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Whale Watching in Stellwagen Bank National Marine Sanctuary: Understanding Passengers and their Economic Contributions

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Neil A. Jacobs, Ph.D.
Assistant Secretary of Commerce for Environmental Observation and Prediction
Performing the duties of Under Secretary of Commerce for Oceans and Atmosphere

National Ocean Service
Nicole LeBoeuf, Assistant Administrator (Acting)

Office of National Marine Sanctuaries
John Armor, Director

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Cover photo: Whale watchers in Stellwagen Bank National Marine Sanctuary. Photo: Matt McIntosh/NOAA

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Contact

Danielle Schwarzmann, Ph.D.
Chief Economist
Office of National Marine Sanctuaries
1305 East West Highway
Silver Spring, MD 20910
Danielle.Schwarzmann@noaa.gov

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Abstract

This report presents information on for-hire whale watching passengers in Stellwagen Bank National Marine Sanctuary, including their estimated economic contributions. The approach used to collect and analyze these data, including survey implementation and sampling design, is also presented. Results include passengers' attitudes, perceptions, and other activities they participated in, as well as a profile of their sociodemographic characteristics (such as where they come from, how long they stay, age, race, and party size). Additionally, this report presents the economic contribution (jobs, income, value-added, and output) of whale watchers, the characteristics they find most important and are most satisfied with, the number of whale watching days and trips they make to the region, and the types of wildlife they prefer to view. These findings will be used to support the Stellwagen Bank National Marine Sanctuary management plan review, inform education and outreach efforts related to whales, and provide additional information to for-hire wildlife viewing operations.

Key Words

Stellwagen Bank National Marine Sanctuary, whale watching, importance/satisfaction, economic contribution

Executive Summary

In 2018 and 2019, Emerson College, in partnership with the Office of National Marine Sanctuaries and the National Marine Sanctuary Foundation, conducted a study of for-hire whale watching passengers that visit Stellwagen Bank National Marine Sanctuary (SBNMS), located in the Gulf of Maine (Figure 1.1). The goal of the study was to provide up-to-date data to support the conservation and management goals of SBNMS to strengthen and improve conservation of marine wildlife, including whales, pinnipeds, seals, and seabirds, within the sanctuary.

Working with the six whale watching operations that were known to visit the sanctuary on a regular basis at the time the project started, surveyors intercepted respondents on the return portion of the whale watching tour and asked the respondent to complete a short screener survey and to participate in a longer follow-up survey about the importance and satisfaction of various aspects of their experience, their expenditures, and the activities they participated in while in the region.

Respondents willing to participate were then recruited into a longer survey implemented via a mailback paper survey or Qualtrics, an online survey platform. The response rate for the on-site short screener was roughly 97% of the 1,853 people intercepted, and roughly 26.4% of the 1,801 respondents who completed the screener completed the longer follow-up survey.

Over 94% of respondents to the screener said that the primary purpose of their trip was whale watching, indicating that a majority of the economic benefits derived from whale watching passengers were directly linked to their desire to go whale watching. About 40% of the screener respondents said that they specifically picked a whale watching tour that was going to SBNMS, which means that a large portion of economic benefits are related to whale watchers specifically targeting SBNMS.

Findings from the longer survey include information about demographics, number of days spent in the region, attitudes, perceptions, and expenditures of respondents. On average, residents of the New England region spent 5.6 days vacationing within the study area (a 14-county region surrounding SBNMS; see Figure 1.1) and take 1.5 trips annually to New England.

Respondents were also asked to rate the importance of different items that could potentially have an influence on their choice of whale watching operator. The biggest influences on whale watchers' choice of operator were the opportunity to see animals they wanted to see, the convenience of the time of day for the tour, and the duration of the trip. The least influential factor was whether smoking was permitted on board.

The most common animals that passengers come to see are whales. The top three most liked animals were dolphins, sea turtles, and humpback whales. The least liked animal was seagulls, and all birds were ranked low.

Respondents were also asked about various attributes of their experience in the region. They rated how important and satisfied they were with 27 different items related to the whale watching experience and facilities.

The items that passengers rated as most *important* were:

- opportunity to see whales,
- friendly staff, and
- clean water.

The items with the highest level of *satisfaction* for passengers were:

- a knowledgeable naturalist on board,
- friendly staff, and
- the naturalist was available to answer questions.

The analytical framework used for importance-satisfaction analysis allows for a four-quadrant presentation and provides information to national marine sanctuary sites for management plan reviews, visitor center proposals, and education and outreach initiatives. The four quadrants are formed by first placing the importance measurement on the vertical axis and the satisfaction measurement on the horizontal axis (see Figure 6.1). This allows for interpretation of the "*relative importance*" and "*relative satisfaction*" of each item. The use of the four quadrants provides a simple but easy-to-interpret summary of results. Scores falling in the upper left quadrant are relatively high on the importance scale and relatively low on the satisfaction scale. This quadrant is labeled "*Concentrate Here*." Scores falling in the upper right quadrant are relatively high on the importance scale and relatively high on the satisfaction scale and are labeled "*Keep up the Good Work*." Scores falling in the lower left quadrant are relatively low on both the importance and satisfaction scale and are labeled "*Low Priority*." And, finally, scores in the lower right quadrant are relatively low on the importance scale but relatively high on the satisfaction scale and are labeled "*Possible Overkill*."

Some of the items that where categorized as "Keep up the Good Work" were:

- the opportunity to see whales,
- a knowledgeable naturalist on board, and
- friendly staff.

Items categorized as "Concentrate Here" were:

- public restrooms available on land and
- whale net bubble feeding.

Respondents were asked to rate their expectations for different items on their whale watching tour, then asked to give a rating for how much the item met their expectations. These scores were used to perform an expectancy-discrepancy analysis where the score for whether or not the item met expectations was subtracted from the expectations score. Of the 14 items tested, 10 items had a negative mean difference, and eight of these differences were statistically significant. This means 10 items exceeded the respondents' average expectations, such as clean air (little to no pollution) and whether operators offered discounts, group rates, and recycling.

Expenditures of respondents were also analyzed. Per-person per-day expenditures were highest for whale watching tours ($21.03), followed by hotels/motels ($8.00), food and beverages bought at restaurants/bars ($5.97), and airline fares ($2.75) (see Chapter 7 for complete expenditures results). This spending was traced through the local economy to understand how jobs, income, value added, and output are supported. In total, roughly 1,400 jobs are supported

annually by those who visit whale watching operations near SBNMS. Further, $76.1 million in labor income, $107.2 million in value added, and $182.1 million in output are supported by these activities each year. See Chapter 8 for the definitions of these terms.

Chapter 1: Introduction

Introduction

Stellwagen Bank National Marine Sanctuary (SBNMS) is an 842-square-mile (638-square-nautical-mile) marine protected area at the mouth of Massachusetts Bay. The sanctuary boundary is somewhat rectangular, stretching from three miles southeast of Cape Ann to three miles north of Cape Cod. The sanctuary is about 25 miles east of Boston and lies totally within federal waters. It encompasses all of Stellwagen and Tillies Banks and the southern portion of Jeffreys Ledge (ONMS, 2020a).

Stellwagen Bank is an underwater plateau at the mouth of Massachusetts Bay, formed by the same processes that formed outer Cape Cod. As the ice sheets of the last Great Ice Age retreated, they left behind sand, gravel, and rock. At one point in time (perhaps 12,000 years ago), Stellwagen Bank was actually above sea level, but as sea level rose and the glaciers continued to melt, the bank was gradually submerged beneath the sea (ONMS, 2020a).

One of the most common activities that takes place within SBNMS is whale watching, with trips lasting around 3 to 4 hours on average. Virtually all of Massachusetts whale watching occurs in SBNMS, one of the top ten whale watching locations in the world, as identified by USA Today in 2016. A study completed by Hoagland and Meeks (2000) estimated that Massachusetts alone accounted for nearly 80% of New England whale watching in terms of for-hire whale watching passengers (referred to as passengers or users hereafter) and revenues. This means passengers embarking for Massachusetts-based whale watching tours accounted for 80% of New England passengers, supporting $24 million/year in revenues to operators.

Whale watching in SBNMS contributes to the larger whale watching industry in North America, which is currently the largest whale watching destination in the world. In 2008 alone, there were over 6 million whale watchers in North America with a total expenditure estimate of over $1.1 billion (O'Connor et al., 2009). O'Connor et al. (2009) also found that roughly 910,000 tourists went on whale watching trips in the New England region (Massachusetts, Maine, New Hampshire, and Rhode Island) in 2008, although participation has decreased by 25% since 1998 (1,240,000 whale watchers). Roughly 80% of whale watching in the New England area took place at SBNMS. The present study focuses specifically on the six Massachusetts operators that are known to take passengers to the sanctuary. Although there are other operations that visit the SBNMS, their use of the sanctuary is not consistent across seasons. Of the total trips other operators take in a given year, their time spent in the sanctuary varies from 2–40%. Given the variation across seasons, these other operations were not included in the study, since the focus is on whale watching in the sanctuary.

Given the importance of SBNMS to the whale watching industry in the New England region, it is important to understand the economic benefits provided by and attitudes of whale watchers in the region. This report attempts to better understand who is using the sanctuary for whale watching and how that use supports the local economy. This report also seeks a greater

understanding of users' attitudes and perceptions toward the sanctuary, its resources, and whale watching operations within the region.

Ecosystem services are benefits that people receive from the environment. This report focuses on the value of whales relative to recreation and tourism through wildlife viewing. However, whales provide many other ecosystem services, such as climate regulation through carbon storage. Whales absorb carbon dioxide from the atmosphere and can accumulate up to 33 tons of carbon dioxide. They also support communities of microorganisms, which also absorb carbon dioxide from the atmosphere. Given these benefits, the value of an average great whale (such as baleen and sperm whales) is estimated at around $2 million over its lifetime (Chami et al., 2019). However, this report only focuses on the value of the whale watching industry to the United States and local economy, respectively.

Whales also contribute to sense of place, which is defined by the Office of National Marine Sanctuaries as aesthetic attraction, spiritual significance, and location identity, and includes the level of recognition a place has (ONMS, 2020b). Looking beyond SBNMS, but still within the sanctuary system, some communities and cultures have historically used whales as a source of food through subsistence harvest (e.g., the Makah Tribe in Washington state).

In addition to ecosystem services, it is also worth considering the ways in which people support whale conservation and stewardship. Scientists and educators have agreed on several principles that everyone should understand about the ocean. Ocean Literacy Principle #6 states that "the ocean and humans are inextricably interconnected" (University of Hawaii, 2020). In the case of SBNMS, whales and the whale watching community have demonstrated that inextricable connection between society and nature. Even before there was a sanctuary, whale watching passengers and companies provided voices in support of a marine protected area. That groundswell (or ocean swell) of awareness led to the creation of New England's only national marine sanctuary.

In support of both whales and the industry, SBNMS has worked with NOAA Fisheries and Whale and Dolphin Conservation to establish a voluntary program called Whale SENSE, which recognizes companies that subscribe to a high level of environmental awareness and conservation. Prior to developing Whale SENSE, SBNMS, NOAA Fisheries, and the industry developed guidelines for safer whale watching. Each company receives outreach materials from the sanctuary to inform their passengers about ocean issues and resources, and sanctuary education staff provide training to whale watch company naturalists on climate change topics that can, in turn, be imparted to the ocean-going public.

As a completely offshore site, SBNMS depends on whale watch companies to spread the word about the sanctuary and to be its eyes and ears on the water. This includes watching for entangled whales and other threats to sanctuary resources. As a world-renowned ecotourism destination, SBNMS and the local whale watching industry have played an important role in whale conservation for more than four decades.

This study provides up-to-date data support the conservation and management goals of SBNMS to strengthen and improve conservation of marine wildlife, including whales, pinnipeds, seals, and seabirds within the jurisdiction of the sanctuary and to satisfy legal mandates under the

National Marine Sanctuaries Act (16 U.S.C. 1431 et seq), Endangered Species Act (16 U.S.C. 1531 et seq), Marine Mammal Protection Act (16 U.S.C. 1361 et seq), National Environmental Policy Act (42 U.S.C. 4321), Executive Order 12866 (EO 12866), and other pertinent statutes. SBNMS is currently in the process of updating its 2010 management plan and has identified a lack of baseline socioeconomic information on ocean recreation businesses. This information is required to assess the possible economic benefits of marine wildlife protection to the local economy or the potential impacts to ocean recreation businesses. This study helps to fill that data gap.

SBNMS Study Area

The local region (also referred to as the study area), for the purposes of this report, is composed of a 14-county region within New England (Figure 1.1). This is consistent with past studies that have used this study area for SBNMS. Primary counties are those that are directly adjacent to the sanctuary. Secondary counties are determined by looking at commuter flow data from the 2016 American Community Survey, the most recent year the data were available. The American Community Survey provides data on where people live versus where they work and vice versa. If total flows to or from primary counties were above 5,000, that county was identified as a secondary county (United States Census Bureau, 2020).

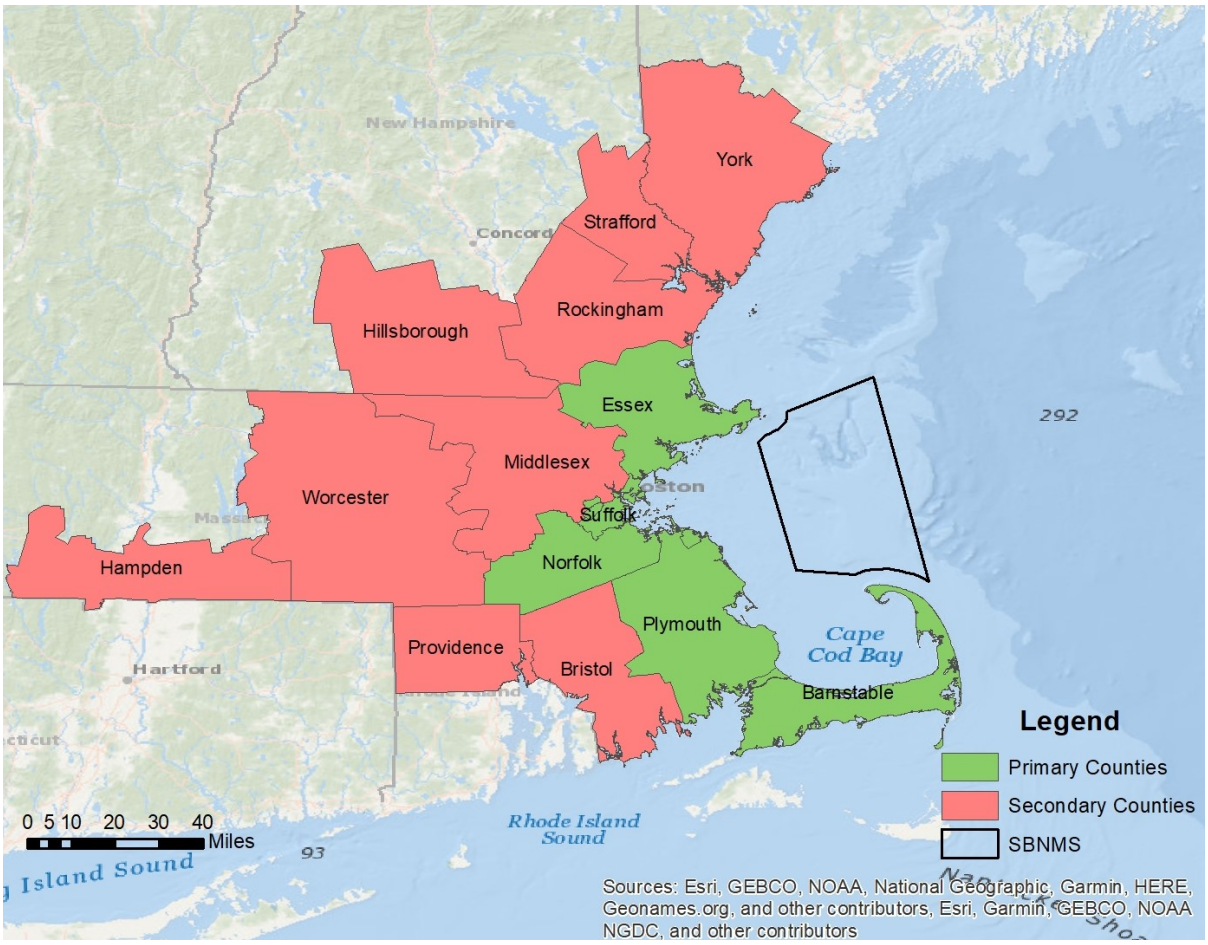

Figure 1.1 SBNMS study area.

