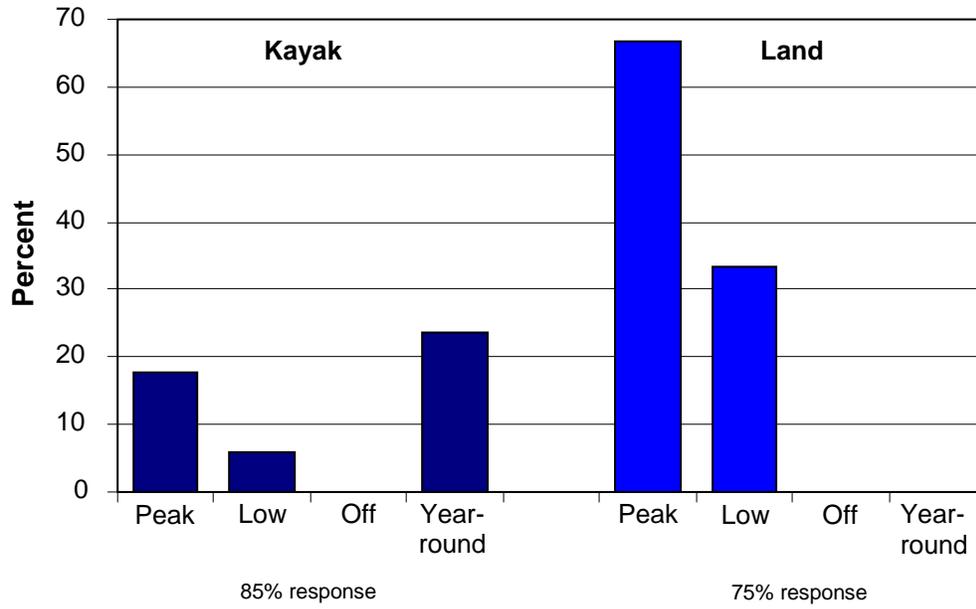


Figure 126. Seasons in which additional commercial activities were conducted by sector. For those participants who indicated commercial activity occurs, the results show when the services were conducted.

SRKW Watching Industry Trends

Trends Summary

To better understand the history of the industry, a section of the survey was devoted to questions concerning trends in the industry over time. A caveat to these data is reflected in the response rates. Many individuals felt they did not have the knowledge to answer these questions, which can be matched to the large number of individuals who had recently entered the industry. As a result, response rates were lower. However, as the results reflected the responses of those individuals who had greater tenure in the industry, responses were considered to be less biased and more accurate. Note that data presented here are analyzed by all responses of survey participants and are not further aggregated by sector or region.

Respondents were asked to indicate whether owners had expanded their operations to include other SRKW viewing opportunities. Of the 36% who said owners had expanded their SRKW viewing opportunities; 54.2% noted expansion into kayaking and 29.2% indicated expansion into “other” categories. Examples of other categories include viewing other whale species, other geographic locations, and contacts with other companies to operate tours. These responses were supported in the next question, which asked participants whether owners had expanded operations into other wildlife viewing opportunities. Responses indicate that 89% had expanded into viewing other marine mammals, 78 % had expanded into viewing other whale species, and 76% had expanded into viewing whales. Overall, the results show owners taking the opportunity to expand their businesses.

Participants were asked to indicate what changes they had seen in vessels in the U.S. industry over time. Seventy-seven percent said vessels were faster, 75% reported a move to larger vessels, and 60.7% said vessels have increased their passenger capacity. Ownership structure questions show that 72.2% indicated owners were purchasing new boats, 61.1% said new owners were buying new boats, and 41.6% said new owners were absorbing existing boats.

The top three responses concerning vessel characteristics are: 77% said vessels were faster, 75% said vessels were larger, and 61% said vessels had a larger carrying capacity. These three changes appear to be the most significant observed by industry members. Other categories reflecting change were acknowledged at a much lower level.

Additional trends pursued include the number of vessels in the U.S. industry, tourism, the number of non-U.S. vessels in the industry, and the number of recreational vessels around SRKWs. Results were close concerning the number of U.S. vessels in the industry. The following results show an aggregate of the strongly agree and agree responses. The highest response, 45.2%, reported the number of vessels was growing, 45% said the number of vessels in the industry had reached a saturation point, and 38.6% agreed that the number of vessels was stable. There was strong agreement that the number of tourists was growing as of the study year

of 2006. The converse was also true, with 71% disagreeing that the number of tourists was declining. An aggregate of the agreement responses shows 62% agreed the number of non-U.S. vessels was growing, while 66.3% disagreed it was declining. In aggregate (sum of disagree and strongly disagree), 66.3% of respondents disagreed that the number of recreational vessels was declining. Combined with a 55.3% agree aggregate response that the number of vessels was growing, this suggests an increase in the number of recreational vessels around SRKW's.

Trends Figures

The eight figures listed here are sequentially provided below.

Figure 127. Expanded SRKW viewing opportunities by industry members.

Figure 128. Expanded viewing opportunities to include other wildlife by the industry.

Figure 129. Changes in the ownership structure in the SRKW watching industry.

Figure 130. Changes in SRKW watching industry vessels.

Figure 131. Perceived change in the number of vessels in the U.S. SRKW watching industry.

Figure 132. Perceived change of tourists in the SRKW watching industry.

Figure 133. Perceived change in the number of non-U.S. vessels in the industry.

Figure 134. Perceived change in the number of recreational vessels around the SRKW's.

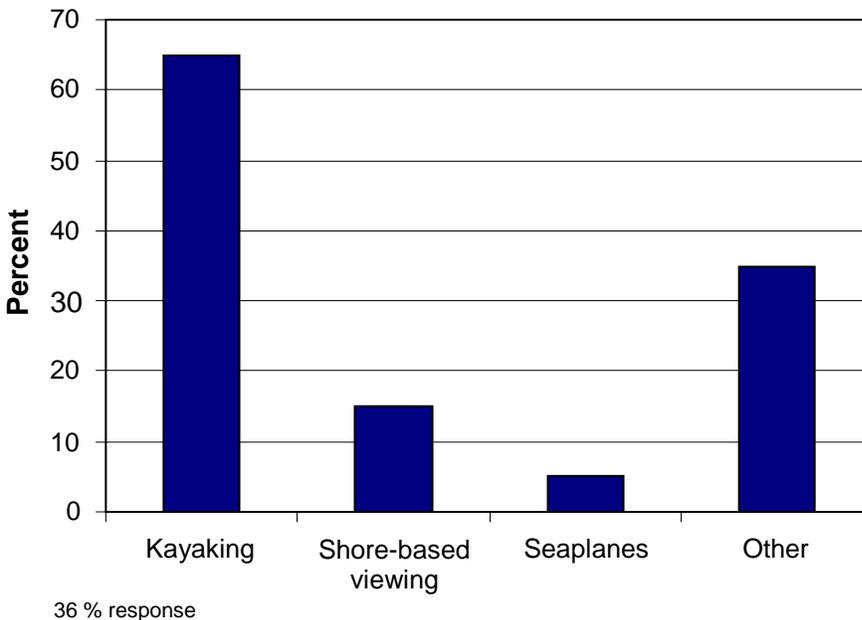


Figure 127. Expanded SRKW viewing opportunities by industry members. This question did not clarify in which season the expanded opportunities occurred. When asked whether owners of companies had expanded other SRKW viewing opportunities, 36% said they agreed with the statement. The response rate is based on the 36% of those who agreed that viewing opportunities had expanded.

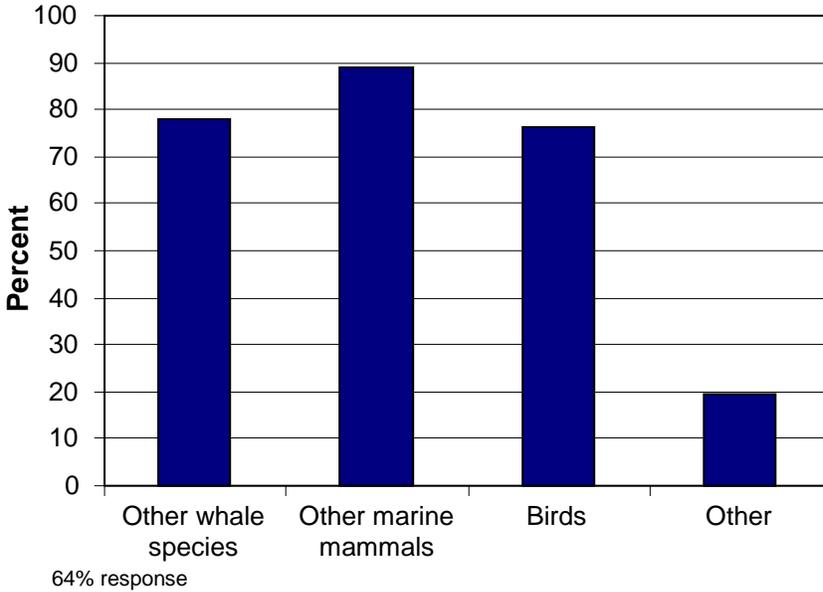


Figure 128. Expanded viewing opportunities to include other wildlife by SRKW watching industry members. When asked whether owners expanded their operations to include the viewing of other wildlife, 65% of respondents agreed. The response rate is based on the 64% of respondents who agreed that expanded wildlife viewing occurred.

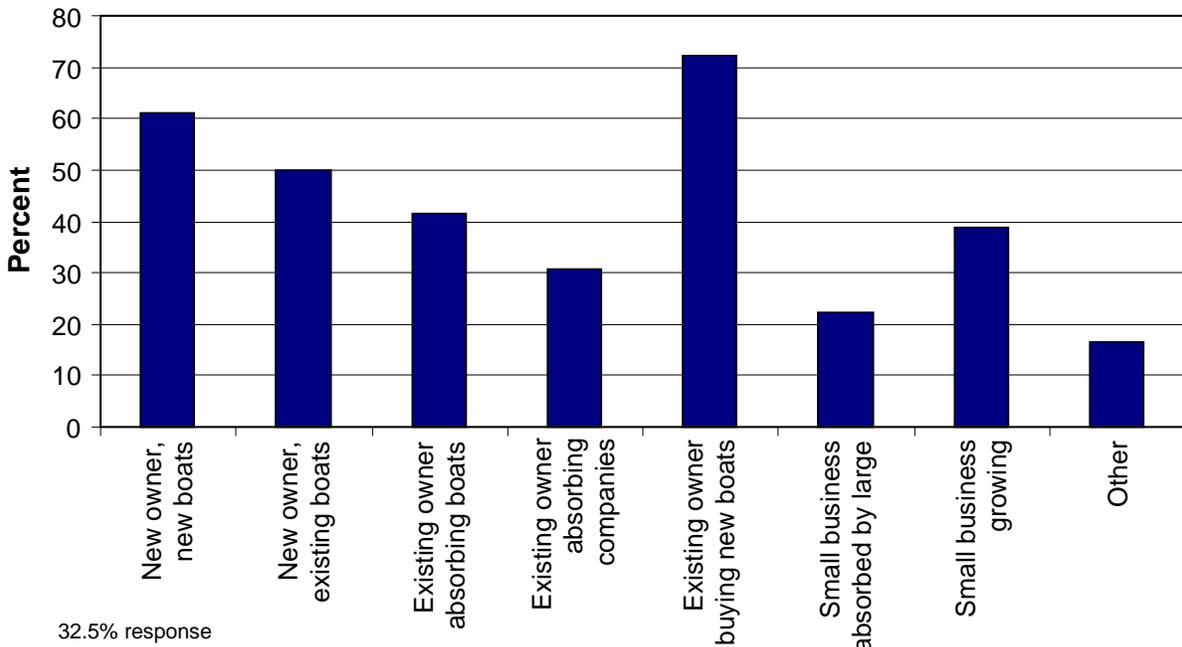


Figure 129. Changes in the ownership structure in the industry. Regarding ownership structure, 31.5% of respondents agreed that changes had occurred. Most respondents, 72.2%, said existing owners were buying new boats. This was followed by 61% saying new owners were entering with new boats and 50% saying new owners were entering the industry and purchasing boats that were already in the SRKW fleet. The response rate is based on the 31.5% of the respondents who agreed that changes had occurred.

