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Northeast Region
Boston, Massachusetts

Research to Support Carrying Capacity Analysis at Boston Harbor Islands National Park Area

Technical Report NPS/NER/NRTR-2006/064

ON THE COVER
Little Brewster Island Light
Photograph by: William Valliere

Research to Support Carrying Capacity Analysis at Boston Harbor Islands National Park Area

Technical Report NPS/NER/NRTR-2006/064

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Northeast Region
Boston, Massachusetts

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Chapter 1. Introduction

The enabling legislation for Boston Harbor Islands National Park Area (P.L. 104-333) requires that park managers protect and maintain the natural and scientific values of the islands, while at the same time, mandating that managers improve access to the area and enhance public outdoor recreation. Thus, in addition to the balance between resource protection and visitor use typical at all units of the NPS system, there is the added legislated requirement at Boston Harbor Islands to *increase* use while protecting resources. It is projected that park visitation to the islands could double over the next few years and quadruple in the foreseeable future. (Two million people can access the islands via public transportation.)

The National Parks and Recreation Act of 1978 (P.L. 95-625) requires that the Boston Harbor Islands general management plan include "identification of and implementation commitments for visitor carrying capacities for all areas of the unit." In response, the area's General Management Plan identifies a process for protecting park resources and providing quality visitor experiences through zoning and the application of carrying capacities to each zone or "use area." The analysis of carrying capacity is defined as "the character of use that can be supported over a specified time by an area developed at a certain level without causing excessive damage to either the environment or the experience" (Lime and Stankey, 1980).

Establishing both a social and ecological carrying capacity is essential to providing guidance on acceptable visitor use management that might range from area closure (to protect rare species, wildlife habitat, or other sensitive areas), or use dispersal (such as hiking and camping) to concentrating use (such as high density visitation at developed facilities) for the long-term protection and preservation of the natural characteristics of the islands.

Boston Harbor Islands National Park Area

Established in 1996, Boston Harbor Islands includes 30 islands within Boston Harbor, Massachusetts. The primary significance of the park resides in:

1) the only drumlin field in the United States that intersects a coast, formed by the glaciers some 15,000 years ago
2) opportunities for solitude and land-and water-based education and recreation within an urban area
3) an island complex composed of 500 hectares (1,200 acres) of land, archeological resources, historic sites, open space, wildlife habitats, and 35 miles of relatively undeveloped shoreline; all inside an area of 50 square miles and within view of downtown Boston and other harbor communities

The park is known to provide habitat for nesting seabirds, harbor seals, more than 70 species of terrestrial birds, and state-listed plants. By its configuration, assemblage of natural, geologic, cultural, and historic features, and proximity to a major metropolitan area, the Boston Harbor Islands system offers a resource that has little parallel in the United States.

The park is administered in partnership by the Secretary of the Interior, the Commonwealth of Massachusetts, City of Boston and others, always in accordance with the laws applicable to units of the National Park System. The NPS is one of 13 members of the Boston Harbor Islands Partnership that manages the park. A 28-member Advisory Council provides valuable public involvement.

Carrying Capacity

The concept of carrying capacity has a rich history in the natural resource professions. Applied to parks, carrying capacity addresses the amount and types of visitor use that can be accommodated without causing unacceptable impacts (Stankey and Lime 1973; Graefe et al. 1984; Shelby and Heberlein 1986; Stankey and Manning 1986). Within the context of parks, carrying capacity has two components—resource and social. Resource carrying capacity refers to impacts that visitors can have on environmental and cultural resources, including soil compaction, destruction of vegetation, disturbance of wildlife, and damage to cultural artifacts. Social carrying capacity refers to impacts that visitors can have on the quality of the park experience, including crowding, conflicting uses, and aesthetic degradation.

Contemporary approaches to carrying capacity focus on indicators and standards of quality. Indicators of quality are measurable, manageable variables that define the quality of the resources and/or the visitor experience. Standards of quality define the minimum acceptable condition of indicator variables. Carrying capacity is managed by monitoring indicator variables and taking management action to maintain standards of quality. This management framework is central to contemporary carrying capacity frameworks, including Limits of Acceptable Change (Stankey et al. 1985), Visitor Impact Management (Graefe et al. 1990), and Visitor Experience and Resource Protection (Hof et al. 1994; National Park Service 1997; Manning et al. 1996a; Manning 2001).

Visitor Experience and Resource Protection (VERP) has been developed as a carrying capacity framework for the national park system (National Park Service 1997). An initial application of this framework was conducted at Arches National Park (Hof et al. 1994; Manning et al. 1996a; Manning et al. 1996b; Manning et al. 1993; Lime et al. 1994; Manning et al. 1995). This application resulted in a carrying capacity management plan that has now been implemented at that park (National Park Service 1995). A second application of VERP was successfully conducted at Acadia National Park (Jacobi and Manning 1997; Manning et al.

1998). Additional applications of this carrying capacity framework are now proceeding at selected units of the national park system.
Resource-related research within the VERP and other carrying capacity frameworks has focused on resource assessment, indicator identification and measurement, and standards formulation. Additional information regarding this information is provided in a separate document addressing the natural resource component of this study.

Social science research within the VERP framework has focused primarily on indicators and standards of quality. Visitor surveys have been used to help identify indicators of quality—measurable, manageable variables that define the quality of the visitor experience (Manning et al. 1996a; Manning et al. 1996b; Manning et al. 1995).

Visitor surveys have also been used to help formulate standards of quality for indicator variables. This research has increasingly focused on personal and social norms. Developed in the fields of sociology and social psychology, norms have attracted considerable attention as an organizing concept in outdoor recreation research and management. In particular, normative theory has special application to setting standards of quality for the recreation experience. Norms in outdoor recreation are generally defined as standards that individuals and groups use for evaluating behavior and social environmental conditions (Vaske et al. 1986; Shelby and Vaske 1991). If visitors have normative standards concerning relevant aspects of recreation experiences, then such norms can be studied and used as a basis for formulating standards of quality.

Application of norms to standards of quality is most fully described by Shelby and Heberlein (1986), Vaske et al. (1986) and Manning (1999). These applications have relied upon the work of Jackson (1965), who developed a methodology to measure norms. Using these methods, the personal norms of individuals can be aggregated to determine social norms. Normative research has focused largely on the issue of crowding (e.g., Vaske et al. 1986; Shelby 1981; Heberlein et al. 1986; Patterson and Hammitt 1990; Williams et al. 1991; Whittaker and Shelby 1988; Manning et al. 1996a; Manning et al. 1996b; Manning et al. 1998), but also has been expanded to include other potential indicators of quality, including ecological impacts at campsites (Shelby et al. 1988).

Traditionally, norms have been measured through a numerical approach. For example, respondents are asked to evaluate the acceptability of alternative use levels, such as 0, 5, or 10 encounters with other groups per day along trails. Resulting data are aggregated to determine social norms. More recently, visual approaches to measuring norms have been developed (Hof et al. 1994; Manning et al. 1995; Manning et al. 1996a; Manning et al. 1996b). In this technique, computer software is used to manipulate photographs to depict alternative use levels and associated resource and social impacts.

The Project

This project has three basic components. The first two address the science needed to support application of the VERP framework to Boston Harbor Islands. The research is focused primarily on developing data that will provide an empirical foundation for formulating indicators and standards of quality for both resource and social conditions. Programs of resource and social research were conducted in two phases during the first two years of the project. The research program was designed and conducted within the context of the third component of this project, an interdisciplinary VERP research/resource planning committee. The committee met periodically throughout the duration of the project, and met intensively during the final year of the project to incorporate study findings into a series of indicators and standards of quality that can be used to manage the carrying capacity of Boston Harbor Islands.

Study objectives for the social science component of this project were to1) collect baseline data on park use and users and associated impacts, 2) identify potential indicators of quality for the visitor experience, and 3) identify potential standards of quality for selected indicator variables.

This report presents study methods and findings from the social science component of the project. The resource component is described in a separate report by Dr. Yu-Fai Leung of North Carolina State University

Chapter 2. Study Methods

Three research methods were used to accomplish the objectives outlined in Chapter 1. These methods were carried out in two phases.

1. In Phase I, a park wide visitor survey was conducted on randomly selected days in the summer of 2000. Visitors returning on ferries from the islands were randomly selected and given a self-administered questionnaire to complete. A researcher collected completed surveys at the end of the ferry trip. The questionnaire used in this survey included both open- and close-ended questions designed to identify socio-demographic characteristics of visitors, potential indicators of quality of the visitor experience, park locations visited, activities participated in, and other baseline information. The questionnaire is shown in Appendix A. This sampling plan resulted in a total of 695 completed questionnaires.

2. In Phase 2, visitor surveys were conducted on randomly selected days in the summer of 2001. A total of 125 days (29 weekend days and 96 weekday days) of visitor surveys were conducted from June 28 through September 2, 2001. Surveys were conducted at seven locations in the park area that are open to the public. These locations included Bumpkin Island, Georges Island, Grape Island, Little Brewster Island, Lovells Island, Peddocks Island and Worlds End. A trained interviewer was stationed at each of these locations between 10:00am and 6:00pm on sampling days. At the beginning of each survey period, the interviewer would randomly approach a departing visitor group and ask for their participation. If the group was willing to participate, the interviewer asked which group member would take responsibility for completing the questionnaire. The group leader was given a copy of the study questionnaire and asked to complete the questionnaire. The number of completed questionnaires for each study location is as follows. Bumpkin Island (104), Georges Island (104), Grape Island (102), Little Brewster Island (109), Lovells Island (101), Peddocks Island (103), and Worlds End (101). The sampling plan resulted in a total of 724 completed questionnaires, with an overall response rate of 90.8%. The questionnaire used in this survey focused primarily on standards of quality for indicator variables identified in Phase I research. Other questions were related to park use and users, and the amount and quality of information and education provided to visitors for their visit to the area. The questionnaires for the seven locations are shown in Appendix B.

3. In Phase 2, detailed visitor counts were also conducted for all visitors in the picnic area of Georges Island on eight randomly selected days from June 28 through September 2, 2001. A trained surveyor counted and recorded the number of visitors in the picnic area every fifteen minutes

between the hours of 11:15am and 5:00pm on the eight days. Additionally, visitor counts for all visitors embarking and debarking the ferries that serve Georges Island were obtained from the Ferry Service. These data were used to statistically estimate the relationship between the number of people in the picnic area and the number of people on Georges Island.

Chapter 3. Study Findings

Phase 1

Use and Users

Respondents were asked several descriptive questions pertaining to their use of Boston Harbor Islands National Park Area. The first question asked respondents if this was their first visit to Boston Harbor Islands National Park Area. A little over half the visitors (54.1%) were visiting the park for the first time (Table 3.1.1). The next question asked repeat visitors to report the number of times they had been to Boston Harbor Islands National Park Area. Table 3.1.2 indicates the frequency distribution of prior visits. Overall, most visitors (63.1%) have been to the park 1 to 4 times.

Table 3.1.1: Is this your first visit to Boston Harbor Islands?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Yes	77.8	39.1	96.7	54.8	76.5	26.9	54.1
No	22.2	60.9	3.3	45.2	23.5	73.1	45.9

Table 3.1.2: Approximately how many times have you visited Boston Harbor Islands?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
1	16.7	0.0	0.0	6.1	0.0		5.0
2	83.3	27.5	100.0	31.3	50.0		32.4
3	0.0	13.7	0.0	17.3	25.0		16.2
4	0.0	19.6	0.0	6.7	25.0		9.5
5	0.0	9.8	0.0	6.1	0.0		6.6
6	0.0	5.9	0.0	6.7	0.0		6.2
7	0.0	0.0	0.0	2.8	0.0		2.1
8	0.0	0.0	0.0	2.8	0.0		2.1
10	0.0	7.8	0.0	8.4	0.0		7.9
More than 10	0.0	15.7	0.0	11.7	0.0		12.0
Mean	1.8	8	2	7.2	2.8		7.1

The next set of questions focused on the group respondents were visiting with. Visitors were asked about the number of adults and children in their group.

Results are shown in Tables 3.1.3 and 3.1.4. Overall, visitors reported an average (mean) of 7 (median of 2) adults and an average (mean) of 6 (median of 2) children per group. Overall, visitors visit Boston Harbor Islands National Park Area with an average (mean) group size of 15.4 and median group size of 5 (Table 3.1.5). A subsequent question asked visitors to report the composition of their group. Results are shown in Table 3.1.6. Overall, the majority of visitors (77.8%) come in groups comprised of family and/ or friends.

Table 3.1.3: Number of adults in group

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
1	4.0	12.9	8.5	14.3	11.8	25.3	14.7
2	32.0	42.4	44.1	39.6	47.1	50.5	41.8
3	20.0	11.8	16.9	11.3	0.0	8.8	11.5
4	4.0	14.1	16.9	8.7	17.6	8.8	10.2
5	4.0	2.4	1.7	3.1	0.0	6.6	3.3
6	0.0	4.7	0.0	1.8	0.0	0.0	1.6
7	0.0	0.0	0.0	1.3	0.0	0.0	0.7
8	0.0	3.5	0.0	1.0	0.0	0.0	1.0
9	0.0	0.0	0.0	0.5	0.0	0.0	0.3
10	0.0	3.5	1.7	1.0	0.0	0.0	1.2
More than 10	36.0	4.7	10.2	17.4	23.5	0.0	13.6
Mean	15.4	3.7	4.2	9.1	5.8	2.2	7.2
Median	3.0	2.0	2.0	2.0	2.0	2.0	2.0

Table 3.1.4: Number of children in group

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
0	0.0	3.8	0.0	7.9	0.0	7.7	6.7
1	75.0	17.0	23.1	26.6	100.0	42.3	27.4
2	0.0	28.3	15.4	21.0	0.0	30.8	22.3
3	25.0	20.8	15.4	10.0	0.0	3.8	11.6
4	0.0	15.1	7.7	6.1	0.0	0.0	7.0
5	0.0	1.9	23.1	3.9	0.0	0.0	4.0
6	0.0	1.9	0.0	2.2	0.0	0.0	1.8
7	0.0	1.9	0.0	1.3	0.0	0.0	1.2
8	0.0	3.8	0.0	1.7	0.0	0.0	1.8
9	0.0	1.9	0.0	0.4	0.0	0.0	0.6
10	0.0	0.0	0.0	2.2	0.0	15.4	2.7
More than 10	0.0	3.8	15.4	16.6	0.0	0.0	12.8

Table 3.1.4: Number of children in group (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Mean	1.5	3.2	4.9	6.7	1.0	2.7	5.6
Median	1.0	3.0	3.0	2.0	1.0	1.5	2.0

Table 3.1.5: Group size

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
1	0.0	0.0	0.0	0.9	0.0	0.0	0.6
2	0.0	7.5	15.4	12.6	0.0	13.0	11.6
3	0.0	15.1	0.0	15.2	33.3	30.4	15.7
4	0.0	15.1	0.0	16.1	0.0	34.8	16.3
5	25.0	24.5	7.7	9.4	0.0	17.4	12.5
6	0.0	5.7	15.4	7.6	0.0	0.0	6.9
7	0.0	5.7	15.4	1.3	0.0	0.0	2.5
8	0.0	3.8	0.0	4.0	0.0	0.0	3.4
9	0.0	0.0	7.7	0.4	0.0	0.0	0.6
10	0.0	3.8	0.0	0.9	0.0	0.0	1.3
More than 10	75.0	18.9	38.5	31.4	66.7	4.3	28.5
Mean	27.5	7.2	13.8	18.5	12.3	3.9	15.4
Median	31.0	5.0	7.0	5.0	13.0	4.0	5.0

Table 3.1.6: Group composition

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Family	38.5	55.3	50.8	40.9	26.7	16.3	39.8
Friends	19.2	20.0	20.3	19.7	40.0	42.4	23.4
Family and friends	3.8	15.3	16.9	12.6	6.7	25.0	14.6
Organized group or club	11.5	4.7	0.0	12.1	6.7	12.0	9.9
Commercial tour group	11.5	0.0	0.0	0.0	0.0	4.3	1.1
Other	15.4	4.7	11.9	14.7	20.0	0.0	11.2

Visitors were asked if they knew that Boston Harbor Islands was a National Park Area. Findings are presented in Table 3.1.7. Overall, about two-thirds of visitors knew that Boston Harbor Islands was a National Park Area.

Table 3.1.7: Did you know that Boston Harbor Islands is a national park area?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Yes		73.3		65.0			66.5
No		26.7		35.0			33.5

Visitors were then asked how they got to the ferry terminal during their current visit. A majority (84.0%) arrived either by car or the subway (Table 3.1.8).

Table 3.1.8: How did you get to the ferry terminal today?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Automobile		95.5		29.9			42.2
Bus		0.0		4.5			3.6
Subway		1.1		51.2			41.8
Other		3.4		14.4			12.4

A subsequent set of questions focused on visitor demographics and selected socio-economic characteristics. Visitors were asked where they lived. Findings are presented in Table 3.1.9. Overall, most visitors (70.9%) were from Boston, non-Boston metro area (inside Rt. 128), and suburban Boston (between Rt. 128 and Rt. 495).

Table 3.1.9: Residence

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Boston	18.5	4.7	12.3	28.1	29.4		22.6
Non-Boston metro area (inside Rt. 128)	33.3	24.4	21.1	21.1	23.5		22.2

Table 3.1.9: Residence (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Suburban Boston (Between Rt. 128 and Rt. 495)	40.7	45.3	29.8	20.1	29.4		26.1
Other area in Massachusetts (outside Rt. 495)	3.7	11.6	5.3	7.8	0.0		7.7
Other New England state	0.0	3.5	1.8	3.4	5.9		3.2
Other state	0.0	10.5	28.1	13.8	11.8		14.0
Canada	0.0	0.0	0.0	0.3	0.0		0.2
Other International	3.7	0.0	1.8	5.5	0.0		4.1

Details regarding other New England state of residence, state of residence for non-New England residents and country of residence for international visitors are presented in Tables 3.1.10, 3.1.11 and 3.1.12. Overall, a majority of residents from other New England states (63.6%) were from Connecticut and New Hampshire. 27 other US states were represented in the sample.

Table 3.1.10: Other New England state of residence

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Connecticut		50.0	100.0	25.0	0.0		31.8
Maine		0.0	0.0	6.3	0.0		4.5
New Hampshire		25.0	0.0	31.3	100.0		31.8
Rhode Island		0.0	0.0	31.3	0.0		22.7
Vermont		25.0	0.0	6.3	0.0		9.1

Table 3.1.11: Other US state of residence

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Arizona		0.0	5.9	3.3	0.0		3.4
California		0.0	5.9	10.0	0.0		7.9
Colorado		10.0	5.9	0.0	0.0		2.2
Florida		10.0	0.0	5.0	50.0		5.6
Georgia		0.0	0.0	1.7	0.0		1.1
Hawaii		0.0	0.0	1.7	0.0		1.1
Idaho		0.0	0.0	1.7	0.0		1.1
Illinois		0.0	11.8	5.0	0.0		5.6
Indiana		0.0	11.8	1.7	0.0		3.4
Iowa		0.0	0.0	1.7	0.0		1.1
Kansas		0.0	5.9	1.7	0.0		2.2
Kentucky		0.0	5.9	0.0	0.0		1.1
Maryland		20.0	5.9	3.3	0.0		5.6
Michigan		10.0	0.0	0.0	0.0		1.1
Minnesota		0.0	11.8		0.0		2.2
Missouri		0.0	0.0	5.0	0.0		3.4
New Jersey		0.0	0.0	6.7	0.0		4.5
New York		30.0	17.6	13.3	0.0		15.7
North Carolina		10.0	0.0	5.0	0.0		4.5
Ohio		0.0	11.8	6.7	0.0		6.7
Oregon		0.0	0.0	0.0	50.0		1.1
Pennsylvania		0.0	0.0	5.0	0.0		3.4
South Carolina		0.0	0.0	5.0	0.0		3.4
Texas		0.0	0.0	1.7	0.0		1.1
Virginia		10.0	0.0	8.3	0.0		6.7
D.C.		0.0	0.0	1.7	0.0		1.1
Wisconsin		0.0	0.0	5.0	0.0		3.4

Table 3.1.12: Country of residence

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Europe	100.0	0.0	100.0	65.5	0.0		68.3
Asia	0.0	0.0	0.0	5.5	0.0		4.9
Africa	0.0	0.0	0.0	5.5	0.0		4.9
Latin America	0.0	0.0	0.0	9.0	0.0		9.7
Australia/New Zealand/Pacific Islands	0.0	0.0	0.0	14.5	0.0		12.2

Next, respondents were asked to indicate whether they were male or female. Overall, there were slightly more female (54.2%) than male (45.8%) respondents (Table 3.1.13). Respondents were also asked in what year they were born. Table 3.1.14 represents a frequency distribution of visitor reported age. Overall, visitors reported a mean age of 41.3 years. A subsequent question addressed respondents' educational background. Results appear in Table 3.1.15. Overall, visitors to Boston Harbor Islands National Park Area tend to be well educated with 88.2% having at least some college education or higher. Table 3.1.16 reports a frequency distribution of employment status of respondents. A majority of respondents (76.3%) reported being employed. Finally respondents were asked about their ethnicity and race. Results are presented in Tables 3.1.17 and 3.1.18. A majority of respondents (95.9%) reported being not Hispanic or Latino. Also the vast majority of respondents (82.6%) were white.