Sampling Methodology

Prior to the start of the survey, SBNMS staff reached out to the known whale watching operators who use the sanctuary for wildlife viewing. There were six operations in total. Site staff explained the purpose of the study and the sampling process and asked for the operators' support in this effort. After the site made initial contact with the operators, Emerson College students and sanctuary volunteers reached out to schedule trips and begin sampling. Sanctuary volunteers and students from Emerson College conducted surveys from July–November of 2018 and April–November of 2019. Interviewers were trained on how to implement the screener (as defined in the executive summary), respond to potential questions, and address any questions or concerns about the survey process or data uses.

Sampling was implemented across all six vessel operations and across all days of the week to ensure a representative sample. As the seasons progressed, some adjustments to the sampling process were made out of necessity due to weather related events and volunteer schedules.

The screener questions (see Appendix A) were administered on board the whale watch vessel on the return portion of the trip. Vessel operators announced the interviewer's presence at the beginning of the trip and explained that the passengers might be approached by the surveyor on

the return portion of the trip. Surveyors did not approach passengers on the first portion of the whale watching trip.

If multiple surveyors were on board, then each surveyor started in a different location on the boat and asked respondents to answer the screener in the order that they encountered interviewees. For example, if 10 people were standing in a line along a railing, the surveyor started with the person closest to them and moved down the line, surveying one person in each group, as time permitted. Only the person in each group who was responsible for paying for the trip was interviewed. This was important, since a portion of the longer survey asked about trip expenditures, thus the person with the most knowledge of expenditures was required to complete this section. If the respondent completed the screener survey, they were then asked to complete a longer version of the survey, either via mail using a paper version (postage was provided by this project) or online via Qualtrics, an online survey platform. The longer version of the survey is used interchangeably with online survey and mailback survey throughout the text.

Response Rates

The response rates for the screener survey and the longer online/paper survey are presented in Table 1.1.

Table 1.1 Response rates and distribution of long survey format.

Survey Type	**Total Asked**	**Total Completed**	**Response Rate**
Screener	1,853	1,801	97.2%
Online/Paper Surveys	1,801	476	26.4%
Online vs. Paper		**Category Total**	**% Completed**
Online		455	95.6%
Paper		21	4.4%

Chapter 2:
Screener Results

Primary Trip Purpose

Was your primary trip purpose wildlife viewing?

Respondents were asked if the primary purpose of their trip to New England was to go wildlife viewing. Of the 1,827 people who responded, over 93% said that the primary purpose of their trip was wildlife viewing. Table 2.1 shows the response distribution.

Did you specifically find a tour that visited SBNMS?

Of the 1,852 respondents to this question, 38.9% said that they specifically found a tour that visited SBNMS, 59.3% said that they did not, while less than 1% were unsure. Of the 1,728 people who stated that the primary purpose of their trip was wildlife viewing, 40.0% said that they specifically found a tour that visited SBNMS. Table 2.1 shows the full results of the responses to this question.

The two questions above are important metrics that also inform sense of place, which is an ecosystem service provided by the sanctuary and its resources.

Table 2.1 Screener responses to "Did you specifically find a wildlife viewing operation that offers trips to SBNMS?"

	Primary Purpose was Whale Watching		**Targeted SBNMS for Whale Watching**		**Primary Purpose Whale Watching and Targeted SBNMS**	
Response	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	1,728	93.3%	720	38.9%	692	40.0%
No	99	5.3%	1,099	59.3%	1,030	59.6%
Unsure	0	0.0%	5	0.3%	3	0.2%
No Response	25	1.3%	28	1.5%	3	0.2%
Total	1,852	100.0%	1,852	100.0%	1,728	100.0%

Did staff talk about the sanctuary?

Many operations have a trained naturalist on board to answer questions and provide additional information. Over 76% of screener respondents said that boat staff talked about the sanctuary during their tour (Table 2.2).

Table 2.2 Screener responses to "Did the staff talk about SBNMS?"

Response	**Frequency**	**Percent**
Yes	1,393	76.3%
No	147	8.1%
Unsure	285	15.6%
Total	1,825	100.0%

Did your tour visit SBNMS?

Just under 54% of respondents said that their tour visited SBNMS, 29% said that the tour did not visit SBNMS, and 17% were unsure (Table 2.3). According to data collected directly from the whale watching operators in the area, about 77% of whale watching activity occurs within the sanctuary. These findings may suggest that despite staff talking about the sanctuary, respondents may not hear all of the announcements being made on the vessel or that vessels are not consistently announcing when they enter the sanctuary.

Table 2.3 Screener responses to "Did the whale watching trip visit SBNMS?"

Response	Frequency	Percent
Yes	984	53.9%
No	528	28.9%
Unsure	313	17.2%
Total	1,825	100.0%

Screener Demographics

Age

Respondents were asked about their age (Table 2.4). The most common age group was 41 to 50 and the least common was 18 to 30. It is worth noting that the age of respondents may not represent the age of passengers. It is possible that younger passengers traveled with parents who paid for the trip; since only the person responsible for paying for the trip was surveyed, this may have resulted in under sampling of younger passengers (e.g., passengers in age group 18–30). Chapter 3, which details the results of the longer survey, showed that nearly 14% of respondents had more than two adults in their household (see Table 3.11).

Table 2.4 Reported age of screener respondents.

Age	Frequency	Percent
18–30	216	11.9%
31–40	353	19.4%
41–50	465	25.5%
51–60	391	21.5%
Over 60	396	21.7%
Total	1,821	100.0%

Gender

About two-thirds of screener respondents identified themselves as female, and the remaining third identified themselves as male. No respondents identified their gender as "other". Since sampling for the screener was based upon the individual who paid for the trip, this distribution may not be representative of all passengers.

Table 2.5 Reported gender of screener respondents.

Gender	Frequency	Percent
Female	1,207	67.1%
Male	593	32.9%
Other	0	0.0%
Total	1,800	100.0%

Chapter 3:
User Profiles of Online/Mailback Respondents

Sanctuary-Related Questions

Did your tour visit SBNMS?

Over 75% of online/mailback survey respondents said that their tour visited SBNMS, 13% said that it did not, and about 12% were unsure. The percentage of people who said that their tour did visit SBNMS was higher for online/mailback survey respondents than it was for screener respondents. The percentage reported by online/mailback survey respondents was similar to the amount of time whale watching operators reported spending within the sanctuary (77%). By comparison, 54% of those who answered the same question on the screener stated that they visited the sanctuary. This suggests that those who visited the sanctuary may have been more likely to either complete the longer survey or that those who completed the longer survey may have paid closer attention to on-board announcements.

Table 3.1 Online/mailback survey responses to "Did your tour visit SBNMS?"

Response	Frequency	Percent
Yes	284	75.1%
No	49	13.0%
Unsure	45	11.9%
Total	378	100.0%

Did staff talk about the sanctuary?

Over 89% of online/mailback survey respondents said that boat staff talked about the sanctuary during their tour (Table 3.2). When considered with the results from the previous question, these findings suggest that even if the boat did not visit the sanctuary for wildlife viewing, operators still provided information about the sanctuary to passengers. This number was also higher than the 76% of screener respondents who reported that boat staff talked about the sanctuary. Additionally, only 2.7% of online/mailback respondents, compared to 15.6% of screener respondents, reported that they were unsure whether staff talked about SBNMS. Together, these results suggest that online/mailback survey respondents may have listened more carefully to on-board announcements.

Table 3.2 Online/mailback survey responses to "Did whale watching staff talk about the sanctuary?"

Response	Frequency	Percent
Yes	336	89.1%
No	31	8.2%
Unsure	10	2.7%
Total	377	100.0%

Did you see any signs, exhibits, or information about the sanctuary on land?

About 39% of respondents said that they saw information about the sanctuary on land, 47.6% said that they did not see anything related to the sanctuary, and 13.7% were unsure (Table 3.3). A lack of sanctuary signage and information on land might indicate an area in which the sanctuary could improve.

Table 3.3 Online/mailback survey responses to "Did you see any signs, exhibits, or information about the sanctuary on land?"

Response	Frequency	Percent
Yes	146	38.6%
No	180	47.6%
Unsure	52	13.8%
Total	378	100.0%

Did you specifically find a tour that visited SBNMS?

Of the 378 respondents to this question, 35.7% said that they specifically found a tour that visited SBNMS, 59.3% said that they did not, and 5.0% were unsure (Table 3.4). These results differ slightly from the screener, primarily because more people said that they were "unsure" when responding to the online/mailback question (5.0% compared to 0.3% on the screener). This pattern diverges from previous questions, in which the percent of "unsure" responses was lower for the online/mailback survey compared to the screener.

Table 3.4 Online/mailback survey responses to "Did you specifically find a tour that visited SBNMS?"

Response	Frequency	Percent
Yes	135	35.7%
No	224	59.3%
Unsure	19	5.0%
Total	378	100.0%

Animal Likeability

Respondents were asked to give a group of 15 species a score from one to seven based on how much they liked each species, with one indicating "Strongly Dislike" and seven indicating "Strongly Like". The top three liked species according to the species likeability score were dolphins, humpback whales, and sea turtles. The lowest scores were given for seagulls and other sharks. Although seagulls and other sharks scored lowest, the average score still indicated "slightly like" and "like", respectively. Figure 3.1 shows the full range of likeability responses.

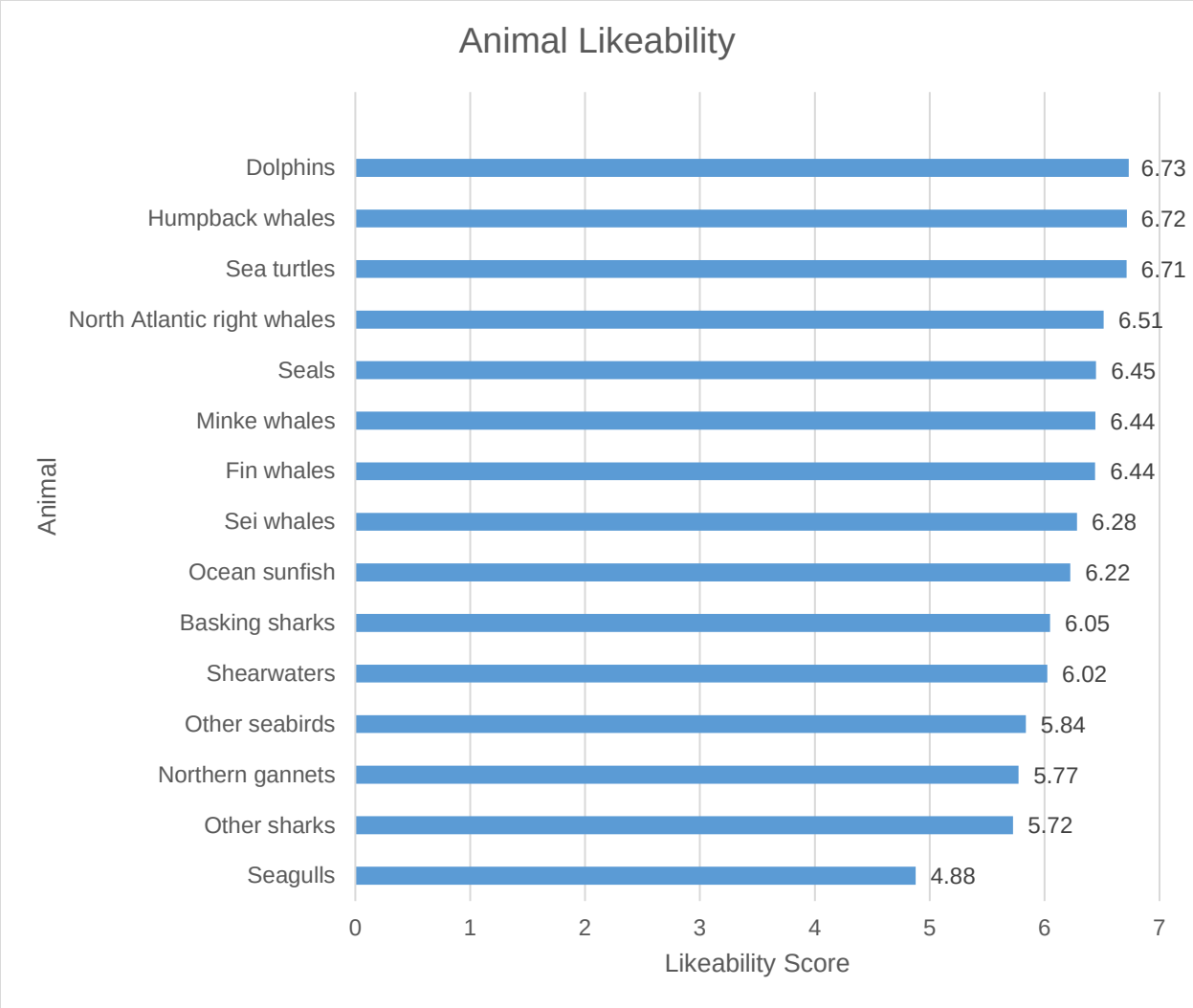

Figure 3.1 Mean animal likeability scores.

Animals Seen

Respondents were asked whether or not they had seen animals in six different categories and asked to select which one of the six categories corresponded to the primary animal they wanted to see. The most common animals that respondents saw were birds and whales, and the most common animals that respondents wanted to see were whales. Although dolphins were the most liked animal according to the animal likeability index, only one respondent listed dolphins as the primary animal they wanted to see. This is important because it shows that whale watchers may like other animals more than whales even though they are visiting for the primary purpose of seeing whales. Table 3.5 shows the full results for this set of questions.