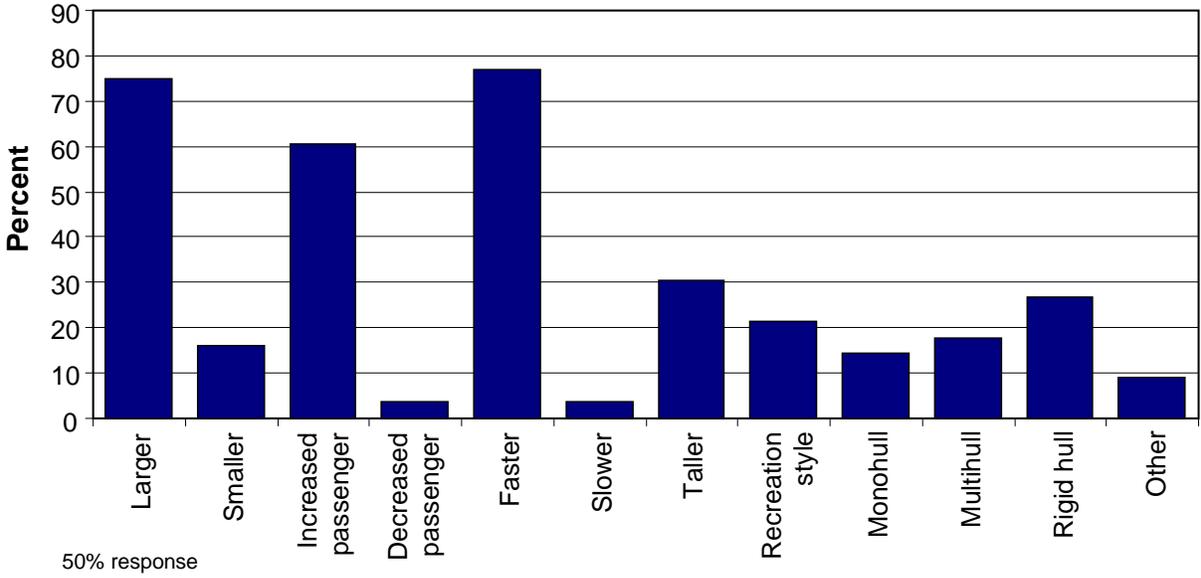


Figure 130. Changes in the SRKW watching industry vessels. When asked whether the general size and type of vessel in the U.S. industry had changed, 50% of respondents agreed. A large majority, 76.8%, said vessels were faster, 75% said vessels were larger, and 60.7% said they had increased passenger capacity. The response rate is based on the 50% of respondents who agreed that changes had occurred in the vessel characteristics of the industry.

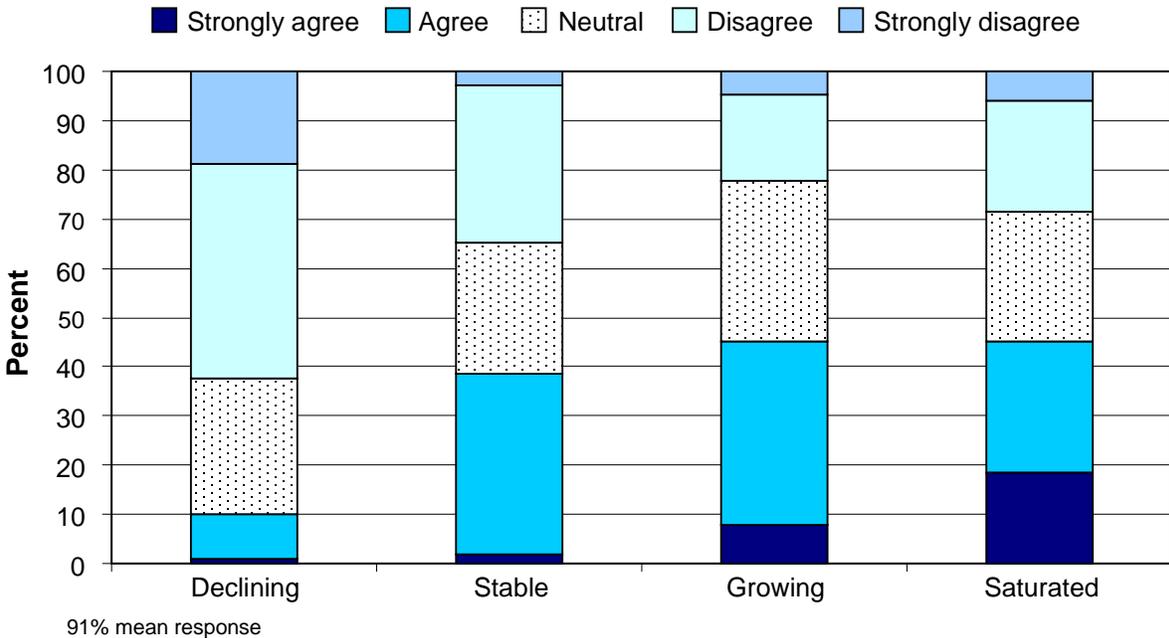


Figure 131. Perceived change in the number of vessels in the U.S. SRKW watching industry. A majority of responses agreed that the number of vessels were either stable or growing—36.6% and 37.5%, respectively—which concurs with the number of responses that disagreed that the number of vessels were declining (44%).

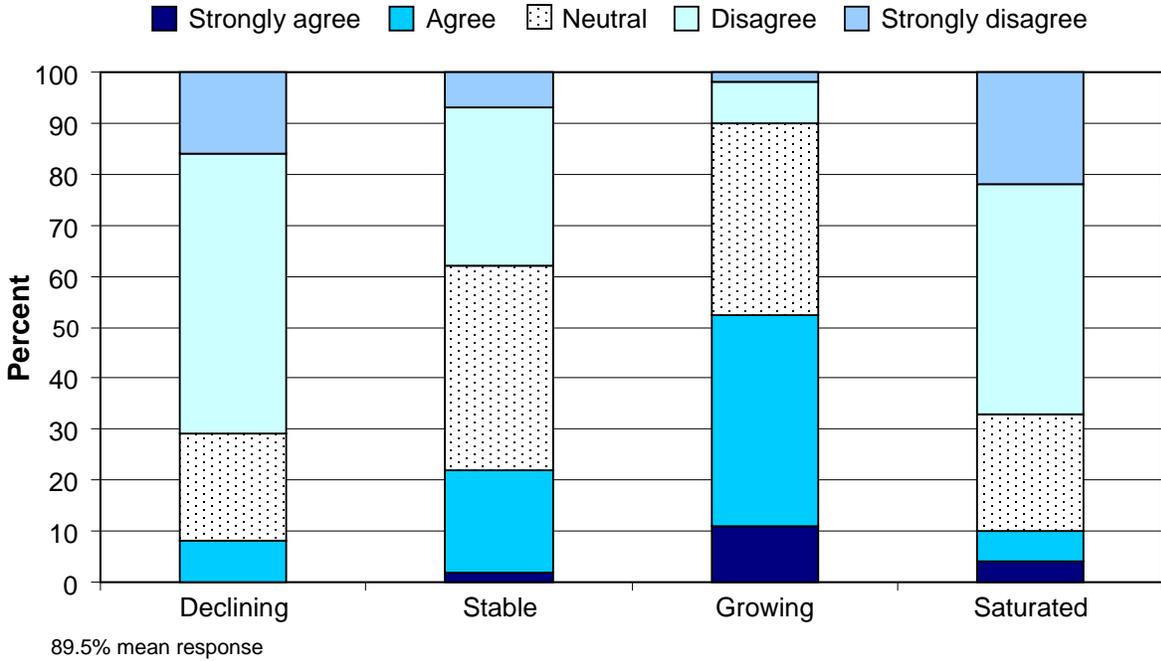


Figure 132. Perceived change in tourists in the SRKW watching industry. The results show 40% of respondents reported a relatively neutral response that the number of tourists were stable and 42% agreed that the number of tourists was growing.

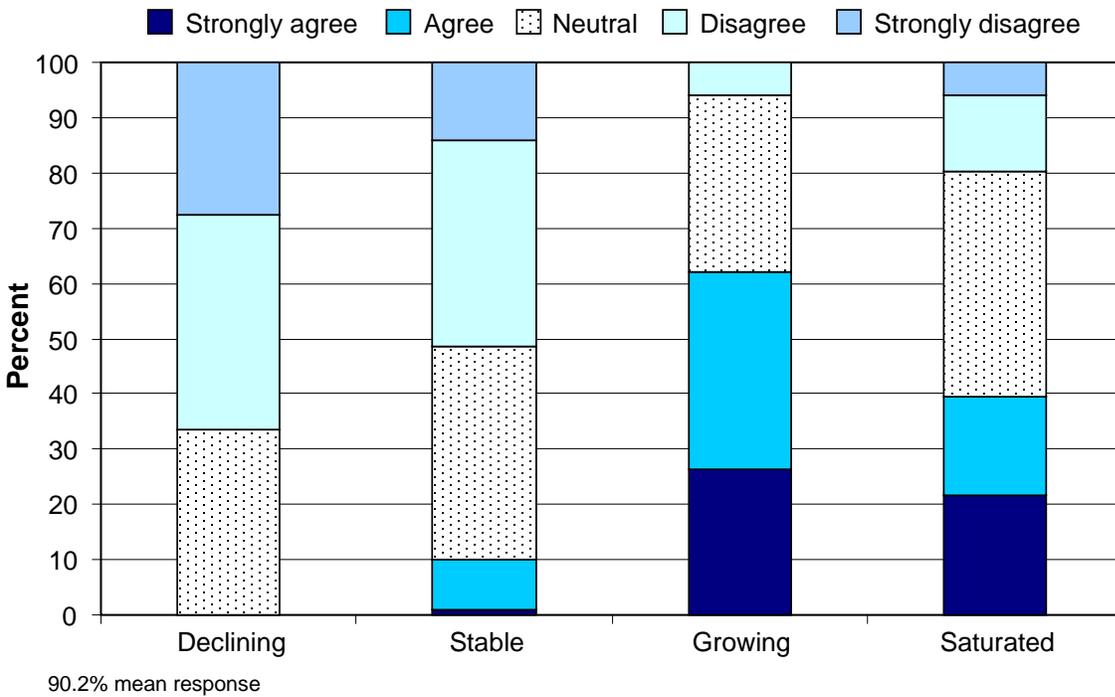


Figure 133. Perceived change in the number of non-U.S. vessels in the SRKW watching industry. The results show 38.4% of responses were neutral, indicating the number of non-U.S. vessels was stable.

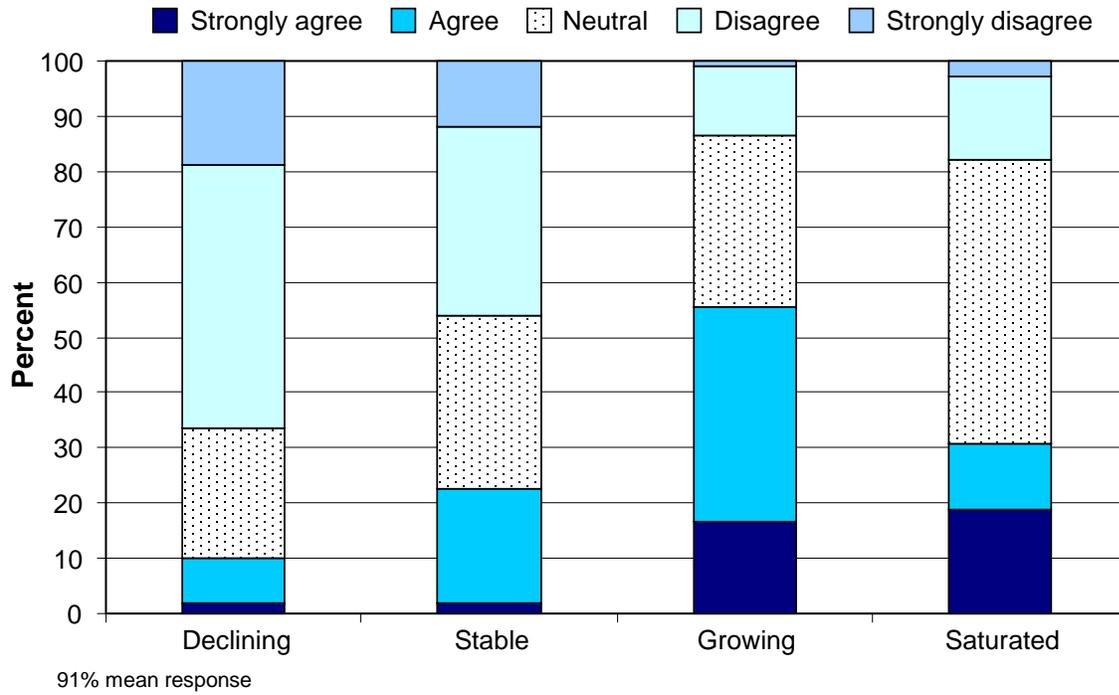


Figure 134. Perceived change in the number of recreational vessels around the SRKWs. Many respondents (39%) agree that the number was growing around the SRKWs and 47.5% disagree that the number was declining.

Effects on the Community

Effects Summary

The commercial industry is intricately linked to a physical place and can have impacts on the local community where the business is based or operates. The line of questioning in this section aimed to achieve a preliminary understanding of the connectivity of the industry with the related communities. While this is an area that could be a study on its own, in conjunction with the goals of this research, the line of questioning is intentionally exploratory.

Tourism industries are often highly linked with various connections between different players in the industry. When asked whether the companies the participants own or work for had partnerships with other members of the tourism industry, a majority of respondents acknowledged memberships with the local chambers of commerce, followed by partnerships with vacation resorts and other tourism companies. When asked where the partnerships occur, an overwhelming majority of respondents said they occur locally, followed by regionally and within Washington state.