Table 3.1.13: Gender

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Female	61.5	51.8	68.5	50.8	64.3	58.2	54.2
Male	38.5	48.2	31.5	49.2	35.7	41.8	45.8

Table 3.1.14: Respondent age

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Under 20	0.0	4.6	3.8	4.9	0.0	5.6	4.6
20 to 29	4.0	9.2	9.6	24.8	8.3	13.5	18.7
30 to 39	16.0	35.6	7.7	25.9	25.0	30.3	25.9
40 to 49	8.0	24.1	28.8	23.5	8.3	20.2	22.6
50 to 59	36.0	9.2	34.6	11.1	25.0	22.5	15.6

Table 3.1.14: Respondent age (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
60 to 69	16.0	12.6	13.5	8.1	8.3	5.6	9.1
70 to 79	12.0	4.6	1.9	1.6	16.7	1.1	2.7
80 and over	8.0	0.0	0.0	0.3	8.3	1.1	0.8
Average	54.8	42.9	47.5	38.7	52.1	41.6	41.3

Table 3.1.15: Education level

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
1	0.0	0.0	1.8	0.0	0.0	0.0	0.2
4	0.0	0.0	0.0	0.3	0.0	1.1	0.3
5	0.0	0.0	0.0	0.3	0.0	0.0	0.2
6	0.0	1.2	1.8	0.0	0.0	0.0	0.3
7	0.0	0.0	0.0	0.3	0.0	0.0	0.2
8	0.0	2.3	0.0	0.3	0.0	0.0	0.5
9	0.0	0.0	0.0	1.1	0.0	3.4	1.1
10	0.0	0.0	1.8	1.1	0.0	0.0	0.8
11	0.0	0.0	0.0	0.5	0.0	1.1	0.5
12	4.0	15.1	10.9	6.4	14.3	5.6	7.9
13	4.0	3.5	3.6	3.5	7.1	4.5	3.7
14	8.0	16.3	7.3	8.5	7.1	0.0	8.2
15	4.0	1.2	1.8	4.0	0.0	1.1	3.0
16	24.0	26.7	25.5	27.2	21.4	34.8	27.8
17	12.0	7.0	3.6	7.5	0.0	6.7	7.0
18	20.0	12.8	18.2	12.8	21.4	9.0	13.2
19	4.0	4.7	3.6	8.0	7.1	6.7	6.8
20	0.0	4.7	9.1	4.3	7.1	9.0	5.3
21	20.0	4.7	10.9	14.1	14.3	16.9	13.2
Average	17.2	15.5	16.1	16.6	16.7	16.9	16.5

Table 3.1.16: Employment status

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Employed	73.1	73.5	84.2	76.4	71.4	75.6	76.3
Unemployed	0.0	1.2	0.0	2.4	0.0	3.3	2.0
Homemaker	3.8	8.4	1.8	4.7	7.1	6.7	5.2
Retired	23.1	12.0	5.3	6.6	21.4	5.6	8.0
Student	0.0	3.6	5.3	6.6	0.0	6.7	5.7
Other	0.0	1.2	3.5	3.4	0.0	2.2	2.8

Table 3.1.17: Ethnicity

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Hispanic or Latino	5.6	0.0	1.9	5.9	0.0	1.5	4.1
Not Hispanic or Latino	94.4	100.0	98.1	94.1	100.0	98.5	95.9

Table 3.1.18: Race

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
American Indian or Alaska Native	0.0	0.0	0.0	0.3	0.0	3.5	0.6
Asian	8.0	0.0	0.0	5.4	0.0	3.5	4.0
Black or African American	0.0	1.3	0.0	3.3	7.1	1.2	2.4
Hispanic or Latino	4.0	0.0	1.8	3.5	0.0	1.2	2.6
White	80.0	97.4	91.2	76.8	85.7	88.4	82.6
Other	0.0	0.0	1.8	4.4	0.0	1.2	2.9
Do not wish to answer	8.0	1.3	5.3	6.3	7.1	1.2	4.9

The next set of questions focused on the nature of the use of Boston Harbor Island National Park Area. Respondents were asked what recreation activities they participated in at the park. Findings are presented in Table 3.1.19. Sightseeing (73.1%), walking (80.1%), picnicking (45.3%), and touring historical/ cultural sites (46.2%) were among the most popular activities. When asked

about their primary recreation activity at the park, a little over a third of visitors (36.8%) reported sightseeing as a primary activity (Table 3.1.20).

Table 3.1.19: Recreation activities

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Sightseeing	36.0	87.6	88.3	82.6	94.1	13.2	73.1
Walking/hiking	28.0	83.1	58.3	80.8	100.0	98.9	80.1
Swimming	0.0	9.0	0.0	5.2	17.6	4.4	5.3
Camping	4.0	14.6	1.7	2.2	0.0	0.0	3.5
Picnicking	8.0	59.6	45.0	54.0	35.3	5.5	45.3
Fishing	4.0	6.7	0.0	0.5	0.0	0.0	1.3
Watching wildlife/nature observation	0.0	36.0	35.0	26.6	70.6	15.4	27.2
Touring historical/cultural sites	4.0	59.6	58.3	54.0	58.8	0.0	46.2
Ranger-led programs	20.0	23.6	58.3	12.9	29.4	0.0	17.3
Special event	12.0	5.6	1.7	3.7	0.0	1.1	3.7
Other	60.0	9.0	23.3	13.4	0.0	1.1	13.5

Table 3.1.20: Primary recreation activity

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Sightseeing	100.0	23.0	43.2	28.3	18.2	81.7	36.8
Walking/hiking	0.0	24.3	2.7	17.1	36.4	7.3	15.9
Swimming	0.0	1.4	0.0	1.6	0.0	1.2	1.3
Camping	0.0	12.2	2.7	1.6	0.0	4.9	3.6
Picnicking	0.0	9.5	0.0	19.9	0.0	0.0	13.5
Fishing	0.0	1.4	0.0	0.0	0.0	3.7	0.8

Table 3.1.20: Primary recreation activity (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Watching wildlife/nature observation	0.0	5.4	2.7	2.8	0.0	1.2	2.8
Touring historical/cultural sites	0.0	14.9	32.4	19.3	27.3	0.0	16.7
Ranger-led programs	0.0	2.7	8.1	2.8	18.2	0.0	3.0
Special event	0.0	1.4	0.0	0.9	0.0	0.0	0.8
Other	0.0	4.1	8.1	5.9	0.0	0.0	4.7

Indicators of Quality

A subsequent set of open-ended questions focused on the quality of the visitor experience at Boston Harbor Island National Park Area. Visitors were asked what they enjoyed most about their visit to Boston Harbor Islands National Park Area (Table 3.1.21.). Around one-half of the respondents (51.2%) reported that the scenery/ views (20.2%), Fort Warren (12.9%), specific activities such as hiking or beachcombing (9.1%), tranquility, peace and quiet (9.0%) were what they enjoyed most. Visitors were also asked what they enjoyed least about their visit. Table 3.1.22 reports frequency distributions of what visitors found least enjoyable. Visitors reported that dirty bathrooms (8.3%), lack of food/ water/ high food prices (8.1%), lack of maintenance/ litter/ graffiti (7.9%) detracted from their experience.

Table 3.1.21: What did you enjoy most about your visit to Boston Harbor Islands?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Lighthouse	0.0	0.0	66.7	0.3	0.0	0.0	5.9
Fort/Fort Warren	0.0	12.9	0.0	19.2	0.0	0.0	12.9
Other specific place	0.0	1.2	0.0	1.8	0.0	1.1	1.4
Ferry/boat service/rides	4.2	4.7	1.8	10.9	0.0	0.0	7.3
Getting away from the city/nature/"fresh air"	0.0	3.5	3.5	4.9	6.3	4.4	4.4
Specific activities (hiking, beachcombing, sightseeing)	0.0	10.6	1.8	10.1	18.8	8.8	9.1
Scenery/views	4.2	16.5	12.3	19.9	12.5	35.2	20.2
Weather	0.0	3.5	3.5	3.4	0.0	15.4	4.9
Quiet/peaceful/relaxing/tranquility	0.0	9.4	1.8	9.8	0.0	13.2	9.0

Table 3.1.21: What did you enjoy most about your visit to Boston Harbor Islands? (continued)

Clean/high level of maintenance	4.2	5.9	0.0	2.3	0.0	1.1	2.4
Facilities/ services (trails, picnic areas, campsites, etc.)	0.0	7.1	0.0	2.3	0.0	1.1	2.4
Lack of crowds/solitude	0.0	0.0	0.0	1.8	0.0	2.2	1.4
Being with friends/family	0.0	1.2	1.8	2.6	0.0	12.1	3.5
Everything	0.0	3.5	1.8	0.8	6.3	0.0	1.2
Other historic sites	0.0	8.2	1.8	2.6	0.0	0.0	2.7
Learning about natural/cultural history/tours	70.8	8.2	0.0	4.7	31.3	0.0	7.1
Friendly/helpful staff	8.3	2.4	3.5	1.3	18.8	2.2	2.4
Miscellaneous	8.3	1.2	0.0	1.3	6.3	3.3	1.8

Table 3.1.22: What did you enjoy least about your visit to Boston Harbor Islands?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Weather	23.1	3.0	0.0	3.5	0.0	4.5	3.8
Not enough time/ limited hours/ limited access	7.7	4.5	15.8	6.0	10.0	6.0	6.7
Aircraft noise/ other noise	0.0	1.5	0.0	2.8	0.0	3.0	2.3
Nothing – everything was nice	46.2	23.9	44.7	15.8	30.0	37.3	23.3
Bathrooms (not enough, dirty)	0.0	13.4	18.4	7.7	0.0	3.0	8.3
Crowding/parking at mainland	0.0	0.0	0.0	3.5	0.0	3.0	2.5
Lack of maintenance /litter/ graffiti	0.0	9.0	2.6	9.5	0.0	6.0	7.9

Table 3.1.22: What did you enjoy least about your visit to Boston Harbor Islands? (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Ferry schedule /too infrequent, late/long boat ride	0.0	16.4	0.0	7.7	0.0	0.0	6.9
Unsupervised children/young people	0.0	4.5	0.0	4.9	0.0	1.5	3.8
Lack of food/ water/high food prices/no gift shop	0.0	7.5	0.0	11.6	10.0	0.0	8.1
Lack of information	0.0	6.0	0.0	7.0	10.0	16.4	7.5
Polluted water/swimming and fishing restrictions	0.0	1.5	2.6	3.5	0.0	0.0	2.5
Seagulls	0.0	1.5	0.0	2.1	0.0	0.0	1.5
Alcohol policy	0.0	0.0	0.0	1.1	0.0	0.0	0.6
Insufficient trails /facilities/ attractions	0.0	0.0	2.6	1.4	0.0	1.5	1.3
Leash requirements for dogs	0.0	0.0	0.0	0.0	0.0	6.0	0.8
Miscellaneous	23.1	7.5	13.2	11.9	40.0	11.9	12.3

A next question focused on what visitors thought should be changed about the way visitors experience Boston Harbor Islands National Park Area. Table 3.1.23 represents a frequency distribution of visitor responses. Overall, 40.5% respondents reported that everything was great. Others requested that there be more information/ education (16.8%) and more facilities and services (15.7%).

Table 3.1.23: Things that should be changed about the way visitors experience Boston Harbor Islands National Park Area?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
More restrooms	0.0	3.1	14.3	2.5	0.0	6.5	4.1
More information/education	6.7	18.5	0.0	20.3	7.1	15.6	16.8
More facilities and services	13.3	10.8	11.9	19.9	14.3	7.8	15.7
More food/water	6.7	7.7	4.8	7.2	0.0	3.9	6.3
Better maintenance/cleaner	0.0	3.1	0.0	5.1	0.0	0.0	3.3
More boats/more frequent ferries	6.7	13.8	0.0	9.1	7.1	0.0	7.4
Everything was great	60.0	36.9	61.9	30.1	64.3	61.0	40.5
More accessibility	0.0	0.0	2.4	1.8	0.0	0.0	1.2
Miscellaneous	6.7	6.2	4.8	4.0	7.1	5.2	4.7

Visitors were then asked a set of questions that focused on impacts to Boston Harbor Islands National Park Area. Respondents were asked if they thought visitors were causing negative impacts to Boston Harbor Islands National Park Area (Table 3.1.24). A majority of visitors felt visitors were not causing negative impacts (61.5%). Those who felt visitors were causing negative impacts, were asked to briefly describe impacts to natural resources, historical/ cultural resources and the quality of the visitor experience. Results are represented in Tables 3.1.25, 3.1.26, and 3.1.27. Litter, graffiti and crowding were identified as negative impacts.

Table 3.1.24: Negative impacts

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Yes	0.0	17.4	3.4	19.6	0.0	7.4	14.9
No	76.9	58.1	79.3	55.0	70.6	74.5	61.5
Not Sure	23.1	24.4	17.2	25.4	29.4	18.1	23.5

Table 3.1.25: Impacts to natural resources

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Soil impact/ erosion	0.0	0.0	25.0	7.5	0.0	0.0	6.8
Disturbance of wildlife/feeding seagulls	0.0	0.0	0.0	5.7	0.0	20.0	5.4
Destruction of vegetation	0.0	18.2	25.0	5.7	0.0	0.0	8.1
Litter/broken glass/trash/ garbage	0.0	72.7	25.0	71.7	100.0	80.0	70.3
Vandalism	0.0	0.0	0.0	1.9	0.0	0.0	1.4
Noise	0.0	9.1	0.0	0.0	0.0	0.0	1.4
Miscellaneous	0.0	0.0	25.0	7.5	0.0	0.0	6.8

Table 3.1.26: Impacts to historical/ cultural resources

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Graffiti	0.0	50.0	0.0	55.6	0.0	0.0	53.5
Vandalism	0.0	16.7	0.0	22.2	0.0	0.0	20.9
Litter/trash	0.0	16.7	0.0	13.9	0.0	0.0	14.0
General wear and tear	0.0	0.0	0.0	8.3	0.0	0.0	7.0
Miscellaneous	0.0	16.7	0.0	0.0	0.0	100.0	4.7

Table 3.1.27: Impacts to the quality of the visitor experience

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Crowding	0.0	0.0	100.0	11.8	0.0	0.0	11.4
Lack of maintenance/dirty facilities	0.0	0.0	0.0	8.8	0.0	0.0	6.8
Litter/trash	0.0	50.0	0.0	29.4	0.0	60.0	34.1

Table 3.1.27: Impacts to the quality of the visitor experience (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Graffiti	0.0	0.0	0.0	5.9	0.0	0.0	4.5
Unsupervised children	0.0	0.0	0.0	14.7	0.0	0.0	11.4
Noise	0.0	25.0	0.0	11.8	0.0	0.0	11.4
Miscellaneous	0.0	25.0	0.0	17.6	0.0	40.0	20.5

Repeat visitors were then asked to report how the condition of the islands was improving or declining compared to previous visits. Results are represented in Tables 3.1.28 and 3.1.29. A little more than a fifth of respondents (21.9%) reported there was improved maintenance and cleaner conditions. On the other hand, nearly a third of respondents (30.2%) reported that buildings and historical sites needed more maintenance.

Table 3.1.28: How do you think the condition of these islands is improving compared to previous visits?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
About the same	0.0	22.5	0.0	28.0	0.0	54.9	32.1
Improved maintenance/ cleaner	0.0	32.5	0.0	21.6	0.0	17.6	21.9
Water quality in Harbor improved	16.7	2.5	0.0	8.0	0.0	0.0	5.4
More people	0.0	0.0	0.0	3.2	0.0	0.0	1.8
More facilities/services/ access	0.0	15.0	100.0	25.6	0.0	7.8	19.2
Not Sure	0.0	7.5	0.0	6.4	0.0	5.9	6.3
Miscellaneous	83.3	20.0	0.0	7.2	100.0	13.7	13.4

Table 3.1.29: How do you think the condition of these islands is declining compared to previous visits?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
About the same	0.0	27.3	0.0	15.9	0.0	0.0	15.9
Nothing	0.0	18.2	0.0	6.8	0.0	14.3	9.5
Too many people	100.0	9.1	0.0	9.1	0.0	14.3	11.1
Graffiti	0.0	0.0	0.0	2.3	0.0	0.0	1.6
Building/historical sites need repair/ more maintenance/ clean	0.0	9.1	0.0	34.1	0.0	42.9	30.2
Don't know/not sure	0.0	9.1	0.0	6.8	0.0	0.0	6.3
Less access	0.0	9.1	0.0	13.6	0.0	0.0	11.1
Litter	0.0	18.2	0.0	4.5	0.0	0.0	6.3
Miscellaneous	0.0	0.0	0.0	6.8	0.0	28.6	7.9

The next question presented visitors with a series of issues that could be potential problems. Respondents were asked to rate the issues on a scale from 1 (“not a problem”) to 3 (“big problem”). A rating of 4 represented “don’t know.” Findings are shown in Table 3.1.30. Overall, respondents did not rate any of the issues as a big problem. Not enough information on natural and cultural resources of the island and poor water quality in Boston Harbor received the highest ratings of 1.7 and 1.7 respectively.

Table 3.1.30: Do you think the following issues are problems at Boston Harbor Islands?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Lack of public access to the island	1.8 (10.5)	1.2 (0.0)	1.1 (3.7)	1.2 (4.5)	1.8 (7.1)		1.3 (4.0)
Lack of facilities or services for visitors	1.5 (0.0)	1.5 (2.4)	1.9 (0.0)	1.5 (4.0)	1.6 (6.7)	1.1 (5.1)	1.5 (3.6)
Too many visitors on the islands	1.3 (11.1)	1.2 (12.2)	1.3 (5.5)	1.2 (9.7)	1.0 (6.7)		1.2 (9.6)
Too much visitor impact to natural/ cultural resources	1.3 (11.8)	1.5 (15.2)	1.3 (9.8)	1.5 (11.8)	1.1 (13.0)	1.0 (0.0)	1.4 (10.5)

Table 3.1.30: Do you think the following issues are problems at Boston Harbor Islands? (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Not enough information about things to do on the island	1.6 (12.5)	1.7 (3.6)	1.1 (0.0)	1.7 (3.0)	1.4 (0.0)		1.6 (3.0)
Not enough information on natural/cultural resources	1.8 (18.8)	1.6 (39.1)	1.2 (0.0)	1.8 (6.5)	1.3 (0.0)		1.7 (6.4)
Poor water quality in Boston Harbor	1.6 (5.9)	1.8 (19.0)	1.4 (17.6)	1.8 (19.6)	1.4 (14.3)	1.1 (2.5)	1.7 (16.6)
Too high a fee charged for ferry service	1.2 (37.5)	1.4 (2.4)	1.5 (5.6)	1.3 (6.1)	1.1 (6.7)		1.4 (6.5)
Lack of access to ferry terminals	1.3 (31.3)	1.2 (2.4)	1.1 (7.5)	1.2 (4.8)	1.6 (13.3)		1.2 (5.7)
Lack of availability of park staff	1.4 (13.3)	1.1 (7.3)	1.0 (0.0)	1.3 (8.4)	1.1 (0.0)		1.2 (7.3)
Lack of knowledge/ helpfulness of park staff	1.2 (12.5)	1.1 (7.5)	1.1 (0.0)	1.2 (11.0)	1.1 (0.0)		1.2 (9.1)
Poor food service	1.7 (20.0)	1.5 (19.0)	1.4 (4.3)	1.7 (23.2)	1.5 (6.7)		1.6 (20.3)
Lack of restrooms	1.5 (5.9)	1.5 (5.0)	2.1 (3.7)	1.5 (4.6)	1.1 (6.3)		1.5 (4.6)
Lack of visitor safety	1.2 (5.3)	1.2 (3.7)	1.2 (1.9)	1.2 (8.3)	1.1 (0.0)	1.0 (0.0)	1.2 (5.8)

1 = Not a Problem; 2 = Small Problem; 3 = Big Problem. Numbers in parentheses are the percentage of respondents who answered “Don’t Know”.

Respondents were asked about the quality of the visitor experience at Boston Harbor Islands National Park Area. Visitors were asked how crowded they felt during their current visit. Overall, slightly less than one-half of visitors reported not feeling crowded at all (Table 3.1.31). Respondents were also asked how the number of people they saw compared to the number of people they expected and preferred to see. Findings are presented in Tables 3.1.32 and 3.1.33. A majority of respondents (77.3%) reported seeing a range of others from a lot less than expected to about as expected. Similarly, a majority of visitors (66.8%) reported seeing a range of others from a lot less than preferred to about as preferred.

Respondents were then asked how the number of visitors affected their enjoyment at the islands. Findings are presented in Table 3.1.34. Overall, a majority of visitors (61.6%) reported that the number of other visitors had no effect. A little over one-fourth of respondents (28.2%) reported that the number of other visitors somewhat or greatly added to their enjoyment, while 10.0% reported that the number of other visitors somewhat reduced enjoyment. Visitors were then asked to rate how satisfied they were with their visit on a scale of 1 = "lowest satisfaction" to 10 = "highest satisfaction." Overall, visitors reported relatively high levels of satisfaction with a mean satisfaction rating of 8.5 (Table 3.1.35).

Table 3.1.31: How crowded did you feel at Boston Harbor Islands today?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
1 Not at all Crowded	77.8	50.6	64.4	44.1	100.0	35.2	48.2
2	18.5	23.6	23.7	22.3	0.0	42.0	24.5
3	0.0	12.4	6.8	16.7	0.0	13.6	13.8
4	0.0	4.5	1.7	5.3	0.0	5.7	4.6
5	3.7	2.2	1.7	3.5	0.0	2.3	3.0
6	0.0	4.5	0.0	4.6	0.0	0.0	3.3
7	0.0	1.1	1.7	2.5	0.0	1.1	1.9
8	0.0	0.0	0.0	0.8	0.0	0.0	0.4
9 Extremely Crowded	0.0	1.1	0.0	0.3	0.0	0.0	0.3
Mean	1.3	2.1	1.6	2.3	1.0	2.0	2.1

Table 3.1.32: How did the number of people you saw at Boston Harbor Islands compare to the number of people you expected to see?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
A lot less than expected		12.5		10.9			11.2
Less than expected		26.1		28.5			28.1
About as expected		40.9		37.4			38.0

Table 3.1.32: How did the number of people you saw at Boston Harbor Islands compare to the number of people you expected to see? (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
More than expected		10.2		12.6			12.2
A lot more than expected		0.0		1.8			1.4
Had no expectation		10.2		8.8			9.1

Table 3.1.33: How did the number of people you saw at Boston Harbor Islands compare to the number of people you preferred to see?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
A lot less than I preferred		2.2		2.0			2.1
Less than I preferred		2.2		3.1			2.9
About as I preferred		57.3		62.8			61.8
More than I preferred		13.5		14.8			14.5
A lot more than I preferred		1.1		3.6			3.1
Had no preference about the number to be seen		23.6		13.7			15.6

Table 3.1.34: How did the number of visitors at Boston Harbor Islands affect your enjoyment of this trip?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Greatly added to enjoyment		14.8		13.7			13.9
Somewhat added to enjoyment		11.4		15.0			14.3
Had no effect		68.2		60.2			61.6
Somewhat reduced enjoyment		5.7		10.9			10.0
Greatly reduced enjoyment		0.0		0.3			0.2

Table 3.1.35: How satisfied were you with your visit to Boston Harbor Islands today?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
1	0.0	3.4	1.8	0.3	0.0	1.1	0.9
2	0.0	0.0	0.0	0.8	0.0	1.1	0.6
3	0.0	0.0	0.0	0.8	0.0	0.0	0.5
4	0.0	1.1	0.0	1.0	0.0	0.0	0.8
5	0.0	2.3	0.0	3.3	0.0	0.0	2.3
6	3.7	5.7	1.8	3.6	0.0	1.1	3.3
7	0.0	13.8	0.0	13.8	0.0	3.3	10.4
8	18.5	27.6	14.0	26.4	20.0	17.8	23.9
9	22.2	19.5	35.1	25.4	33.3	23.3	25.2
10	55.6	26.4	47.4	24.6	46.7	52.2	32.3
Average	9.3	8.1	9.1	8.3	9.3	9.1	8.5

Visitors were asked in an open-ended question to briefly describe why they chose to visit Boston Harbor Islands National Park Area on this trip. Findings are presented in Table 3.1.36. Overall, a little over a tenth of respondents (13.6%) visited because it was an outing planned by their employer. Another set of respondents (12.1%) visited because it was close to their home. Visitors were then presented with some reasons that people might visit Boston Harbor Islands National Park Area (Table 3.1.37 and 3.1.38). Visitors were asked to indicate how important each of these reasons were for them on a scale of 1 = “not important” to 5 = “extremely important.” Visitors reported “to get away from the

usual demands of life" (4.1) and "to get some fresh air" (4.1) as very important reasons to visit Boston Harbor Islands. Visitors were further asked how well Boston Harbor Islands National Park Area provided an opportunity to fulfill each of these reasons on a scale of 1 = "no opportunity" to 5 = "excellent opportunity." Visitors gave both reasons mentioned above a rating of 4.2 and 4.4 respectively.