Table 3.5 Animals seen during whale watching trips.

Animal Category	This Was the Primary Animal I Wanted to See	Yes, I Saw This Animal	No, I Did Not See This Animal
Whales	173	201	3
Seals	4	123	242
Dolphins	1	72	293
Birds	1	331	40
Sharks	3	13	348
Other wildlife	1	109	253

Resource Improvement

Respondents were asked how many whales they would need to see to make their whale watching trip worthwhile. They were then asked if they would spend more time in the study area if resource conditions were such that they were guaranteed seeing this number of whales during their trip.

On average, respondents said that they would need to see 3.6 whales to make their whale watching trip worthwhile. Out of the 374 people who responded to this question, 338 (90%) said that they did see at least that many whales during their trip. If respondents were guaranteed to see their desired number of whales, 42% said that they would extend their trip to the study area and 65% said that they would take more trips to the study area. Respondents then recorded how many extra days they would spend and how many more trips they would take. Responses show that people would spend an average of 0.71 more days per trip in the study area and take an average of 0.94 more trips to the study area if they were guaranteed to see their desired number of whales. Although a guarantee would not be possible, this does suggest that as resource conditions improve and the abundance of whales increases, people may be more likely to spend more time in the study area, thus increasing economic contributions to the region.

Trip Influencers

Respondents were asked to rank the importance of different items that could potentially have an influence on their choice of whale watching operator. Respondents were asked to state how much they agree or disagree with a statement. “Strongly disagree” was equal to one, “no impact” was equal to four, and “strongly agree” was equal to seven. Respondents indicated that the opportunity to see animals they wanted to see was the biggest influence on the choice of whale watching operation. The least influential factor was that smoking was permitted on board. Table 3.6 shows the full results for this set of questions.

Table 3.6 Influences on selection of whale watching operation.

Item	Mean[1]	Standard Deviation	Count
The operation was targeting animals I wanted to see	6.62	0.84	371
They had tours at the time of day I wanted to go	5.95	1.22	364
The amount of time for the trip met my requirements	5.53	1.49	358
Size and speed of the vessel	5.31	1.56	357
The company is recognized for sustainable operations and/or conservation efforts	5.28	1.62	318
Ticket price	5.22	1.33	354
The boat prohibited smoking	5.04	1.94	318
There was parking nearby	5.01	1.68	356
I preferred/liked the company's website	4.77	1.44	335
You had a coupon or other discount	4.53	1.86	343
I saw an advertisement online	4.51	1.77	343
I relied on consumer reviews on Yelp, Trip Advisor, or other review service	4.1	1.96	350
The operation was near my hotel	4.06	1.55	344
I relied on recommendations of family/friends	3.98	1.96	349
The operation was near my house	3.89	1.89	356
I saw an advertisement in a travel publication	3.81	1.72	342
I saw an advertisement on social media	3.59	1.69	342
I saw an advertisement at the hotel	3.57	1.63	336
I saw an advertisement at a restaurant	3.26	1.53	337
I relied on recommendations made by my hotel	3.26	1.57	337
I recognized or researched Whale SENSE	3.12	1.67	313
I used a travel agent	2.86	1.49	344
The boat permitted smoking onboard	2.23	1.54	320

1. "Strongly disagree" was equal to one, "no impact" was equal to four, and "strongly agree" was equal to seven.

Age

The most common age category for the online/mailback respondents was the over 60 age group. The least common age group was people between the ages of 18 and 31. Table 3.7 shows the full results for ages of online/mailback survey respondents.

Table 3.7 Ages of online/mailback survey respondents.

Age Group	Frequency	Percent
18-30	33	9.4%
31-40	56	16.0%
41-50	81	23.1%
51-60	85	24.3%
Over 60	95	27.1%
Total	350	100.0%

Gender

A majority of online/mailback respondents were female (Table 3.8). About one third of respondents were male, and one respondent identified their gender as other.

Table 3.8 Gender of online/mailback survey respondents.

Gender	Frequency	Percent
Female	233	67.5%
Male	111	32.2%
Other	1	0.3%
Total	345	100.0%

Race

The vast majority of respondents to the online/mail back survey were white. No other race category accounted for more than 3% of responses individually. Table 3.9 shows the full breakdown of race for the online/mailback survey respondents.

Table 3.9 Race of online/mailback survey respondents.

Race	Frequency	Percent
White or Caucasian	319	93.50%
Other	8	2.30%
Asian	7	2.10%
Two or more races	4	1.20%
American Indian or Alaskan Native	2	0.60%
Black or African American	1	0.30%
Total	341	100.00%

Ethnicity

Almost 98% of respondents identified themselves as not Hispanic or Latino. Only 7 survey respondents identified themselves as Hispanic.

Table 3.10 Ethnicity

Ethnicity	Frequency	Percent
Not Hispanic	334	97.9%
Hispanic	7	2.1%
Total	341	100.0%

Household Composition

The most common household type for respondents was two adults with no children under the age of 18. The least common category was a single adult with children under 18. Table 3.11 shows the full breakdown of household categories.

Table 3.11 Household composition of online/mailback survey respondents.

Household Type	Total	Percent
Single adult with no children under 18	41	13.6%
Single adult with children under 18	5	1.7%
Two adults with no children under 18	110	36.4%
Two adults with children under 18	83	27.5%
More than two adults with no children under 18	41	13.6%
More than two adults with children under 18	22	7.3%
Total	302	100.0%

Income

The most common household income category for online/mailback respondents was $100,000 to $149,999. Around 75% of respondents to the screener made over $75,000 annually. The least common income category was $10,000-$19,999.

Table 3.12 Income of online/mailback survey respondents.

Income Category	Frequency	Percent
$150,000 or more	76	26.67%
$100,000 to $149,999	90	31.58%
$75,000 to $99,999	47	16.49%
$60,000 to $74,999	28	9.82%
$50,000 to $59,999	13	4.56%
$40,000 to $49,999	14	4.91%
$30,000 to $39,999	10	3.51%
$20,000 to $29,999	4	1.40%
$10,000 to $19,999	3	1.05%
Total	285	100.00%

Chapter 4:
Testing for Differences in Screener and Mailback Results

Introduction

Non-response bias occurs when the group that responds to the online/mailback survey is different from the population for which one wants to estimate certain parameters. The group that responds is different from the population if they have statistically different responses. For example, average expenditures per person per trip for lodging may be a function of age. If those over 60 have higher expenditures and replied to the survey at higher rates than the total population of users, then applying the higher average to all visitors would result in an overestimate of lodging expenditures. This overestimation would be the result of non-response bias.

Two variables were included on the in-person screeners to test for non-response bias in two components of the online/mailback survey: trip expenditures and importance/satisfaction. Both age and gender were questions on the on-site screener and the online/mailback survey. If non-response bias does exist, it would be necessary to weight the data when analyzing the results of the longer survey. In other words, because demographics were collected on the on-site screener survey, non-response bias can be assessed in the online/mailback survey.

In addition to testing for the significance of demographic variables in determining whether or not a person responds to the longer online/mailback survey, non-response was tested based upon the operation the respondent used. This is important, since the distribution of survey responses by a given whale watching company may not be the same as the distribution across all operators. By testing for non-response bias by operation, if responses vary by operation, then this can be identified and controlled for in the analysis.

The approach used here for non-response bias has two steps. First, it is necessary to determine whether the likelihood of completing the online/mailback survey was related to various socioeconomic factors. Second, if any of the socioeconomic factors (age and gender) are found to be significant in determining whether or not a person completes the survey, then tests are performed to see if there is a relationship between socioeconomic factors and online/mailback question responses. Non-response bias requires not only that respondents to the online/mailback survey differ from the full user population, but also that the factors that relate to whether the visitor responded to the online/mailback survey are also related to their online/mailback survey responses. While some factors differed between the full user population and online/mailback survey respondents, our results indicate these factors were not a significant predictor of online/mailback survey responses, therefore the data were not weighted.

Non-Response Bias for Satisfaction Survey

Non-Response Bias for Demographics

A logistic regression was performed to test whether or not demographics (age and gender) were significant in predicting whether or not a person completed the online/mailback survey. Respondents were asked to give their age category, and responses were coded to dummy

variables for ages 18–30, 31–40, 41–50, 51–60, and over 60 (these ranges are inclusive). Age group 18–30 was the only age group that was significant in determining whether a person completed the online/mailback survey (respondents in this age group were less likely to complete the survey). The respondent's gender was not significant in determining whether a person completed the online/mailback survey. The base categories for comparison were over the age of 60 for the age groups and females for gender.

Table 4.1 Statistical test results assessing the effects of demographics on whether or not a person completed online/mailback survey. Tests were performed on 1,904 total observations.

Variable	Coefficient	Standard Error	z	P Value	95% Confidence Interval	
Gender_Male	-0.1287	0.131	-0.983	0.325	-0.385	0.128
Age_18–30	-0.4510	0.228	-1.974	0.048	-0.899	-0.003
Age_31–40	-0.3683	0.191	-1.928	0.054	-0.743	0.006
Age_41–50	-0.2145	0.172	-1.245	0.213	-0.552	0.123
Age_51–60	0.0284	0.172	0.165	0.869	-0.309	0.366
Intercept	-1.3416	0.127	-10.539	0.000	-1.591	-1.092

The next step was to determine if age group 18–30 was significant in predicting responses to the expenditures, importance/satisfaction, and/or expectations questions. Note that gender is included in these regressions to ensure that none of the effects of gender are captured in the age coefficients. For expenditures, the total lodging and total food expenses per person-day (a continuous variable) were used as dependent variables to test if age was a significant predictor. For importance-satisfaction, the average score for importance attributes and the average score for satisfaction attributes were used as dependent variables (continuous variables). For expectations, the average score for expectation level and the average score for how much each item met expectations were used as the dependent variables (continuous variables). Age group 18–30 was not found to be significant in determining online/mailback survey responses (Tables 4.2–4.7). Although the age category of 51–60 was significant in predicting food expenditures, it was not significant in determining whether or not a person responded to the online/mailback survey. It was therefore not necessary to weight the data based on age.

Table 4.2 Statistical test results assessing the effect of age and gender on lodging expenditures. Tests were performed on 303 total observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Gender_Male	-3.0524	10.238	-0.298	0.766	-23.200	17.095
Age_18–30	-29.8053	18.406	-1.619	0.106	-66.028	6.417
Age_31–40	-16.5636	14.575	-1.136	0.257	-45.248	12.120
Age_41–50	5.7838	12.791	0.452	0.651	-19.388	30.955
Age_51–60	-3.6780	13.007	-0.283	0.778	-29.275	21.919
Intercept	51.1392	9.533	5.364	0.000	32.379	69.900

Table 4.3 Statistical test results assessing the effect of age and gender on food expenditures. Tests were performed on 303 total observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Gender_Male	-3.7294	6.703	-0.556	0.578	-16.922	9.463
Age_18-30	-11.3334	12.052	-0.940	0.348	-35.051	12.384
Age_31-40	4.1217	9.544	0.432	0.666	-14.660	22.903
Age_41-50	1.9608	8.375	0.234	0.815	-14.521	18.443
Age_51-60	16.8663	8.516	1.980	0.049	0.106	33.627
Intercept	27.4778	6.242	4.402	0.000	15.194	39.762

Table 4.4 Statistical test results assessing the effect of age and gender on importance variables. Tests were performed on 326 total observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Gender_Male	-0.0894	0.076	-1.177	0.240	-0.239	0.060
Age_18-30	-0.0232	0.137	-0.170	0.865	-0.292	0.246
Age_31-40	0.0065	0.111	0.059	0.953	-0.211	0.224
Age_41-50	0.0359	0.099	0.362	0.717	-0.159	0.231
Age_51-60	0.0493	0.099	0.499	0.618	-0.145	0.243
Intercept	2.9798	0.074	40.039	0.000	2.833	3.126

Table 4.5 Statistical test results assessing the effect of age and gender on satisfaction variables. Tests were performed on 326 total observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Gender_Male	-0.1122	0.083	-1.359	0.175	-0.275	0.050
Age_18-30	0.0453	0.149	0.305	0.761	-0.247	0.338
Age_31-40	-0.1064	0.120	-0.883	0.378	-0.343	0.131
Age_41-50	0.0918	0.108	0.852	0.395	-0.120	0.304
Age_51-60	0.1641	0.107	1.528	0.128	-0.047	0.375
Intercept	3.3958	0.081	41.943	0.000	3.237	3.555

Table 4.6 Statistical test results assessing the effect of age and gender on respondents' expectations. Tests were performed on 311 total observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Gender_Male	0.0430	0.084	0.510	0.611	-0.123	0.209
Age_18-30	-0.2195	0.155	-1.416	0.158	-0.525	0.086
Age_31-40	-0.1370	0.124	-1.103	0.271	-0.381	0.107
Age_41-50	-0.0204	0.109	-0.186	0.852	-0.235	0.195
Age_51-60	0.0637	0.109	0.583	0.561	-0.151	0.279
Intercept	2.9874	0.083	36.147	0.000	2.825	3.150

Table 4.7 Statistical test results assessing the effect of age and gender on whether expectations were met. Tests were performed on 311 total observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Gender_Male	-0.0747	0.093	-0.807	0.420	-0.257	0.108
Age_18-30	0.2145	0.170	1.259	0.209	-0.121	0.550
Age_31-40	-0.0143	0.136	-0.105	0.917	-0.283	0.254
Age_41-50	0.1133	0.120	0.943	0.346	-0.123	0.350
Age_51-60	0.1485	0.120	1.236	0.217	-0.088	0.385
Intercept	3.2122	0.091	35.361	0.000	3.033	3.391

Non-Response Bias by Operation

A logistic regression was performed to test whether location was significant in predicting whether or not a person completed the online/mailback survey. The location of respondent interviews was recorded and locations were coded to dummy variables for Boston Harbor, Barnstable, Gloucester (7 Seas), Gloucester (Cape Ann), Plymouth, and Provincetown. The Cape Ann and 7 Seas operators were in the same city and were thus differentiated by company name. Every location except for Gloucester (Cape Ann) was significant in determining whether or not a respondent completed the online/mailback survey compared to the Barnstable location.

Table 4.8 Statistical test results assessing the effect of operation on whether or not respondents completed the online/mailback survey. Tests were performed on 1,915 observations.

Variable	Coefficient	Standard Error	z	P Value	95% Confidence Interval	
Boston Harbor	1.7272	0.262	6.604	0.000	1.215	2.240
Gloucester (7 Seas)	1.1386	0.306	3.724	0.000	0.539	1.738
Gloucester (Cape Ann)	0.2513	0.359	0.701	0.483	-0.451	0.954
Plymouth	0.5782	0.154	3.746	0.000	0.276	0.881
Provincetown	1.0016	0.225	4.460	0.000	0.561	1.442
Intercept	-2.1972	0.119	-18.410	0.000	-2.431	-1.963

The next step was to determine whether location was significant in predicting how a person responds to the expenditures, importance/satisfaction, and/or expectations questions. Using the same dependent variables that were used to test whether or not responses varied based on demographic variables, the effect of operation on online/mailback survey responses was tested. Operation was not found to be significant in determining online/mailback survey responses (Tables 4.9–4.14). It was therefore not necessary to weight the data based on operation.