Participants were also asked what type of shore support services they used. It is important to clarify for this question that respondents were given the opportunity to provide information for up to three vessels. Where multiple vessels were acknowledged, they were either multiple vessels within the same company that conducted whale watching tours or multiple vessels with different companies where the respondent worked for different companies. The distinction in the data analysis was not pursued, as the results did not alter dramatically. It was thought that no distinction was evident, as the vessels that were indicated as secondary and tertiary for some participants were primary vessels for others. Therefore, they are already represented in the data set. However, the information is provided here for clarification purposes. The graph showing the results for this question represents the aggregate for all three vessels. As seen in the graph, results comparing each vessel vary slightly but maintain consistency in the categories. Here, the focus is on the first vessel as a representation of the data set. Results show the primary shore support service was fuel, followed by graphics/printing services, and both Web/computer services and office or rental space.

A supplemental question asked where these shore services occur. The locations are specifically correlated to the home port of the vessel or the operational port. It was noted that for some vessels, the home port and operational port were the same, but for others they were different. Results indicate that 48.2% of respondents obtained 76–100% of the shore services in the vessel's home port and 23.2% of respondents obtained 76–100% of their services in the vessel's operational port.

Additional analysis in this section is qualitative in nature and consequently represented in a different organization. Three questions were asked. The first and second were on the

significance of the whale watching industry to the local community and the general public. The third question sought additional comments on the importance and unique characteristics of the industry. The results for these questions were analyzed and sorted into themes and subthemes, supplemented by examples of the responses.

Responses to the question of the industry's significance to the local community resulted in the identification of three main themes and multiple subthemes under each theme. The themes are tourism with 119 occurrences, education with 34 occurrences, and local/local community with 28 occurrences. Frequencies of themes and subthemes are provided in Figure 139, which is followed by a qualitative data description and exemplary excerpts of responses.

Responses to the question of the industry's significance to the general public resulted in the identification of four main themes and multiple subthemes under each. The themes are SRKWs with 20 occurrences, education with 88 occurrences, tourism with 18 occurrences, no impact with 7 occurrences, nature with 9 occurrences, and economy with 6 occurrences. Frequencies of themes and subthemes are provided in Figure 140, which is followed by a qualitative data description and exemplary excerpts of responses.

Responses with additional comments resulted in the identification of two main themes and multiple subthemes under each. The themes are industry with 26 occurrences and education with 18 occurrences. Frequencies of themes and subthemes are provided in Figure 141, which is followed by a qualitative data description and exemplary excerpts of responses.

Effects Figures

The seven figures listed here are sequentially provided below. The last three are each followed by a qualitative data description and exemplary excerpts of responses.

Figure 135. Partnerships with other tourism entities.

Figure 136. Location where partnerships with other tourism entities occurred.

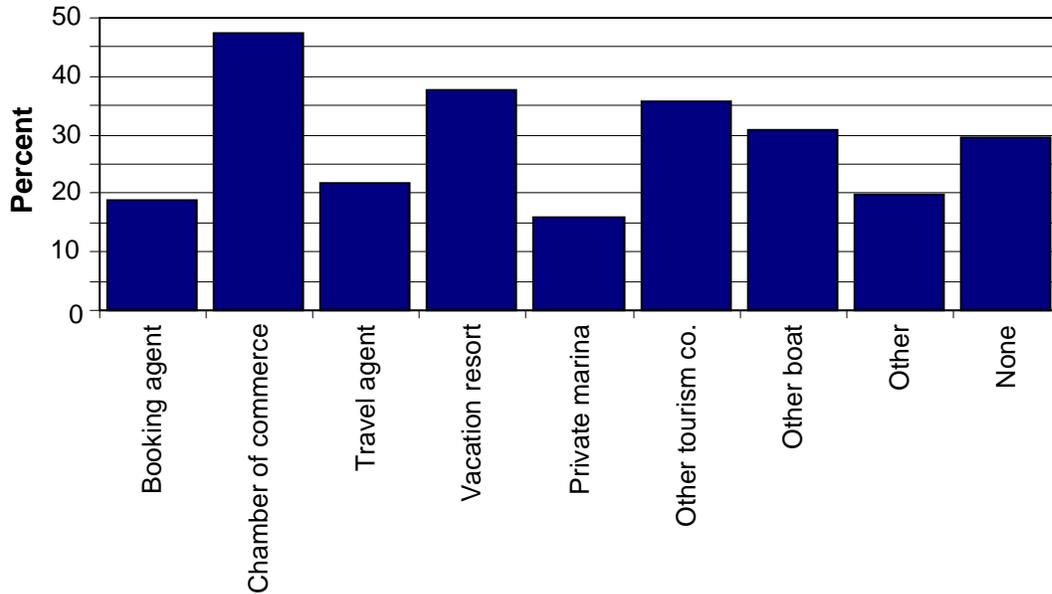
Figure 137. Description of shore support services.

Figure 138. Location of shore support services by percent.

Figure 139. Significance of the SRKW watching industry to the local community.

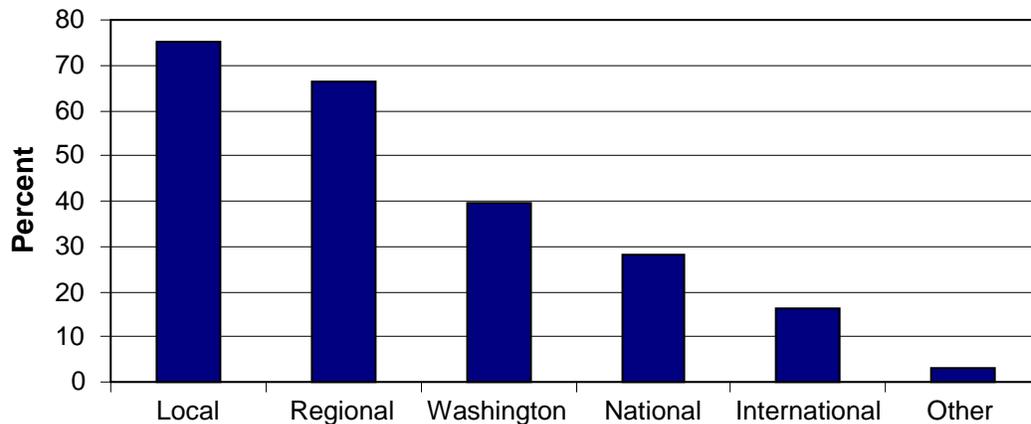
Figure 140. Significance of the SRKW industry to the general public.

Figure 141. Additional comments regarding the importance of the industry.



90.2% response

Figure 135. Types of partnerships with other tourism entities. The top three responses show 47.5% acknowledged membership in a chamber of commerce, 37.6% had partnerships with vacation resorts, and 35.6% had partnerships with other tourism companies.



60.7% response

Figure 136. Location where partnerships with other tourism entities occurred. Responses indicate the majority of partnerships, 75%, occurred in the local areas, 66.2% occurred in the region, and 40% occurred in Washington state.

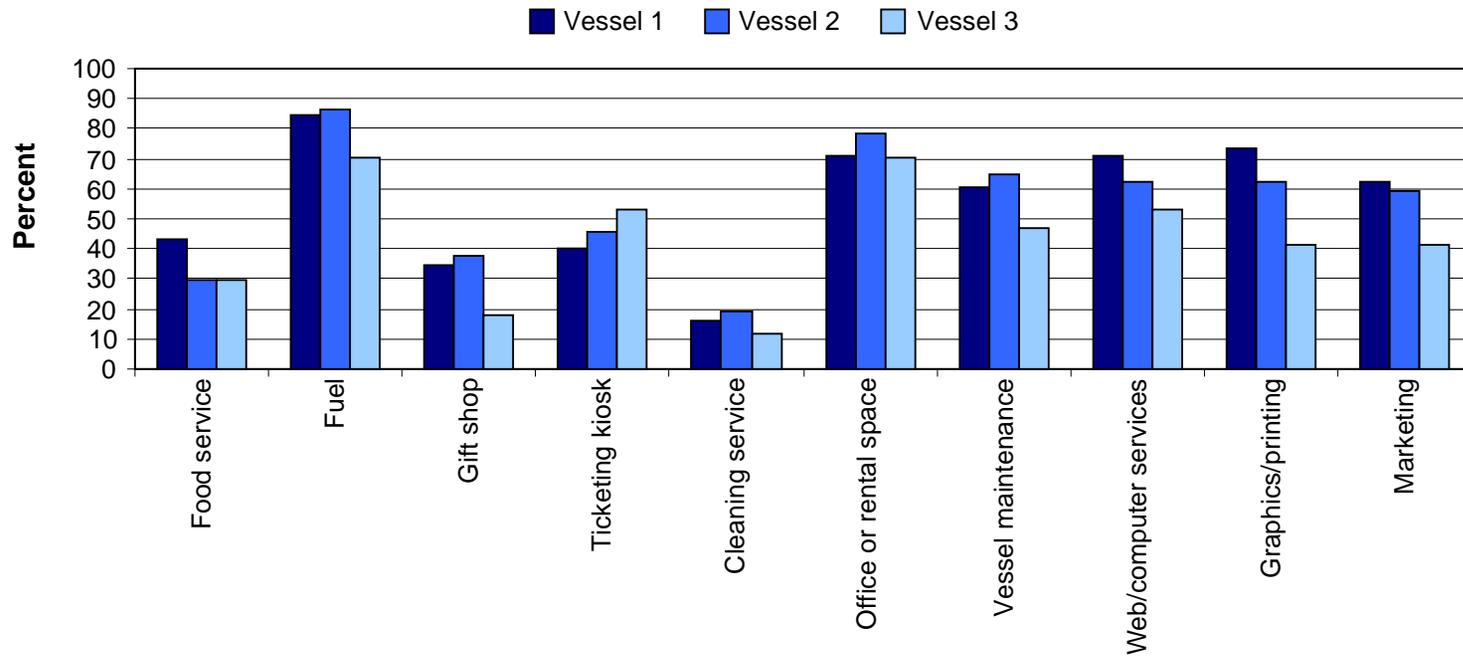


Figure 137. Shore support services described and sorted by the first, second, and third vessels. Note that the multiple vessels can represent either multiple vessels a single company owned and operated in the industry or multiple vessels that a single individual worked on across multiple companies. Responses indicate that 84.8% accessed fuel services, 73.7% used graphics/printing services, 70.7% used Web/computer services, and 70.7% had office or rental space.

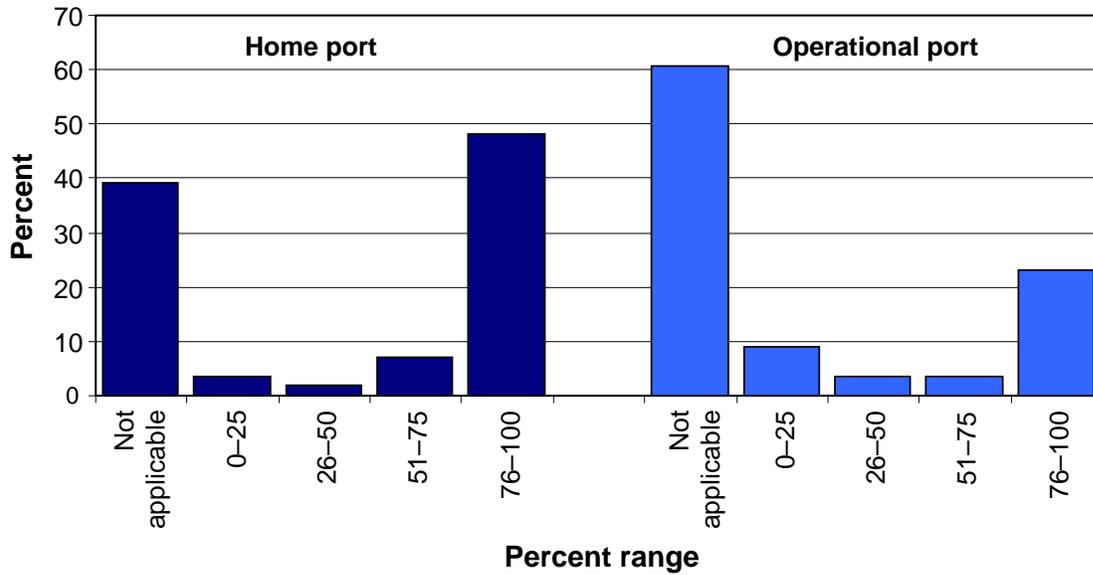


Figure 138. Location of shore support services by percent. Responses for the home port show 48.2% used shore services in the home port of the vessel 76–100% of the time. Responses for the operational port indicate 23.2% used shore services in the operational port 76–100% of the time.