Table 3.1.36: Why did you choose to visit Boston Harbor Islands on this trip?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
The group I am with decided		7.3		8.6			8.4
Boat ride		4.9		6.2			5.9
Wanted to see the harbor/ islands/skyline/ scenery		6.1		7.8			7.5
Camping/ swimming/ picnicking		7.3		3.8			4.4
Have never visited, always wanted to		8.5		5.4			5.9
Have visited before/enjoyed previous visits		2.4		4.0			3.7
Close to home/ convenient day trip/do not have much time		12.2		12.1			12.1
To visit historical sites/ lighthouses		4.9		4.3			4.4
To visit nature/ see wildlife		6.1		2.1			2.9
Family outing		15.9		6.7			8.4
To get away (from city)/ peacefulness		1.2		5.9			5.1
It is something different		3.7		5.1			4.8
Outing planned by my employer		9.8		14.5			13.6

Table 3.1.36: Why did you choose to visit Boston Harbor Islands on this trip? (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Inexpensive/a good value		0.0		2.4			2.0
It is such a nice day		2.4		1.9			2.0
Miscellaneous		7.3		9.4			9.1

Table 3.1.37: How important were each of these reasons for you to visit Boston Harbor Islands?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Do something with your family		3.5		3.5			3.5
Observe other people in the area		1.5		1.4			1.4
Bring your family closer together		3.4		3.1			3.2
Experience new and different things		3.8		3.8			3.8
Learn more about nature		3.3		3.1			3.1
Learn more about history		3.5		3.5			3.5
Get away from the usual demands of life		4.0		4.1			4.1
Be with others who enjoy the same things you do		3.5		3.5			3.5
Talk to new and varied people		1.8		1.9			1.9
Be with friends		3.6		3.5			3.5
Experience tranquility		3.7		3.9			3.8

Table 3.1.37: How important were each of these reasons for you to visit Boston Harbor Islands? (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Learn what you are capable of		2.2		2.0			2.0
Develop your skills and abilities		2.1		2.1			2.1
Get fresh air		4.0		4.2			4.1
Get some exercise		3.8		3.7			3.7
Go for a boat ride		3.6		3.9			3.8
See views of Boston from the harbor		3.5		3.9			3.9

1 = Not important; 2 = Somewhat important; 3 = Moderately important; 4= Very important; 5 = Extremely important

Table 3.1.38: How well did Boston Harbor Islands provide an opportunity to fulfill each of these reasons?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Do something with your family		4.1		4.0			4.0
Observe other people in the area		3.0		3.0			3.0
Bring your family closer together		3.8		3.6			3.7
Experience new and different things		4.0		3.9			4.0
Learn more about nature		3.6		3.2			3.3
Learn more about history		3.8		3.8			3.8
Get away from the usual demands of life		4.3		4.2			4.2

Table 3.1.38: How well did Boston Harbor Islands provide an opportunity to fulfill each of these reasons? (continued)

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
Be with others who enjoy the same things		3.9		3.9			3.9
Talk to new and varied people		3.0		2.9			2.9
Be with friends		3.8		3.9			3.8
Experience tranquility		3.9		3.8			3.9
Learn what you are capable of		2.7		2.3			2.4
Develop your skills and abilities		2.8		2.3			2.4
Get some fresh air		4.3		4.4			4.4
Get some exercise		4.2		4.0			4.0
Go for a boat ride		4.3		4.5			4.4
See views of Boston from the harbor		4.2		4.5			4.4

1 = No opportunity; 2 = Poor opportunity; 3 = Good opportunity; 4 = Very good opportunity; 5 = Excellent opportunity

Finally, respondents were asked about facilities or programs they would like to have available to improve their visit to Boston Harbor Islands National Park Area. Findings are reported in Table 3.1.39. Overall, slightly less than one-half of visitors (47.7%) reported they would like more facilities and services. These included food facilities (13.1%), more tours (17.0%), and more historical/ nature/ general information (17.6%).

Table 3.1.39: What facilities or programs would you like to have available to improve your visit to Boston Harbor Islands?

	Deer Island	Hingham ferry	Little Brewster Island	Long Wharf ferry	Thompson Island	Worlds End	Total
More and varied food facilities/ water		3.8		15.2			13.1
More ferries/ shuttles		19.2		9.7			11.4
More tours/ nature programs/ children's programs		15.4		17.3			17.0
More historical/ nature/ general information		19.2		17.3			17.6
More interpretive staff		5.8		3.8			4.2
Better and more restroom facilities		9.6		5.9			6.6
Nothing		5.8		8.0			7.6
Swimming beaches/other water activities		5.8		3.0			3.5
Better and more camping facilities		1.9		1.3			1.4
Visitor center/museum		0.0		2.1			1.7
Don't know		3.8		1.3			1.7
More restoration of buildings		3.8		2.1			2.4
Other		5.8		13.1			11.8

Phase 2

Bumpkin Island: Use and Users

Respondents were asked several descriptive questions pertaining to their use of Boston Harbor Islands National Park Area. The first question asked respondents to report the number of people in their group. Table 3.2.1 indicates the frequency distribution of group size. Most visitors (61.4%) come to Bumpkin Island in groups of 2 to 4. Average (mean) group size of visitors to Bumpkin Island was 4.7 people and median group size was 3.0 people. The next question asked respondents to report the composition of their group. Results are shown in Table 3.2.2. The majority of visitors (78.1%) come in groups comprised of family and/ or friends. Respondents were also given the opportunity to indicate an "other" type of group. "Other" types of groups included couples, park staff and business groups (Table 3.2.3).

Table 3.2.1: Group size

	Frequency	Percent
1	12	12.9
2	29	31.2
3	14	15.1
4	14	15.1
5	1	1.1
6	8	8.6
7	0	0
8	5	5.4
9	1	1.1
10 or more	9	9.9

N = 93; Mean = 4.7; Median = 3.0

Table 3.2.2: Group composition

	Frequency	Percent
Family	27	29.7
Friends	28	30.8
Family and friends	16	17.6
Organized group	7	7.7
Alone	9	9.9
Other	4	4.4

N = 91

Table 3.2.3: Other group type

	Frequency	Percent
Couple	2	50
Park staff	1	25
Business outing	1	25

N = 4

Next, respondents were asked if they had been to any of the areas within Boston Harbor Islands National Park Area before. Results are shown in Table 3.2.4. and indicate that most visitors (65.6%) have visited Boston Harbor Islands National Park Area prior to their current visit. Respondents were also asked if they had been to Bumpkin Island before. Most visitors (66.7%) were visiting the island for the first time (Table 3.2.5).

Table 3.2.4: Prior visits to any of the areas within Boston Harbor Islands National Park Area

	Frequency	Percent
Yes	61	65.6
No	32	34.4

N = 93

Table 3.2.5: Prior visits to Bumpkin Island

	Frequency	Percent
Yes	29	31.2
No	62	66.7
Not sure	2	2.2

N = 93

The next set of questions focused on visitor demographics and selected socio-economic characteristics. Visitors were asked where they lived (Table 3.2.6). Most respondents (85.3%) were from Massachusetts.

Table 3.2.6: Residence

	Frequency	Percent
Massachusetts	76	85.3
Other State	8	9.1
Other Country	5	5.6

N = 89

Details regarding city or town of residence in Massachusetts, state of residence for non-Massachusetts residents and country of residence for international visitors are presented in Tables 3.2.7, 3.2.8. and 3.2.9. Slightly less than a fifth of Massachusetts visitors (16.7%) were from Boston. Eight other states and four other countries were represented among the sample.

Table 3.2.7: Town in Massachusetts

	Frequency	Percent
Weymouth	5	6.9
Quincy	4	5.6
Somerville	2	2.8
Boston	12	16.7
Newton	1	1.4
Sharon	1	1.4
Worcester	2	2.8
Cambridge	6	8.3
Arlington	2	2.8
Lexington	1	1.4
Hull	4	5.6
Beverly	1	1.4
Winthrop	1	1.4
Hingham	7	9.7
Allston	1	1.4
Springfield	1	1.4
Norwell	1	1.4
Framingham	1	1.4
Milton	1	1.4
Lancaster	1	1.4
Brighton	1	1.4
Hyde Park	2	2.8
Pembroke	1	1.4
Amherst	1	1.4
Littleton	1	1.4
Belmont	1	1.4
Burlington	1	1.4
Lowell	1	1.4
Revere	1	1.4
Tewksbury	1	1.4
Chelsea	1	1.4
Ipswich	1	1.4
East Taunton	1	1.4
Duxbury	1	1.4

N = 76

Table 3.2.8: Other state of residence

	Frequency	Percent
California	1	12.5
Florida	1	12.5
Indiana	1	12.5
Louisiana	1	12.5
Maine	1	12.5
New Hampshire	1	12.5
New York	1	12.5
Virginia	1	12.5

N = 8

Table 3.2.9: Country of residence

	Frequency	Percent
Germany	2	40.0
France	1	20.0
Ireland	1	20.0
Italy	1	20.0

N = 5

Next, respondents were asked to indicate whether they were male or female. There was a nearly equal number of female (50.6%) and male (49.4%) respondents (Table 3.2.10). Respondents were also asked to record the year in which they were born. Visitors reported a mean and median age of 38 years. A subsequent question addressed respondents' educational background. Overall, visitors to Bumpkin Island tend to be well educated with 94.2% having at least some college education or higher. Table 3.2.10 reports a frequency distribution of employment status of respondents. A majority of respondents (76.7%) reported being employed. Finally, respondents were asked to indicate their ethnicity and race. A majority of respondents (95.8%) reported being not Hispanic or Latino. Also, the vast majority of respondents (79.3%) were white.

Table 3.2.10: Demographic profile

	Frequency	Percent
Gender (N = 89)		
Female	45	50.6
Male	44	49.4

Table 3.2.10: Demographic profile (continued)

Respondent age (N = 87; Mean = 38.0; Median = 38.0)		
	Frequency	Percent
Under 20	2	2.3
20-29	25	28.7
30-39	25	28.7
40-49	19	21.8
50-59	13	14.9
60-69	0	0.0
70-79	3	3.5
Education level in years (N = 86; Mean = 16.8; Median = 16.0)		
12	5	5.8
13	2	2.3
14	13	15.1
15	7	8.1
16	22	25.6
17	3	3.5
18	11	12.8
19	4	4.7
20	6	7.0
21	13	15.1
Employment status (N = 86)		
Employed	66	76.7
Unemployed	3	3.5
Homemaker	3	3.5
Retired	4	4.7
Student	6	7.0
Other	4	4.8
Ethnicity (N = 72)		
Hispanic or Latino	3	4.2
Not Hispanic or Latino	69	95.8
Race (N = 87)		
American Indian or Alaska Native	2	2.3
Asian	3	3.5
Black or African American	2	2.3
Native Hawaiian or other Pacific Islander	1	1.2
White	69	79.3
Other	10	11.7

Indicators and Standards of Quality

A major section of the survey questionnaire contained a series of questions used to measure indicator variables and determine standards of quality for visitor-use related issues. One set of questions concerned hiking on Bumpkin Island. Respondents were asked if they had hiked on any of the trails on Bumpkin Island. A majority of visitors (91.4%) indicated that they had hiked the trails (Table 3.2.11).

Table 3.2.11: Hike on trails on Bumpkin Island

	Frequency	Percent
Yes	85	91.4
No	8	8.6

N = 93

Respondents were then asked a series of questions about their standards of quality with respect to the number of hikers per hour on the trails on Bumpkin Island. Respondents were asked to indicate the 1) maximum acceptable number of hikers per hour to see without the trails on Bumpkin Island being too crowded (referred to as “acceptability”), 2) preferred number of hikers per hour on the trails (referred to as “preference”), 3) maximum number of hikers per hour before they would no longer hike the trails (referred to as “displacement”), 4) highest number of hikers per hour that should be allowed before visitor use is restricted (referred to as “management action”), and 5) number of hikers per hour seen by respondents on the day of the study (referred to as “existing conditions”). Where appropriate, visitors were allowed the options to indicate that they would continue to hike the trails on Bumpkin Island regardless of the number of other hikers seen, or that the number of hikers on Bumpkin Island should not be restricted. Findings for these questions are shown in Tables 3.2.12, 3.2.13, 3.2.14, 3.2.15, 3.2.16 and summarized in Table 3.2.17.

Respondents reported that 1) an average (mean) of 18.7 (median of 12.0) was the maximum acceptable number of hikers per hour 2) they prefer to see an average (mean) of 9.6 (median of 8.0) hikers per hour, 3) they would be displaced by an average (mean) of 31.0 (median of 25.0) hikers per hour, 4) no more than an average (mean) of 26.6 or (median of 22.0) hikers per hour should be allowed, and 5) they typically saw an average (mean) of 5.1 (median of 4.0) hikers per hour. The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to hike the trails regardless of the number of other hikers seen or that the number of hikers on Bumpkin Island should not be restricted.

Table 3.2.12: Acceptability (Number of hikers per hour)

	Frequency	Percent
0-10	40	47.8
11-20	27	33.1
21-30	5	6.0
31-40	3	3.6
41-50	6	7.2
51-60	1	1.2
61-70	0	0
71-80	1	1.2
81-90	0	0
91-100	0	0
101 or more	1	1.2

N = 84; Mean = 18.7; Median = 12.0

Table 3.2.13: Preference (Number of hikers per hour)

	Frequency	Percent
0-10	64	77.0
11-20	12	14.4
21-30	5	6.0
31-40	1	1.2
41-50	1	1.2

N = 83; Mean = 9.6; Median = 8.0

Table 3.2.14: Displacement (Number of hikers per hour)

	Frequency	Percent
0-10	7	8.4
11-20	24	28.9
21-30	10	12.0
31-40	2	2.4
41-50	12	14.5
51-60	3	3.6
61-70	1	1.2
71-80	3	3.6
81-90	0	0
91-100	3	3.6
101 or more	0	0
I would continue to hike the trails regardless of the number of other hikers seen	17	20.5

N = 82; Mean = 31.0; Median = 25.0

Table 3.2.15: Management action (Number of hikers per hour)

	Frequency	Percent
0-10	8	10.3
11-20	14	17.9
21-30	12	15.4
31-40	2	2.6
41-50	5	6.4
51-60	1	1.3
61-70	1	1.3
71-80	1	1.3
81 or more	0	0
The number of hikers on Bumpkin Island should not be restricted	33	42.3

N = 77; Mean = 26.6; Median = 22.0

Table 3.2.16: Existing conditions (Number of hikers per hour)

	Frequency	Percent
0-10	76	92.5
11-20	4	4.8
21-30	1	2.4
31-40	1	2.4
41 or more	0	0

N = 82; Mean = 5.1; Median = 4.0

Table 3.2.17: Summary (Number of hikers per hour)

	N	Mean	Median
Acceptability	84	18.7	12.0
Preference	83	9.6	8.0
Displacement	65	31.0	25.0
Management action	44	26.6	22.0
Existing conditions	82	5.1	4.0

The next set of questions presented visitors with a series of five photographs depicting a range of environmental impacts to soil and vegetation on hiking trails on Bumpkin Island. Study photographs are shown in Appendix C. Respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.18 and Figure 3.1. Figure 3.1 represents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that fewer impacts to the trails are more acceptable than greater impacts and that aggregate evaluations of the photographs fall out of the acceptable range and into the

unacceptable range at approximately photograph 3.6. This value is referred to as “acceptability (long form).”

Table 3.2.18: Acceptability for trail impacts on Bumpkin Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	81	0	1.2	1.2	0	2.5	1.2	3.7	7.4	82.7	3.6
Photo 2	81	2.5	0	1.2	2.5	3.7	11.1	24.7	38.3	16	2.3
Photo 3	78	5.1	0	3.8	6.4	23.1	21.8	19.2	16.7	3.8	0.9
Photo 4	81	11.1	9.9	21	14.8	9.9	16	4.9	8.6	3.7	-0.6
Photo 5	80	33.8	15	13.8	7.5	10	3.8	5	6.3	5	-1.6

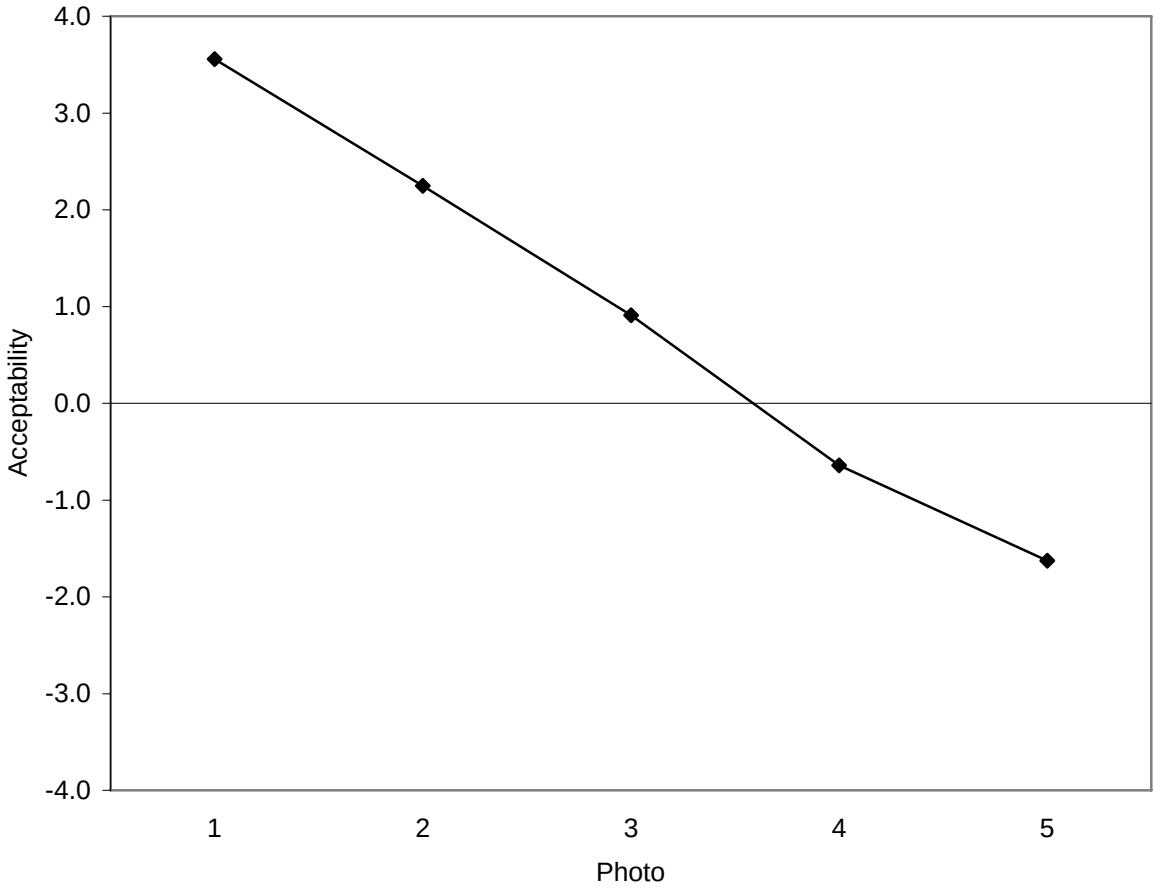

Figure 3.1: Norm curve for trail impacts on Bumpkin Island

Respondents were also asked to indicate the photograph that depicts the 1) highest level of environmental impact that is acceptable (referred to as “acceptability (short form)”), 2) amount of environmental impact preferred (referred to as “preference”), 3) amount of environmental impact that is so

unacceptable that respondents would no longer hike on the trails on Bumpkin Island (referred to as “displacement”), 4) highest level of environmental impact that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of environmental impact typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to hike the trails on Bumpkin Island regardless of environmental impacts on the trails, or that none of the photographs show a high enough level of environmental impact to restrict people from hiking on Bumpkin Island. Findings for these questions are shown in Tables 3.2.19, 3.2.20, 3.2.21, 3.2.22, 3.2.23, and summarized in Table 3.2.24.

Respondents reported that 1) acceptable environmental impacts were represented by an average (mean) photograph number of 2.5 (or a median photograph number of 3.0), 2) they prefer to see environmental impacts represented by an average (mean) photograph number of 1.5 (or a median photograph number of 1.0), 3) they would be displaced by environmental impacts represented by an average (mean) photograph number of 4.2 (or a median photograph number of 4.0), 4) no more environmental impacts than represented by an average (mean) photograph number of 3.3 (or a median photograph number of 3.0) should be allowed and 5) they typically saw environmental impacts represented by an average (mean) photograph number of 2.0 (or a median photograph number of 1.0). The displacement and management action values are slightly underestimated as some respondents reported that either they would continue to hike the trails regardless of environmental impacts on the trails or that none of the photographs show a high enough level of environmental impact to restrict people from hiking on Bumpkin Island.