Table 4.9 Statistical test results assessing the effect of operation on lodging expenditures. Tests were performed on 272 observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Boston Harbor	8.2328	18.201	0.452	0.651	-27.603	44.069
Gloucester (7 Seas)	-16.3842	23.830	-0.688	0.492	-63.305	30.536
Gloucester (Cape Ann)	-15.4082	27.517	-0.560	0.576	-69.587	38.771
Plymouth	-23.4423	12.319	-1.903	0.058	-47.698	0.813
Provincetown	-1.4693	17.015	-0.086	0.931	-34.971	32.032
Intercept	57.2606	9.729	5.886	0.000	38.105	76.416

Table 4.10 Statistical test results assessing the effect of operation on food expenditures. Tests were performed on 272 observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Boston Harbor	9.8629	10.102	0.976	0.330	-10.026	29.752
Gloucester (7 Seas)	-12.5160	13.226	-0.946	0.345	-38.557	13.525
Gloucester (Cape Ann)	0.0729	15.272	0.005	0.996	-29.997	30.143
Plymouth	8.6871	6.837	1.271	0.205	-4.775	22.149
Provincetown	10.5847	9.443	1.121	0.263	-8.009	29.178
Intercept	23.1688	5.400	4.291	0.000	12.538	33.800

Table 4.11 Statistical test results assessing the effect of operation on importance variables. Tests were performed on 289 observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Boston Harbor	0.2418	0.135	1.792	0.074	-0.024	0.507
Gloucester (7 Seas)	-0.0840	0.174	-0.484	0.629	-0.426	0.258
Gloucester (Cape Ann)	0.0019	0.222	0.008	0.993	-0.435	0.439
Plymouth	0.0199	0.093	0.215	0.830	-0.162	0.202
Provincetown	-0.0527	0.131	-0.403	0.687	-0.310	0.205
Intercept	2.9684	0.74	40.096	0.000	2.823	3.114

Table 4.12 Statistical test results assessing the effect of operation on satisfaction variables. Tests were performed on 289 observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Boston Harbor	0.1340	0.149	0.897	0.370	-0.160	0.428
Gloucester (7 Seas)	0.2137	0.192	1.113	0.267	-0.164	0.592
Gloucester (Cape Ann)	0.3800	0.246	1.547	0.123	-0.103	0.864
Plymouth	0.0087	0.103	0.084	0.933	-0.193	0.210
Provincetown	0.2404	0.145	1.662	0.098	-0.044	0.525
Intercept	3.3701	0.082	41.156	0.000	3.209	3.531

Table 4.13 Statistical test results assessing the effect of operation on expectations. Tests were performed on 277 observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Boston Harbor	0.1053	0.152	0.692	0.489	-0.194	0.405
Gloucester (7 Seas)	0.0324	0.184	0.176	0.861	-0.331	0.396
Gloucester (Cape Ann)	-0.0998	0.231	-0.432	0.666	-0.555	0.355
Plymouth	0.0644	0.102	0.631	0.528	-0.136	0.265
Provincetown	0.0152	0.145	0.105	0.917	-0.270	0.301
Intercept	2.9605	0.080	37.134	0.000	2.804	3.117

Table 4.14 Statistical test results assessing the effect of operation on whether expectations were met. Tests were performed on 277 observations.

Variable	Coefficient	Standard Error	t	P Value	95% Confidence Interval	
Boston Harbor	0.1625	0.167	0.971	0.332	-0.167	0.492
Gloucester (7 Seas)	0.2833	0.203	1.396	0.164	-0.116	0.683
Gloucester (Cape Ann)	0.3613	0.254	1.422	0.156	-0.139	0.862
Plymouth	-0.0212	0.112	-0.189	0.850	-0.242	0.200
Provincetown	0.1752	0.160	1.098	0.273	-0.139	0.489
Intercept	3.2500	0.088	37.065	0.000	3.077	3.423

Chapter 5:
Tourist Visits in the Sanctuary

Respondents were asked to report how many days they spent in New England[1], how many days they spent wildlife viewing, how many days they spent on for-hire charter operations, and how many trips they have taken in the past 12 months to New England to go wildlife viewing.

Outlier Analysis

If a respondent left the number of days they spent in New England blank, this was assigned a value of one. This is a conservative estimate for the number of days spent in the region since it is possible for someone to only travel for one day to go whale watching and then return home. Some respondents also indicated that they were local residents or entered in 365 for the number of days spent in the study area; these responses were also assigned a value of one. If someone reported that they spent more than 30 days on their trip, then their response was truncated to 30. The cutoff of 30 was chosen because it was equal to 2.5 standard deviations above the mean (this rule was used for all outlier truncations). Nine was chosen as the cutoff for number of trips, and 33 was chosen as the cutoff for number of days spent wildlife viewing. There was no outlier truncation performed for number of days on for-hire charter operations since the standard deviation was relatively small. In total, six observations were truncated for days per trip, eight were truncated for number of trips, and five were truncated for number of days spent wildlife viewing.

Person-Day Analysis

Excluding outliers, on average, respondents took 1.5 trips to New England per year and spent 5.6 days in the region per trip (Table 5.1). Around 2.4 of these days were spent wildlife viewing and 1.2 days were spent on for-hire charter operations. This means that although respondents may have engaged in other types of wildlife viewing (like from the shore or private vehicles or boats), the majority of respondents engaged in one for-hire whale watching boat tour per trip.

Six whale watching operations in the New England region regularly take visitors to SBNMS for whale watching. These operations were asked to provide their total number of passengers for the year and the percentage of total trips that visited the sanctuary. Companies reported that they served an average of 347,475 passengers annually and that 77.3% of their trips visited the sanctuary. This means that nearly 269,000 passengers visited SBNMS on their whale watching tour. It is possible that one person could have gone whale watching more than once in a single year, meaning that the number of reported passengers represents the total number of person-trips spent whale watching. The number of passengers/person-trips was converted to the number of person-days spent within the New England region by multiplying the number of passengers/person-trips by the average number of days spent in the region per trip. The number of person days spent in the New England region is what is ultimately used to perform the economic contribution analysis. Tables 5.1 and 5.2 provide full results of time spent traveling

[1] New England is defined as the region comprising Maine, Vermont, New Hampshire, Massachusetts, Connecticut, and Rhode Island

and wildlife viewing in the New England region without and with outliers, respectively. Outliers appear to have a noticeable effect on the estimates; person-days increased by about 200,000, or 10.7%, when outliers were included. Removing outliers provided a more conservative estimate of person-days.

Table 5.1 Number and length of trips to the New England region without outliers (n=396).

Category	Mean	Standard Deviation
Days per trip	5.63	5.81
Number of passengers[1]	347,475	--
Person-days[2]	1,956,284	N/A
Number of trips	1.47	1.40
Number of days wildlife viewing	2.36	4.43
Number of days on for-hire charters	1.2	0.91

1. This is the number of passengers directly reported by the whale watching operators.
2. This number was determined by multiplying the number of days per trip by the number of passengers.

Table 5.2 Number and length of trips to the New England region with outliers (n=396).

Category	Mean	Standard Deviation
Days per trip	6.23	9.67
Number of passengers[1]	347,475	--
Person-days[2]	2,164,769	N/A
Number of trips	1.89	5.70
Number of days wildlife viewing	3.16	12.04
Number of days on for-hire charters	1.2	0.91

1. This is the number of passengers directly reported by the whale watching operators.
2. This number was determined by multiplying the number of days per trip by the number of passengers.

Chapter 6:
Consumer Preferences

For many years, the U.S. Forest Service and many other federal, state, and local agencies that manage parks and/or other natural resources have used the National Satisfaction Index (NSI) to measure visitor satisfaction. Satisfaction is a complex feature of the recreation/tourist experience and it is now agreed upon by most researchers that "importance-performance" or "importance-satisfaction" is a much more complete measure and provides a much simpler interpretation than the NSI. First described in the marketing literature by Martilla and James (1977), importance-satisfaction has been described and/or used in such studies as Guadagnolo (1985), Richardson (1987), Hollenhorst et al. (1992), and Leeworthy and Wiley (1996). Since then, this approach has been used in Florida Keys National Marine Sanctuary (Leeworthy & Ehler, 2010) and Olympic Coast National Marine Sanctuary (Leeworthy et al., 2016).

In the present study, a questionnaire was divided into two sections to obtain the necessary information for the importance-satisfaction analysis. The first section asked the respondent to read each statement and to rate the importance of each of 27 items that contribute to visitor experiences at different whale watching companies. Each item was rated or scored on a one to five Likert scale (1–5) with one (1) meaning "Not Important" and five (5) meaning "Extremely Important." The respondent was also given the choice to answer "Not Applicable" or "Don't Know." The second section asked the respondent to consider the same list of items they just rated for importance and to rate them for how satisfied they were with each of the items on their visit to the SBNMS region. Again, a five-point scale was used with one (1) meaning "Not Satisfied" and five (5) meaning "Extremely Satisfied." Respondents were also given the choice to answer "Not Applicable" or "Don't Know."

The collected data are presented in multiple ways. First, the means, or average scores, are reported along with the estimated standard errors of the mean and the count (number of people who gave a rating). This latter measure is important because many respondents provided importance ratings for only the items relevant to them. Alternatively, respondents may not have had a chance to use a resource, facility, or service and therefore did not provide a satisfaction rating. This can lead to biases in comparing importance and satisfaction.

The second method of presenting the findings is bar charts showing the mean scores of each item's importance and satisfaction rating. It is important to note that while both importance and satisfaction are measured on a one to five scale, the scales are measuring different outcomes and are not directly comparable. They do, however, communicate relative importance/satisfaction relationships across the different items.

The most useful analytical framework provided in importance-satisfaction analysis is the four-quadrant presentation. Four quadrants are formed by first placing the importance measurement on the vertical axis and the satisfaction measurement on the horizontal axis (see Figure 6.1). A vertical line is placed at the mean score for all 27 items on the satisfaction scale and an additional horizontal line is placed at the mean score for all 27 items on the importance scale. The intersection of these two lines divides the importance-satisfaction space into four quadrants. This allows for interpretation of the "relative importance" and "relative satisfaction"

of each item. That is, if everyone gave high scores to all items, we would still be able to judge relative importance and satisfaction to establish priorities.

The use of the four quadrants provides a simple but easy-to-interpret summary of results. Scores falling in the upper left quadrant are relatively high on the importance scale and relatively low on the satisfaction scale. This quadrant is labeled “Concentrate Here.” Scores falling in the upper right quadrant are relatively high on the importance scale and relatively high on the satisfaction scale and are labeled “Keep up the Good Work.” Scores falling in the lower left quadrant are relatively low on both the importance and satisfaction scale and are labeled “Low Priority.” And, finally, scores in the lower right quadrant are relatively low on the importance scale but relatively high on the satisfaction scale and are labeled “Possible Overkill.”

In general, the 27 items that respondents were asked to rate are organized into four categories. In the survey, the order of the items was mixed. Each of the items was given a letter rather than a number and are labeled A through AA.

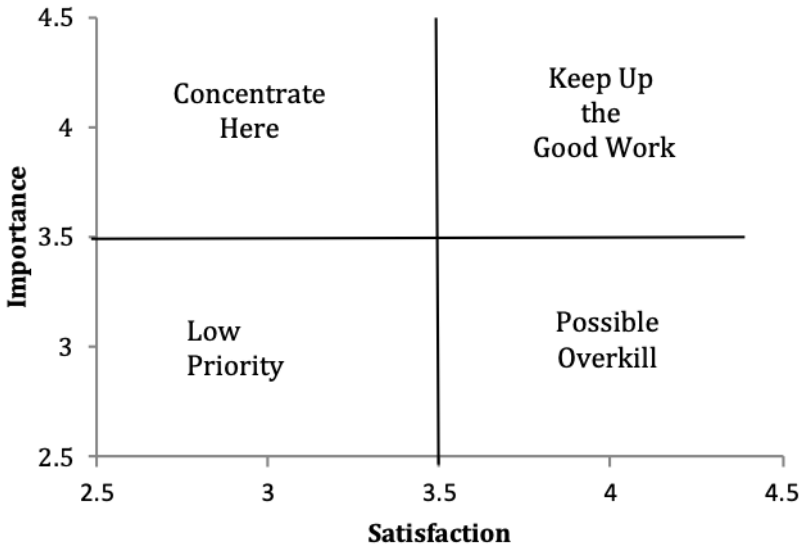

Figure 6.1 Importance-satisfaction four-quadrant key.

Importance-Satisfaction Mean Ratings

This section presents the mean level of importance and satisfaction for the sample as a whole. The items with the highest level of importance were that the trip gave passengers the opportunity to see whales and that the staff was friendly and helpful. The lowest importance items were that alcoholic beverages were available on board and that a gift shop was available. The items with the highest satisfaction level were the presence of a knowledgeable naturalist on board the tour and that the naturalist was available to answer questions. The items with the lowest satisfaction were that the tour gave passengers the opportunity to see sharks and that there were a large number of seals. Some other key takeaways from the scores are that the opportunity to see whales is more important than the quantity of whales seen and that birds score the lowest on the importance scale compared to other animals. There have been recent reports of great white sharks in the area (B. Haskell, personal communication, October 18,

2019), however the importance score for the opportunity to see sharks remains low compared to the score for whales. Table 6.1, Table 6.2, and Figure 6.2 show the full importance and satisfaction scores.

Table 6.1 Mean importance ratings for items related to respondents' experiences.

Item	Mean	Standard Error	Number of Responses
Natural Resources			
Clean water	4.04	0.93	357
Clean air	4.03	0.91	359
Large number of whales	3.32	1.10	369
Different types of whales	2.78	1.18	367
Opportunity to see whales	4.17	0.85	369
Opportunity to see sharks	2.34	1.21	345
Large number of seals	2.22	1.17	353
Large number of birds	2.05	1.19	352
Many types of birds	2.07	1.19	352
Whale breaching surface	3.50	1.16	367
Whale net bubble feeding	2.93	1.23	310
Education			
Knowledgeable naturalist	4.07	0.98	365
Available naturalist	3.86	1.07	367
Educational exhibits on boat	3.05	1.29	358
Educational exhibits on land	2.40	1.09	343
Boat Amenities			
Clean restrooms	3.81	1.01	363
Friendly staff	4.09	0.88	366
Operator offered discount	2.31	1.21	239
Operator offered group rate	1.83	1.18	179
Recycling available	3.22	1.23	271
Locally sourced food	2.32	1.27	250
Food and beverages available	2.45	1.14	341
Alcohol available	1.41	0.90	328
Access and Parking			
Marina facilities	2.54	1.21	325
Parking available	3.16	1.22	348
Gift Shop available	1.65	1.01	341
Public restrooms on land	3.16	1.18	349

Table 6.2 Mean satisfaction ratings for items related to respondents' experiences.