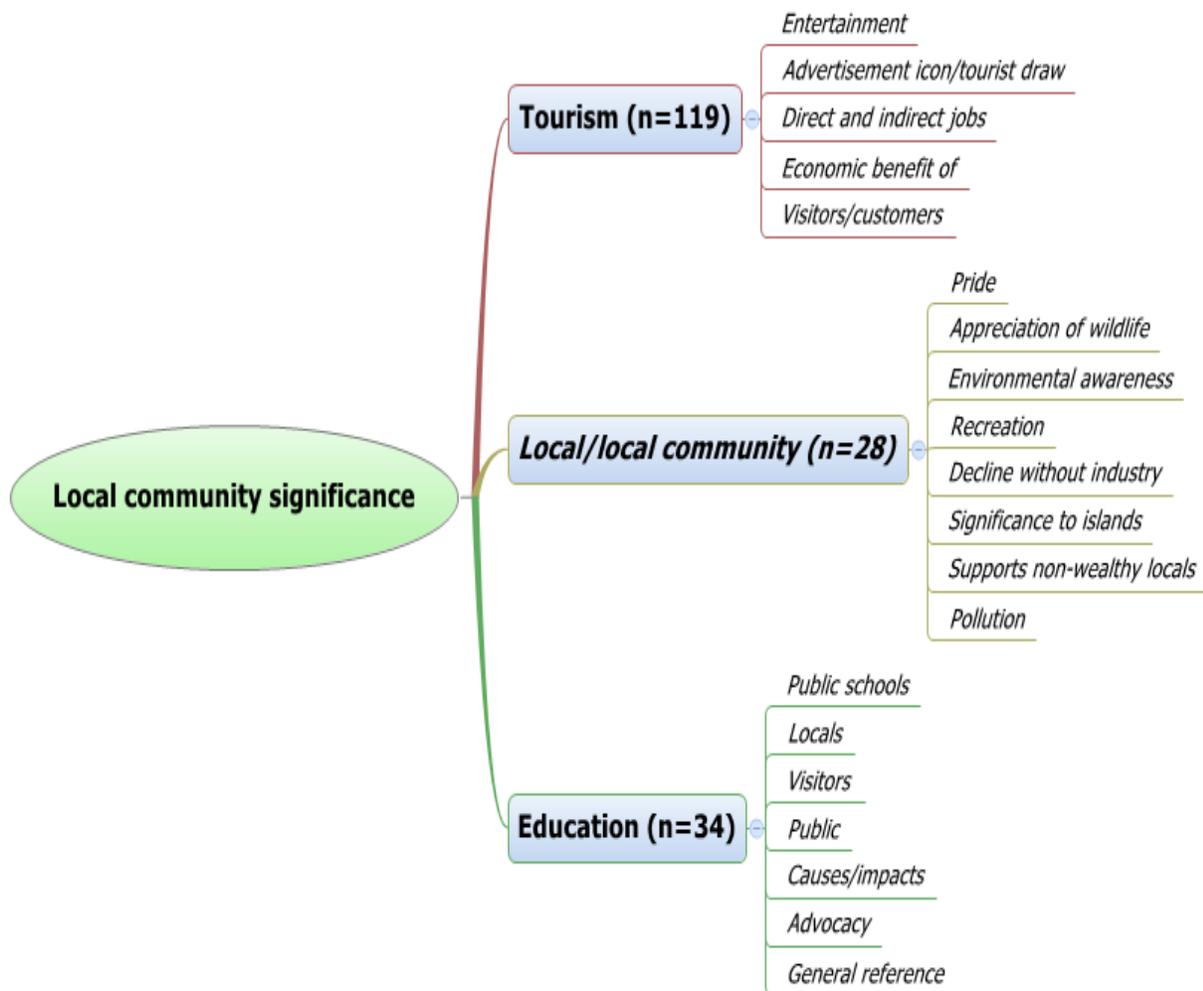


Figure 139. Qualitative responses to a question asking participants to describe the significance of the SRKW watching industry to their local communities. The qualitative analysis begins on the left, indicating that these responses are directly tied to the local community, followed by three overarching themes with sample size parenthetically provided. The final branches of the figure, indicated in italics, are detailed subthemes representing actual responses to the question.

Data in this question are qualitative in nature. Respondents were asked to comment on the significance of the SRKW watching industry to the local community in which their company (i.e., the company they either own or work for) operates. As indicated in the figure, data were aggregated into larger themes and smaller subthemes. All the themes and subthemes were derived from the participant responses. The themes represent the overall context of the comment, while the subtheme provides a deeper, more accurate context of the response.

Many of the subthemes are interconnected, but an effort was made to be as descriptive as possible to show the accuracy of the information collected. In the first theme of tourism, for example, economic benefit, jobs, and customers are intricately linked, but they are also independently listed in responses. So the subtheme provides a little more information on how

the tourism is beneficial, whether the responses mentioned tourism as an economic benefit, indicating that visitors and customers contribute to economic benefit by spending money, and that because they spend money, direct and indirect jobs are supported. Similarly between themes, the concept of economic benefit and direct/indirect jobs that are provided by tourism can be seen as linked to the local community theme and the subtheme of a decline in the local community without the industry. While these subthemes are related to the economy, they are separated by theme, because the subtheme was not raised in the context of tourism directly, but was raised in the context of the local community.

Further examination of the themes is beneficial. In the tourism theme, subthemes and the context of the subthemes were directly linked to tourism. So for example, the concept that the whale watching industry is a source of tourism, benefits the local economy, attracts many visitors/customers to the local area, who in turn spend money, support local businesses, means direct and indirect jobs are linked to the tourist industry, which provides entertainment including whale watching for those on vacation. Excerpts of some of the responses follow.

In my opinion SRKW watching is the main tourist attraction in the community. I live in [San Juan Island]. I can't imagine any other potential tourist attraction that would draw as many people to the San Juans as whale watching does. I think the whale watching industry is supporting the economy of the San Juan Islands.

The SRKW watching industry attracts people from all over the world. I see direct financial benefits to many local businesses, lodging, restaurants, grocery, taxi and bus, retail art and craft, clothing, state parks. Thousand come for the whale and spend dollars locally.

I think a substantial amount of visitation to San Juan Island is generated by the presence of SRKWs. Many, many day visitors come to the island to go whale watching or kayaking, and spend money on ferries, food, gifts, and lodging, providing many jobs and lots of tax revenue. Many varieties of businesses can stay open year-round to provide services to residents because of the influx of visitors in season—many hoping to experience the SRKW.

Attraction to local economy, hotels, motels, tourism, outlets, printing and graphics, fuel deposits, banking, education, etc. are all affected by the whale watching industry. The income from this industry is spread over a large area [region] and affects many people that are not aware of it.

Almost every flyer or brochure for a business on San Juan island includes a picture of a killer whale. People from all over the world and the United States and Washington state come to Friday Harbor, specifically to see a killer whale (preferably a breaching one!—like the rack card). They don't feel their trip is complete unless they see one.

The second theme in this question regards the local context—be that the local community, the local people, or other local factors. Subthemes were organized to very clearly describe the context of local. Local pride is self-explanatory, where appreciation of wildlife is a little different. This subtheme refers to the concept that locals do not appreciate wildlife that live in the same environment they do. The industry provides an opportunity for locals to access and experience the local wildlife through the tour process that may result in a greater appreciation of

local wildlife. The decline without industry subtheme refers to a decline in the local economy and tourism in the absence of the industry. Recreation again speaks to the recreational opportunities for locals. Environmental awareness relates to the locals being aware of their surroundings and contributing to those surroundings in a positive manner. The industry was generally described as being highly significant to the local communities. This subtheme aims to measure the occurrence of the concept of the industry as a significant aspect of the local community. The subtheme of supporting nonwealthy locals provides a glimpse into the difference between those who have vacation or seasonal residence on the islands versus those who have lived there for generations and live on the island year round. Pollution is another subtheme that was brought up, commonly in the realm of dumping in the ocean. Excerpts of some of the responses follow.

Much of the whale watching supports significant economic growth and such things. Without the whale watching, I would think local communities would be greatly effected negatively.

Whale watching is very popular amongst residents and tourists. You can see the name/image of orcas virtually everywhere—logos for companies, our local soccer teams is called the Bellingham Orcas ... etc.

It is a very significant industry in the Friday Harbor area and San Juans.

In the San Juans, whale watching is a backbone and major draw to this area. Businesses would be greatly affected by their decline.

Very significant and if not for the SRKW there would only be retired or very wealthy people on the island. The whales support the non-retirees and other than very wealthy here. If not for the whales, a lot of us would not live on San Juan Island, as we would have no means of support.”

...provides this community access to the San Juan Islands, San Juan Island wildlife and orcas....

It is especially helpful to teach the community about the orca whales in order for the community to see these animals and to take in the actual environment in which they live. People who live near these whales will support any measures taken to help them if they do ‘know’ about these incredible animals.

The final theme is education. This was a prevalent theme in the analysis, but crossed many subthemes. Education was spoken about in a general context, in the context of educating locals, taking local public school kids on educational trips, educating tourists and visitors, public education, education in the context of environmental advocacy, and education to understand the linkages between people and ecosystems. Education definitely was a broad theme in the results of this question. Excerpts of some of the responses follow.

In my opinion, the SRKW watching industry has a significant impact on the local community. It has a positive effect on 1) economy, 2) education and 3) scientific research in the Greater Puget Sound region. Trips are open not only for tourists, but also for school students. They help to educate future generations about the

significance of the welfare of wild animals as well as teach children important moral values.

Education to preserve natural environments and wildlife and natural areas....

It provides education to the people for the whales and the environment.

We provide an educational experience for locals and tourists. We offer them an opportunity to see the orcas in the wild and promote 'captive free' whales....

It is especially helpful to teach the community about the orca whales in order for the community to see these animals and to take in the actual environment in which they live. People who live near these whales will support any measures taken to help them if they do 'know' about these incredible animals. [Note: This excerpt that appeared under the local context theme above is repeated under the education theme here to reflect its applicability to both themes.]

Very important to the community, for education, teaching the public about the whales, how important and fragile their environment is, and how important a person's role is in preserving the whales environment.

Also the SRKW/wildlife tour helps to educate people about the beauty, special features, and ecological conditions of this area of Washington and British Columbia.

This analysis aims to clarify some unique themes and subthemes that occur in the qualitative data provided for this question. The examples provided illustrate the connectivity between the themes and the overlap of concepts. Overall observations of this data set connect the importance of the tourist industry to the economy of the local communities, while also providing opportunities for the education of both tourists and local residents. In addition, the local communities are further described to benefit and possibly depend on the industry for jobs, lodging, fuel, grocery, and other community infrastructure that is crucial to a functioning community.

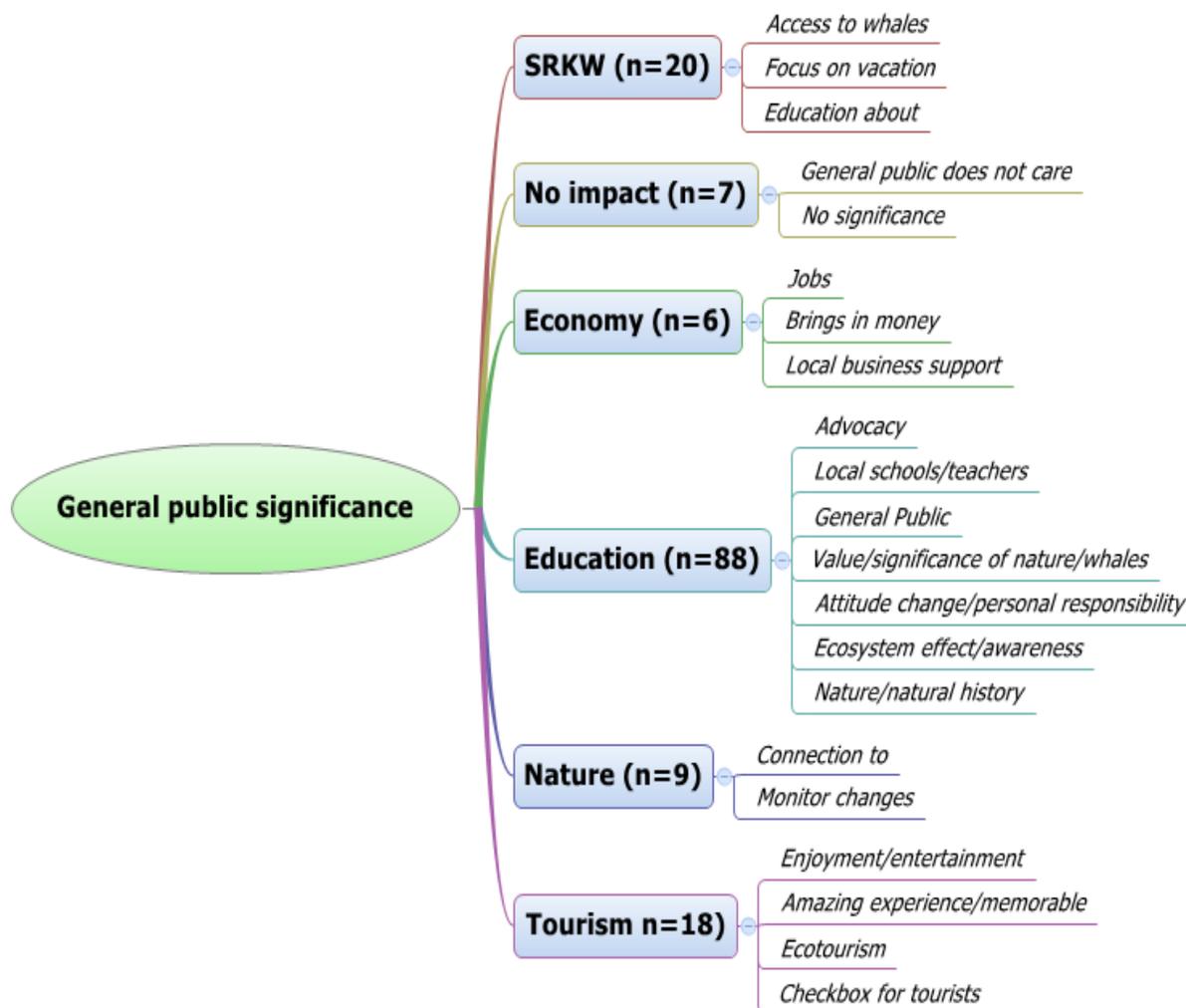


Figure 140. Qualitative responses to a question asking participants to describe the significance of the SRKW watching industry to the general public. The qualitative analysis begins on the left, indicating that these responses are directly tied to the general public, followed by six overarching themes with sample size parenthetically provided. The final branches of the figure, indicated in italics, are detailed subthemes representing actual responses to the question.