Table 3.2.19: Acceptability (Trail impacts)

Photo	Frequency	Percent
1	12	14.8
2	18	22.2
3	23	28.4
4	7	8.6
5	3	3.7
All the photographs are acceptable	18	22.2

N = 81; Mean = 2.5; Median =3.0

Table 3.2.20: Preference (Trail impacts)

Photo	Frequency	Percent
1	58	70.7
2	14	17.1
3	8	9.7
4	1	1.2
5	1	1.2

N = 82; Mean = 1.5; Median =1.0

Table 3.2.21: Displacement (Trail impacts)

Photo	Frequency	Percent
1	1	1.2
2	2	2.4
3	1	1.2
4	10	12.1
5	13	15.7
None of the photographs are so unacceptable	56	67.5

N = 83; Mean = 4.2; Median = 4.0

Table 3.2.22: Management action (Trail impacts)

Photo	Frequency	Percent
1	5	6.0
2	7	8.4
3	21	25.3
4	13	15.7
5	12	14.5
People should not be restricted at any point in photos	16	19.3
People should not be restricted	9	10.8

N = 83; Mean = 3.3; Median = 3.0

Table 3.2.23: Existing conditions (Trail impacts)

Photo	Frequency	Percent
1	42	53.2
2	14	17.7
3	9	11.4
4	8	10.1
5	6	7.6

N = 79; Mean = 2.0; Median = 1.0

Table 3.2.24: Summary (Trail impacts)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		3.6	
Acceptability (short form)	63	2.5	3.0
Preference	82	1.5	1.0
Displacement	27	4.2	4.0
Management action	58	3.3	3.0
Existing conditions	79	2.0	1.0

The next set of questions focused on environmental impacts at campsites on Bumpkin Island. Respondents were asked if they had camped on Bumpkin Island during the time of the study. Most respondents (71.1%) were day use visitors (Table 3.2.25).

Table 3.2.25: Camp on Bumpkin Island

	Frequency	Percent
Yes	24	28.9
No	59	71.1

N = 83

Those who had camped on Bumpkin Island were presented a series of photographs depicting environmental impacts to soil and vegetation at campsites. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.26 and Figure 3.2. Figure 3.2 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that fewer impacts to the campsites are more acceptable than larger impacts and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.2. This value is referred to as “acceptability (long form).”

Table 3.2.26: Acceptability for campsite impacts on Bumpkin Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	33	0	0	0	0	0	0	3	3	93.9	3.9
Photo 2	33	3	0	3	0	6.1	6.1	9.1	42.4	30.3	2.6
Photo 3	32	12.5	0	3.1	6.3	31.3	12.5	21.9	9.4	3.1	0.3
Photo 4	31	19.4	6.5	29	19.4	3.2	12.9	6.5	0	3.2	-1.4
Photo 5	31	54.8	16.1	6.5	9.7	3.2	6.5	0	0	3.2	-2.7

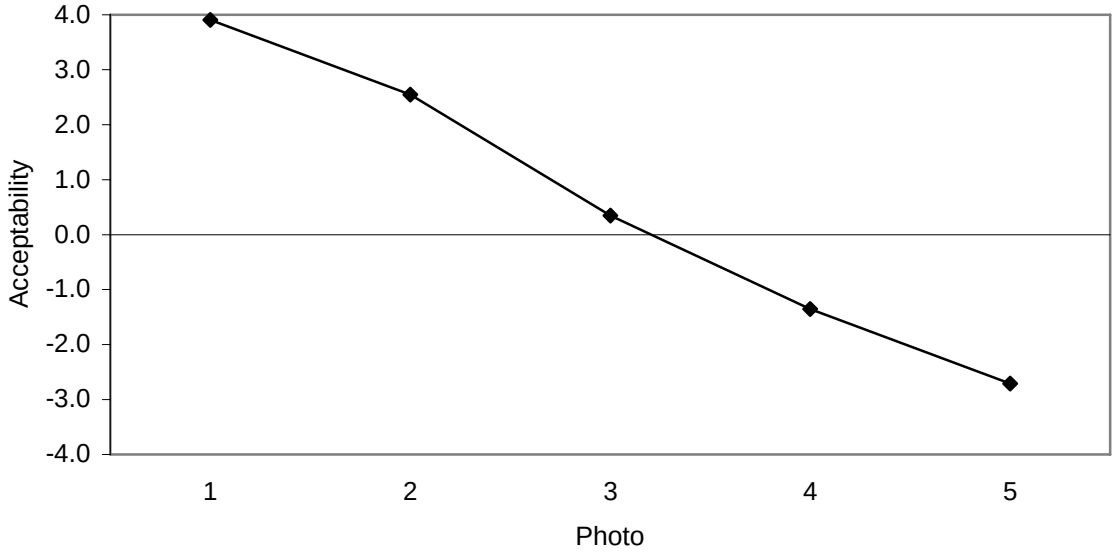

Figure 3.2: Norm curve for campsite impacts on Bumpkin Island

Respondents were also asked to indicate the photograph that depicts the 1) highest level of environmental impact that is acceptable (referred to as “acceptability (short form)”), 2) amount of environmental impact preferred (referred to as “preference”), 3) amount of environmental impact that is so unacceptable that respondents would no longer camp on Bumpkin Island referred to as “displacement”), 4) highest level of environmental impact that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of environmental impact typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to camp on Bumpkin Island regardless of environmental impacts at campsites, or that none of the photographs show a high enough level of environmental impact at campsites to restrict people from camping on Bumpkin Island. Findings for these questions are shown in Tables 3.2.27, 3.2.28, 3.2.29, 3.2.30, 3.2.31 and summarized in Table 3.2.32.

Respondents reported that 1) acceptable environmental impacts were represented by an average (mean) photograph number of 2.3 (or a median photograph number of 2.0), 2) they prefer to see environmental impacts represented by an average (mean) photograph number of 1.4 (or a median photograph number of 1.0), 3) they would be displaced by environmental impacts represented by an average (mean) photograph number of 4.0 (or a median photograph number of 4.0), 4) no more environmental impacts than represented by an average (mean) photograph number of 2.8 (or a median photograph number of 3.0) should be allowed, and 5) they typically saw environmental impacts represented by an average (mean) photograph number of 1.8 (or a median photograph number of 2.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to camp regardless of environmental impacts on the campsites or that none of the photographs show a high enough level of environmental impact to restrict people from camping on Bumpkin Island.

Table 3.2.27: Acceptability (Campsite impacts)

Photo	Frequency	Percent
1	7	21.2
2	9	27.3
3	12	36.4
4	1	3.0
5	1	3.0
All the photographs are acceptable	3	9.1

N = 33; Mean = 2.3; Median = 2.0

Table 3.2.28: Preference (Campsite impacts)

Photo	Frequency	Percent
1	22	68.8
2	8	25.0
3	1	3.1
4	0	0.0
5	1	3.1

N = 32; Mean = 1.4; Median = 1.0

Table 3.2.29: Displacement (Campsite impacts)

Photo	Frequency	Percent
1	1	1.0
2	3	9.4
3	2	6.3
4	8	25.0
5	9	28.1
None of the photographs are so unacceptable	10	31.3

N = 33; Mean = 4.0; Median = 4.0

Table 3.2.30: Management action (Campsite impacts)

Photo	Frequency	Percent
1	2	6.1
2	6	18.2
3	15	45.5
4	4	12.1
5	0	0.0
People should not be restricted at any point in photos	2	6.1
People should not be restricted	4	12.1

N = 33; Mean = 2.8; Median = 3.0

Table 3.2.31: Existing conditions (Campsite impacts)

Photo	Frequency	Percent
1	12	42.9
2	12	42.9
3	3	10.7
4	1	3.6
5	0	0.0

N = 28; Mean = 1.8; Median = 2.0

Table 3.2.32: Summary (Campsite impacts)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		3.2	
Acceptability (short form)	30	2.3	2.0
Preference	32	1.4	1.0
Displacement	23	4.0	4.0
Management action	27	2.8	3.0
Existing conditions	28	1.8	2.0

A next set of questions addressed the issue of litter on Bumpkin Island. Respondents were presented a series of photographs depicting increasing amounts of litter. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.33. and Figure 3.3. Figure 3.3 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.4. This value is referred to as “acceptability (long form).”

Table 3.2.33: Acceptability for litter on Bumpkin Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	90	2.2	0	0	0	2.2	0	0	5.6	90	3.7
Photo 2	88	59.1	9.1	8	8	9.1	3.4	2.3	1.1	0	-2.8
Photo 3	90	78.9	5.6	7.8	5.6	0	0	1.1	0	1.1	-3.5
Photo 4	89	87.6	6.7	2.2	1.1	0	1.1	0	0	1.1	-3.7
Photo 5	88	95.5	1.1	0	0	1.1	0	0	0	2.3	-3.8

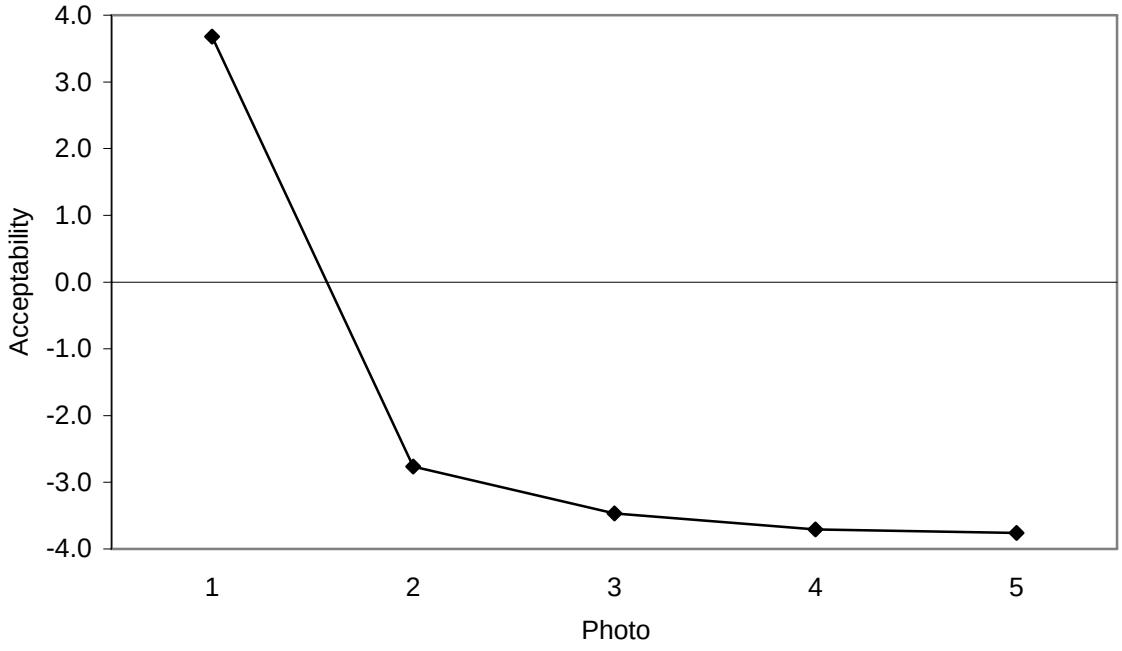

Figure 3.3: Norm curve for litter on Bumpkin Island

Respondents were also asked to indicate the photograph that depicts the 1) highest amount of litter that is acceptable (referred to as “acceptability (short form)”), 2) amount of litter preferred (referred to as “preference”), 3) amount of litter that is so unacceptable that respondents would no longer visit Bumpkin Island (referred to as “displacement”), 4) highest amount of litter that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of litter typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Bumpkin Island regardless of litter, or that none of the photographs show a high enough amount of litter to restrict people from visiting Bumpkin Island. Findings for these questions are shown in Tables 3.2.34, 3.2.35, 3.2.36, 3.2.37, 3.2.38 and summarized in Table 3.2.39.

Respondents reported that 1) acceptable amounts of litter were represented by an average (mean) photograph number of 1.2 (or a median photograph number of 1.0), 2) they prefer to see no litter as represented by an average (mean) photograph number of 1.0 (or a median photograph number of 1.0), 3) they would be displaced by amounts of litter represented by a mean photograph number of 2.5 (or a median photograph number of 2.0), 4) no more litter than represented by an average (mean) photograph number of 1.4 (or a median photograph number of 1.0) should be allowed, and 5) they typically saw litter represented by an average (mean) photograph number of 1.1 (or a median photograph number of 1.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of amounts of litter on Bumpkin Island, or that none of the photographs show a high enough level of litter to restrict people from visiting Bumpkin Island.

Table 3.2.34: Acceptability (Litter)

Photo	Frequency	Percent
1	73	82.0
2	15	16.9
3	0	0.0
4	0	0.0
5	1	1.1

N = 89; Mean = 1.2; Median = 1.0

Table 3.2.35: Preference (Litter)

Photo	Frequency	Percent
1	85	97.7
2	2	2.3
3	0	0.0
4	0	0.0
5	0	0.0

N = 87; Mean = 1.0; Median = 1.0

Table 3.2.36: Displacement (Litter)

Photo	Frequency	Percent
1	3	3.5
2	52	60.5
3	22	25.6
4	4	4.7
5	4	4.7
None of the photographs are so unacceptable	1	1.2

N = 86; Mean = 2.5; Median = 2.0

Table 3.2.37: Management action (Litter)

Photo	Frequency	Percent
1	57	63.3
2	25	27.8
3	3	3.3
4	1	1.1
5	0	0.0
People should not be restricted at any point in photos	0	0.0
People should not be restricted	4	4.4

N = 90; Mean = 1.4; Median = 1.0

Table 3.2.38: Existing conditions (Litter)

Photo	Frequency	Percent
1	82	92.1
2	7	7.8
3	0	0.0
4	0	0.0
5	0	0.0

N = 89; Mean = 1.1; Median = 1.0

Table 3.2.39: Summary (Litter)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		1.4	
Acceptability (short form)	89	1.2	1.0
Preference	87	1.0	1.0
Displacement	85	2.5	2.0
Management action	86	1.4	1.0
Existing conditions	89	1.1	1.0

To measure visitor evaluations of the ferry service provided to Georges Island from Boston (Long Wharf), respondents were given a question containing a range of ferry frequencies from “every 15 minutes” to “every 2 hours” with 15 minute time intervals. Respondents were asked to rate each of these intervals on a scale of –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are presented in Table 3.2.40 and Figure 3.4. Figure 3.4 presents the norm curve associated with the mean acceptability rating for each time interval. Respondents rated a range of ferry intervals of 36 minutes to 1hr 35 minutes as acceptable, with a one hour interval as most acceptable.

Table 3.2.40: Acceptability for ferry service

Ferry service frequency	N	-4	-3	-2	-1	0	1	2	3	4	Mean
15 mins	73	47.9	5.5	11.0	2.7	5.5	4.1	4.1	2.7	16.4	-1.5
30 mins	74	24.3	13.5	9.5	4.1	9.5	1.4	5.4	10.8	21.6	-3.0
45 mins	75	12.0	6.7	14.7	5.3	8.0	8.0	12.0	12.0	21.3	.5
1 hr	78	5.1	1.3	2.6	7.7	6.4	10.3	5.1	12.8	48.7	2.2
1 hr 15 mins	72	6.9	2.8	5.6	15.3	13.9	8.3	12.5	25.0	9.7	0.9
1 hr 30 mins	75	8.0	6.7	13.3	9.3	12.0	9.3	22.7	10.7	8.0	0.3
1 hr 45 mins	74	18.9	12.2	9.5	6.8	8.1	23.0	8.1	8.1	5.4	-5.3
2 hrs	74	31.1	5.4	8.1	6.8	17.6	8.1	4.1	2.7	16.2	-7.4

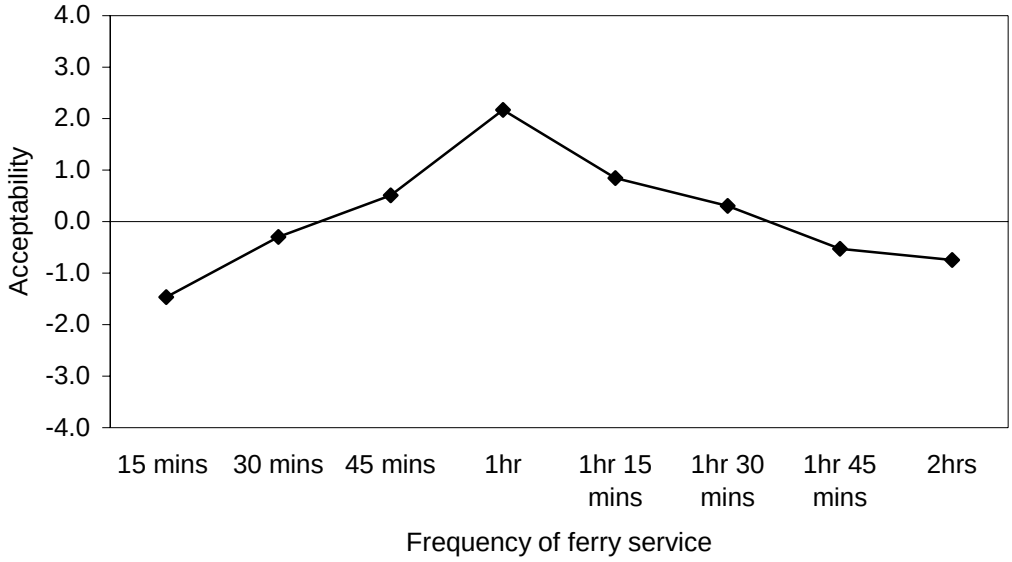

Figure 3.4: Norm curve for ferry service to Georges Island

Similarly, visitors were asked to evaluate the water shuttle service from Georges Island to other islands. Respondents were presented a question containing a range of water shuttle frequencies from “every 15 minutes” to “every 2 hours” with 15 minute time intervals. Respondents were asked to rate each of these time intervals on a scale of –4 (“very unacceptable”) to +4 (“very acceptable”). Study findings are shown in Table 3.2.41 and Figure 3.5. Figure 3.5 presents the norm curve associated with the mean acceptability rating for each time interval. Respondents rated a range of water shuttle intervals of 28 minutes to 1 hr 32 minutes as acceptable, with an interval of one hour as most acceptable.

Table 3.2.41: Acceptability for water shuttle service

Water shuttle service frequency	N	-4	-3	-2	-1	0	1	2	3	4	Mean
15 mins	76	42.1	6.6	6.6	2.6	7.9	6.6	3.9	3.9	19.7	-9.9
30 mins	79	27.8	7.6	5.1	5.1	7.6	0	6.3	7.6	32.9	0.2
45 mins	76	19.7	5.3	10.5	5.3	6.6	6.6	10.5	15.8	19.7	0.3
1 hr	78	5.1	2.6	6.4	5.1	15.4	10.3	1.3	12.8	41.0	1.7
1 hr 15 mins	72	8.3	4.2	2.8	15.3	20.8	11.1	15.3	13.9	8.3	0.5
1 hr 30 mins	76	13.2	2.6	15.8	7.9	10.5	14.5	17.1	13.2	5.3	0.1
1 hr 45 mins	76	18.4	11.8	11.8	10.5	10.5	15.8	7.9	5.3	7.9	-6.4
2 hrs	78	34.6	6.4	6.4	3.8	12.8	5.1	6.4	3.8	20.5	-6.3

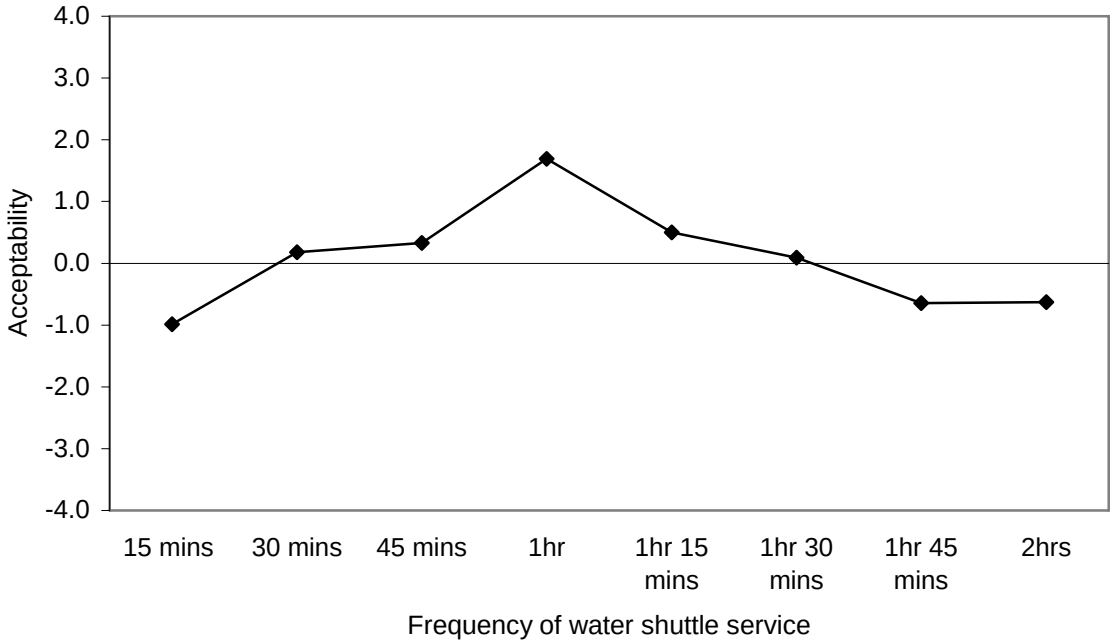

Figure 3.5: Norm curve for shuttle service to Bumpkin Island

The next set of questions focused on information provided to visitors to Boston Harbor Islands National Park Area. Respondents were asked to evaluate the amount and quality of information related to visitor opportunities and activities; ferry schedules and other means of access; the natural history of Boston Harbor Islands; and the human history of Boston Harbor Islands. Evaluation of amount of information was measured on a scale of 1 ("adequate") and 2 ("inadequate"). Evaluation of quality of information was measured on a scale of 1 ("excellent") to 5 ("very poor"). Findings are presented in Tables 3.2.42 through 3.2.45. The vast majority of respondents (90.3%) reported that the amount of information on visitor opportunities and activities at Boston Harbor Islands was adequate (mean = 1.1) and that the quality of the same (84.0%) was good to excellent (mean = 1.9) (Table 3.2.42).

Table 3.2.42: Information on visitor opportunities and activities at Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	65	90.3
Inadequate (2)	7	9.7
Mean	1.1	
Quality of Information		
Excellent (1)	28	37.3
Good (2)	35	46.7
Fair (3)	8	10.7
Poor (4)	1	1.3
Very Poor (5)	3	4.0
Mean	1.9	

The vast majority of visitors (84.1%) reported that the amount of information on ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of the same (72.0%) was good to excellent (mean = 2.1) (Table 3.2.43).