Item	Mean	Standard Error	Number of Responses
Natural Resources			
Clean water	3.77	0.89	344
Clean air	3.87	0.84	347
Large number of whales	3.57	1.21	348
Different types of whales	2.87	1.32	308
Opportunity to see whales	3.94	1.08	345
Opportunity to see sharks	1.85	1.20	156
Large number of seals	2.36	1.34	195
Large number of birds	2.81	1.02	226
Many types of birds	2.66	1.11	205
Whale breaching surface	3.48	1.41	320
Whale net bubble feeding	3.11	1.49	231
Education			
Knowledgeable naturalist	4.12	0.90	344
Available naturalist	4.07	0.94	333
Educational exhibits on boat	3.32	1.12	270
Educational exhibits on land	2.93	0.95	215
Boat Amenities			
Clean restrooms	3.72	1.02	301
Friendly staff	4.07	0.91	346
Operator offered discount	2.89	1.33	131
Operator offered group rate	2.94	1.56	33
Recycling available	3.28	1.07	172
Locally sourced food	2.76	1.29	87
Food and beverages available	3.19	0.88	262
Alcohol available	3.18	0.80	120
Access and Parking			
Marina facilities	3.46	0.90	262
Parking available	3.38	1.10	290
Gift shop available	3.26	0.93	184
Public restrooms on land	3.15	1.15	232

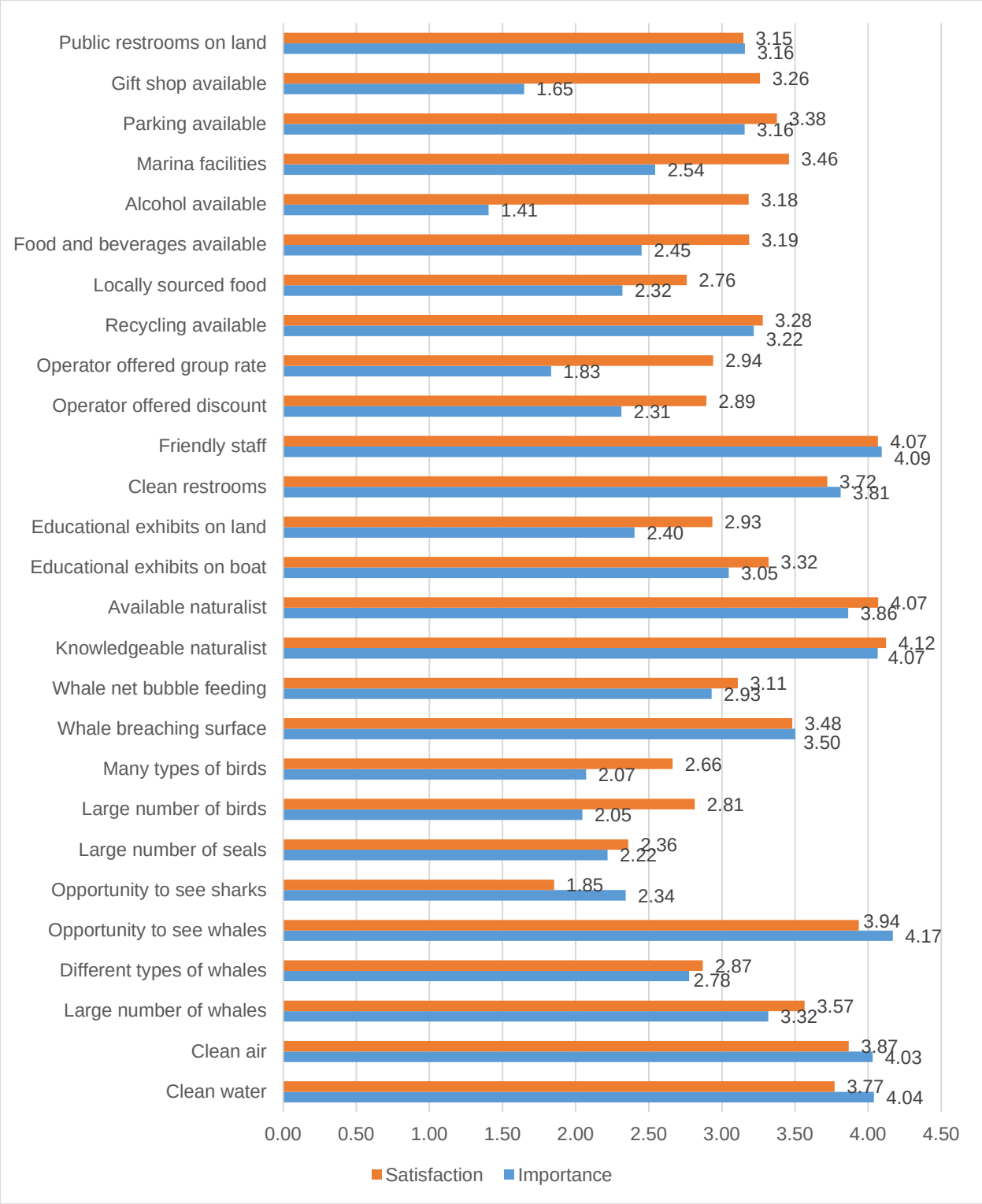

Figure 6.2 Importance-satisfaction scores for items related to respondents' experiences.

Four Quadrant Analysis

Figure 6.3 shows a scatter plot for the four quadrant analysis. The mean importance score for all items was 2.92 and the mean satisfaction score for all items was 3.26. Using these means as guides, the 27 items can be separated into the quadrants. Some of the "Low Priority" items (low satisfaction and low importance) were that there were a large number of seals on the tour and that the operator offered a group rate. The presence of friendly staff fell into the "Keep up the Good Work" category (relatively more importance and satisfaction). Very few items fell into the "Concentrate Here" or "Possible Overkill" categories. The only item in the "Possible Overkill" category was marina facilities, boat ramps, and launching facilities and the only items in the "Concentrate Here" category were the availability of public restrooms and whale bubble net feeding. The ability to increase public restroom availability may be within the sanctuary's control, particularly if a visitor center were to be built. Increasing the opportunity to see whale bubble net feeding would be especially difficult for the sanctuary and partners. However, increasing education and outreach products that illustrate this whale behavior may be more feasible.

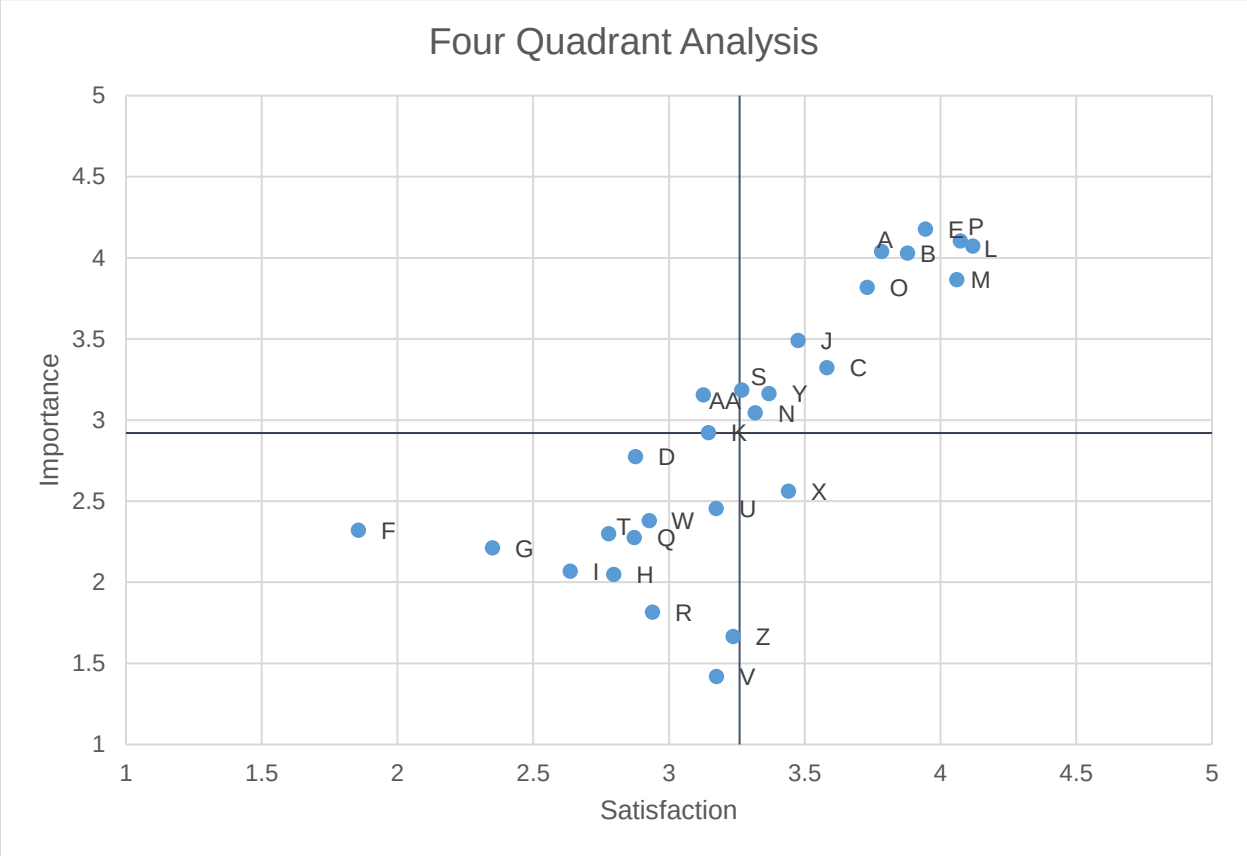

Figure 6.3 Four quadrant analysis. Importance and satisfaction are both measured on a one to five scale, however the scales measure different outcomes and are not directly comparable. This graph helps communicate relative importance/satisfaction relationships across items of interest. See Table 6.3 for item keys.

Table 6.3 Key for items presented in Figure 6.3.

Item	Letter	Category
Clean water (little to no pollution)	A	Keep up the good work
Clean air (little to no pollution)	B	Keep up the good work
A large number of whales	C	Keep up the good work
Different types of whales	D	Low priority
Opportunity to see whales	E	Keep up the good work
Opportunity to see sharks	F	Low priority
A large number of seals	G	Low priority
A large number of birds	H	Low priority
Many types of birds	I	Low priority
Whale breaching the surface	J	Keep up the good work
Whale bubble net feeding	K	Concentrate here
A knowledgeable naturalist on board	L	Keep up the good work
The naturalist available to answer questions	M	Keep up the good work
Educational exhibits or activities available onboard the vessel when wildlife is not present	N	Keep up the good work
Clean restrooms on the boat	O	Keep up the good work
The staff was friendly and helpful	P	Keep up the good work
Operator offered a discount	Q	Low priority
Operator offered a group rate	R	Low priority
The boat offered recycling	S	Keep up the good work
The boat offered locally sourced food	T	Low priority
Availability of food and non-alcoholic beverages on the wildlife viewing vessel	U	Low priority
Availability of alcoholic beverages on the wildlife viewing vessel	V	Low priority
Educational posters, signs, exhibits, and brochures on land	W	Low priority
Marina facilities, boat ramps, and launching facilities	X	Possible overkill
Availability of parking	Y	Keep up the good work
Availability of a gift shop	Z	Low priority
Availability of public restrooms	AA	Concentrate Here

Expectations

Respondents were asked to rate their level of expectation for a subset of items on a scale from one to five, with one meaning “did not expect” and five meaning “big expectation”. They were then asked to give a rating for how much each of these items met their expectations with one meaning “completely did not meet my expectations”, two meaning “slightly met my expectations”, three meaning “met my expectations”, four meaning “slightly exceeded my expectations,” and five meaning “completely exceeded my expectations.” Table 6.4 shows scores

for respondents' expectations for each item and the whether or not the item met expectations. The three items with the largest expectations scores were "clean air", "clean water", and "clean restrooms on boat." Each of these items had a met expectations score between 3.45 and 3.55, meaning that each of the items at least met respondents' expectations, on average. The item that exceeded expectations the most was "a knowledgeable naturalist on board," which had a met expectations score of 3.86 (and an expectations score of 3.49). The items that met expectations the least were "a large number of seals" and "operator offered a group rate." For each item, a majority of people had their expectations met (a score of three or higher). The items that had the highest percent of people who had their expectations met were "clean air," "clean water," and "clean restrooms on boat." The items that had the lowest percent of people who had their expectations met were "a large number of seals" and "operator offered a group rate."

Table 6.4 Respondents' expectations and met expectations scores for a set of items related to visitor experience.

Item	Average Expectation Score	Average Met Expectations Score	Percent of People who had their Expectations Met[1]	Count
Clean water (little to no pollution)	3.65	3.52	96.9%	324
Clean air (little to no pollution)	3.74	3.53	96.9%	326
A large number of whales	3.30	3.40	76.4%	331
Different types of whales	2.93	2.86	60.2%	299
A large number of seals	2.02	2.51	57.0%	200
A large number of birds	2.30	2.76	70.7%	215
Many types of birds	2.20	2.75	69.1%	207
Whale breaching the surface	3.10	3.34	72.8%	309
Whale bubble net feeding	2.68	3.10	70.0%	217
A knowledgeable naturalist on board	3.49	3.86	94.5%	330
Clean restrooms on the boat	3.65	3.49	92.6%	283
Operator offered a discount	2.36	2.83	66.9%	127
Operator offered a group rate	2.02	2.79	64.3%	42
The boat offered recycling	2.95	3.14	79.3%	174

1. A person had their expectations met if they selected a 3 or higher for their met expectations score.

Chapter 7:
Whale Watching Expenditures

For each spending item, respondents were asked how much money they spent on their trip, how much of that money was spent in the study area, and how many people were covered with that money. An earlier question asked how many days were spent on their trip. If someone said that they spent no money on whale watching tours, their response was changed such that spending per person was equal to $58 ($58 per ticket was the lowest ticket price that could be found online and thus the most conservative estimate). Outliers for person-days were handled the same way as in Chapter 4.

Respondents were asked about their expenditures in both the study area (defined in Chapter 1, Figure 1.1) and for their total trip. Expenditures in the study area help to better inform how whale watching supports businesses in the local economy adjacent to the sanctuary. Total expenditures include spending both within the study area and outside the study area. For example, if a person lives in Minneapolis and purchases airfare to fly to Boston, airfare would be part of their total expenditure but would be excluded from study area expenditures.

All items were reviewed for outliers, but the following four items underwent outlier analysis: "hotel/motel," "cottage/condo/rental home," "food and drinks bought at restaurants and bars," and "airline fare." No outliers were found for "cottage/condo/rental home" and "airline fare," one outlier was truncated for "hotel/motel," and two outliers were truncated for "food and drinks bought at restaurants and bars." For total trip expenditures, an item was tested for outliers[2] if per person per day spending had a standard deviation above 40.