This question is the second of three questions that are qualitative in nature. Respondents were asked to describe the significance of the SRKW watching industry to the general public. While there are more themes identified for this question, the actual number of responses was less than in the previous question, which targeted information specific to the local community. Again within this theme and subtheme arrangement, there are connections between them, but the organization attempts to clarify the data to explore the foundational connections and concepts illustrated in the data.

The first theme, SRKW, highlights subthemes that were directed specifically toward the killer whales. Comments indicated that the SRKWs were the main focus of vacations for

visitors, that education information specific to the SRKW was discussed, and that the industry provided access to these whales. Education is further discussed as the fourth theme. For clarification, the education subtheme here refers to comments specifically tied to the SRKW. Excerpts of some of the responses follow.

Thousands of tourists come to the area to see and learn about the SRKW specifically.

The industry is highly significant to the general public!

The San Juan Islands have many appealing factors which attract visitors, and the SRKWs can be the icing on the cake for them or the primary reason they visit. The SRKW watching industry provides a means where the public can view and experience these amazing animals, as well as many other species of the environment. The industry is entertainment and education rolled into one for many members of the public. If people see, they can love—they can become advocates.

... enables people to see something they may not be able to otherwise....

For anyone anywhere who has the slightest interest in cetaceans in general and orcas in particular, the SRKW provides the best access to study, observe, and learn. For many the SRKW is the reason and focus of an entire vacation.

The second theme is that of no impact to the general public. Again this theme is an example of the interpretation of a negative perspective on the impact of the industry on the general public. This is an important theme to consider, especially in the realm of a tourist industry, as not everyone who partakes in tourism is looking for an educational or ecotourist opportunity; some rather prefer an entertainment or enjoyment factor with no strings attached. Excerpts of some of the responses that reflect this theme and the subtheme of the general public not caring follow.

It seems it matters to those involved with orcas, but most don't care about it that much, in my opinion.

The general public probably does not care as a whole, many people would go to Sea World instead.

To the general public I don't believe there is much significance.

It's an amusement provider, it offers tourists an attraction. The general public isn't concerned nor going to care a whole lot about a marine ecosystem unless it hits their wallets. We're Americans—we are all about consumption and pursuits of happiness, ask those who come to whale watch what they drive. The only 'education' out there is that of supply and demand—SRKWs teach kids you can make a buck off of another living creature....

The third theme identified for this question is that of the economy. Again, the importance of the industry and the resultant economy it generates through jobs, local business support, and money arose in the responses for this question. Excerpts of some of the responses follow.

Many of the people in town make their money in the season.

Many businesses are based on tourism and would not survive without the SRKWs.

Business provides jobs and helps support other local businesses.

...personal employee income, local awareness of surrounding marine ecosystems on a personal level....

...creates dollars into our economy.

The fourth and largest theme in this data set is education. This theme is prevalent in a larger percent of responses to this question. Education was spoken about in the context of the education surrounding nature and natural history, as well as the education about the ecosystem and the environmental awareness of the ecosystem. Concepts of attitude change and the fostering of advocacy are spoken about when the general public is exposed to information about the SRKW, nature, and the ecosystem. Having the opportunity to educate the public was a common reference. Several responses indicated that through education, the value of nature and the whales increases, and can be seen as interlinked with an increase in environmental awareness and advocacy. In addition, as in the previous question, the opportunity to educate teachers and students in public schools through specific tours was commonly mentioned. Excerpts of some of the responses follow.

We help educate the public about the whales and wildlife, their environment, and the issues they face. We provide a way for people to connect with nature.

Educational avenue to talk about marine wildlife and issues relating to sustainable—may encourage people to join as advocates for marine environment.

I think it's incredibly important to educate the public on what's really happening in the ecosystem in the Puget Sound and how it impacts the whales. For the public to really understand these animals and why we should conserve them and their habitat starts with viewing them in their natural surroundings and not in a tank.

This is a huge educational opportunity to teach the public about not just orcas, but the whole ecosystem revolving around the salmon cycle of the Pacific Northwest. We cannot hope to change our environmental problem without this education. The public needs to understand that the future of the SRKWs are deeply intertwined with our own. It gives the public an opportunity to ask questions in an informal setting.

I think the opportunity to view the SRKW population from a water platform provides an experience that helps people build bridges between personal values and conservation/environmental ethics. It gives people a real sense of wild animals in their natural habitat. I believe this becomes foundational in a paradigm that helps translate into action ... consumer decisions, votes, conservation, etc.

Whale watching can provide people with a memorable experience and possibly help develop an awareness of whales needs. This in turn might lead to advocacy/activism by concerned individuals.

The fifth theme of nature is further clarified with the subthemes. Comments regarding nature as a theme were in the context of people being provided the opportunity to connect to nature or the ability of the industry to assist in the monitoring of nature and contribute to the science and knowledge of what is going on in nature. Excerpts of some of the responses follow.

We provide a way for people to connect with nature.

I also feel that we are able to monitor the effect of Navy sonar on the wildlife.

SRKWs have made the orca the great icon of the Northwest. They are now of great interest too.

I believe that exposing the general public to the animals is a very important step to ensure their survival. It's been said many times in one way or another—what people do not see, they will not understand, and what people don't understand, they will not protect. I believe this viewpoint is very relevant to the whales and their well-being. Whale watching is very important!

Looking at the big picture of significance of the SRKW watching industry to the Puget Sound region is immense. It gets millions of people out on the water and connected with nature. In most cases the people are only expecting killer whales and are overjoyed to see seals, eagles, porpoises, and depending on the season, other types of whales, sea lions, and numerous migratory birds. Along with interesting and humorous information, they should walk away with a life experience they will never forget. The weakest link is to tactfully inspire them to want to be part of the solution for preserving the natural habitats in their region. For people whose existence is primarily in cities, it allows them the opportunity to see the earth uncluttered and raw and hopefully make them feel alive again. Essential for a healthy society and public that cares.

People love to see orcas and come to the island to do so. I think it is very important for people to develop connections with species that dwarf their own humanness, and especially outside of Sea World–esque prisons.

We are in a position to educate the public. Not only can we teach about the wildlife, but also about the environmental issues surrounding the health of Puget Sound. We are also monitors of trends in the wildlife and health of the animals.

Tourism, the sixth theme, was also mentioned in this question. However, the subthemes in this question varied slightly from the previous question. The subthemes were more diverse and represent a broader context of the theme of tourism. For example, in the check box for tourists subtheme, some of the responses were consistent in mentioning that the experience of whale watching to the general public is more of a matter of having completed the item or checking the experience off on a long list of things to do, with no other real connection to the experience. This perspective was often perceived in a negative context. In contrast to this subtheme, the remaining subthemes were more light and positive in response where there is reference to ecotourism, amazing and memorable experiences that are provided to the public, and experiences that are for pure enjoyment and entertainment. Excerpts of some of the responses follow.

Clean fun, enjoyment, and being a part of nature....

I would like to think that the SRKW watching industry is an educational asset to the general public and that it raises awareness about the Puget Sound ecosystem as a whole. But after spending a few years talking with tourists, I get the feeling that it is more like a check mark on a list of things people feel they need to do when they visit the San Juans.

Through educating people about the natural world, we will get closer to the paradigm shift that must occur in the minds of human beings necessary to save our natural resources and wildlife. If people don't know what is out there to save, they will make no effort to do so. This is part of the 'watchable wildlife' ideology and the ecotourism movement.

There are tourists who are mildly interested, dragged along by others, and then hard core passionate ones about SRKWs. People love getting out on the water, but they want to see what's 'advertised'—which is stated or unstated (the photo)—a breaching KW. Some become fascinated with the specific information and data collected on the SRKW, some return and return (if in the Seattle or Washington area) to see them again....

We have guests come off our boat literally crying after seeing orcas in the wild. The naturalists do a great job describing their life and what makes them so special. The public seems awestruck by orcas.

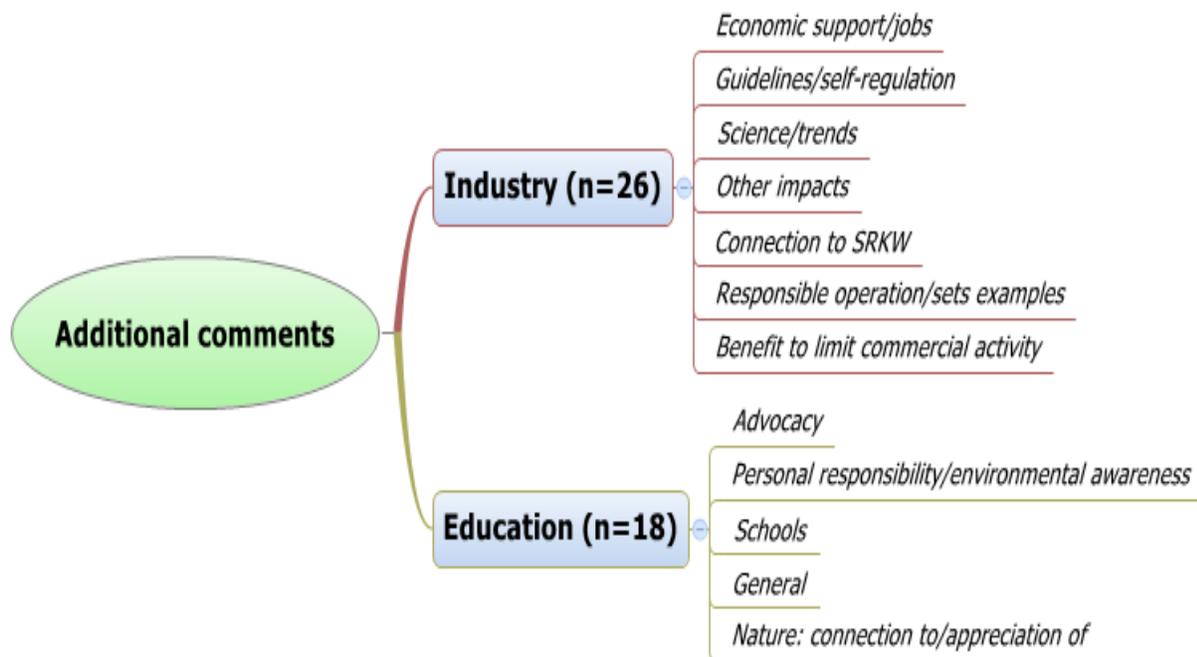


Figure 141. Qualitative responses to a question asking participants to provide any additional comments to identify the important and unique characteristics of the SRKW watching industry. The qualitative analysis begins on the left, indicating that these responses are directly tied to additional comments, followed by two overarching themes with sample size parenthetically provided. The final branches of the figure, indicated in italics, are detailed data representing actual responses to the question.

The final qualitative question asked respondents to provide any additional comments to help the researchers better understand the important and unique characteristics of the SRKW watching industry. While responses to this question were fewer, they were just as extensive and important to the research.

Two major themes were identified for this question with multiple subthemes. The first theme is the industry. The first subtheme of economic support/jobs is consistent with the themes and subthemes previously mentioned, but in this case is commonly referred to as linked to the industry. Essentially the existence of the industry provides economic support to the communities by drawing tourism to local areas, referring to and working with other aspects of the tourist industry such as lodging and restaurants. Respondents also referred to the jobs the industry creates, with some companies employing locals for extended periods of time, supporting the local community with job infrastructure.

The second subtheme, the concept of guidelines and self-regulation, was selected as a subtheme for the industry, as many responses referred to the voluntary guidelines that the industry follows as well as their efforts at self-regulation to protect the SRKW. Many responses were in praise of the voluntary guidelines and the use of those guidelines to educate the tourists

aboard the vessels, as previously referred to, setting an example of how to operate around the whales.