Table 3.2.43: Information on ferry schedules and other means of access to Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	58	84.1
Inadequate (2)	11	15.9
Mean	1.2	
Quality of Information		
Excellent (1)	25	33.3
Good (2)	29	38.7
Fair (3)	12	16.0
Poor (4)	8	10.7
Very Poor (5)	1	1.3
Mean	2.1	

Findings regarding visitor evaluations of information on the natural history of Boston Harbor Islands are presented in Table 3.2.44. The vast majority of visitors (86.1%) reported the amount of information was adequate (mean = 1.1), and the quality of information (77.4%) was good to excellent (mean = 2.1).

Table 3.2.44: Information on the natural history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	62	86.1
Inadequate (2)	10	13.9
Mean	1.1	
Quality of Information		
Excellent (1)	17	22.7
Good (2)	41	54.7
Fair (3)	12	16.0
Poor (4)	4	5.3
Very Poor (5)	1	1.3
Mean	2.1	

Findings regarding visitor evaluations of information on the human history of Boston Harbor Islands are presented in Table 3.2.45. The vast majority of visitors (84.9%) reported the amount of information was adequate (mean = 1.1), and the quality of information (71.7%) was good to excellent (mean = 2.1).

Table 3.2.45: Information on the human history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	62	84.9
Inadequate (2)	11	15.1
Mean	1.2	
Quality of Information		
Excellent (1)	17	23.0
Good (2)	36	48.7
Fair (3)	13	17.6
Poor (4)	7	9.5
Very Poor (5)	1	1.4
Mean	2.2	

Summary

Visitors to Bumpkin Island can generally be described by the following characteristics:

- About two-thirds of visitors arrived in groups of 2 to 4.
- A majority of visitor groups comprised of family and/or friends.
- About two-thirds of visitors had visited Boston Harbor Islands National Park Area before.
- About one-thirds of visitors had visited Bumpkin Island before.
- A majority of visitors were from Massachusetts.
- The sample of visitors was about equally split between males and females.
- The average (mean) age of visitors was 38 years.
- Visitors tended to be highly educated with about 94% of visitors reporting at least some college education or higher.
- A majority of visitors (76.7%) reported being employed.
- A majority of visitors reported being not being Hispanic or Latino. Also, the vast majority of visitors (79.3%) were white.

Study findings show that the following range of standards for indicator variables

- Visitors indicated that they preferred seeing an average (median) of 8 hikers per hour and they would no longer visit Bumpkin Island if they saw an average (median) of 25 hikers per hour. Standards for other dimensions of visitor evaluation of number of hikers lay between this range.
- Findings indicate that fewer environmental impacts to the trails are more acceptable than greater impacts and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.6.
- Findings indicate that fewer environmental impacts to the campsites are more acceptable than greater impacts and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.2.
- Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.4.
- When asked to evaluate the ferry service from Boston (Long Wharf) to Georges Island, respondents rated a range of ferry intervals from 36 minutes to 1 hour 35 minutes as acceptable with a one hour interval as most acceptable.
- When asked to evaluate the water shuttle service from Georges Island to other Islands, respondents rated a range of water shuttle intervals of 28 minutes to 1 hour 32 minutes as acceptable, with an interval of one hour as most acceptable.

- The vast majority of visitors (90.3%) reported that the amount of information of visitor opportunities and activities at Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of the same (84.0%) was good to excellent (mean = 1.9).
- The vast majority of visitors (84.1%) reported that the amount of information of ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of the same (72.0%) was good to excellent (mean = 2.1).
- The vast majority of visitors (86.1%) reported that the amount of information on the natural history of Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of information (77.4%) was good to excellent (mean = 2.1).
- The vast majority of visitors (84.9%) reported that the amount of information on the human history of Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of information (71.7%) was good to excellent (mean = 2.1).

Georges Island: Use and Users

Respondents were asked several descriptive questions pertaining to their use of Boston Harbor Islands National Recreation Area. The first question asked respondents to report the number of people in their group. Table 3.2.45 indicates the frequency distribution of group size. Most visitors (58.7%) come to Georges Island in groups of 2 to 5. Average (mean) group size of visitors to Georges Island was 8.5 people and median group size was 4.0 people. The next question asked respondents to report the composition of their group. Results are shown in Table 3.2.46. The majority of visitors (78.9%) come in groups comprised of family and/ or friends. Respondents were also given the opportunity to indicate an “other” type of group. “Other” types of groups included camp, law partner and temporary home (Table 3.2.47).

Table 3.2.45: Group size

	Frequency	Percent
1	5	4.8
2	29	27.9
3	7	6.7
4	14	13.5
5	11	10.6
6	4	3.9
7	4	3.9
8	3	2.9
9	3	2.9
10 or more	24	23.1

N = 104; Mean = 8.5; Median = 4.0

Table 3.2.46: Group composition

	Frequency	Percent
Family	49	47.1
Friends	17	16.4
Family and friends	16	15.4
Organized group	14	13.5
Alone	5	4.8
Other	3	2.9

N = 104

Table 3.2.47: Other group type

	Frequency	Percent
Camp	1	33.3
Law partner	1	33.3
Temporary home	1	33.3

N = 3

Next, respondents were asked if they had been to any of the areas within Boston Harbor Islands National Park Area before. Results are shown in Table 3.2.48 and indicate that most visitors (65.4%) have visited Boston Harbor Islands National Park Area prior to their current visit. Respondents were also asked if they had been to Georges Island before. Most visitors (63.5%) were repeat visitors (Table 3.2.49).

Table 3.2.48: Prior visits to any of the areas within Boston Harbor Islands National Park Area

	Frequency	Percent
Yes	68	65.4
No	35	33.6
Not sure	1	1.0

N = 104

Table 3.2.49: Prior visits to Georges Island

	Frequency	Percent
Yes	66	63.5
No	37	35.6
Not sure	1	1.0

N = 104

The next set of questions focused on visitor demographics and selected socio-economic characteristics. Visitors were asked where they lived (Table 3.2.50). Most respondents (81.2%) were from Massachusetts.

Table 3.2.50: Residence

	Frequency	Percent
Massachusetts	82	81.2
Other State	13	12.9
Other Country	6	5.9

N = 101

Details regarding city or town of residence in Massachusetts, state of residence for non-Massachusetts residents and country of residence for international visitors are presented in Tables 3.2.51, 3.2.52 and 3.2.53. About a tenth of Massachusetts visitors (10.3%) were from Boston. Seven other states and four other countries were represented among the sample.

Table 3.2.51: Town in Massachusetts

	Frequency	Percent
Boston	8	10.3
Quincy	5	6.4
Somerville	5	6.4
Cambridge	4	5.1
Dorchester	3	3.9
Hull	3	3.9
Charlestown	2	2.6
Everett	2	2.6
Newton	2	2.6
Brookline	3	3.9
Roxbury	2	2.6
Reading	2	2.6
Weymouth	1	1.3
Shrewsbury	1	1.3
Cohasset	1	1.3
Newbury Port	1	1.3
Holyoke	1	1.3
Millis	1	1.3
Billenia	1	1.3
Scituate	1	1.3
South Dorough	1	1.3
Norton	1	1.3
Framingham	1	1.3
Malden	1	1.3
Peabody	1	1.3
Sharon	1	1.3
Worcester	1	1.3
Canton	1	1.3
Waltham	1	1.3
Westboro	1	1.3
Arlington	1	1.3
Medford	1	1.3
Lexington	1	1.3
Stoughton	1	1.3
Needham	1	1.3
Foxboro	1	1.3

Table 3.2.51: Town in Massachusetts (continued)

	Frequency	Percent
Lawrence	1	1.3
Middleborough	1	1.3
Draco	1	1.3
Andover	1	1.3
Whitman	1	1.3
Beverly	1	1.3
Bryantville	1	1.3
Norfolk	1	1.3
Monson	1	1.3
Winthrop	1	1.3
Braintree	1	1.3
Provincetown	1	1.3
Marshfield	1	1.3

N = 82

Table 3.2.52: Other state of residence

	Frequency	Percent
California	2	16.7
Florida	1	8.3
Indiana	1	8.3
New Hampshire	3	25.0
New York	1	8.3
Ohio	2	16.7
Texas	2	16.7

N = 12

Table 3.2.53: Country of residence

	Frequency	Percent
U.K.	3	50.0
Canada	1	16.7
France	1	16.7
Ireland	1	16.7

N = 6

Next, respondents were asked a series of demographic related questions. Respondents were asked to indicate whether they were male or female. There were slightly more female (54.6%) than male (45.5%) respondents (Table 3.2.54). Respondents were also asked to record the year in which they were born. Visitors reported an average (mean) age of 43 and a median age of 42 years. A subsequent question addressed respondents' educational background.

Overall, visitors to Georges Island tend to be well educated with 87.0% having at least some college education or higher. Table 3.2.54 reports a frequency distribution of employment status of respondents. A majority of respondents (72.0%) reported being employed. Finally, respondents were asked to indicate their ethnicity and race. A majority of respondents (94.8%) reported being not Hispanic or Latino. Also, the vast majority of respondents (77.9%) were white.

Table 3.2.54: Demographic profile

	Frequency	Percent
Gender (N = 101)		
Female	55	54.6
Male	46	45.5
Respondent age (N = 91; Mean = 43.0; Median = 42.0)		
Under 20	1	1.1
20-29	18	19.8
30-39	22	24.2
40-49	21	23.1
50-59	16	17.6
60-69	6	6.6
70-79	5	5.5
80 and over	2	2.2
Education level in years (N = 100; Mean = 16.1; Median = 16.0)		
9	2	2.0
10	1	1.0
12	10	10.0
13	9	9.0
14	12	12.0
15	4	4.0
16	23	23.0
17	6	6.0
18	11	11.0
19	6	6.0
20	4	4.0
21	12	12.0
Employment status (N = 100)		
Employed	72	72.0
Unemployed	4	4.0
Homemaker	7	7.0
Retired	11	11.0
Student	4	4.0
Other	2	2.0

Table 3.2.54: Demographic profile (continued)

Ethnicity (N = 78)		
	Frequency	Percent
Hispanic or Latino	4	5.1
Not Hispanic or Latino	74	94.8
Race (N = 95)		
American Indian or Alaska Native	0	0
Asian	5	5.3
Black or African American	7	7.4
Native Hawaiian or other Pacific Islander	3	3.2
White	74	77.9
Other	4	4.3
Do not wish to answer	2	2.1

Indicators and Standards of Quality

A major section of the survey questionnaire contained a series of questions used to measure indicator variables and determine standards of quality for visitor-use related issues. One set of questions concerned the number of people at one time on Georges Island.

Visitors were presented a series of photographs depicting increasing number of people at the picnic area on Georges Island. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 ("very unacceptable") to +4 ("very acceptable"). Findings are shown in Table 3.2.55 and Figure 3.6. Figure 3.6 presents the norm curve associated with the mean acceptability ratings for each photograph. Findings indicate that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.6 (185 people at one time). This value is referred to as acceptability (long form).

Table 3.2.55: Acceptability for PAOT on Georges Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	100	12.0	5.0	3.0	4.0	3.0	6.0	4.0	7.0	56.0	1.9
Photo 2	100	0	3.0	2.0	1.0	1.0	4.0	12.0	19.0	58.0	3.0
Photo 3	101	3.0	2.0	1.0	5.9	12.9	10.9	25.7	16.8	21.8	1.7
Photo 4	100	31.0	14.0	11.0	15.0	6.0	8.0	7.0	2.0	6.0	-1.5
Photo 5	100	68.0	14.0	3.0	7.0	1.0	2.0	1.1	1.1	3.0	-3.1

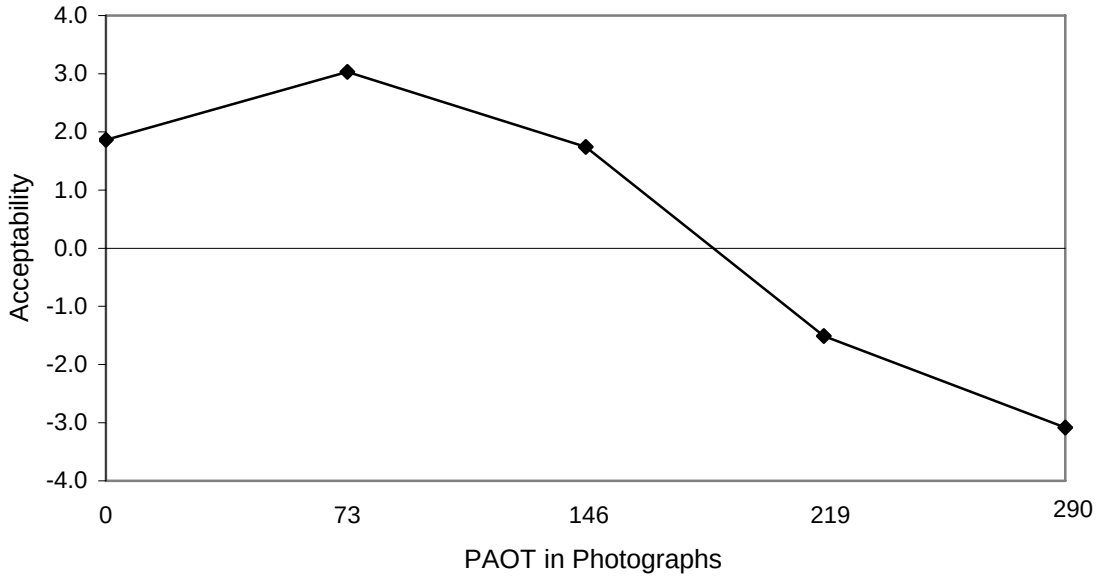

Figure 3.6: Norm curve for people at one time (PAOT) on Georges Island

Respondents were also asked to indicate the photograph that depicts the 1) maximum acceptable number of people at one time (referred to as “acceptability (short form)”), 2) preferred number of people at one time (referred to as “preference”), 3) maximum number of people at one time before visitors would no longer visit Georges Island (referred to as “displacement”), 4) maximum number of people that should be allowed before visitor use is restricted (referred to as “management action”), and 5) number of people seen at one time by respondents on the day of the study (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Georges Island regardless of number of people at one time, or that none of the photographs show a high enough number of people to restrict people from visiting Georges Island. Findings for these questions are shown in Tables 3.2.56, 3.2.57, 3.2.58, 3.2.59, 3.2.60 and summarized in Table 3.2.61.

Respondents reported that 1) an average (mean) of 156 (median of 145) was the maximum acceptable PAOT represented by an average (mean) photograph number of 3.2 (or a median photograph number of 3.0), 2) they prefer to see an average (mean) of 110 (median of 110) PAOT as represented by an average (mean) photograph number of 2.5 (or a median photograph number of 2.5), 3) they would be displaced by an average (mean) of 252 (median of 290) PAOT as represented by a mean photograph number of 4.5 (or a median photograph number of 5.0), 4) no more than an average (mean) of 185 (median of 145) PAOT as represented by an average (mean) photograph number of 3.6 (or a median photograph number of 3.0) should be allowed, and 5) they typically saw

an average (mean) of 102 (median of 73) PAOT as represented by an average (mean) photograph number of 2.4 (or a median photograph number of 2.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of number of people on Georges Island, or that none of the photographs show a high enough number of people to restrict people from visiting Georges Island.

Table 3.2.56: Acceptability (PAOT)

Photo	Frequency	Percent
1 (0 PAOT)	1	1.0
2 (73 PAOT)	13	12.5
3 (145 PAOT)	63	60.6
4 (217 PAOT)	20	19.2
5 (290 PAOT)	5	4.8
All the photographs are acceptable	2	1.9

N = 104; Mean = 3.2 (156 PAOT); Median = 3.0 (145 PAOT)

Table 3.2.57: Preference (PAOT)

Photo	Frequency	Percent
1 (0 PAOT)	6	5.9
2 (73 PAOT)	45	44.1
3 (145 PAOT)	45	44.1
4 (217 PAOT)	5	4.9
5 (290 PAOT)	1	1.0

N = 102; Mean = 2.5 (110 PAOT); Median = 2.5 (110 PAOT)

Table 3.2.58: Displacement (PAOT)

Photo	Frequency	Percent
1 (0 PAOT)	2	1.9
2 (73 PAOT)	1	1.0
3 (145 PAOT)	3	2.9
4 (217 PAOT)	31	29.8
5 (290 PAOT)	55	52.9
None of the photographs are so unacceptable	12	11.5

N =104; Mean = 4.5 (252 PAOT); Median = 5.0 (290 PAOT)

Table 3.2.59: Management action (PAOT)

Photo	Frequency	Percent
1 (0 PAOT)	0	0
2 (73 PAOT)	2	1.9
3 (145 PAOT)	41	39.4
4 (217 PAOT)	29	27.9
5 (290 PAOT)	9	8.7
People should not be restricted at any point in photos	8	7.7
People should not be restricted	14	13.5

N =103; Mean =3.6 (185 PAOT); Median = 3.0 (145 PAOT)

Table 3.2.60: Existing conditions (PAOT)

Photo	Frequency	Percent
1 (0 PAOT)	3	3.0
2 (73 PAOT)	59	58.4
3 (145 PAOT)	35	34.7
4 (217 PAOT)	4	4.0
5 (290 PAOT)	0	0

N =101; Mean = 2.4 (102 PAOT); Median = 2.0 (73 PAOT)

Table 3.2.61: Summary (PAOT)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		3.6 (185)	
Acceptability (short form)	102	3.2 (156)	3.0 (145)
Preference	102	2.5 (110)	2.5 (110)
Displacement	104	4.5 (252)	5.0 (290)
Management action	81	3.6 (185)	3.0 (145)
Existing conditions	101	2.4 (102)	2.0 (73)

The next set of questions addressed the issue of litter on Georges Island. Respondents were presented a series of photographs depicting increasing amounts of litter. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.62 and Figure 3.7. Figure 3.7 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that even small amounts of litter are evaluated as

unacceptable and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.6. This value is referred to as “acceptability (long form).”

Table 3.2.62: Acceptability for litter on Georges Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	104	0	1.0	0	1.0	1.0	2.9	1.0	1.0	92.3	3.7
Photo 2	104	54.5	11.9	7.9	9.9	5.0	5.9	3.0	1.0	1.0	-2.6
Photo 3	102	73.5	8.8	10.8	3.9	1.0	0	1.0	1.0	0	-3.4
Photo 4	101	84.2	10.9	4.0	0	0	1.0	0	0	0	-3.8
Photo 5	101	97.0	2.0	0	0	1.0	0	0	0	0	-3.9

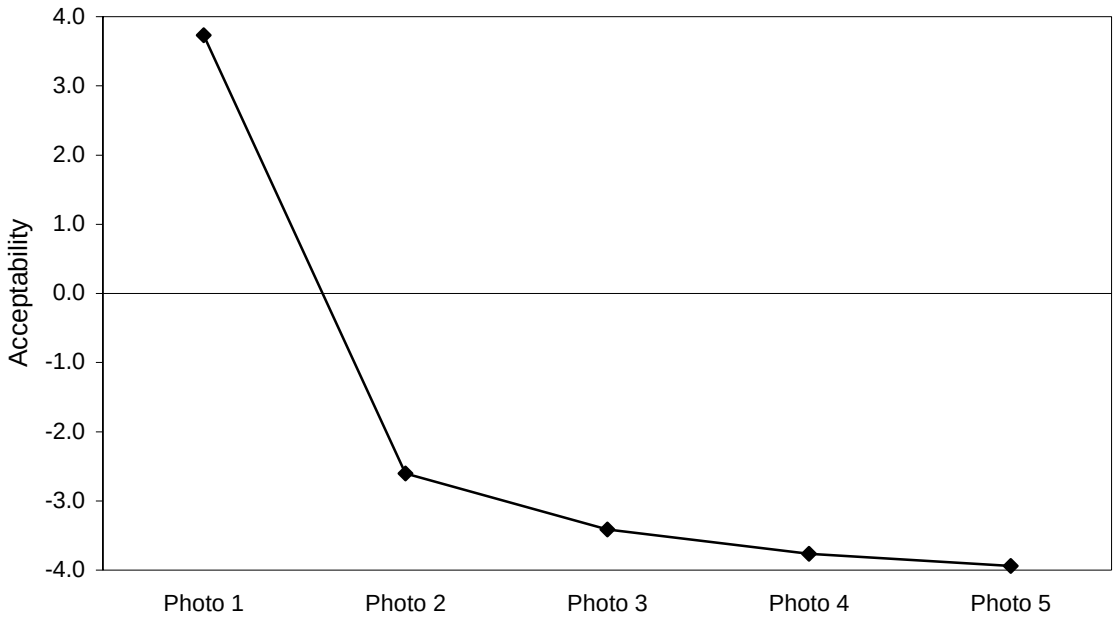

Figure 3.7: Norm curve for litter on Georges Island

Respondents were also asked to indicate the photograph that depicts the 1) highest amount of litter that is acceptable (referred to as “acceptability (short form)”), 2) amount of litter preferred (referred to as “preference”), 3) amount of litter that is so unacceptable that respondents would no longer visit Georges Island (referred to as “displacement”), 4) highest amount of litter that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of litter typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Georges Island regardless of litter, or that none of the photographs show a high enough amount of litter to restrict people from visiting Georges Island.

Findings for these questions are shown in Tables 3.2.63, 3.2.64, 3.2.65, 3.2.66, 3.2.67 and summarized in Table 3.2.68.

Respondents reported that 1) acceptable amounts of litter were represented by an average (mean) photograph number of 1.2 (or a median photograph number of 1.0), 2) they prefer to see no litter as represented by an average (mean) photograph number of 1.0 (or a median photograph number of 1.0), 3) they would be displaced by amounts of litter represented by a mean photograph number of 3.0 (or a median photograph number of 3.0), 4) no more litter than represented by an average (mean) photograph number of 1.7 (or a median photograph number of 1.0) should be allowed, and 5) they typically saw litter represented by an average (mean) photograph number of 1.2 (or a median photograph number of 1.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of amounts of litter on Georges Island, or that none of the photographs show a high enough level of litter to restrict people from visiting Georges Island.