For trip expenditures within the study area, the values for "whale watching tour" were set equal to the values from total trip expenses since all for-hire operators are located within the study area. If someone reported that their spending within the study area was higher than their spending for the total trip, then their study area expenditures were truncated to their spending for the total trip. No outlier testing was done for expenditures within the study area since most of the standard deviations for the expenditure categories were relatively small. The tables below show the resulting spending profiles with the outliers removed. Table 7.1 shows the average spending per person per day for an entire trip and Table 7.2 shows the average spending per person per day within the study area. Total expenditures were determined simply by adding the spending per person-day for each category. In both spending profiles, the highest spending categories were "whale watching tour," "food and drinks bought at restaurants and bars," and "hotel/motel." The total trip spending per person per day on average was roughly $144. For total average trip spending, $21.03, $21.17, and $19.34 were the average spending per person per day for "whale watching tour," "food and drinks bought at restaurants and bars," and "hotel/motel," respectively. The average spending per person per day in the study area was roughly $50. The average total study area spending per person per day was $21.03, $5.97, and $8.00 for "whale watching tour," "food and drinks bought at restaurants and bars," and "hotel/motel,"

[2] The following process was used to test for outliers. First, the data were transformed using the square root function, then outliers were determined using the three-sigma rule. If data points were outside of three-sigma, then the data points were truncated to the value of three-sigma. Finally, the data were squared to transform back to the original specification (Temple et al., 2020).

respectively. It is worth noting that the second highest category for total trip spending was food and drinks bought at a restaurant, whereas in the study area, hotel/motel was the second and food and drinks was the third highest expenditure category. Also, given the difference in spending for the total trip compared to the study area, the data suggest that not only does a whale watching trip support economic activity in the local economy, but that whale watchers spend two-thirds of their total expenditures outside of the study area, supporting other economies.

The number for many of the spending items is low because the mean reflects spending per person per day. For example, if one person bought an item for themselves at a price of $50 but stayed in the region for five days, their spending per person day would be $50/five days/one person, which would make their spending per person per day equal to $10. Many categories are low because few survey respondents spent money on those categories (spending was zero dollars), and therefore the average across all respondents is small.

Table 7.1 Total trip spending per person per day (n=320).

Category	Mean	Standard Deviation	Min	Max
Scenic Tours				
Whale watching tour	$21.03	20.58	$0.07	$120.00
Other wildlife tour	$0.70	6.39	$0.00	$100.00
Sailing charters	$0.13	1.58	$0.00	$25.00
Sunset cruises	$0.13	1.99	$0.00	$35.00
Other	$0.13	1.07	$0.00	$11.67
Sightseeing				
Land-based sightseeing tours	$2.09	10.25	$0.00	$126.67
Admission to amusement, festivals, and other attractions	$2.36	12.26	$0.00	$200.00
Other	$1.59	9.02	$0.00	$100.00
Other Activities				
Rental fee for recreation equipment	$0.42	2.36	$0.00	$30.00
Guided service tours	$0.36	2.99	$0.00	$44.50
Tickets for motion pictures, theaters, musical performances, concerts, etc.	$2.05	12.28	$0.00	$125.00
Wine tour	$0.05	0.56	$0.00	$8.50
Other	$1.24	13.64	$0.00	$200.00
Lodging				
Hotel/motel	$19.34	38.78	$0.00	$267.08
Bed and breakfast	$3.93	32.20	$0.00	$500.00
Cabin	$0.30	3.77	$0.00	$53.13
Cottage/condo/rental home	$18.23	64.09	$0.00	$514.29
Other	$1.70	12.97	$0.00	$160.50

Category	Mean	Standard Deviation	Min	Max
Food and Beverage				
Food purchased at a grocery store	$4.85	15.81	$0.00	$233.33
Food and drinks bought at restaurants and bars	$21.17	29.13	$0.00	$179.66
Food and drinks consumed on a wildlife viewing vessel	$1.71	5.08	$0.00	$50.00
Other	$0.28	3.20	$0.00	$50.00
Transportation				
Rental automobile, motor home, trailer, motorcycle, etc.	$4.25	12.52	$0.00	$83.33
Gas and oil for automobile or RV	$5.45	10.57	$0.00	$83.33
Automobile or RV parking fees and tolls	$1.88	5.58	$0.00	$45.00
Taxi fare	$1.00	5.98	$0.00	$80.00
Ferry	$0.51	2.49	$0.00	$22.00
Train	$0.19	0.98	$0.00	$8.93
Bus fare	$0.24	1.65	$0.00	$21.00
Airline fare	$16.09	40.61	$0.00	$270.83
Other	$0.18	1.68	$0.00	$25.00
Miscellaneous				
Camera and supplies—film, batteries, memory stick, film development	$1.58	25.22	$0.00	$450.00
Footwear	$0.46	3.03	$0.00	$33.33
Binoculars	$0.21	2.16	$0.00	$30.00
Clothing	$2.37	9.43	$0.00	$91.67
Sunblock and other sundries	$0.65	2.8	$0.00	$30.00
Souvenirs and gifts	$4.52	14.77	$0.00	$200.00
Other	$0.33	4.42	$0.00	$75.00
Total	**$143.70**	**138.88**	**$2.11**	**$726.2**

Table 7.2 Study area spending per person per day (n=320).

Category	Mean	Standard Deviation	Min	Max
Scenic Tours				
Whale watching tour	$21.03	20.58	$0.07	$120.00
Other wildlife tour	$0.27	3.01	$0.00	$51.67
Sailing charters	$0.08	1.40	$0.00	$25.00
Sunset cruises	$0.02	0.35	$0.00	$6.25
Other	$0.03	0.46	$0.00	$8.25
Sightseeing				
Land-based sightseeing tours	$0.57	3.22	$0.00	$44.50
Admission to amusement, festivals, and other attractions	$0.60	3.39	$0.00	$37.50
Other	$0.60	5.84	$0.00	$78.13
Other Activities				
Rental fee for recreation equipment	$0.11	0.92	$0.00	$12.50
Guided service tours	$0.27	2.88	$0.00	$44.50
Tickets for motion pictures, theaters, musical performances, concerts, etc.	$0.43	4.02	$0.00	$62.50
Wine tour	$0.00	0.00	$0.00	$0.00
Other	$0.06	0.77	$0.00	$12.45
Lodging				
Hotel/motel	$8.00	32.00	$0.00	$400.00
Bed and breakfast	$0.49	7.00	$0.00	$120.00
Cabin	$0.00	0.00	$0.00	$0.00
Cottage/condo/rental home	$1.97	11.83	$0.00	$154.01
Other	$0.49	3.45	$0.00	$37.50
Food and Beverage				
Food purchased at a grocery store	$0.89	3.49	$0.00	$38.00
Food and drinks bought at restaurants and bars	$5.97	15.30	$0.00	$100.00
Food and drinks consumed on a wildlife viewing vessel	$0.45	1.89	$0.00	$20.00
Other	$0.04	0.71	$0.00	$12.50
Transportation				
Rental automobile, motor home, trailer, motorcycle, etc.	$1.38	8.31	$0.00	$83.33
Gas and oil for automobile or RV	$1.11	5.41	$0.00	$80.00
Automobile or RV parking fees and tolls	$0.52	2.59	$0.00	$25.00
Taxi fare	$0.28	2.43	$0.00	$29.17
Ferry	$0.16	1.14	$0.00	$13.89
Train	$0.07	0.57	$0.00	$7.50

Category	Mean	Standard Deviation	Min	Max
Bus fare	$0.07	0.52	$0.00	$5.33
Airline fare	$2.75	14.18	$0.00	$116.67
Other	$0.02	0.31	$0.00	$5.25
Miscellaneous				
Camera and supplies—film, batteries, memory stick, film development	$0.00	0.02	$0.00	$0.42
Footwear	$0.02	0.40	$0.00	$7.08
Binoculars	$0.00	0.00	$0.00	$0.00
Clothing	$0.36	1.66	$0.00	$14.29
Sunblock and other sundries	$0.03	0.18	$0.00	$1.67
Souvenirs and gifts	$0.81	3.01	$0.00	$25.00
Other	$0.01	0.23	$0.00	$4.17
Total	**$49.96**	**65.82**	**$0.13**	**$432**

Table 7.3 shows the number of people the respondent paid for in different spending categories. On average, the category that had the most people was “whale watching tour” followed by “food and drinks bought at restaurants and bars” and “gas and oil for automobile or RV.”

For each spending category, respondents’ were asked how many people their expenditures paid for. For example, if hotel spending for a family of four was $200, the respondent would report that four people were covered for that expenditure. Four relatively high numbers were reported in responses to the number of people their expenditures covered. One person said that they paid for 45 people, one person said they paid for 600 people, another said they paid for 900 people, and lastly someone said they paid for 100 people. These responses were all truncated to 15, since 15 was the highest number of people reported with the exception of the outliers listed.

Table 7.3 Average number of people covered by expenditures per activity (n=320).

Category	Mean	Standard Deviation	Min	Max
Scenic Tours				
Whale watching tour	3.16	1.98	1	14
Other wildlife tour	0.15	0.81	0	8
Sailing charters	0.04	0.35	0	4
Sunset cruises	0.03	0.27	0	4
Other	0.07	0.51	0	5
Sightseeing				
Land-based sightseeing tours	0.47	1.43	0	15
Admission to amusement, festivals, and other attractions	0.70	1.74	0	15
Other	0.24	0.96	0	10

Category	Mean	Standard Deviation	Min	Max
Other Activities				
Rental fee for recreation equipment	0.21	1.01	0	10
Guided service tours	0.09	0.51	0	4
Tickets for motion pictures, theaters, musical performances, concerts, etc.	0.30	1.08	0	8
Wine tour	0.03	0.27	0	4
Other	0.07	0.46	0	4
Lodging				
Hotel/motel	0.92	1.75	0	15
Bed and breakfast	0.07	0.39	0	4
Cabin	0.02	0.28	0	4
Cottage/condo/rental home	0.59	1.74	0	11
Other	0.17	0.83	0	8
Food and Beverage				
Food purchased at a grocery store	1.32	2.15	0	11
Food and drinks bought at restaurants and bars	2.07	2.23	0	15
Food and drinks consumed on a wildlife viewing vessel	1.10	1.72	0	9
Other	0.02	0.20	0	2
Transportation				
Rental automobile, motor home, trailer, motorcycle, etc.	0.55	1.52	0	12
Gas and oil for automobile or RV	1.48	2.21	0	15
Automobile or RV parking fees and tolls	0.93	1.81	0	12
Taxi fare	0.25	0.94	0	8
Ferry	0.26	1.08	0	8
Train	0.16	0.76	0	6
Bus fare	0.10	0.56	0	6
Airline fare	0.61	1.48	0	10
Other	0.08	0.47	0	4
Miscellaneous				
Camera and supplies—film, batteries, memory stick, film development	0.03	0.27	0	4
Footwear	0.07	0.47	0	7
Binoculars	0.02	0.15	0	2
Clothing	0.53	1.40	0	11
Sunblock and other sundries	0.45	1.38	0	10
Souvenirs and gifts	0.79	1.44	0	8
Other	0.02	0.21	0	3

Chapter 8:
Economic Contributions of Whale Watching

Study Area

When people recreate in an area and spend money, their expenditures contribute to local area economies. This chapter quantifies the economic contributions (employment, income, value-added, and output) by those who visited whale watching operations in the study area. Using the expenditures profiles presented in Chapter 7 of this report, the economic contributions of whale watching operation users were estimated.

Estimating Economic Contributions

The primary tool used by national marine sanctuaries (and other federal agencies) to estimate these relationships is an input-output model developed by the United States Forest Service in cooperation with the Federal Emergency Management Agency. The model, IMPLAN, is now maintained and updated annually by MIG, Inc. (Day, 2011). The software provides mathematical algorithms to estimate the input-output model and the resulting multipliers. The model uses the Bureau of Economic Analysis (BEA) I/O Benchmark Tables, Bureau of Labor Statistics Quarterly Census of Employment and Wages, Census Bureau's County Business Patterns, and the BEA's Regional Economic Accounts. IMPLAN is used by multiple federal agencies in addition to state and other non-governmental organizations. Economic analyses that use IMPLAN have been cited in a myriad of peer-reviewed studies (Bonn & Harrington, 2008; Watson et al., 2007; Lindall et al., 2006), and it serves as the basis for National Environmental Policy Act and other regulatory analyses.

Impacts/contributions are defined as direct, indirect, or induced. In short, direct effects are those that occur within the sector of the expenditure. Indirect effects occur as a result of spending within the primary sector on goods and services from other sectors. Induced effects result from wage earners within the study area spending money on goods and services within the region. The indirect plus induced effects make up what is generally referred to as "multiplier" effects. Multipliers show how every dollar spent in the industry helps to support the local economy. For example, if an output multiplier is 3, that means that for every dollar spent on for-hire passenger whale watching, $3.00 of activity (an additional $2.00) is supported in the local economy (Day, 2011). Table 8.2 explains these types of impacts/contributions in more detail.

Table 8.1 Definitions of IMPLAN economic indicators. Source: Day, 2011

Indicator	Definitions and Relationships
Employment	Average total annual average jobs. This includes self-employed and wage and salary employees, and all full-time, part-time and seasonal jobs, based on a count of full-time/part-time averages over 12 months
Labor Income	Defines the total value paid to local workers within a region. Labor income is the income source for induced household spending estimations. Labor Income = Employee Compensation + Proprietor Income
Value Added	Comprised of Labor Income, Indirect Business Taxes (IBT), and Other Property Type Income (OPTI), Value Added demonstrates an industry's value of production over the cost of its purchasing the goods and services required to make its products. Value Added is often referred to as Gross Regional Product (GRP). Value Added = Labor Income + IBT + OPTI
Output	The total value of an industry's production, comprised of the value of Intermediate Inputs1 and Value Added. In IMPLAN, this is typically viewed as the value of a change in sales or the value of increased production. However, annual production is not always equal to annual sales. If production levels are higher than sales, surpluses become inventory. Because inventory does not drive additional impacts in the year it was produced, in IMPLAN, Direct industry sales = Direct Output. Output = Intermediate Inputs + Value Added

1. The BEA and IMPLAN define Intermediate Inputs as "goods and services that are used in the production process of other goods and services and are not sold in final-demand markets" (Day, 2011).

Table 8.2 Definitions of impacts/contribution types.

Type	Definition
Direct Effect	The effect of spending by visitors at each business they purchase goods or services from within the study area.
Indirect Effect	The result of a sector purchasing goods and services to produce their product from other industries located within the study area.
Induced Effect	The result of spending employee wages that stem from both direct and indirect effects within the study area.