The third subtheme, science/trends, refers to the industry participation in science that is directly correlated to the SRKWs. It also refers to the industry's ability to observe and note trends occurring in nature and in public perception. As industry members are working every day during a season, and some have worked for years and decades, comments spoke to their level of knowledge of the change that has occurred over time.

The fourth subtheme connected to the industry theme is other impacts. This subtheme refers to the focus of the impact of the industry on the decline of the SRKW. Comments highlighted the other issues that are contributing to the decline of the SRKW independent of the whale watching industry.

The fifth subtheme of connection to the SRKWs refers to the personal connection some industry members feel to the SRKWs specifically. Respondents spoke about industry members watching the population closely and awaiting their return year after year. Reference was made to some industry members caring greatly for the SRKWs and hoping to contribute to their conservation either through educational efforts or how they operate in the vicinity of the whales.

The sixth subtheme under the industry theme is the responsible operation of motorized vessels and the ability of motorized vessels to provide a positive example of how to operate vessels around the SRKWs.

The seventh subtheme is regarding the benefit to limit commercial activity on the water. Comments under this subtheme alluded to the change in types of vessels from small vessels with a few passengers to large vessels with a greater number of passengers. This was commonly linked with the removal of many small vessels on the water and replacement with fewer larger commercial vessels, which was explained to be a benefit. Additional general comments supported a limit of the number of commercial vessels on the water. Excerpts of some of the industry theme responses follow.

The industry members (many of them) are making efforts to lessen any impact on the SRKWs. The industry boats can be the example for 'how to operate' around the whales. ... As an educational platform, you can take 6–60 people on one vessel instead of so many private boats and actually provide an opportunity to both view and learn—therein lies hope for positive action.

We are a very significant part of Washington state tourism, which is a very significant part of Washington state's income and tax returns.

I strongly feel that whale watching boats are more of a benefit for these whales than people may believe. There are much bigger problems for these whales than boats (pollution, lack of food, the capture of these animals in the 1970s). Boats bring people out to these whales and teach them about these amazing creatures so the bigger problems can be solved. By banning or limiting whale watching, this would not happen. The bigger problems would still exist. Those in power are attacking about 2.5% of the problem rather than doing something serious for these

whales. Stopping whale watch boats or pleasure boats from watching altogether would be a drastic mistake.

I believe that a regulated industry would be a very good thing—limits on the number of boats and expectations on the training and experience of the captains and crew (the Association is a good step—and all who belong voluntarily follow guidelines). I'd rather have 60 people on one boat than six people on 10 boats—and have an educational component.

I believe there is an incredible opportunity to awaken the general public to some of the environmental issues facing our planet today. Whether it is the Navy's sonar, global warming, or salmon restoration, all these are linked to the health of the whales. Because we are out on a daily basis, we can see trends developing.

SRKWs are extended family for us. Many of us count down the days in April until their return. Members not returning, new members (babies) are all part of the daily chatter amongst islanders and previous guests.

We have been in a 10-year study with Wisconsin's Ripon University to collect data from our guests about the impact and perception of whale watching—Lime Kiln Park. We employ five people from our community and have had the same crew for 13 years. We retired from fishing and feel this is an environmentally friendly way to make our living. We help supply people with lodging, restaurants and seasonal gifts, care giving services, fuel, and moorage. We bring in revenue to many businesses in our island community and act responsibly on the water.

The captains and crews of these boats love and care for the orca. That is reflected in the experience of the viewer. The SRKW industry has protected and promoted the survival of the orca.

The second major theme is education. In the context of this question, subthemes are similar to those of the prior questions, but more emphasis was placed on the role of the industry in the education of tourists. Comments spoke to the ability of the industry to foster advocacy for the SRKWs, as well as providing an experience that contributes to an individual's increased environmental awareness and feeling of personal responsibility for the environment. This contributes to the concept that, due to the experience of viewing the SRKW and immediate wildlife, education has the ability to influence tourists such that they think about their personal impact on nature and may make a change at home that benefits the environment. Other subthemes refer to the contribution to schools and the educational opportunities the industry provides to schools, whether it be simply the role of education, education within the industry, or the importance of education. These subthemes are similar to an additional subtheme that speaks to a connection to or appreciation of nature. In this case, comments were less driven towards advocacy or action, but more focused on the service and education provided to tourists which leave them with an experience of connection to nature or a greater appreciation of nature. Excerpts reflecting these subthemes of the education theme follow.

On our trips we talk about geology of this area, tides, currents, other wildlife we come across (eagles, seabirds, harbor porpoises, minke, grey or humpback whales, and SRKWs). We hope to educate people about the concerns there are for Puget Sound, the Salish Sea, oceans of the world, well, the planet—and with

this education, hope for political action as well as everyday personal ecological actions by individuals. It's the SRKW that brings them, we hope the take home message is much broader.

For our community we've offered an intern program for the past 10 years for local high school marine science classes. We go into the schools and speak about stewardship and offer children trips on the boat as part of their class work.

I consider it to be an honor to share time in this key environment for the SRKW. The responsibility of informing the general public on the role they can take to lessen their negative impact on the environment is important to me, though I spend most of my energy focused on the safety of the trip and the enjoyment of our participants. I hope that folks walk away with a sense of wonder and connection to their wider environment, which will then inform the discussions they make on how they can lessen their impact.

For people all over the world, the orca is a mystical, larger than life creature. For them to be able to view them in their natural habitat is at the same time an educational and religious experience. They come away from the experience with not only a greater intellectual understanding of the orca and it's environment, but as advocates for that environment.

The whale watching industry brings education about the whales and other animals living in and around the Salish Sea. We view our boats as floating classrooms. The industry also brings joy into people's lives that have always wanted to see a whale and we fulfill that for them. We bring awareness to the public about issues that face the marine mammals, salmon, and sea birds of the Salish Sea and Puget Sound.

Concluding Discussion

The results of this research provide a foundation for understanding the people within the whale watching industry, the business structures, various sectors identified, and complexities within the system. These attributes open the opportunity to ask more complex questions of the community, suggest connections, and identify characteristics or trends within the system. Together this information provides a baseline description of the industry, which allows us to understand this community and its participants at the time of the study. In addition, the opportunity to measure change in the system over time now exists.

Demographics

Demographic data are standard information about people that helps to describe a population. These are foundational data that describe people and allow for comparison between groups with in-depth analysis. Demographic data collected were compared to U.S. Census data where applicable and were analyzed by all participants who took the survey, by sector, and by region. This discussion compares and brings together unique characteristics of the various in-depth analyses to paint a demographic picture of the industry. Overall results show more males than females working in the industry. This trend applied to all methods of analysis. The only place where the ratios came in close proximity was in the land sector, where an equal number of males and females worked. This is not surprising; examination of maritime industries suggests dominance by the male gender. This theory is supported by U.S. Census data that also show a more than two-to-one ratio of males to females in farming, fishing, and forestry occupations.

Age data show there were more people working in the industry who were more than 45 years old. Most people working in the industry were older than those employed in Washington state and the United States. This can be significant as people of different ages can be impacted differently by change. For example, those close to retirement may be affected differently than those just entering the industry. Further analysis of this data shows that individuals in Tier 4 smaller companies were predominately more than 45 years old. Tier 1 and Tier 2 companies had more individuals working younger than age 45. Regional analysis also indicates a greater number of individuals older than 45 working in the island region. Kayak sector participants were primarily younger than 45, but there were some older individuals. The majority of land sector participants were more than 35 years old. As a result, impacts may be more extensive in the island region than in the mainland region.

Education data show that many people in the industry had higher education degrees, bachelor's and graduate degrees. In comparison to Washington State labor statistics and U.S. Census statistics, individuals in the industry were more highly educated. Additional analysis of the data reveals that the majority of those holding higher degrees worked in Tier 2 and Tier 3 companies. Those working in the island region held 65% of the bachelor's and graduate degrees. Levels of education may assist in understanding how to communicate with members of the

industry. Those with higher levels of education may have different abilities to understand and interpret scientific findings, as well as make informed business decisions. In addition, varying levels of education may result in different impacts to members in the industry; for example, one with a higher degree may be more marketable for alternate jobs.

Residence data show a majority of the individuals working in the industry resided in San Juan County. Most of these individuals worked in Tier 2, Tier 3, and Tier 4 companies. A majority of those working in Tier 1 companies resided in King County. Regional data indicate that most people lived close to where they work, although a few individuals traveled great distances to work in the industry, residing as far away as eastern Washington. For the kayak and land sectors, a majority of individuals resided in San Juan County. Other counties of note included Snohomish, Whatcom, and Skagit. This information contributes to our knowledge of local communities. For those living close to where they work, employment in the industry may be more important. For example, those living on the San Juan Islands may have limited employment opportunities. Also, those working close to home may provide a return contribution to their local communities in many forms. For those living farther away, one can hypothesize a greater connection to the work and industry that drives their motivation to work in the industry.

Income data were collected in two categories. The first is an estimation of total annual income and the second is the estimated percent of income derived from the SRKW watching industry. The results show the majority of individuals made lower incomes of less than \$30,000 a year. Less than one-third of respondents reported incomes above \$50,000 a year. The income of those working in the industry was lower than the Washington state labor force or U.S. Census totals. A majority of those earning higher incomes were owners. Regional results indicate that, of those earning higher incomes, more lived in the island region than in the mainland region. Most respondents, 40%, said they received less than a quarter of their income from the industry. For those reporting that more than half of their income came from the industry, half were owners. More individuals from the island region reported they received more than half of their income from the industry. Kayak sector responses show a greater income than land sector responses, with a greater percent of that income derived from the SRKW watching industry. Income data can provide clarification about the level of dependence of industry members on the industry to support their livelihood. As this is a seasonal industry, some may depend on this industry to provide enough income to support them all year long. Some may depend on this industry to provide income where other opportunities are limited due to the communities in which they live. Others may just participate in the industry due to personal motivations and the income is secondary to another source of income. Taking into consideration the differences in the regional results, the question that arises is the importance of the industry and how it varies between the island region and the mainland region.

Looking at multiple variables in concert, such as age and residence, further clarifies the data. Results show a large portion of older individuals working in the industry resided in the island region. Additional qualitative interview data speak to the importance of the industry as a source of jobs and income to those in the islands. Comments also suggested limited employment opportunities in the island region. This helped to clarify the significance of the industry to those living in the islands, of older ages, and of the economy of the islands.

Another layer of information that can be added is income. The data indicate that, while a majority of individuals make less than the national or state standards, in the island region a large percent of individuals received more than half of their income from the SRKW industry. So while this industry is a seasonal industry, it was a source of a large portion of the incomes of those living in the islands.

These multiple types of in-depth analysis applied to the demographic data have led to a better comprehension of those working in the industry. They allow for the understanding that specific groups of people have different connections to the industry and as a result may be affected differently by changes in the management of the industry. As further sections of the data are discussed, this trend will be further highlighted.

Individual Participation

The purpose of collecting data on individual participation is to gain a better understanding of the people working in the industry beyond the information obtained through demographics. As with the demographic data, these data were analyzed in-depth by tier, sector, and region to provide the most clear and complete understanding of the data. Here we sought to understand the choices they made to work in the industry through the work schedules they maintained, maritime work history they had, training they pursued, and the reasons that they participated in the industry.

A commonality in maritime tourism industries, especially those surrounding maritime adventures, is the different jobs a single individual may hold while working in the industry. For example, the person helping with the lines that hold the ship to the pier may also operate the snack bar. We wanted to know how many roles individuals played while working in the industry. Overall results show that the majority of people worked at least two roles, with other combinations ranging up to five roles. Individuals on larger vessels in the Tier 1 category reported they worked primarily one role. Of those who said they worked more than one role, a majority worked three or fewer roles. In contrast, a majority of individuals working on smaller vessels in the Tier 4 category stated that they worked six or more roles. This correlated with the regional data, where those in the mainland region were more closely associated with working one role and those in the island region related to more than one role. Kayak sector results show participants worked multiple roles, while the land sector results indicate individuals worked fewer roles. When considering the type of role, the role most individuals associated with was that of the naturalist. Other common role combinations included operator/naturalist, deck hand/naturalist, and owner/naturalist/guide/administration. This information on roles provides us with a better understanding of how vessels of different sizes operate, the level of experience different vessels may require for their operation, and the type of experience that may be had aboard different vessel types.

Since this is primarily a maritime industry, USCG licensing is required to operate the vessels. Survey questions sought to better understand the level of licensing pursued by people in the industry. Of those working in the industry, 43% had and maintained an active USCG license. Of those who had a license, an overwhelming majority had a master license. Most had 100 ton inland and 100 ton near coastal master licenses. The distribution of licenses shows that a majority in all tiers that had licenses held master licenses. Those working in Tier 1 companies

were the only individuals who reported 1,600 ton ocean licenses, in addition to other licenses. All tiers show a distribution of 100 ton inland licenses, with 100 ton near coastal licenses distributed across Tier 2, Tier 3, and Tier 4 companies and 200 ton near coastal licenses limited to those working in Tier 4 companies. Inland and near coastal 500 ton licenses were limited to Tier 2 companies. Additional licenses held by individuals in the industry were described as able bodied seaman and merchant marine licenses. This distribution of licenses seems to be correlated to the vessel size, where Tier 1 companies have the largest vessel size and therefore the most comprehensive requirements for licensing. Licensing information contributes to our knowledge of the size and types of vessels that operate in the industry based on USCG requirements and illustrates the investment made by some to achieve the highest levels of licensing to operate larger vessels. This also reflects some of the limitations of vessel size based on USCG requirements.