Table 3.2.63: Acceptability (Litter)

Photo	Frequency	Percent
1	78	75.7
2	24	23.3
3	1	1.0
4	0	0.0
5	0	0.0

N = 103; Mean = 1.2; Median = 1.0

Table 3.2.64: Preference (Litter)

Photo	Frequency	Percent
1	101	97.1
2	2	1.9
3	1	1.0
4	0	0.0
5	0	0.0

N = 104; Mean = 1.0; Median = 1.0

Table 3.2.65: Displacement (Litter)

Photo	Frequency	Percent
1	1	1.0
2	45	43.7
3	27	26.2
4	6	5.8
5	23	22.3
None of the photographs are so unacceptable	1	1.0

N = 103; Mean = 3.0; Median = 3.0

Table 3.2.66: Management action (Litter)

Photo	Frequency	Percent
1	57	55.9
2	27	26.5
3	11	10.8
4	0	0.0
5	5	4.9
People should not be restricted at any point in photos	0	0
People should not be restricted	2	2.0

N = 102; Mean = 1.7; Median = 1.0

Table 3.2.67: Existing conditions (Litter)

Photo	Frequency	Percent
1	83	82.2
2	16	15.8
3	1	1.0
4	0	0.0
5	1	1.0

N = 101; Mean = 1.2; Median =1.0

Table 3.2.68: Summary (Litter)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		1.6	
Acceptability (short form)	103	1.2	1.0
Preference	104	1.0	1.0
Displacement	102	3.0	3.0
Management action	100	1.7	1.0
Existing conditions	101	1.2	1.0

The next set of questions addressed the issue of graffiti on Georges Island. Respondents were presented a series of photographs depicting increasing amounts of graffiti. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.69 and Figure 3.8. Figure 3.8 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that even small amounts of graffiti are evaluated as unacceptable and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 2.0. This value is referred to as “acceptability (long form).”

Table 3.2.69: Acceptability for graffiti on Georges Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	101	3.0	0	0	1.0	0	3.0	2.0	2.0	89.1	3.6
Photo 2	101	26.7	5.0	5.9	6.9	5.0	7.9	12.9	24.8	5.0	-0.1
Photo 3	98	41.8	9.2	6.1	9.2	14.3	3.1	12.2	2.0	2.0	-1.7
Photo 4	98	56.1	18.4	9.2	6.1	1.0	5.1	1.0	2.0	1.0	-2.9
Photo 5	100	77.0	8.0	5.0	4.0	1.0	2.0	1.0	1.0	1.0	-3.3

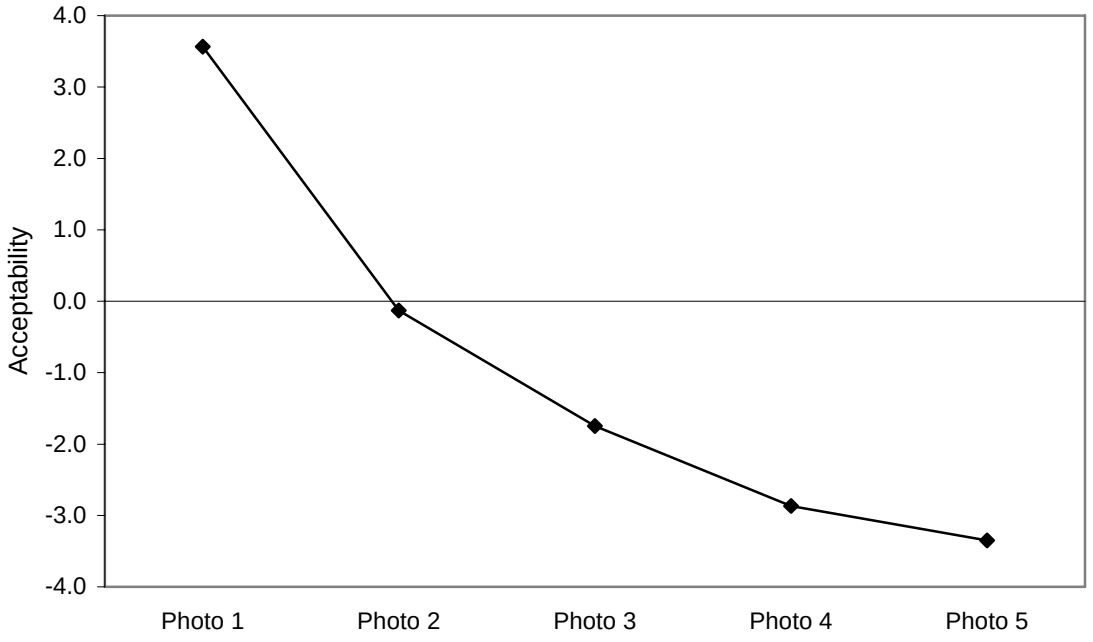

Figure 3.8: Norm curve for graffiti on Georges Island

Respondents were also asked to indicate the photograph that depicts the 1) highest amount of graffiti that is acceptable (referred to as “acceptability (short form)”), 2) amount of graffiti preferred (referred to as “preference”), 3) amount of graffiti that is so unacceptable that respondents would no longer visit Georges Island (referred to as “ displacement”), 4) highest amount of graffiti that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of graffiti typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Georges Island regardless of graffiti, or that none of the photographs show a high enough amount of graffiti to restrict people from visiting Georges Island. Findings for these questions are shown in Tables 3.2.70, 3.2.71, 3.2.72, 3.2.73, 3.2.74 and summarized in Table 3.2.75.

Respondents reported that 1) acceptable amounts of graffiti were represented by an average (mean) photograph number of 1.9 (or a median photograph number of 2.0), 2) they prefer to see no graffiti as represented by an average (mean) photograph number of 1.0 (or a median photograph number of 1.0), 3) they would be displaced by amounts of graffiti represented by a mean photograph number of 3.9 (or a median photograph number of 4.0), 4) no more graffiti than represented by an average (mean) photograph number of 2.0 (or a median photograph number of 2.0) should be allowed, and 5) they typically saw graffiti represented by an average (mean) photograph number of 1.8 (or a median photograph number of 1.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of amounts of graffiti on Georges Island, or that none of the photographs show a high enough level of graffiti to restrict people from visiting Georges Island.

Table 3.2.70: Acceptability (Graffiti)

Photo	Frequency	Percent
1	41	41.0
2	35	35.0
3	14	14.0
4	3	3.0
5	4	4.0
All the photos are acceptable	3	3.0

N = 100; Mean = 1.9; Median = 2.0

Table 3.2.71: Preference (Graffiti)

Photo	Frequency	Percent
1	91	91.0
2	6	6.0
3	1	1.0
4	1	1.0
5	1	1.0

N = 100; Mean = 1.1; Median = 1.0

Table 3.2.72: Displacement (Graffiti)

Photo	Frequency	Percent
1	3	3.0
2	7	6.9
3	16	15.8
4	20	19.8
5	30	29.7
None of the photographs are so unacceptable	25	24.8

N = 101; Mean = 3.9; Median = 4.0

Table 3.2.73: Management action (Graffiti)

Photo	Frequency	Percent
1	40	40.0
2	21	21.0
3	15	15.0
4	5	5.0
5	5	5.0
People should not be restricted at any point in photos	11	11.0
People should not be restricted	0	0.0

N = 97; Mean = 2.0; Median = 2.0

Table 3.2.74: Existing conditions (Graffiti)

Photo	Frequency	Percent
1	46	51.1
2	24	26.7
3	13	14.4
4	5	5.6
5	2	2.2

N = 90; Mean = 1.8; Median =1.0

Table 3.2.75: Summary (Graffiti)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		2.0	
Acceptability (short form)	97	1.9	2.0
Preference	100	1.1	1.0
Displacement	76	3.9	4.0
Management action	86	2.0	2.0
Existing conditions	90	1.8	1.0

To measure visitor evaluations of the ferry service provided to Georges Island from Boston (Long Wharf), respondents were given a question containing a range of ferry frequencies from “every 15 minutes” to “every 2 hours” with 15 minute time intervals. Respondents were asked to rate each of these intervals on a scale of –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are presented in Table 3.2.81 and Figure 3.9. Figure 3.9 presents the norm curve associated with the mean acceptability rating for each time interval. Respondents rated a range of ferry intervals of 1hr 18 minutes or less as acceptable, with a one hour interval as most acceptable.

Table 3.2.76: Acceptability for ferry service

Ferry service frequency	N	-4	-3	-2	-1	0	1	2	3	4	Mean
15 mins	85	25.9	5.9	4.7	2.4	5.9	7.1	8.2	5.9	34.1	.5
30 mins	90	12.2	10.0	3.3	1.1	6.7	2.2	8.9	16.7	38.9	1.4
45 mins	86	12.8	2.3	8.1	2.3	4.7	10.5	11.6	17.4	30.2	1.3
1 hr	98	7.1	0	5.1	3.1	7.1	7.1	14.3	10.2	45.9	2.1
1 hr 15 mins	87	16.1	8.0	2.3	12.6	8.0	12.6	13.8	19.5	6.9	0.2
1 hr 30 mins	91	23.1	5.5	15.4	9.9	12.1	8.8	14.3	7.7	3.3	-0.8
1 hr 45 mins	88	26.1	20.5	10.2	13.6	9.1	8.0	5.7	3.4	3.4	-1.6
2 hrs	92	40.2	15.2	13.0	6.5	6.5	6.5	3.3	2.2	6.5	-1.9

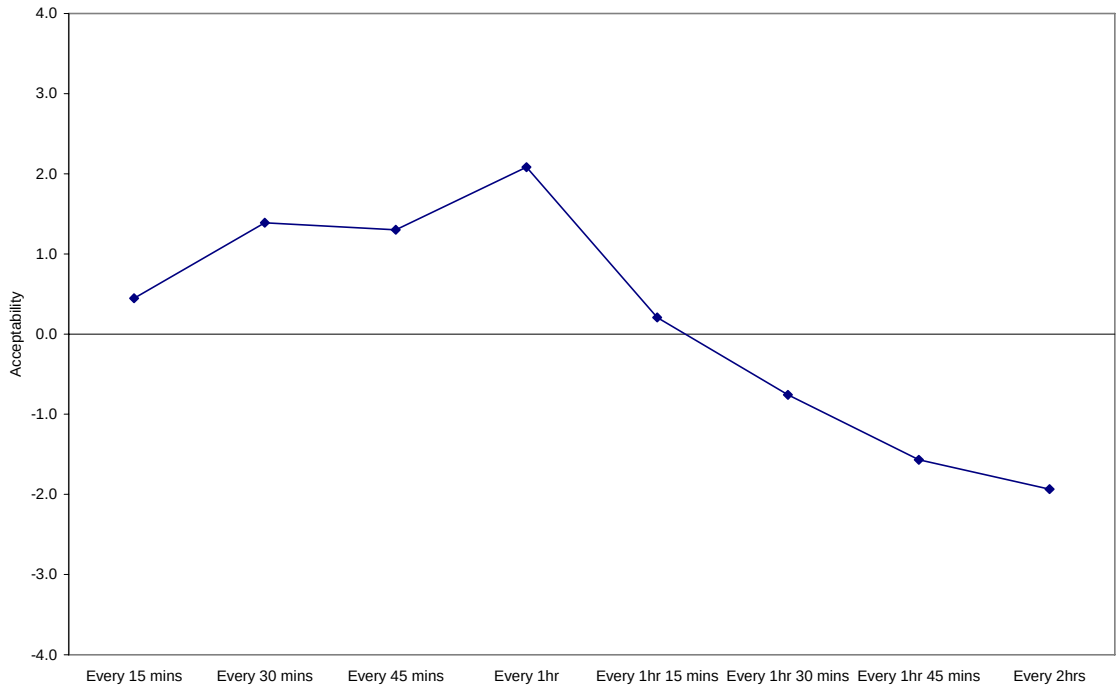

Figure 3.9: Norm curve for frequency of ferry service to Georges Island

Similarly, visitors were asked to evaluate the water shuttle service from Georges Island to other islands. Respondents were presented a question containing a range of water shuttle frequencies from “every 15 minutes” to “every 2 hours” with 15 minute time intervals. Respondents were asked to rate each of these time intervals on a scale of –4 (“very unacceptable”) to +4 (“very acceptable”). Study findings are shown in Table 3.2.77 and Figure 3.10. Figure 3.10 presents the norm curve associated with the mean acceptability rating for each time interval. Respondents rated a range of water shuttle intervals of 1 hr 18 minutes or less as acceptable, with an interval of 30 minutes as most acceptable.

Table 3.2.77: Acceptability for water shuttle service

Water shuttle service frequency	N	-4	-3	-2	-1	0	1	2	3	4	Mean
15 mins	84	19.0	6.0	3.6	2.4	9.5	3.6	4.8	6.0	45.2	1.1
30 mins	89	10.1	6.7	4.5	1.1	3.4	1.1	7.9	14.6	50.6	1.9
45 mins	85	7.1	7.1	9.4	4.7	4.7	8.2	15.3	14.1	29.4	1.3
1 hr	89	5.6	1.1	4.5	6.7	11.2	7.9	11.2	13.5	38.2	1.8
1 hr 15 mins	88	10.2	8.0	3.4	15.9	14.8	12.5	13.6	15.9	5.7	0.2
1 hr 30 mins	84	20.2	6.0	13.1	17.9	10.7	9.5	9.5	8.3	4.8	-0.7
1 hr 45 mins	87	25.3	19.5	9.2	11.5	9.2	8.0	4.6	10.3	2.3	-1.3
2 hrs	87	46.0	8.0	6.9	10.3	8.0	3.4	5.7	6.9	4.6	-1.8

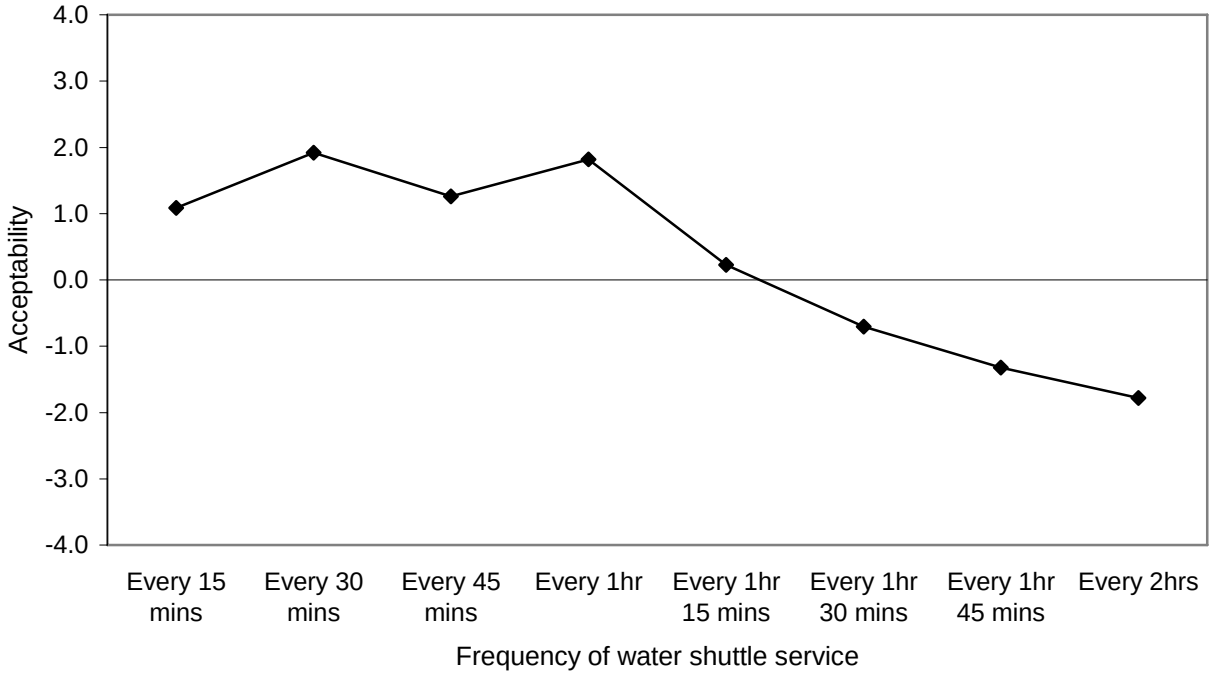

Figure 3.10: Norm curve for frequency of water shuttle service for Georges Island

The next set of questions focused on information provided to visitors to Boston Harbor Islands National Park Area. Respondents were asked to evaluate the amount and quality of information related to visitor opportunities and activities; ferry schedules and other means of access; the natural history of Boston Harbor Islands; and the human history of Boston Harbor Islands. Evaluation of amount of information was measured on a scale of 1 (“adequate”) and 2 (“inadequate”). Evaluation of quality of information was measured on a scale of 1 (“excellent”) to 5 (“very poor”). Findings are presented in Tables 3.2.78 through 3.2.81. The vast majority of respondents (87.7%) reported that the amount of information on visitor opportunities and activities at Boston Harbor Islands was adequate (mean = 1.1) and that the quality of the same (82.1%) was good to excellent (mean = 2.0) (Table 3.2.78).

Table 3.2.78: Information on visitor opportunities and activities at Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	71	87.7
Inadequate (2)	10	12.3
Mean	1.1	
Quality of Information		
Excellent (1)	20	22.5
Good (2)	53	59.6
Fair (3)	12	13.5
Poor (4)	3	3.4
Very Poor (5)	1	1.1
Mean	2.0	

The vast majority of visitors (88.0%) reported that the amount of information on ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of the same (82.2%) was good to excellent (mean = 2.0) (Table 3.2.79).

Table 3.2.79: Information on ferry schedules and other means of access to Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	73	88.0
Inadequate (2)	10	12.0
Mean	1.1	
Quality of Information		
Excellent (1)	28	31.1
Good (2)	46	51.1
Fair (3)	9	10.0
Poor (4)	5	5.6
Very Poor (5)	2	2.2
Mean	2.0	

Findings regarding visitor evaluations of information on the natural history of Boston Harbor Islands are presented in Table 3.2.80. The vast majority of visitors (77.2%) reported the amount of information was adequate (mean = 1.2), and the quality of information (76.5%) was good to excellent (mean = 2.1).

Table 3.2.80: Information on the natural history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	61	77.2
Inadequate (2)	18	22.8
Mean	1.2	
Quality of Information		
Excellent (1)	23	27.1
Good (2)	42	49.4
Fair (3)	12	14.1
Poor (4)	6	7.1
Very Poor (5)	2	2.4
Mean	2.1	

Findings regarding visitor evaluations of information on the human history of Boston Harbor Islands are presented in Table 3.2.81. The vast majority of visitors (77.9%) reported the amount of information was adequate (mean = 1.2), and the quality of information (72.3%) was good to excellent (mean = 2.2).

Table 3.2.81: Information on the human history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	60	77.9
Inadequate (2)	17	22.1
Mean	1.2	
Quality of Information		
Excellent (1)	18	21.7
Good (2)	42	50.6
Fair (3)	15	18.1
Poor (4)	6	7.2
Very Poor (5)	2	2.4
Mean	2.2	

Summary

Visitors to Georges Island can generally be described by the following characteristics:

- Most visitors (58.7%) come to Georges Island in groups of 2 to 5.
- A majority of visitors (78.9%) come in groups comprised of family and/or friends.
- About two-thirds of visitors to Georges Island had visited Boston Harbor Islands National Park Area before.
- About two-thirds (63.5%) of visitors had visited Georges Island before.
- A majority of visitors (82.1%) were from Massachusetts.
- There were slightly more female (54.6%) than male (45.5%) respondents.
- The average (mean) age of visitors was 43 years.
- Visitors tended to be highly educated with about 87.0% of visitors reporting at least some college education or higher.
- A majority of visitors (72.0%) reported being employed.
- A majority of visitors (94.8%) reported being not being Hispanic or Latino. Also, the vast majority of visitors (77.9%) were white.

Study findings show that the following range of standards for indicator variables:

- Visitors indicated that they preferred seeing an average (median) of 110 people at one time and they would no longer visit Georges Island if they saw an average (median) of 290 people at one time. Standards for other dimensions of visitor evaluation of number of people at one time lay between this range.
- Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.6.
- Findings indicate that even small amounts of graffiti are evaluated as unacceptable and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 2.0.
- When asked to evaluate the ferry service from Boston (Long Wharf) to Georges Island, respondents rated a range of ferry intervals of 1 hour 18 minutes or less as acceptable, with a one hour interval as most acceptable.
- When asked to evaluate the water shuttle service from Georges Island to other Islands, respondents rated a range of water shuttle intervals of 1 hour 18 minutes or less as acceptable, with an interval of 30 minutes as most acceptable.
- The vast majority of visitors (87.7%) reported that the amount of information of visitor opportunities and activities at Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of the same (82.1%) was good to excellent (mean = 2.0).

- The vast majority of visitors (88.1%) reported that the amount of information of ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of the same (82.2%) was good to excellent (mean = 2.0)
- The vast majority of visitors (77.2%) reported that the amount of information on the natural history of Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of information (76.5%) was good to excellent (mean = 2.1).
- The vast majority of visitors (77.9%) reported that the amount of information on the human history of Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of information (72.3%) was good to excellent (mean = 2.2).

Grape Island: Use and Users

Respondents were asked several descriptive questions pertaining to their use of Boston Harbor Islands National Recreation Area. The first question asked respondents to report the number of people in their group. Table 3.2.82 indicates the frequency distribution of group size. Most visitors (67.4%) come to Grape Island in groups of 1 to 3. Average (mean) group size of visitors to Grape Island was 4.3 people and median group size was 2.0 people. The next question asked respondents to report the composition of their group. Results are shown in Table 3.2.83. The majority of visitors (79.8%) come in groups comprised of family and/ or friends. Respondents were also given the opportunity to indicate an "other" type of group. "Other" types of groups included a couple (Table 3.2.84).

Table 3.2.82: Group size

	Frequency	Percent
1	14	13.9
2	40	39.6
3	14	13.9
4	7	6.9
5	4	4.0
6	4	4.0
7	3	3.0
8	2	2.0
9	3	3.0
10 or more	10	10.0

N = 101; Mean = 4.3; Median = 2.0

Table 3.2.83: Group composition

	Frequency	Percent
Family	48	48.5
Friends	22	22.2
Family and friends	9	9.1
Organized group	6	6.1
Alone	13	13.1
Other	1	1.0

N = 99

Table 3.2.84. Other group type

	Frequency	Percent
Couple	1	100

N = 1

Next, respondents were asked if they had been to any of the areas within Boston Harbor Islands National Park Area before. Results are shown in Table 3.2.85 and indicate that most visitors (80.2%) have visited Boston Harbor Islands National Park Area prior to their current visit. Respondents were also asked if they had been to Grape Island before. A little over half the visitors (54.5%) had visited the island before (Table 3.2.86).