Contributions

Economic contributions resulting from the expenditures explained in Chapter 7 were estimated using IMPLAN (with 2017 multipliers). Table 8.3 provides the IMPLAN sector codes that were used with the corresponding total expenditures presented in Chapter 7. In cases where there are multiple codes assigned to an activity, the total expenditures were distributed evenly across sectors. Sectors are a way of describing the relevant industry and are based upon the North American Industry Classification System (NAICS) used by federal statisticians to classify business establishments for the purposes of collecting, analyzing, and publishing statistical data. A few expenditure categories were entered as commodities, specifically state/local government non-education and groceries. Commodities in IMPLAN are used when a good or service that is purchased might be produced by multiple industries. For example, groceries might be produced by farms, factories, or other facilities. The commodity applies the expenditure to a variety of industries that would be used to produce that commodity.

Table 8.3 IMPLAN codes used in economic contribution analysis.

Category	IMPLAN Code
Scenic Tours	
Whale watching tour	414
Other wildlife tour	414
Sailing charters	414
Sunset cruises	414
Other	414
Sightseeing	
Land-based sightseeing tours	414
Admission to amusement, festivals, and other attractions	493
Other	414
Other Activities	
Rental fee for recreation equipment	443
Guided service tours	414
Tickets for motion pictures, theaters, musical performances, concerts, etc.	423
Wine tour	414
Other	493
Lodging	
Hotel/motel	499
Bed and breakfast	500
Cabin	500
Cottage/condo/rental home	500
Other	500
Food and Beverage	
Food purchased at a grocery store	Grocery Commodity
Food and drinks bought at restaurants and bars	503
Food and drinks consumed on a wildlife viewing vessel	414
Other	Grocery Commodity
Transportation	
Rental automobile, motor home, trailer, motorcycle, etc.	442
Gas and oil for automobile or RV	3156
Automobile or RV parking fees and tolls	State/Local Government Non-Education
Taxi fare	412
Ferry	412
Train	412
Bus Fare	412

Category	IMPLAN Code
Airline fare	408
Other	412
Miscellaneous	
Camera and supplies - film, batteries, memory stick, film development	398
Footwear	403
Binoculars	405
Clothing	403
Sunblock and other sundries	405
Souvenirs and gifts	405
Other	405

Respondents were asked to mark down the amount of money they spent throughout their entire trip (total trip spending) as well as the amount they spent in the study area as defined in Figure 1.1 (study area spending). The IMPLAN model for study area spending was restricted to the counties listed in the study area, while the model for the entire United States was used for total trip spending. The entire United States was used since the place of residence for these visitors was unknown. (Note: while there are international visitors to SBNMS, IMPLAN does not currently have the ability to estimate impacts for other countries, therefore countries outside the United States were not included.)

Table 8.4 presents the economic contributions to the nation from total trip spending that included visits to wildlife viewing operations near SBNMS. Total trip expenditures were run through the IMPLAN model for the United States, meaning that the values generated represent contributions to the entire United States economy. Overall, those who use whale watching operations that visit SBNMS regularly contribute about $692 million in output, $394 million in value added, $258 million in income, and 5,300 full- and part-time jobs to the United States economy.

Table 8.5 shows the economic contributions related to wildlife viewing to the SBNMS local economy (study area) specifically. The IMPLAN model was restricted to only include the 14-county study area. Whale watching contributes $182 million in output, $107 million in value added, $76 million in income, and 1,400 full- and part-time jobs to the local economy. About 77.3% of whale watching activity in the study area occurs within SBNMS, which means that these contributions have the potential to be greatly affected by changes within the sanctuary.

A study by Van Deren et al. (2019) looked at the contributions of whale watching in San Juan County to the Puget Sound region. The contribution levels they found were fairly similar to the local contributions outlined in this report. Overall, spending due to whale watching in San Juan County contributes about $216.9 million in output, $66.7 million in income, and 1,870 full- and part-time jobs to the Puget Sound region (Van Deren et al., 2019).

Table 8.4 Economic contributions to the USA from total trip spending.

Contribution	Employment	Labor Income	Value Added	Output
Direct	2,952.5	$119,511,388	$157,896,922	$266,981,395
Indirect	847.6	$56,095,155	$91,347,087	$168,648,580
Induced	1,518.6	$82,262,673	$144,740,507	$256,674,033
Total	5,318.8	$257,869,216	$393,984,516	$692,304,008

Table 8.5 Economic contributions to the SBNMS local economy from study area spending.

Contribution	Employment	Labor Income	Value Added	Output
Direct	858.5	$41,235,976	$53,746,886	$95,145,968
Indirect	238.0	$15,928,585	$22,590,838	$37,204,253
Induced	316.7	$18,961,265	$30,942,216	$49,754,787
Total	1,413.3	$76,125,826	$107,279,941	$182,105,007

Table 8.6 Multipliers for input-output analysis.

Multiplier Type	Employment	Labor Income	Value Added	Output
USA	0.00002	0.91743	1.40169	2.46302
Study Area	0.00001	0.77877	1.09748	1.86295

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Literature Cited

Bonn, A., & Harrington, J. (2008). A comparison of three economic impact models for applied hospitality and tourism research. *Tourism Economics*, *14*(4), 769–789. https://doi.org/10.5367/000000008786440148

Chami, R., Cosimano, T., Fullenkamp, C., & Oztosun, S. (2019). Nature's solution to climate change: A strategy to protect whales can limit greenhouse gases and global warming. *Finance & Development*, *56*(4), 34–38.

Clouse, C. (2019) Understanding multipliers. Retrieved from https://implanhelp.zendesk.com/hc/en-us/articles/115009505707-Understanding-Multipliers

Day, F. (2011). Principles of impact analysis and IMPLAN applications. First Edition. MIG.

Guadagnolo, F. (1985). The importance-performance analysis: An evaluation and marketing tool. *Journal of Park and Recreation Administration*, *3*(2), 13–22.

Hoagland, P., & Meeks, A. E. (2000). The demand for whale watching at Stellwagen Bank National Marine Sanctuary. In: *The economic contribution of whalewatching to regional economies: Perspectives from two national marine sanctuaries*. Marine Sanctuaries Conservation Series MSD-00-2. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Marine Sanctuaries Division.

Hollenhorst, S., Olson, D., & Fortney, R. (1992). Use of importance-performance analysis to evaluate state park cabins: The case of the West Virginia park system." *Journal of Park and Recreation Administration*, *10*(1), 1–11.

Leeworthy, V. R., & Wiley, P.C. (1996). *Importance and satisfaction ratings by recreating visitors to the Florida Keys/Key West*. Strategic Environmental Assessments Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, National Oceanic and Atmospheric Administration.

Leeworthy, V. R., & Ehler, R. (2010). *Importance and satisfaction ratings by recreating visitors to the Florida Keys/Key West 2007–08*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Office of National Marine Sanctuaries.

Leeworthy, V., Schwarzmann, D., Reyes Saade, D., Goedeke, T. L., Gonyo, S., & Bauer, L. (2016). *Importance-satisfaction ratings for natural resource attributes facilities and services in the outer coast of Washington and the Olympic Coast National Marine Sanctuary: Volume 3, 2014*. Marine Sanctuaries Conservation Series ONMS-16-04. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries.

Lindall, S. A., Olson, D. C., & Alward, G. S. (2006). Deriving multi-regional models using the IMPLAN National Trade Flows Model. *The Journal of Regional Analysis & Policy*, *36*(1), 76–83.

Martilla, J. A., & James, J. C. (1977). Importance-performance analysis. *Journal of Marketing*, *41*(1), 77–79. https://doi.org/10.2307/1250495

Office of National Marine Sanctuaries (2020a). Stellwagen Bank National Marine Sanctuary socioeconomics. Retrieved from https://sanctuaries.noaa.gov/science/socioeconomic/factsheets/stellwagenbank.html

Office of National Marine Sanctuaries (2020b). Description of ecosystem services and methods to determine ratings. Retrieved from https://sanctuaries.noaa.gov/science/condition/ecosystem.html

O'Connor, S., Campbell, R., Cortez, H., & Knowles, T. (2009) *Whale watching worldwide: Tourism numbers, expenditures and expanding economic benefits*. A special report from the International Fund for Animal Welfare prepared by Economists at Large & Associates.

Richardson, S. L. (1987). An importance-performance approach to evaluating communication effectiveness. *Journal of Park and Recreation Administration*, *5*(4), 71–83.

Temple, M., Gussenbauer, J., & Filzmoser, P. (2020). Evaluation of robust outlier detection methods for zero-inflated complex data. *Journal of Applied Statistics*, *47*(7), 1144–1167. https://doi.org/10.1080/02664763.2019.1671961

United States Census Bureau (2020). Retrieved from http://www.census.gov

University of Hawaii (2020). Ocean literacy principles (OLP). Retrieved from https://manoa.hawaii.edu/exploringourfluidearth/standards-alignment/ocean-literacy-principles-olp

Van Deren, M., Mojica, J., Martin, J., Koefod, C. (2019). *The whales in our waters: The economic benefits of whale watching in San Juan County*. Earth Economics.

Watson, P., Wilson, J., Thilmany, D., & Winter, S. (2007). Determining economic contributions and impacts: What is the difference and why do we care? *The Journal of Regional Analysis & Policy*, *37*(2), 15–19.

Appendix A: Surveys

On-Site Survey

Privacy Act Statement

Authority: The collection of this information is authorized under the National Marine Sanctuaries Act (16 U.S.C. 1431 et seq), Endangered Species Act (16 U.S.C. 1531 et seq), Marine Mammal Protection Act (16 U.S.C. 1361 et seq), National Environmental Policy Act (42 U.S.C. 4321), Executive Order 12866 (EO 12866), and other pertinent statutes.

Purpose: Your e-mail address may be collected for those requesting data, but will not be shared. Up-to-date socioeconomic data is needed to support the conservation and management goals of Stellwagen Bank National Marine Sanctuary (SBNMS), to strengthen and improve conservation of marine wildlife, including whales, pinnipeds, seals, and seabirds within the jurisdiction of the sanctuary, and to satisfy the legal mandates above.

NOAA Routine Uses: NOAA will use this information to coordinate with wildlife viewers who have agreed to take this survey. Disclosure of this information is permitted under the Privacy Act of 1974 (5 U.S.C. Section 552a) to be shared among NOAA staff for work-related purposes. Disclosure of this information is also subject to all of the published routine uses as identified in the Privacy Act System of Records Notice Commerce/NOAA-11, Contact Information for Members of the Public Requesting or Providing Information Related to NOAA's Mission.

Disclosure: Furnishing this information is voluntary; however, failure to participate in the survey will result in less information to support the conservation and management goals of SBNMS.

We'd like to ask you a few questions about you and your experience today.

1. Was the primary purpose of your trip marine wildlife viewing? _____Yes _____No
2. Did you specifically find a wildlife viewing operation that offers trips to Stellwagen Bank National Marine Sanctuary? _____Yes _____No
3. While on your wildlife viewing tour, did you visit the sanctuary? ____Yes ____No ___Unsure

4. While on your wildlife viewing tour, did staff on the boat talk about the sanctuary?

   ____Yes ____No ___Unsure

5. What is your age?
   ___18-30 ___31-40 ___41-50 ___51-60 ___Over 60

6. What is your sex? ___Female ___Male ___Other

We'd like to follow up with you to ask you more details about your trip and experience. The information will help conservation and management of Stellwagen Bank National Marine Sanctuary. By providing your e-mail address, we will be able to e-mail you the link to complete the survey online at your convenience. We will only contact you to complete the survey and will not provide your e-mail address to any other person, business, or lists.

May I have your e-mail address? _____

Respondent Number _____

Mailback/Online Survey

Today's Date_____

Your participation in this recreation expenditure survey is ***GREATLY APPRECIATED.***

Dear Valued Visitor,

During your recent trip to the New England region, you participated in an on-site survey during a wildlife viewing tour and indicated that you would be willing to complete this questionnaire. It is very important that the same person who participated in the on-site survey completes this questionnaire. Your cooperation in this effort is greatly appreciated.

The questionnaire will take about 20 minutes to complete. Instructions and an example response are provided below for your convenience. Please print answers accurately and legibly. Your participation is voluntary and your responses will remain confidential. After the completion of the project, all materials identifying you as an individual will be destroyed. **To mail back your completed questionnaire, fold it so that our return address is facing out, and seal with tape before placing in mailbox. No postage is needed.**

We thank you again for your participation, as this information is valuable to further improve management in Stellwagen Bank National Marine Sanctuary.

Respondent ID: _____

Public reporting burden for this collection of information is estimated to average 20 minutes, including time for reviewing instructions, gathering the information needed, and to complete the survey. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to U.S. Department of Commerce, Clearance Officer, Office of Chief Information Officer, Rm. 6625, 14th and Constitution Avenue NW, Washington, DC 20230.

Privacy Act Statement

Authority: The collection of this information is authorized under 5 U.S.C. § 301, Departmental regulations, and 15 U.S.C. § 1512, Powers and duties of Department.

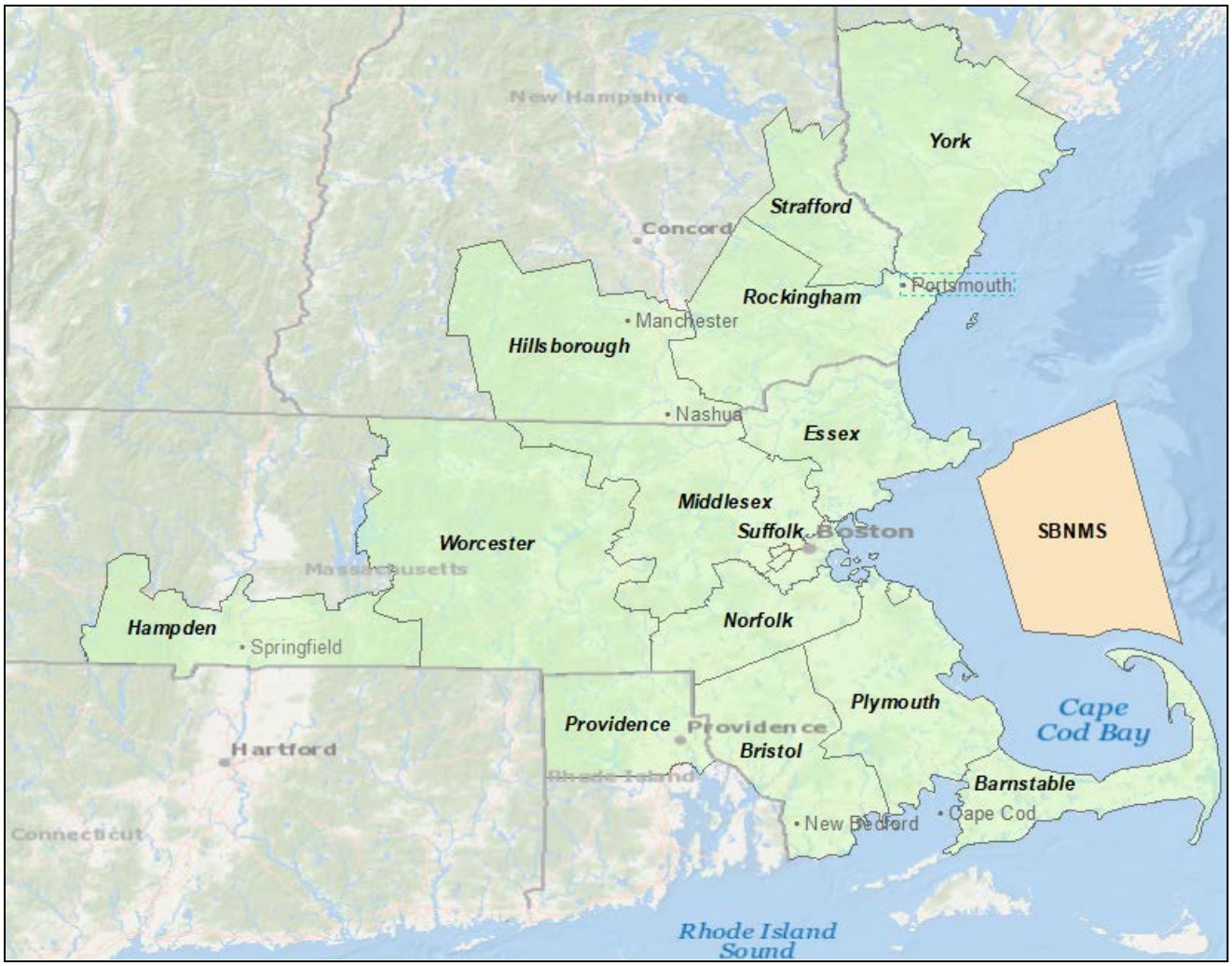
Purpose: Your e-mail address may be collected for those requesting data. The purpose of this information collection is to obtain the information necessary to calculate estimates and build tools that can be used by natural resource managers at Stellwagen Bank National Marine Sanctuary (SBNMS) to evaluate the value of whales, pinnipeds, sea otters, and seabirds within the sanctuary, as well as estimating potential impacts of alternative management options on the local tourism industry. Socioeconomic data will be gathered from commercial whale and marine wildlife observation passengers and will be used to develop social and demographic profiles of passengers. Importance/satisfaction information and expenditure data to understand how passengers rate their experiences and how their activity contributes to the local economy.