In addition to maritime training, we collected information on other forms of training. A large number of people working in the industry had taken the Whale Museum's marine naturalist training. This was reflected across the tier, regional, and sector data. Additional maritime training included licenses and endorsements such as for radar, lifeboatman, firefighting, observers, and STCW. This training was more prominent in Tier 1 and Tier 4 companies, as well as on the mainland. Kayak respondents reported high levels of training in kayak and paddling certifications. Additional training included first aid, self study, and biological and environmental conferences. Training information contributes to our knowledge of the level of commitment industry members make to work in this industry. It also aligns with the concepts discussed about education; various types of training pursued increase the study participant's level of knowledge and may affect one's role in the industry.

Entry year data help to understand how long people have been working in the industry. Survey data indicate the years with the highest number of people entering the industry were 2006 and 2004. The earliest year reported as a first year for entering the industry was 1978. Data reflect an increase in entrants from the mid 1990s until the late 1990s, then again in the mid 2000s until the study year of 2006. Most Tier 1 entrants began after 2000, while those in Tier 2 companies had some early entrants, then followed the general trend of entrants in the mid to late 1990s and again in the mid 2000s. Tier 3 entrants had a continuous flow of entrants after 1997, with peaks in 1997 and 2004. Tier 4 participants reported they entered on or before 1998. Most of those working in the mainland region started after 2000, while those working in the island region experienced entry peaks in 1997 and 2004. Kayak sector participants experienced peaks in 1998, 2001, 2005, and 2006. Land sector responses had some entering in the early 1990s and other in the early 2000s. Entry year data are one piece of the puzzle that help to understand the history of the industry. They help distinguish those who have participated for long periods of time from those who are recent participants. Combined with other data to be discussed, such as tenure data, they lead to understanding more about the levels of historical participation in the industry, as well as the size of the industry.

Tenure data show how many individuals had worked consistently in the industry over time. A small percentage of individuals departed the industry and returned, but the analysis reflects a focus on those with uninterrupted participation in the industry over time. A majority of respondents said they had worked in the industry 2–5 years, followed by 6–10 years. Tier 1 respondents primarily had worked 2–5 years, with some holding longer tenures. Most

individuals with the longest tenure of more than 11 years in the industry worked for Tier 2 and Tier 4 companies. The longest tenures reported, 26–30 years, were in Tier 1 and Tier 2 companies. The mainland region shows the greatest number of people reporting 2–5 years, while the island region shows the majority at 6–10 years. Further analysis reveals 33% of mainland respondents and 58% of island respondents had worked in the industry for more than 5 years. The majority of individuals in the kayak and land sectors had worked 2–5 years; however, some individuals in the kayak industry had 26–30 year tenures. Owners had the longest tenures. These tenure data are another indication of the differences between those who live and work in the different regions. Combined with other data, tenure data also contribute to understanding the importance of the industry to the island region.

Work schedule data were collected through several survey questions in order to learn when people worked. This is important because the industry is seasonal. The results show a gradual increase in participants commencing work in April, peaking in July, then gradually decreasing into October. This trend is consistent across tiers and regions. A clarification shows a greater number of Tier 2 and Tier 3 individuals working in April and October. This is also reflected in the island region results. Some individuals worked year-round, primarily for Tier 1 and Tier 4 companies. The kayak sector shows greater activity in the off-season months from November to March.

Work schedule data indicate a similar number of individuals work part-time, full-time and more than full-time. Tier 1 and Tier 2 had more individuals working full-time schedules and greater than full-time schedules. Tier 3 and Tier 4 had mostly part-time work schedules. Overall trends are also reflected in the regional data analysis. The kayak sector had more individuals working full-time schedules or more than full-time schedules. The land sector had the greatest number of people working more than full-time schedules.

Additional questions asked whether people in the industry worked multiple jobs, and if so, were these jobs solely within the industry. A majority of individuals worked one full-time job in the industry. This is reflected in Tier 1 and Tier 2 companies as well. For those working in part-time positions, Tier 3 and Tier 4 respondents reported they work multiple part-time jobs. The mainland region shows primarily one full-time job was worked, while the island region had more people working multiple part-time jobs. The kayak sector shows most worked one full-time job, while the land sector shows an equal distribution of individuals working either one full-time job or more than one full-time job.

We also addressed when multiple jobs are worked. This helps us understand whether there were individuals who worked jobs outside the industry year-round and also worked in the industry during the active season. A majority of people worked multiple jobs year-round. Tier 1 participants worked multiple jobs primarily during the peak seasons while Tier 3 and Tier 4 individuals worked multiple jobs year-round. Both the mainland and island regions show most individuals worked multiple jobs all year. The kayak sector shows most worked multiple jobs during the peak season and the land sector shows some individuals worked during the peak season and others all year.

Supporting data addressed the types of additional jobs people worked. This helps us understand whether individuals worked multiple jobs in the industry or a job in the industry and

other jobs outside the industry. Of those working multiple jobs, most worked in various “other” jobs not described or in maritime positions. A high number of respondents across tiers worked other maritime positions. For the mainland region, in addition to many working “other” jobs, many worked in maritime positions. In the island region, most worked multiple jobs in the tourism industry. Many kayak sector workers with multiple jobs said they worked in other positions within the SRKW watching industry. The land sectors reported that those working multiple jobs did so in tourism.

Participants were asked for the number of hours they worked in the industry, as well as the number of hours worked outside the industry. Within the industry, a majority of individuals said they worked 31–40 hours per week. This was consistent for Tier 2 and Tier 3 companies. Tier 1 had the greatest number of people working 41–50 hours per week. Tier 4 was distributed across ranges, where most worked 11–20 hours per week and an equal percent worked 1–10 hours per week, 21–30 hours per week, and 51–60 hours per week. The mainland region had most working 31–40 hours per week. The island region had most working 21–30 hours per week. The kayak sector had many individuals working 51–60 hours per week. The land sector had half of the participants working 0–10 hours per week while others worked 61–70 hours per week. For those working outside the industry, Tier 4 respondents had the greatest activity in non-tourism jobs, ranging from 40% working 21–30 hours per week to 20% working 51–60 hours per week. The kayak sector had a large percent, 86%, working 0–10 hours per week in nonindustry positions.

Information on off-season activity was also pursued to better understand those who work multiple jobs year-round. Overall results show the highest percent of individuals traveling in both years questioned, followed by working in marine tourism jobs where they currently were employed. This is further clarified in the tier analysis, which shows more than 40% of individuals in Tier 1 companies working in marine tourism positions in the current location in both years the data pursued. Travel activities occur across all tiers and are most prevalent in Tier 2, Tier 3, and Tier 4, with slight variations across years. This prevalence of travel activities across tiers contributes to revealing travel as the highest response. This is further supported by the regional analysis where travel activities were the highest activity in the island region and marine tourism work in the current location was the highest response in the mainland region. Both sectors also show high levels of travel activity in the off-season, where the kayak sector also had participation in marine tourism activities in the current location.

Past work history was collected to better understand where people had worked before they joined the industry. Categories were drawn from the U.S. Census. Most respondents had past work history in categories “other” than those provided. Clarifications of the “other” selection include other maritime occupations, military careers, real estate, public safety, and information technology. Survey administrators determined that other descriptions such as environmental education and carpentry fit into the categories provided, such as educational services and building trades. However, the results were left in the “other” category to remove any bias from the analysis. Across all tiers, many participants had backgrounds in education. Tier 2 and Tier 4 responses show a high emphasis in accommodation and food service, which was slightly less prominent but notable in Tier 3 as well. Across regions, results were consistent, with most selecting the “other” category followed by accommodation and food services backgrounds. Those in the island region reported a higher percent with backgrounds in

education. The kayak sector reported a majority with backgrounds in education and recreation or entertainment. The land sector mostly reported the “other” category.

Since this industry can be considered maritime, we wanted to know whether people who work in the industry had a background in other maritime aspects. Of those with a maritime background, the majority had worked in the fishing industry. This was closely followed by marine education and ecotourism. Fishing occupied the highest level of activity across all tiers. Tier 1 also had an emphasis in the cruise ship industry; Tier 2 in scuba, education, and ecotourism; Tier 3 in scuba; and Tier 4 was spread across several maritime industries. These were reflected as shipyards, tug/tow, sail charters, and education and ecotourism. The mainland region was highest in the fishing industry while the island region was highest in scuba diving. Kayak and land sector individuals with maritime backgrounds also reported emphasis in the fishing industry.

If individuals had a background in the maritime industry, survey questions asked for information on the locations where individuals participated in the maritime industry. Responses show most had participated in maritime industries in Greater Puget Sound, followed by Alaska. Further analysis reveals most Tier 1 individuals focused their efforts in Alaska, Tier 2 in Greater Puget Sound, Tier 3 in both the aforementioned locations, and Tier 4 in Greater Puget Sound and other Washington areas. The mainland region had activity primarily out of Anacortes, while the island region had activity around the San Juan Islands. The kayak sector had activity in Alaska and California. The land sector had activity in Alaska and other areas.

The last line of questioning in the maritime history section of the questionnaire asked the number of years people had worked in the maritime industry. Most participants had worked in it 1–5 years, followed by more than 25 years. Each tier had individuals who had worked in the maritime industry for more than 25 years. Tier 2 had the most individuals with maritime industry experience. Regionally, respondents in both regions had 1–5 years of experience in maritime industries. However, there were more individuals on the mainland with more than 25 years of experience in maritime industries, while the island region had more individuals with more than 15 years of experience. The kayak sector was varied, with an emphasis in more than 25 years, 1–5 years, and 11–15 years. The land sector had the least level of activity in maritime industries, but for those with experience it was 1–5 years.

The final line of questioning in the individual participation section of the questionnaire addressed why people worked in the industry. A Likert scale question was provided with various reasons and respondents were asked to rate their agreement on a scale ranging from strongly agree to strongly disagree. The results reflecting strongly agree responses show most individuals were in the industry to work outside on the water, work in the region, and educate the public. Overall results that aggregated the positive agree and strongly agree responses slightly altered the reasons. The “other” category was more consistently agreed with, along with to work in the region and work outside on the water. Descriptors of the “other” response included to maintain maritime licenses, accrue sea time, and educate people other than the public.

In the motorized vessel sector, most respondents across tiers strongly agreed that they were in the industry to work in the region, educate the public, work outside on the water, and spend time with the SRKWs. The aggregate of the agree responses across tiers were to work for

“other” reasons as previously described, work in the region, and work outside on the water. Regional results vary slightly. The mainland region strongly agreed reasons included to work in the region, work outside on the water, and educate the public. Agree aggregate responses included “other” reasons, to work in the region, and work outside on the water. Island region strongly agree responses were to work outside on the water, educate the public, and spend time with the SRKWs. Agree aggregate responses show a slight change where “other” reasons were followed by to work outside on the water, with equal weight given to educate the public and spend time with SRKWs.

The kayak sector strongly agree responses followed the trend to work outside on the water, work in the region, and educate the public. Agree aggregate kayak responses also were equivalent with “other” reasons, to educate the public, and work outside on the water. The land sector followed the trend where strongly agree responses included to work in the region, educate the public, and spend time with SRKWs. Land sector agree aggregate responses include to educate the public, spend time with the SRKWs, and work in the region. Across the board, the most disagreement for working in the industry was to transition from another maritime industry or because it was a seasonal job.

The individual participant section clarified information about the people in the industry beyond demographic information. We learned that, depending on the vessel, region, and sector, differences were identified and trends were noted. These are all very important when considering possible changes in the industry. This level of detail will contribute to a greater understanding of the impacts of change on the different sectors and regions of the industry.

Business Operations

In order to better understand the businesses operating in the industry, survey participants were asked to answer a series of questions about the businesses they either worked for or owned. It is important to note that the data provided in this section are primarily based on the survey responses; a few cases refer to secondary data. The resulting information shows how survey participants perceived the companies. This was the best way we could obtain information, but it was conducive to the subjective tones that go along with perception. This was seen not to weaken the data, but rather to provide clarification.

All businesses working in this industry are dependent on tourism, thus it is understood that they provide tourism services, specifically in the form of tours. This survey question was formatted as a Likert scale question where participants were asked to indicate on a scale of responses from strongly applies to not applicable. Tour descriptions were provided and respondents were asked how the descriptions applied to the company they worked for or owned. Motorized vessel survey responses show the majority of participants selected the tour description of “boat-based tours on which the SRKWs are a focal point” as strongly applying to the types of tours they provide. This was followed by strong agreement with the tour description of “boat-based wildlife tours” and “boat-based tours on which SRKW viewing is the exclusive intent.” These same results are reflected in the regional data analysis. Responses from the kayak sector are different, where a clear majority reported the tour description of “kayak tours exclusively” strongly applied to their companies. In the land sector responses, the tour descriptors of “land-

based whale watching tours” and “transit service on which whales are occasionally seen” are prominent.