Table 3.2.85: Prior visits to any of the areas within Boston Harbor Islands National Park Area

	Frequency	Percent
Yes	81	80.2
No	19	18.8
Not sure	1	1.0

N = 101

Table 3.2.86: Prior visits to Grape Island

	Frequency	Percent
Yes	55	54.5
No	46	45.5
Not sure	0	0

N = 101

The next set of questions focused on visitor demographics and selected socio-economic characteristics. Visitors were asked where they lived (Table 3.2.87). Most respondents (95.1%) were from Massachusetts.

Table 3.2.87: Residence

	Frequency	Percent
Massachusetts	96	95.1
Other state	3	3.0
Other Country	2	2.0

N = 101

Details regarding city or town of residence in Massachusetts, state of residence for non-Massachusetts residents and country of residence for international visitors are presented in Tables 3.88, 3.2.89 and 3.2.90. Slightly more than a quarter of Massachusetts visitors (26.1%) were from Boston and Quincy. Two

other states (New York and Virginia) and two other countries (U.K. and Sweden) were represented among the sample.

Table 3.2.88: Town in Massachusetts

	Frequency	Percent
Weymouth	9	9.8
Quincy	12	13.1
Somerville	2	2.2
Newbury port	2	2.2
Boston	12	13.0
Charlestown	3	3.3
Newton	2	2.2
Dorchester	3	3.3
Brookline	1	1.1
Waltham	1	1.1
Cambridge	3	3.3
Arlington	2	2.2
Stoughton	1	1.1
Hull	3	3.3
Brookline	1	1.1
Braintree	1	1.1
Watertown	3	3.3
Norill	2	2.2
Acton	2	2.2
Lynn	1	1.1
South east	1	1.1
South Weymouth	2	2.2
Hannover	1	1.1
Hingham	9	9.8
Bedford	1	1.1
Chelsea	1	1.1
Templeton	1	1.1
Ashland	1	1.1
Brockton	1	1.1
Allston	1	1.1
Plymouth	1	1.1
Springfield	1	1.1
Norwood	2	2.2
Jamaica Plain	2	2.2
Framingham	1	1.1

N=101

Table 3.2.89: Other state of residence

	Frequency	Percent
New York	2	66.7
Virginia	1	33.3

N = 3

Table 3.2.90: Country of residence

	Frequency	Percent
U.K	1	50.0
Sweden	1	50.0

N = 2

Next, respondents were asked to indicate whether they were male or female. There were slightly more female (59.4%) than male (40.6%) respondents (Table 3.2.91). Respondents were also asked to record the year in which they were born. Visitors reported a mean age of 39 years and median age of 36 years. A subsequent question addressed respondents' educational background. Overall, visitors to Grape Island tend to be well educated with 87.2% having at least some college education or higher. Table 3.2.91 reports a frequency distribution of employment status of respondents. A majority of respondents (72.0%) reported being employed. Finally, respondents were asked to indicate their ethnicity and race. A majority of respondents (98.9%) reported being not Hispanic or Latino. Also, the vast majority of respondents (90.0%) were white.

Table 3.2.91: Demographic profile

	Frequency	Percent
Gender (N = 101)		
Female	60	59.4
Male	41	40.6
Respondent age (N = 97; Mean = 39.0; Median = 36.0)		
Under 20	3	2.9
20-29	19	18.6
30-39	35	34.3
40-49	19	18.6
50-59	14	13.7
60-69	6	5.9
70-79	1	1.0

Table 3:.2.91: Demographic profile (continued)

Education level in years (N = 101; Mean = 15.9; Median = 16.0)		
	Frequency	Percent
< 12	4	4.0
12	9	8.9
13	4	4.0
14	15	14.9
15	5	5.0
16	28	27.7
17	8	7.9
18	11	10.9
19	8	7.9
20	0	0
21	9	8.9
Employment status (N = 100)		
Employed	72	72.0
Unemployed	2	2.0
Homemaker	5	5.0
Retired	10	10.0
Student	8	8.0
Other	3	3.0
Ethnicity (N = 93)		
Hispanic or Latino	1	1.1
Not Hispanic or Latino	92	98.9
Race (N = 100)		
American Indian or Alaska Native	0	0
Asian	2	2.0
Black or African American	1	1.0
Native Hawaiian or other Pacific Islander	0	0
White	90	90.0
Other	6	6.0
Do not wish to answer	1	1.0

Indicators and Standards of Quality

A major section of the survey questionnaire contained a series of questions used to measure indicator variables and determine standards of quality for visitor-use related issues. One set of questions concerned hiking on Grape Island. Respondents were asked if they had hiked on any of the trails on Grape Island. A majority of visitors (91.4%) indicated that they had hiked the trails (Table 3.2.92).

Table 3.2.92: Hike on trails on Grape Island

	Frequency	Percent
Yes	85	85.0
No	15	15.0

N = 100

Respondents were then asked a series of questions about their standards of quality with respect to the number of hikers per hour on the trails on Grape Island. Respondents were asked to indicate the 1) maximum acceptable number of hikers per hour to see without the trails on Grape Island being too crowded (referred to as “acceptability”), 2) preferred number of hikers per hour on the trails (referred to as “preference”), 3) maximum number of hikers per hour before they would no longer hike the trails (referred to as “displacement”), 4) highest number of hikers per hour that should be allowed before visitor use is restricted (referred to as “management action”), and 5) number of hikers per hour seen by respondents on the day of the study (referred to as “existing conditions”). Where appropriate, visitors were allowed the options to indicate that they would continue to hike the trails on Grape Island regardless of the number of other hikers seen, or that the number of hikers on Grape Island should not be restricted. Findings for these questions are shown in Tables 3.2.93, 3.2.94, 3.2.95, 3.2.96, 3.2.97, and summarized in Table 3.2.98.

Respondents reported that 1) an average (mean) of 13.5 (median of 10.0) was the maximum acceptable number of hikers per hour 2) they prefer to see an average (mean) of 8.4 (median of 5.0) hikers per hour, 3) they would be displaced by an average (mean) of 27.2 (median of 24.5) hikers per hour, 4) no more than an average (mean) of 20.1 or (median of 12.0) hikers per hour should be allowed, and 5) they typically saw an average (mean) of 4.1 (median of 2.0) hikers per hour. The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to hike the trails regardless of the number of other hikers seen or that the number of hikers on Grape Island should not be restricted.

Table 3.2.93: Acceptability (Number of hikers per hour)

	Frequency	Percent
0-10	25	61.0
11-20	13	31.7
21-30	2	4.8
31-40	1	2.4

N = 41; Mean = 13.5; Median = 10.0

Table 3.2.94: Preference (Number of hikers per hour)

	Frequency	Percent
0-10	35	85.4
11-20	5	12.2
21-30	1	3.4

N = 41; Mean = 8.4; Median = 5.0

Table 3.2.95: Displacement (Number of hikers per hour)

	Frequency	Percent
0-10	10	23.8
11-20	10	23.8
21-30	11	26.2
31-40	2	4.8
41-50	2	4.8
51-60	1	2.4
I would continue to hike the trails regardless of the number of other hikers seen	5	11.9

N = 41; Mean = 27.2; Median = 25

Table 3.2.96: Management action (Number of hikers per hour)

	Frequency	Percent
0-10	17	22.1
11-20	12	15.6
21-30	6	7.8
31-40	3	3.9
41-50	4	5.2
51-60	0	0
61-70	1	1.3
The number of hikers on Grape Island should not be restricted	34	44.2

N = 77; Mean = 20.1; Median = 12.0

Table 3.2.97: Existing conditions (Number of hikers per hour)

	Frequency	Percent
0-10	39	95.1
11-20	1	2.4
21-30	1	2.4

N = 41; Mean = 4.1; Median = 2.0

Table 3.2.98: Summary (Number of hikers per hour)

	N	Mean	Median
Acceptability	41	13.5	10.0
Preference	41	8.4	5.0
Displacement	36	27.2	25.0
Management action	43	20.1	12.0
Existing conditions	41	4.1	2.0

The next set of questions presented visitors with a series of five photographs depicting a range of environmental impacts to soil and vegetation on hiking trails on Grape Island. Study photographs are shown in Appendix C. Respondents were asked to rate the acceptability of each photograph on a scale from –4 ("very unacceptable") to +4 ("very acceptable"). Findings are shown in Table 3.2.99 and Figure 3.11. Figure 3.11 represents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that fewer impacts to the trails are more acceptable than greater impacts and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.3. This value is referred to as "acceptability (long form)."

Table 3.2.99: Acceptability for trail impacts on Grape Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	86	0	0	0	0	3.5	0	2.3	2.3	91.9	3.8
Photo 2	86	1.2	1.2	1.2	8.1	8.1	10.5	19.8	32.6	17.4	2.0
Photo 3	85	4.7	7.1	10.6	9.4	20.0	14.1	16.5	8.2	9.4	0.4
Photo 4	85	11.8	25.9	20.0	8.2	4.7	9.4	9.4	4.7	5.9	-1.1
Photo 5	85	52.9	5.9	10.6	3.5	5.9	4.7	7.1	2.4	7.1	-2.0

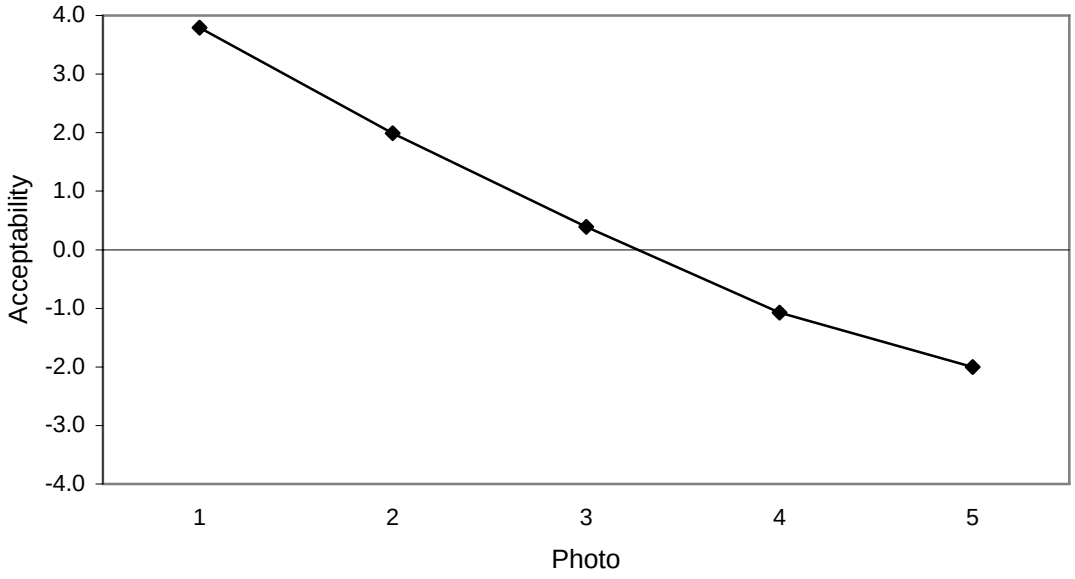

Figure 3.11: Norm curve for trail impacts on Grape Island

Respondents were also asked to indicate the photograph that depicts the 1) highest level of environmental impact that is acceptable (referred to as "acceptability (short form)"), 2) amount of environmental impact preferred (referred to as "preference"), 3) amount of environmental impact that is so unacceptable that respondents would no longer hike on the trails on Grape Island (referred to as " displacement"), 4) highest level of environmental impact that should be allowed before visitor use is restricted (referred to as "management action"), and 5) amount of environmental impact typically seen (referred to as "existing conditions"). Where appropriate, visitors were allowed the option to indicate that they would continue to hike the trails on Grape Island regardless of environmental impacts on the trails, or that none of the photographs show a high enough level of environmental impact to restrict people from hiking on Grape Island. Findings for these questions are shown in Tables 3.2.100, 3.2.101, 3.2.102, 3.2.103, 3.2.104, and summarized in Table 3.2.105.

Respondents reported that 1) acceptable environmental impacts were represented by an average (mean) photograph number of 2.2 (or a median photograph number of 2.0), 2) they prefer to see environmental impacts represented by an average (mean) photograph number of 1.2 (or a median photograph number of 1.0), 3) they would be displaced by environmental impacts represented by an average (mean) photograph number of 4.0 (or a median photograph number of 4.0), 4) no more environmental impacts than represented by an average (mean) photograph number of 2.9 (or a median photograph number of 3.0) should be allowed and 5) they typically saw environmental impacts represented by an average (mean) photograph number of 1.3 (or a median photograph number of 1.0). The displacement and management action

values are slightly underestimated as some respondents reported that either they would continue to hike the trails regardless of environmental impacts on the trails or that none of the photographs show a high enough level of environmental impact to restrict people from hiking on Grape Island.

Table 3.2.100: Acceptability (Trail impacts)

Photo	Frequency	Percent
1	18	21.7
2	26	31.3
3	18	21.7
4	4	4.8
5	1	1.2
All the photographs are acceptable	16	19.3

N = 83; Mean = 2.2; Median = 2.0

Table 3.2.101: Preference (Trail impacts)

Photo	Frequency	Percent
1	80	92.0
2	2	2.3
3	2	2.3
4	2	2.3
5	1	1.2

N = 87; Mean = 1.2; Median =1.0

Table 3.2.102: Displacement (Trail impacts)

Photo	Frequency	Percent
1	0	0.0
2	2	2.3
3	11	12.6
4	14	16.1
5	15	17.2
None of the photographs are so unacceptable	45	51.7

N = 87; Mean = 4.0; Median = 4.0

Table 3.2.103: Management action (Trail impacts)

Photo	Frequency	Percent
1	4	4.7
2	20	23.3
3	22	25.6
4	8	9.3
5	6	7.0
People should not be restricted at any point in photos	8	9.3
People should not be restricted	18	20.9

N = 86; Mean = 2.9; Median = 3.0

Table 3.2.104: Existing conditions (Trail impacts)

Photo	Frequency	Percent
1	66	82.5
2	9	11.3
3	3	3.8
4	1	1.3
5	1	1.3

N = 80; Mean = 1.3; Median = 1.0

Table 3.2.105: Summary (Trail impacts)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		3.3	
Acceptability (short form)	67	2.2	2.0
Preference	87	1.2	1.0
Displacement	42	4.0	4.0
Management action	60	2.9	3.0
Existing conditions	80	1.3	1.0

The next set of questions focused on environmental impacts at campsites on Grape Island. Respondents were asked if they had camped on Grape Island during the time of the study. Most respondents (70.7%) were day use visitors (Table 3.2.106).

Table 3.2.106: Camp on Grape Island

	Frequency	Percent
Yes	29	29.3
No	70	70.7

N = 99

Those who had camped on Grape Island were presented a series of photographs depicting environmental impacts to soil and vegetation at campsites. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.107 and Figure 3.12. Figure 3.12 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that fewer impacts to the campsites are more acceptable than larger impacts and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.0. This value is referred to as “acceptability (long form).”

Table 3.2.107: Acceptability for campsite impacts on Grape Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	33	0	0	0	0	3.0	3.0	3.0	9.1	81.8	3.6
Photo 2	33	0	3.0	9.1	0	3.0	9.1	9.1	42.4	24.2	2.2
Photo 3	33	9.1	3.0	6.1	21.2	15.2	30.3	12.1	0	3.0	-0.1
Photo 4	33	15.2	27.3	18.2	21.2	6.1	9.1	0	3.0	0	-1.8
Photo 5	32	50.0	18.8	12.5	6.3	3.1	3.1	3.1	3.1	0	-2.7

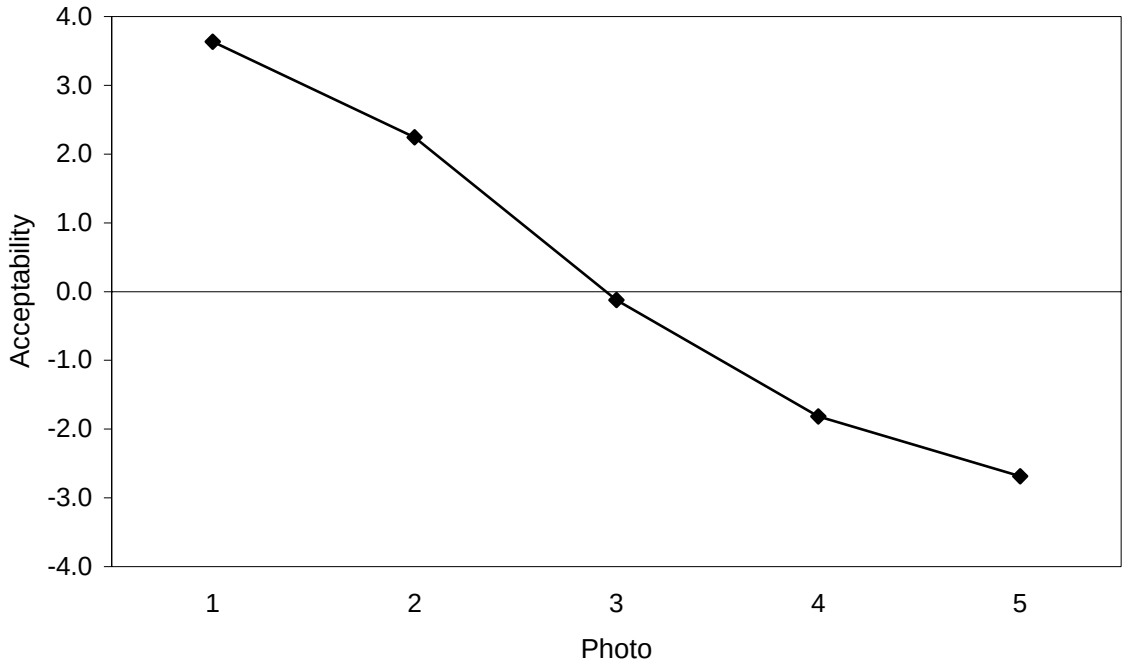

Figure 3.12: Norm curve for campsite impacts on Grape Island

Respondents were also asked to indicate the photograph that depicts the 1) highest level of environmental impact that is acceptable (referred to as "acceptability (short form)"), 2) amount of environmental impact preferred (referred to as "preference"), 3) amount of environmental impact that is so unacceptable that respondents would no longer camp on Grape Island (referred to as " displacement"), 4) highest level of environmental impact that should be allowed before visitor use is restricted (referred to as "management action"), and 5) amount of environmental impact typically seen (referred to as "existing conditions"). Where appropriate, visitors were allowed the option to indicate that they would continue to camp on Grape Island regardless of environmental impacts at campsites, or that none of the photographs show a high enough level of environmental impact at campsites to restrict people from camping on Grape Island. Findings for these questions are shown in Tables 3.2.108, 3.2.109, 3.2.110, 3.2.111, 3.2.112 and summarized in Table 3.2.113.

Respondents reported that 1) acceptable environmental impacts were represented by an average (mean) photograph number of 2.3 (or a median photograph number of 2.0), 2) they prefer to see environmental impacts represented by an average (mean) photograph number of 1.4 (or a median photograph number of 1.0), 3) they would be displaced by environmental impacts represented by an average (mean) photograph number of 4.4 (or a median photograph number of 4.5), 4) no more environmental impacts than represented by an average (mean) photograph number of 2.7 (or a median photograph

number of 3.0) should be allowed, and 5) they typically saw environmental impacts represented by an average (mean) photograph number of 1.9 (or a median photograph number of 2.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to camp regardless of environmental impacts on the campsites or that none of the photographs show a high enough level of environmental impact to restrict people from camping on Grape Island.

Table 3.2.108: Acceptability (Campsite impacts)

Photo	Frequency	Percent
1	8	22.9
2	10	28.6
3	10	28.6
4	3	8.6
5	0	0
All the photographs are acceptable	4	11.4

N = 35; Mean = 2.3; Median = 2.0

Table 3.2.109: Preference (Campsite impacts)

Photo	Frequency	Percent
1	26	70.3
2	8	21.6
3	2	5.4
4	0	0
5	1	2.7

N = 37; Mean = 1.4; Median = 1.0

Table 3.2.110: Displacement (Campsite impacts)

Photo	Frequency	Percent
1	0	0
2	1	2.9
3	2	5.7
4	10	28.6
5	13	37.1
None of the photographs are so unacceptable	9	25.7

N = 35; Mean = 4.4; Median = 4.5

Table 3.2.111: Management action (Campsite impacts)

Photo	Frequency	Percent
1	5	14.3
2	8	22.9
3	11	31.4
4	4	11.4
5	3	8.6
People should not be restricted at any point in photos	4	11.4
People should not be restricted	0	0

N = 35; Mean = 2.7; Median = 3.0

Table 3.2.112: Existing conditions (Campsite impacts)

Photo	Frequency	Percent
1	9	26.5
2	21	61.7
3	3	8.8
4	0	0
5	1	2.9

N = 34; Mean = 1.9; Median = 2.0

Table 3.2.113: Summary (Campsite impacts)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		3.0	
Acceptability (short form)	31	2.3	2.0
Preference	36	1.4	1.0
Displacement	26	4.4	4.5
Management action	31	2.7	3.0
Existing conditions	34	1.9	2.0

A next set of questions addressed the issue of litter on Grape Island. Respondents were presented a series of photographs depicting increasing amounts of litter. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.114 and Figure 3.13. Figure 3.13 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of the photographs fall out of the

acceptable range and into the unacceptable range at approximately photograph 1.6. This value is referred to as “acceptability (long form).”