Routine Uses: Disclosure of this information is permitted under the Privacy Act of 1974 (5 U.S.C. Section 552a) to be shared among Department staff for work-related purposes. Disclosure of this information is also subject to all of the published routine uses as identified in the Privacy Act System of Records Notice COMMERCE/NOAA-11, Contact Information for Members of the Public Requesting or Providing Information Related to NOAA's Mission.

For the purposes of this survey, the term *STUDY AREA* includes the following counties:

- Barnstable, MA
- Bristol, MA
- Essex, MA
- Hampden, MA
- Middlesex, MA
- Norfolk, MA
- Plymouth, MA
- Suffolk, MA
- Worcester, MA
- Hillsborough, NH
- Rockingham, NH
- Strafford, NH
- Providence, RI
- York, ME

Map of study area for Stellwagen Bank National Marine Sanctuary.



1. On your most recent trip to New England (defined as Maine, Vermont, New Hampshire, Massachusetts, Connecticut, and Rhode Island), how many days did you spend there? Count partial days as whole days.
   _____days

2. On your most recent trip to New England, how many days did you spend wildlife viewing? Count partial days as whole days.
   _____days

3. On your most recent trip to New England, how many times did you go out on a for-hire charter operation, such as a whale watching boat tour? _____days

4. Including your most recent trip, in the past 12 months how many trips have you taken to New England to go wildlife viewing?
   _____trips

5. On your most recent trip, what month did you go wildlife viewing?

o January	o May	o September
o February	o June	o October
o March	o July	o November
o April	o August	o December

6. While visiting New England, what was the primary purpose of your visit or trip?
   _____

7. The next set of questions refer to the wildlife viewing boat tour you took while in New England. Please also indicate the primary type of animals or animal group you were trying to view on the tour. Please check only one primary animal or animal group.

a.	Did you see whales?	_____Yes	_____No	_____Primary Animal
b.	Did you see seals?	_____Yes	_____No	_____Primary Animal
c.	Did you see dolphins or porpoises?	_____Yes	_____No	_____Primary Animal
d.	Did you see birds?	_____Yes	_____No	_____Primary Animal
e.	Did you see sharks?	_____Yes	_____No	_____Primary Animal
f.	Did you see other wildlife?	_____Yes	_____No	_____Primary Animal

8. Now we'd like to ask some questions about Stellwagen Bank National Marine Sanctuary (SBNMS). SBNMS is a marine protected area located off the coast of Massachusetts in the Atlantic Ocean.
    a. While on your wildlife viewing tour (from when you were asked to participate in this survey), did you visit the sanctuary? ____Yes ____No ___Unsure

    b. While on your wildlife viewing tour (from when you were asked to participate in this survey), did staff on the boat talk about the sanctuary? ____Yes ____No ___Unsure

    c. While on land during your visit to New England, did you see signage, exhibits, literature, or information about the sanctuary? ____Yes ____No ___Unsure

    d. Did you choose your wildlife viewing tour (from when you were asked to participate in this survey) because it visits the sanctuary? ____Yes ____No ___Unsure

9. If you were to visit the region again and go wildlife viewing, how likely are you to use the same wildlife viewing company (from when you were asked to participate in this survey)? Please circle one.

    Very Likely Somewhat Likely Unsure Somewhat Unlikely Very Unlikely

    9a. Please explain_____

10. For each marine animal listed below, please indicate how much you like or dislike it, or indicate that you are not familiar with the animal.

Marine Animals	Strongly Dislike	Dislike	Slightly Dislike	Neither like or dislike	Slightly Like	Like	Strongly Like	Don't know this animal
Humpback whales								
North Atlantic right whales								
Minke whales								
Fin whales								
Sei whales								
Dolphins and porpoises								
Seals								
Basking sharks								
Other sharks								
Ocean sunfish								
Sea turtles								
Shearwaters								
Seagulls								
Northern gannets								
Other seabirds								

11. Below is a list of items that may have influence on how you choose your wildlife viewing tour (from when you were asked to participate in this survey). For the following items, please indicate how strongly you agree or disagree with their influence on your choice.

Item	Strongly Disagree	Disagree	Slightly Disagree	No Impact	Slightly Agree	Agree	Strongly Agree	Don't know
Ticket price								
You had a coupon or other discount								
The operation was near my hotel								
The operation was near my house								
The operation was targeting animals I wanted to see								
I saw an advertisement online								
I saw an advertisement in a travel publication								
I saw an advertisement at the hotel								
I saw an advertisement on social media								
I saw an advertisement at a restaurant								
I used a travel agent								
I recognized or researched Whale SENSE								
I relied on consumer reviews on Yelp, Trip Advisor, or other review service								
The amount of time for the trip met my requirements								
Size and speed of the vessel								
There was parking nearby								
They had tours at the time of day I wanted to go								
The boat permitted smoking onboard								
The boat prohibited smoking								
I relied on recommendations of family/friends								
I relied on recommendations made by my hotel								
The company is recognized for sustainable operations and/or conservation efforts								
I preferred/liked the company's website								

12. How many whales would you need to see on a whale watching trip to make it worthwhile?
_____

13. Did you see this many whales (answer from previous question) on your trip? ___Yes ___No

14. Using your answer from question 12 above, if conditions were such that you were guaranteed to see at least that many whales every day for the rest of the season would you
    a. Extend your trip in the study area ___Yes ___No
        i. If yes, by how many days_____
    b. Take more trips to the study area ___Yes ___No
        i. If yes, by how many trips_____

Importance and Satisfaction:

15. Please read each statement and rate the **importance** of each item as it pertains to your wildlife viewing experience (from when you were asked to participate in this survey) in the New England region on the dates listed on the first page. If an item does not apply, indicate by checking "N/A" (not applicable). Likewise, if you don't know, check "Don't Know."

	N/A	Don't Know	Not Important	Somewhat Important	Important	Very Important	Extremely Important
Items During Your Wildlife Viewing Experience							
Clean water (little to no pollution)							
Clean air (little to no pollution)							
A large number of whales							
Different types of whales							
Opportunity to see whales							
Opportunity to see sharks							
A large number of seals							
A large number of birds							
Many types of birds							
Whale breaching the surface							
Whale bubble net feeding							
A knowledgeable naturalist on board							
The naturalist available to answer questions							
Educational exhibits or activities available on board the vessel when wildlife is not present							
Clean restrooms on the boat							
The staff was friendly and helpful							
Operator offered a discount							
Operator offered a group rate							
The boat offered recycling							
The boat offered locally sourced food							
Availability of food and non-alcoholic beverages on the wildlife viewing vessel							
Availability of alcoholic beverages on the wildlife viewing vessel							
Items Experienced on Land During Your Trip							
Educational posters, signs, exhibits, and brochures							
Marina facilities, boat ramps, and launching facilities							
Availability of parking							
Availability of a gift shop							
Availability of public restrooms							

16. Please read each statement and rate how **satisfied** you were with each item as it pertains to your wildlife viewing experience (from when you were asked to participate in this survey) in the New England region on the date listed on the first page. If an item does not apply, indicate by checking "N/A" (not applicable). Likewise, if you don't know, check "Don't Know."

	N/A	Don't Know	Not Satisfied	Somewhat Satisfied	Satisfied	Very Satisfied	Extremely Satisfied
Items During Your Wildlife Viewing Experience							
Clean water (little to no pollution)							
Clean air (little to no pollution)							
A large number of whales							
Different types of whales							
Opportunity to see whales							
Opportunity to see sharks							
A large number of seals							
A large number of birds							
Many types of birds							
Whale breaching the surface							
Whale bubble net feeding							
A knowledgeable naturalist on board							
The naturalist available to answer questions							
Educational exhibits or activities available onboard the vessel when wildlife is not present							
Clean restrooms on the boat							
The staff was friendly and helpful							
Operator offered a discount							
Operator offered a group rate							
The boat offered recycling							
The boat offered locally sourced food							
Availability of food and non-alcoholic beverages on the wildlife viewing vessel							
Items Experienced on Land During Your Trip							
Educational posters, signs, exhibits, and brochures							
Marina facilities, boat ramps, and launching facilities							
Availability of parking							
Availability of a gift shop							
Availability of public restrooms							

17. Some people may have expectations about an activity or event before it happens. Please read the list of items below and rate your **expectations** (prior to the wildlife viewing tour) for each of the following. If an item does not apply select "N/A". Likewise, if you don't know, select "Don't Know".

	N/A	Don't Know	Did Not Expect	Small Expectations	Moderate Expectations	Large Expectations	Big Expectations
Clean water (little to no pollution)							
Clean air (little to no pollution)							
A large number of whales							
Different types of whales							
A large number of seals							
A large number of birds							
Many types of birds							
Whale breaching the surface							
Whale bubble net feeding							
A knowledgeable naturalist on board							
Clean restrooms on the boat							
Operator offered a discount							
Operator offered a group rate							
The boat offered recycling							

18. Now, please read the list of items below and rate how they **met your expectations** (after the wildlife viewing tour (from when you were asked to participate in this survey) for each of the following. If an item does not apply select "N/A". Likewise, if you don't know, select "Don't Know".

	N/A	Don't Know	Completely Did Not Meet My Expectations	Slightly Met My Expectations	Met My Expectations	Slightly Exceeded My Expectations	Completely Exceeded My Expectations
Clean water (little to no pollution)							
Clean air (little to no pollution)							
A large number of whales							
Different types of whales							
A large number of seals							
A large number of birds							
Many types of birds							
Whale breaching the surface							
Whale bubble net feeding							
A knowledgeable naturalist on board							
Clean restrooms on the boat							
Operator offered a discount							
Operator offered a group rate							
The boat offered recycling							

Expenditures:

We would like to ask you about the expenses related to your recent trip as it pertains to your whale watching or wildlife viewing experience in the New England region. We are interested in expenses made *only* for the trip associated with the trip from when you were asked to participate in this survey.

Please estimate how much money, rounded to the nearest dollar, your party spent on the following items and the number of people it covered. If no money was spent for any item, please place a zero in the corresponding box. Please use the map to identify the total amount spent within the study area.

Items	**Total Amount Spent**	**Total Amount Spent in the Study Area**	**Number of People Covered**
Scenic Tours			
Whale watching tour			
Please list company _____			
Other wildlife tour			
Please list company _____			
Sailing charters			
Sunset cruises			
Other, please specify:_____ _			
Sightseeing			
Land-based sightseeing tours			
Admission to amusement, festivals, and other attractions (e.g., zoos, aquariums, and museums)			
Other, please specify:_____ _____			
Other Activities			
Rental fee for recreation equipment (e.g., bicycles, golf carts, kayaks, and paddle boats)			
Guided service tours (not listed above)			
Tickets for motion pictures, theaters, musical performances, concerts, etc.			
Wine tour			
Other, please specify: _____			
Lodging			
Hotel/motel			
Bed and breakfast			
Cabin			
Cottage/Condo/Rental Home			

Items	Total Amount Spent	Total Amount Spent in the Study Area	Number of People Covered
Other, please specify: _____			
Food & Beverages			
Food purchased at a grocery store (e.g., farmers market)			
Food and drinks bought at restaurants and bars			
Food and drinks consumed on a wildlife viewing vessel			
Other, please specify: _____			
Transportation			
Rental automobile, motor home, trailer, motorcycle, etc.			
Gas and oil for automobile or RV			
Automobile or RV parking fees and tolls			
Taxi fare			
Ferry			
Train			
Bus fare (e.g., day passes and package tours)			
Airline fare			
Other, please specify: _____			
Miscellaneous Expenditures			
Camera and supplies—film, batteries, memory stick, film development			
Footwear			
Binoculars			
Clothing (including foul weather gear, hats, sweatshirts, etc.)			
Sunblock and other sundries			
Souvenirs and gifts (not including clothing)			
Other, please specify: _____			

Demographics:

1. What is your country of residence? _____
2. If you live in the United States, what is your zip code? _____
3. What is your age?
   - 18-30
   - 31-40
   - 41-50
   - 51-60
   - Over 60

4. What is your sex?
   - Female
   - Male
   - Other

5. Are you Hispanic or Latino? _____Yes _____No

6. What is your race? Please check all that apply.
   - White or Caucasian
   - Black or African American
   - Asian
   - American Indian or Alaskan Native
   - Native Hawaiian or Other Pacific Islander
   - Other_____

7. What is your employment status? Please select the best one.
   - Unemployed
   - Employed full-time
   - Employed part-time
   - Self-employed
   - Retired
   - Student
   - Homemaker
   - None of the above

8. How many adults, age 18 and over, live in your household? _____

9. How many children, under the age of 18, live in your household?_____

10. What is your household income?
    - Less than $5,000
    - $5,000 to $9,999
    - $10,000 to $14,999
    - $15,000 to $19,999
    - $20,000 to $24,999
    - $25,000 to $29,999
    - $30,000 to $34,999
    - $35,000 to $39,999
    - $40,000 to $44,999
    - $45,000 to $49,999
    - $50,000 to $59,999
    - $60,000 to $74,999
    - $75,000 to $99,999
    - $100,000 to $149,999
    - $150,000 or more

AMERICA'S UNDERWATER TREASURES