Another line of questioning attempted to understand how much vessel time was dedicated to SRKW watching trips. Participants could provide information for multiple vessels. Results here reflect the aggregation of the data for all vessels provided. Motorized vessel responses show the most, 42.9%, felt that 91–100% of the vessels activity was dedicated to SRKW viewing. It is important to note this is a plurality of 42.9%, therefore 57.1% felt otherwise. In descending order, 15% indicated 81–80% and 12% indicated 1–10% of vessels activity was dedicated to SRKW viewing.¹⁷ This analysis is consistent across tiers and regions. Kayak sector responses indicate this question was primarily not applicable; however, 22% reported 41–60% of activity was dedicated to SRKW viewing and 17% reported 91–100% was dedicated to SRKW viewing. Land sector responses show 60% reported 1–20% of the activity was dedicated to SRKW viewing. In combination with the tour descriptions, these data point to SRKWs being a focus of the tours, but other activities were occurring as well, such as other wildlife viewing.

While tour information was collected on the survey, the question and resultant data proved to be highly complex and very difficult to summarize. Therefore, secondary data were used to determine the number of tours offered. All data presented are for trip data occurring during the peak season. Motorized vessel data suggest 17 companies offered a total of 37 tours daily. Tours ranged from one to five per day. Seven companies provided one tour per day, five companies offered two tours per day, two companies offered three tours per day, two companies offered five tours per day, and one company offered one tour per day. Tier 1 companies offered one tour per day, Tier 2 companies offered a range in tour numbers per day from one to five, Tier 3 companies offered one or two tours per day, and Tier 4 companies offer two or three tours per day. Regional data indicate that most mainland companies offered one tour per day and island companies offered a range of tours from one to five per day.

Kayak sector results were more difficult to surmise from secondary data. Tours appeared to be less fixed for some companies. Thus the data are weaker in representing kayak and land tours. Tours appear to be offered both on a daily basis and in various durations of multiday trips. The number of daily and multiday trips was difficult to estimate; however, the data show a trend that approximately seven kayak companies offer approximately 21 daily trips. In addition, the most common multiday trip appears to be a 3-day trip, where approximately seven companies offered 3-day trips once a week during the peak season. Land sector data vary as well, where a fixed tour schedule provided drop off points at SRKW viewing locations in addition to tours specifically offered for SRKW viewing.

We also sought information on the duration of the tours. As in the tour data, secondary data were used. Secondary data analysis shows that tour durations ranged from 2.5 hours to 7 hours. Motorized vessel data indicate 4-hour tours were the most common, followed by 3-hour tours. Tour durations were distributed across tiers. The most common trend shows that 3-4 hour trips were common in all tiers except Tier 1. Regional data also indicate that all trips 5 hours or longer departed from the mainland and all trips 4 hours or less departed from the island region. Kayak sector data again are varied. Daily trips appeared to range in duration from 1 to 7 hours.

¹⁷ See footnote 16.

The majority of trips offered appeared to be 3 hours. The duration of land sector trips either is not available or varies greatly.

Trip data include departure times. Secondary data for motorized vessels were summarized and indicate a majority of the tours departed between 10 a.m. and noon, followed by 8 a.m. to 10 a.m. and noon to 2 p.m. Tier 1 data show a majority of tours departing either between 8 a.m. and 10 a.m. or 10 a.m. and noon. Tier 2 data show equivalent departures throughout the day with a decline in departures after 4 p.m. Tier 3 data indicate the most departures, 30%, leaving between noon and 2 p.m., followed by 20% departing between 8 a.m. and 10 a.m. and 20% between 10 a.m. and noon, with a decline in activity from 2 p.m. into the evening. Tier 4 data show a majority of departure activity between 4 p.m. and 6 p.m., followed by between 10 a.m. and noon. Regional data indicate most mainland tours depart between 8 a.m. and 10 a.m. or between 10 a.m. and noon. Island region tours departed primarily between noon and 2 p.m., with an equivalent number of tours departing between 10 a.m. and noon, 2 p.m. and 4 p.m., as well as 4 p.m. and 6 p.m. There are insufficient data to report for the kayak and land sectors.

Data on occupancy rates were also sought. Data here represent results for tours held during the peak season. For the motorized vessel companies, responses show the highest occupancy rates are 71–80%. Of all the responses to this question, 64% said that occupancy rates were greater than 71%, indicating the majority of overall occupancy rates range 71–100%. A majority of regional responses, 43%, reported an occupancy rate of 76–100% for mainland companies and 62% reported a rate of 76–100% for island companies. Both kayak and land sector responses show primary occupancy rates of 71–80%.

Respondents were also asked to indicate whether the company they worked for or owned conducted additional commercial activity with the vessels other than SRKW viewing. Motorized vessel responses show 62% conducted additional commercial activity year-round. Mainland responses indicate 82% conducted additional commercial activity primarily year-round, while island region responses show 48% conducted additional commercial activity primarily year-round. Most in the kayak sector did not conduct additional activity, while the land sector conducted additional activity primarily during the peak season.

A summary of all business operations data suggests that most motorized vessel companies would describe their tours as “boat-based tours where the SRKWs are a focal point.” A majority of vessel activity was dedicated to SRKW viewing. Tour results using secondary data suggest that 17 companies offered 37 tours during the peak season. The number of tours ranged from one to five per day per company. The duration of tours per day ranged from 2.5 hours to 7 hours. A majority of the tours departed between 10 a.m. and noon. The data suggest that the larger vessels, operating out of the mainland, offered fewer tours per day for a longer duration and departing earlier in the day. Companies with single boats, primarily operating out of the island region, offered more tours of shorter duration per day, with departure times throughout the day. Companies operating multiple vessels offered the most number of tours per day, varied in tour duration, and provided more tours departing throughout the day. Occupancy rates for motorized vessel companies were above 71%. Data for all motorized vessels indicate that most conducted additional commercial activities year-round. Kayak sector responses show

very little additional activity and land sector responses show additional peak season commercial activity.

The in-depth analysis of business operations indicates unique characteristics of the businesses as well as some consistencies. Differences between large and small vessels are notable, as well as differences between the regional locations of those vessels. Reflection of differences between regions suggests island resources such as pier space may be a contributing factor to vessel size, as well as the need to draw more tourists to the islands to fill larger boats. Mainland companies may have an easier time drawing tourists who do not take a ferry to the islands to obtain tour services. This is often clearly used as a marketing tool by those industries on the mainland. Land and kayak tours have different focuses, as they may be limited on range and seasons, so their data are again unique as compared to motorized vessel data. These analyses assist in understanding the way businesses function and the unique differences between companies.

Industry Trends

The data in the SRKW Watching Industry Trends section were analyzed using all survey responses. This decision was due in part to a reduced response rate in this section. As previously discussed, many individuals had lower tenures in the industry and did not feel they had the history to respond to this line of questioning. While the response rates were lower, it was thought they were more accurate, as they are comprised of a majority of the sample size of the participants with longer tenures.

The discussion on this data section is brief, as the analysis is not comprised of any other aggregations for comparison. Therefore, the section summary provides comprehensive review. The observations about the data in this section include noted expansions in the tourism field, such as other types of SRKW viewing and kayaking. Respondents also reported a stability of the number of vessels in the U.S. industry with a slight indication of an increase in the number of vessels. These vessels were said to be larger, with a higher passenger capacity, and faster. Responses also revealed a growth in the number of tourists in the study year of 2006, as well as a growth in the number of non-U.S. vessels and recreational vessels. This information is useful when combined with other analysis, as it speaks to the drivers for more vessels and types of vessels, as well as trends to which the industry may be responding. In an atmosphere where vessel proximity and noise is a concern, industry trends may be informative.

Effects on the Community

As in the SRKW Watching Industry Trends section, data analysis in the Effects on the Community section, was limited to an overall analysis of all survey respondents. As a result, to avoid duplication, the summary in the data section for this topic has more in-depth information than is presented here. Key points to note in this section are the connections some businesses in the industry have to their local ports and communities. As a tourist industry, the whale watching industry makes investments in partnerships and memberships such as the local chambers of commerce and vacation resorts that are primarily local to the business locations. This suggests an investment back into the local communities. Most businesses also seek shore support services in their local communities, including fuel and office space. The analysis of the qualitative

responses regarding the significance of the industry to the local community and general public echo support of their local communities. References were made to supporting the communities by drawing tourists, who become patrons at restaurants, hotels, and gift shops, supporting local jobs, as well as providing educational and experiential experiences to local children and community members. Information in this section highlights the connections the industry has to their local communities and the contribution they make, which may vary depending on the community.

Additional Analysis

During the process of completing this report, several actions were taken by the NMFS NRO's Protected Species Division. One of these actions was the completion of the Final Environmental Assessment for New Regulations to Protect Killer Whales from Vessel Effects in Inland Waters of Washington. As this research aims to assist in the management of the killer whales, we worked closely with NRO staff to do so. Results were contributed and referenced in the environmental assessment document. The analysis conducted for the NRO compared data across the sections discussed in this technical memorandum. The complete analysis is not represented herein, but was conducted to provide specific information for the NRO and the environmental assessment process. Refer to the NRO document for the results of the analysis.¹⁸

Final Remarks

The purpose of the discussion is to further clarify what we have learned, but also point out the importance of the manner in which the data were analyzed. This is a complex industry with multiple sectors, unique characteristics within the motorized vessel sector, and unique distinctions due to geography. Any lack of in-depth analysis would not have resulted in a clear understanding of the industry. These distinct and unique characteristics that vary between regional and sector analyses can contribute to a greater understanding of different impacts to different portions of the industry, either by economic factors or regulatory change.

Examples of these differences are predominant in the regional analysis combined with the motorized vessel analysis. Island region analysis shows participants are predominantly older and operate smaller vessels. Vessel size characteristics may be linked to personal preference of the vessel/company owner. The types of tours the smaller vessels provide is considered to be more personal and one-on-one. This results in a different experience for both the tourist and the daily operator of the vessel. In addition, resources on islands are different than on the mainland. Pier space, access to tourists, local wildlife, and the proximity of the SRKW viewing grounds all may contribute to a type of carrying capacity for the number of businesses, types of businesses, and vessel types that operate in the island region. Kayak and land business that have the SRKWs as a focus of their tours show diversity in the tour services they provide on the islands. They also show some access and link to the SRKWs that is limited to the geographic region and would not be possible in other regional areas. These considerations may all be factors that are taken into account when operating these tourist companies in the San Juan Islands.

¹⁸ Online at <http://www.nwr.noaa.gov/publications/nepa/marine%20mammals/vessel-rule-ea.pdf>.

Mainland region companies show variations in company design where limiting factors are rare or nonexistent. Pier space is more diversified in various communities, allowing for increased vessel size and capacity. Larger vessels have the ability to travel farther and faster to reach the SRKWs and provide a different viewing experience than the smaller vessels. This experience may be one more commonly found in mass tourism operations where a multitude of people participate in each tour. The viewing platform may be perceived as more comfortable while still gaining a viewing experience. Other options also provide a combination of inside seating or exterior seating with exposure to the elements and a more “extreme” experience while wearing maritime outdoor gear and getting splashed with water during the tour. Access to the Interstate 5 corridor appears to make it easier to draw tourists without the additional cost of a ferry ride, which has been noted to be a marketing tool for some companies. This also may contribute to the ability to draw a larger number of tourists. These factors contribute to vessel size, ability, and business design in the participation in the industry. All in all, mainland tours provide a different viewing experience.

In considering regulations, noting the types of vessels and the unique characteristics of vessels may help to understand the impacts on the varying companies. For example, smaller vessels with outboard motors may be limited in the ability to reduce noise, where inboard larger vessels may have the ability to install mufflers and operate on a quieter platform. Some companies with larger boats have already taken this into account and made adjustments to their vessels. Biodiesel options may or may not be more accessible to certain engine types than others. Some companies have already taken advantage of this option to operate a “greener” business. This concept is also used in marketing. Larger vessels with higher viewing decks may have a better viewing platform for the whales as viewing distances increase, where lower platforms would have a diminished viewing capacity. New regulations may further alter vessel characteristics or tour emphasis as companies change or alter their behavior to be in compliance with regulations. Smaller vessels may or may not focus more highly on overall wildlife tour experiences and only access the SRKWs when the circumstances allow. These varying characteristics of vessel types were taken into consideration by the NRO when working on the regulation alternatives in the environmental assessment.

The SRKWs have obviously grown to be a huge tourist draw in the region. Whether companies use the image, name, or concept to draw tourists to a diverse wildlife experience, or focus their entire company’s efforts on viewing the whales, the whales are a center of attention in these communities in the region. It is difficult to travel anywhere without seeing businesses incorporate the SRKW or orca in their business names, logos, or local artwork. The whales have grown to be highly incorporated into these communities from the lowest to highest levels of marketing. They are a unique characteristic to these communities, and as some describe it, an extensive source of the regional economy, not to mention an experience of a lifetime.

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