Table 3.2.114: Acceptability for litter on Grape Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	98	0	0	0	0	1.0	1.0	3.1	4.1	90.8	3.8
Photo 2	97	55.7	8.2	9.3	8.2	7.2	2.1	6.2	2.1	1.0	-2.5
Photo 3	98	70.4	14.3	8.2	0	2.0	3.1	0	2.0	0	-3.3
Photo 4	98	86.7	6.1	4.1	0	2.0	0	1.0	0	0	-3.7
Photo 5	98	95.9	1.0	1.0	1.0	0	1.0	0	0	0	-3.9

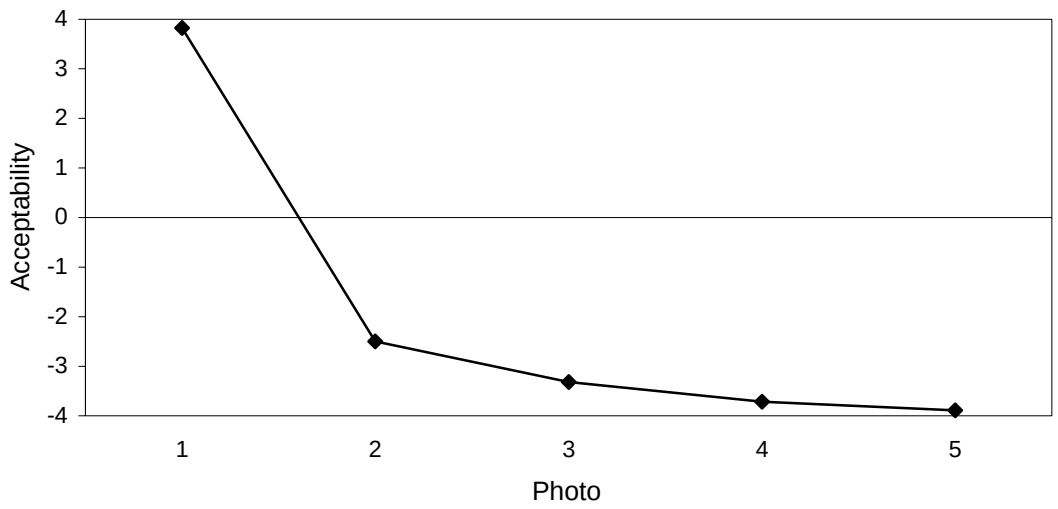

Figure 3.13: Norm curve for litter on Grape Island

Respondents were also asked to indicate the photograph that depicts the 1) highest amount of litter that is acceptable (referred to as “acceptability (short form)”), 2) amount of litter preferred (referred to as “preference”), 3) amount of litter that is so unacceptable that respondents would no longer visit Grape Island (referred to as “displacement”), 4) highest amount of litter that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of litter typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Grape Island regardless of litter, or that none of the photographs show a high enough amount of litter to restrict people from visiting Grape Island.

Findings for these questions are shown in Tables 3.2.115, 3.2.116, 3.2.117, 3.2.118, 3.2.119 and summarized in Table 3.2.120.

Respondents reported that 1) acceptable amounts of litter were represented by an average (mean) photograph number of 1.0 (or a median photograph number of 1.0), 2) they prefer to see no litter as represented by an average (mean) photograph number of 1.1 (or a median photograph number of 1.0), 3) they would be displaced by amounts of litter represented by a mean photograph number of 2.6 (or a median photograph number of 2.0), 4) no more litter than represented by an average (mean) photograph number of 1.5 (or a median photograph number of 1.0) should be allowed, and 5) they typically saw litter represented by an average (mean) photograph number of 1.1 (or a median photograph number of 1.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of amounts of litter on Grape Island, or that none of the photographs show a high enough level of litter to restrict people from visiting Grape Island.

Table 3.2.115: Acceptability (Litter)

Photo	Frequency	Percent
1	87	87.8
2	10	10.1
3	1	1.0
4	0	0
5	0	0
All of the photographs are acceptable	1	1.0

N = 99; Mean = 1.1; Median = 1.0

Table 3.2.116: Preference (Litter)

Photo	Frequency	Percent
1	97	99.0
2	0	0
3	0	0
4	0	0
5	1	1.0

N = 98; Mean = 1.0; Median = 1.0

Table 3.2.117: Displacement (Litter)

Photo	Frequency	Percent
1	0	0
2	59	59.0
3	27	27.0
4	0	0
5	9	9.0
None of the photographs are so unacceptable	5	5.0

N = 100; Mean = 2.6; Median = 2.0

Table 3.2.118: Management action (Litter)

Photo	Frequency	Percent
1	56	57.1
2	23	23.5
3	7	7.5
4	1	1.0
5	1	1.0
People should not be restricted at any point in photos	3	3.1
People should not be restricted	7	7.1

N = 98; Mean = 1.5; Median = 1.0

Table 3.2.119: Existing conditions (Litter)

Photo	Frequency	Percent
1	87	92.6
2	6	6.4
3	1	1.1
4	0	0
5	0	0

N = 94; Mean = 1.1; Median = 1.0

Table 3.2.120: Summary (Litter)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		1.6	
Acceptability (short form)	98	1.0	1.0
Preference	98	1.1	1.0
Displacement	95	2.6	2.0
Management action	88	1.5	1.0
Existing conditions	94	1.1	1.0

To measure visitor evaluations of the ferry service provided to Georges Island from Boston (Long Wharf), respondents were given a question containing a range of ferry frequencies from “every 15 minutes” to “every 2 hours” with 15 minute time intervals. Respondents were asked to rate each of these intervals on a scale of –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are presented in Table 3.2.121 and Figure 3.14. Figure 3.14 presents the norm curve associated with the mean acceptability rating for each time interval. Respondents rated a range of ferry intervals of 45 minutes or more as acceptable, with a one hour interval as most acceptable.

Table 3.2.121: Acceptability for ferry service

Ferry service frequency	N	-4	-3	-2	-1	0	1	2	3	4	Mean
15 mins	84	47.6	9.5	10.7	4.8	7.1	1.2	2.4	3.6	13.1	-1.8
30 mins	82	28.0	15.9	9.8	6.1	6.1	9.8	3.7	2.4	1`8.3	-0.9
45 mins	80	18.8	3.8	13.8	11.3	11.3	5.0	8.8	11.3	16.3	0
1 hr	86	5.8	3.5	0	7.0	8.1	8.1	11.6	9.3	46.5	2.1
1 hr 15 mins	82	7.3	4.9	4.9	8.5	17.1	17.1	9.8	14.6	15.9	0.8
1 hr 30 mins	83	7.2	6.0	9.6	10.8	12.0	14.5	14.5	13.3	12.0	0.5
1 hr 45 mins	80	11.3	11.3	8.8	10.0	17.5	7.5	11.3	12.5	10.0	0
2 hrs	87	21.8	8.0	5.7	9.2	10.3	5.7	5.7	9.2	24.1	0.1

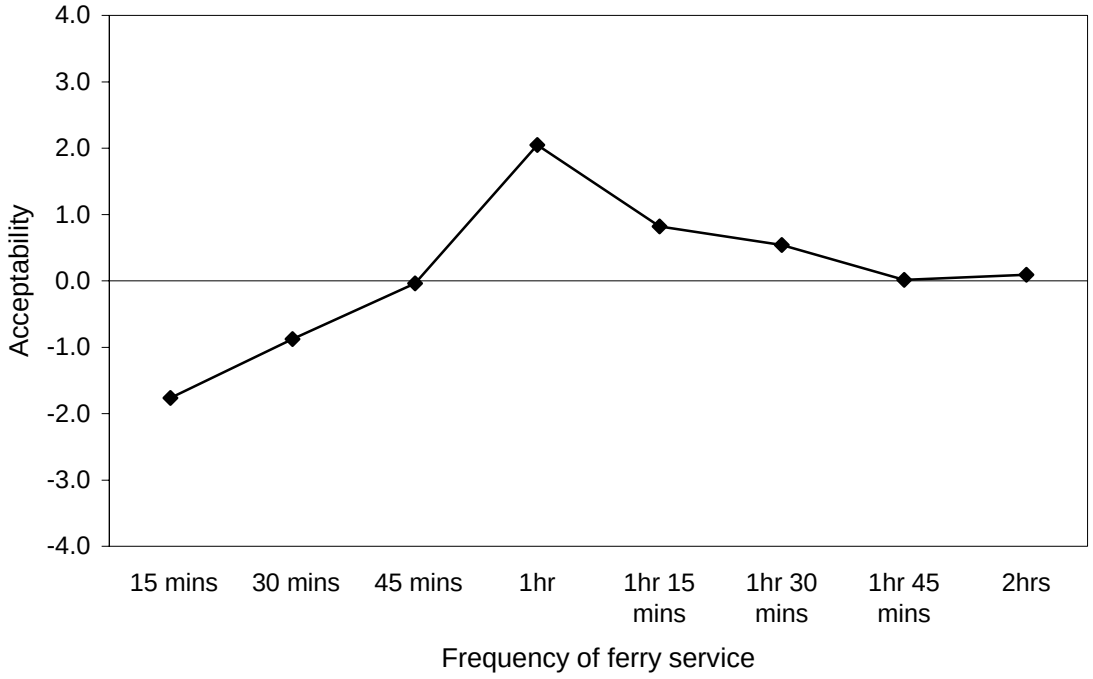

Figure 3.14: Norm curve for ferry service to Georges Island

Similarly, visitors were asked to evaluate the water shuttle service from Georges Island to other islands. Respondents were presented a question containing a range of water shuttle frequencies from “every 15 minutes” to “every 2 hours” with 15 minute time intervals. Respondents were asked to rate each of these time intervals on a scale of –4 (“very unacceptable”) to +4 (“very acceptable”). Study findings are shown in Table 3.2.122 and Figure 3.15. Figure 3.15 presents the norm curve associated with the mean acceptability rating for each time interval. Respondents rated a range of water shuttle intervals of 30 minutes or more as acceptable, with an interval of one hour as most acceptable.

Table 3.2.122: Acceptability for water shuttle service

Water shuttle service frequency	N	-4	-3	-2	-1	0	1	2	3	4	Mean
15 mins	84	45.2	6.0	4.8	4.8	11.9	3.6	4.8	2.4	16.7	-1.3
30 mins	83	25.3	7.2	12.0	3.6	8.4	1.2	6.0	9.6	26.5	0
45 mins	85	18.8	3.5	9.4	4.7	12.9	4.7	9.4	16.5	20.0	0.4
1 hr	90	6.7	2.2	3.3	7.8	13.3	8.9	10.0	13.3	34.4	1.6
1 hr 15 mins	86	7.0	3.5	9.3	8.1	16.3	14.0	15.1	12.8	14.0	0.7
1 hr 30 mins	86	4.7	9.3	7.0	5.8	15.1	12.8	20.9	8.1	16.3	0.8
1 hr 45 mins	85	10.6	4.7	11.8	5.9	21.2	12.9	11.8	12.9	8.2	0.2
2 hrs	87	20.7	5.7	8.0	6.9	12.6	9.2	4.6	9.2	23.0	0.2

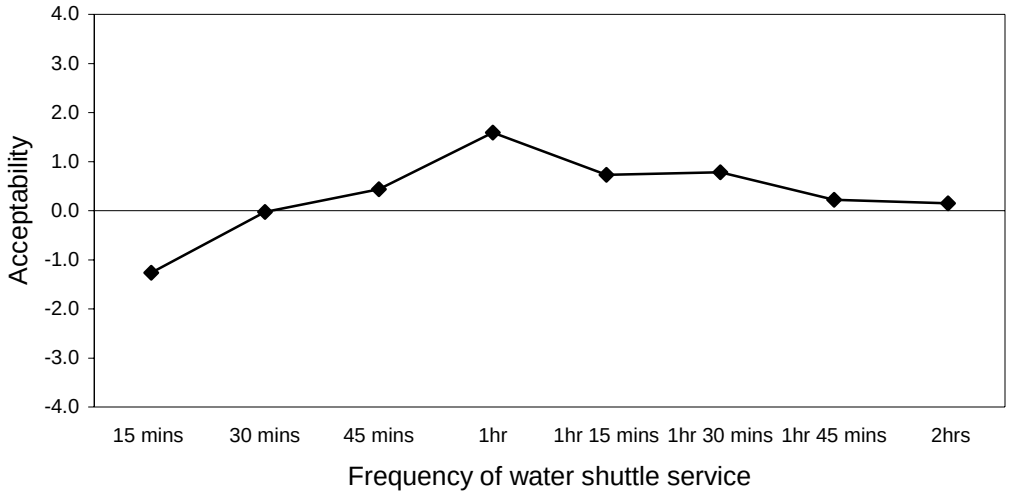

Figure 3.15: Norm curve for water shuttle service to Grape Island

The next set of questions focused on information provided to visitors to Boston Harbor Islands National Park Area. Respondents were asked to evaluate the amount and quality of information related to visitor opportunities and activities; ferry schedules and other means of access; the natural history of Boston Harbor Islands; and the human history of Boston Harbor Islands. Evaluation of amount

of information was measured on a scale of 1 (“adequate”) and 2 (“inadequate”). Evaluation of quality of information was measured on a scale of 1 (“excellent”) to 5 (“very poor”). Findings are presented in Tables 3.2.123 through 3.2.126. The vast majority of respondents (85.6%) reported that the amount of information on visitor opportunities and activities at Boston Harbor Islands was adequate (mean = 1.1) and that the quality of the same (76.4%) was good to excellent (mean = 2.1) (Table 3.2.123).

Table 3.2.123: Information on visitor opportunities and activities at Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	77	85.6
Inadequate (2)	13	14.4
Mean	1.1	
Quality of Information		
Excellent (1)	24	26.7
Good (2)	42	46.7
Fair (3)	18	20.0
Poor (4)	6	6.7
Very Poor (5)	0	0
Mean	2.1	

The vast majority of visitors (75.9%) reported that the amount of information on ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.3) and that the quality of the same (62.8%) was good to excellent (mean = 2.3) (Table 3.2.124).

Table 3.2.124: Information on ferry schedules and other means of access to Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	64	75.9
Inadequate (2)	21	24.7
Mean	1.3	
Quality of Information		
Excellent (1)	17	19.8
Good (2)	37	43.0
Fair (3)	19	22.1
Poor (4)	12	14.0
Very Poor (5)	1	1.2
Mean	2.3	

Findings regarding visitor evaluations of information on the natural history of Boston Harbor Islands are presented in Table 3.2.125. The vast majority of visitors (82.0%) reported the amount of information was adequate (mean = 1.2), and the quality of information (69.7%) was good to excellent (mean = 2.2).

Table 3.2.125: Information on the natural history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	73	82.0
Inadequate (2)	16	18.0
Mean	1.2	
Quality of Information		
Excellent (1)	17	19.1
Good (2)	45	50.6
Fair (3)	22	24.7
Poor (4)	4	4.5
Very Poor (5)	1	1.1
Mean	2.2	

Findings regarding visitor evaluations of information on the human history of Boston Harbor Islands are presented in Table 3.2.126. The vast majority of visitors (77.3%) reported the amount of information was adequate (mean = 1.2), and the quality of information (67.4%) was good to excellent (mean = 2.2).

Table 3.2.126: Information on the human history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	68	77.3
Inadequate (2)	20	22.7
Mean	1.2	
Quality of Information		
Excellent (1)	18	20.2
Good (2)	42	47.2
Fair (3)	23	25.8
Poor (4)	6	6.7
Very Poor (5)	0	0
Mean	2.2	

Summary

Visitors to Grape Island can generally be described by the following characteristics:

- Most visitors (67.4%) come to Grape Island in groups of 1 to 3.
- A majority of visitors (70.7%) come in groups comprised of family or friends.
- About four-fifths of visitors to Grape Island had visited Boston Harbor Islands National Park Area before.
- A little over half (54.5%) of visitors had visited Grape Island before.
- A vast majority of visitors (95.1%) were from Massachusetts.
- There were slightly more female (59.4%) than male (40.6%) respondents.
- The average (mean) age of visitors was 39 years.
- Visitors tended to be highly educated with about 87.2% of visitors reporting at least some college education or higher.
- A majority of visitors (72.0%) reported being employed.
- A majority of visitors (98.9%) reported being not being Hispanic or Latino. Also, the vast majority of visitors (90.0%) were white.

Study findings show that the following range of standards for indicator variables

- Visitors indicated that they preferred seeing an average (median) of 5 hikers per hour and they would no longer visit Grape Island if they saw an average (median) of 25 hikers per hour. Standards for other dimensions of visitor evaluation of number of hikers lay between this range.
- Findings indicate that fewer impacts to the trails are more acceptable than greater impacts and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.3.
- Findings indicate that fewer impacts to the campsites are more acceptable than greater impacts and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.0.
- Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.6.
- When asked to evaluate the ferry service from Boston (Long Wharf) to Georges Island, respondents rated a range of ferry intervals of 45 minutes or more as acceptable, with a one hour interval as most acceptable.
- When asked to evaluate the water shuttle service from Georges Island to other Islands, respondents rated a range of water shuttle intervals of 30 minutes or more as acceptable, with an interval of 1 hour as most acceptable.

- The vast majority of visitors (85.6%) reported that the amount of information of visitor opportunities and activities at Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of the same (73.4%) was good to excellent (mean = 2.1).
- The majority of visitors (75.9%) reported that the amount of information of ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.3) and that the quality of the same (62.8%) was good to excellent (mean = 2.3).
- The majority of visitors (82.0%) reported that the amount of information on the natural history of Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of information (69.7%) was good to excellent (mean = 2.2).
- The majority of visitors (77.3%) reported that the amount of information on the human history of Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of information (67.4%) was good to excellent (mean = 2.2).

Little Brewster Island: Use and Users

Respondents were asked several descriptive questions pertaining to their use of Boston Harbor Islands National Recreation Area. The first question asked respondents to report the number of people in their group. Table 3.2.127 indicates the frequency distribution of group size. Most visitors (76.9%) come to Little Brewster Island in groups of 2 to 4. Average (mean) group size of visitors to Little Brewster Island was 4.8 people and median group size was 3.0 people. The next question asked respondents to report the composition of their group. Results are shown in Table 3.2.128. The majority of visitors (86.1%) come in groups comprised of family and/ or friends. Respondents were also given the opportunity to indicate an "other" type of group. "Other" types of groups included a camp (Table 3.2.129).

Table 3.2.127: Group size

	Frequency	Percent
1	6	5.6
2	46	42.6
3	19	17.6
4	18	16.7
5	4	3.7
6	2	1.9
7	0	0
8	0	0
9	1	0.9
10 or more	12	11.0

N = 108; Mean = 4.8; Median = 3.0

Table 3.2.128: Group composition

	Frequency	Percent
Family	65	60.8
Friends	22	20.6
Family and friends	5	4.7
Organized group	8	7.8
Alone	6	5.6
Other	1	0.9

N = 107

Table 3.2.129: Other group type

	Frequency	Percent
Camp	1	100

N = 1

Next, respondents were asked if they had been to any of the areas within Boston Harbor Islands National Park Area before. Results are shown in Table 3.2.130 and indicate that slightly more than half the visitors (59.8%) have visited Boston Harbor Islands National Park Area prior to their current visit. Respondents were also asked if they had been to Little Brewster Island before. Most visitors (91.7%) were visiting the island for the first time (Table 3.2.131).

Table 3.2.130: Prior visits to any of the areas within Boston Harbor Islands National Park Area

	Frequency	Percent
Yes	64	59.8
No	43	40.2

N = 107

Table 3.2.131: Prior visits to Little Brewster Island

	Frequency	Percent
Yes	8	7.4
No	99	91.7
Not sure	1	0.9

N = 108

The next set of questions focused on visitor demographics and selected socio-economic characteristics. Visitors were asked where they lived (Table 3.2.132). Most respondents (73.0%) were from Massachusetts.

Table 3.2.132: Residence

	Frequency	Percent
Massachusetts	73	68.2
Other State	32	29.9
Other Country	2	1.9

N = 107

Details regarding city or town of residence in Massachusetts, state of residence for non-Massachusetts residents and country of residence for international visitors are presented in Tables 3.2.133, 3.2.134 and 3.2.135. Slightly more than a tenth of Massachusetts visitors (11.3%) were from Boston. Eighteen other

states and two other countries (Canada and Germany) were represented among the sample.

Table 3.2.133: Town in Massachusetts

	Frequency	Percent
Weymouth	2	2.8
Quincy	4	5.6
Boston	8	11.3
Newton	4	5.7
Dorchester	2	2.8
Brookline	3	4.2
Canton	1	1.4
Waltham	1	1.4
Cambridge	2	2.8
Arlington	3	4.2
Stoughton	2	2.8
Needham	1	1.4
Hull	1	1.4
Lawrence	1	1.4
Andover	1	1.4
Whitman	2	2.8
Reading	1	1.4
Braintree	2	2.8
Hingham	1	1.4
Acton	3	4.2
South Weymouth	1	1.4
Chelsea	1	1.4
Jamaica Plain	1	1.4
North Quincy	1	1.4
South Boston	1	1.4
Wellesley	2	2.8
Halifax	1	1.4
West Brookfield	1	1.4
Hudson	1	1.4
Wakefield	2	2.8
Milton	2	2.8
Holliston	1	1.4
Carlisle	1	1.4
Walpole	2	2.8
Westwood	1	1.4
South Hadley	1	1.4
Attleboro	1	1.4

Table 3.2.133: Town in Massachusetts (continued)

	Frequency	Percent
Wenham	1	1.4
Hadley	1	1.4
Medway	1	1.4
Holbrook	2	2.8

N = 73

Table 3.2.134: Other state of residence

	Frequency	Percent
Alabama	1	3.1
California	2	6.3
Connecticut	1	3.1
Florida	5	15.6
Georgia	1	3.1
Illinois	2	6.3
Indiana	1	3.1
Kentucky	1	3.1
Louisiana	1	3.1
Maine	2	6.3
Michigan	1	3.1
New Jersey	3	9.4
New Mexico	1	3.1
Ohio	3	9.4
Pennsylvania	4	12.5
South Carolina	1	3.1
Virginia	1	3.1
Wisconsin	1	3.1

N = 32

Table 3.2.135: Country of residence

	Frequency	Percent
Canada	1	50.0
Germany	1	50.0

N = 2

Next, respondents were asked to indicate whether they were male or female. There were more female (61.7%) than male (38.3%) respondents (Table 3.2.136). Respondents were also asked to record the year in which they were born. Visitors reported a mean and median age of 52 years. A subsequent question addressed respondents' educational background. Overall, visitors to

Little Brewster Island tend to be well educated with 86.8% having at least some college education or higher. Table 3.2.136 reports a frequency distribution of employment status of respondents. A majority of respondents (73.2%) reported being employed. Finally, respondents were asked to indicate their ethnicity and race. A majority of respondents (97.8%) reported being not Hispanic or Latino. Also, the vast majority of respondents (95.2%) were white.

Table 3.2.136: Demographic profile

	Frequency	Percent
Gender (N = 107)		
Female	66	61.7
Male	41	38.3
Respondent age (N = 102; Mean = 52.0; Median = 52.0)		
Under 20	0	0
20-29	5	4.9
30-39	12	11.8
40-49	21	20.6
50-59	35	34.3
60-69	19	18.6
70-79	10	9.8
Education level in years (N = 106; Mean = 16.9; Median = 1670)		
< 12	2	1.9
12	12	11.3
13	1	0.9
14	7	6.6
15	3	2.8
16	19	17.9
17	10	9.4
18	19	17.9
19	12	11.3
20	3	2.8
21	18	17.0
Employment status (N = 108)		
Employed	79	73
Unemployed	0	0
Homemaker	5	4.6
Retired	20	18.5
Student	3	2.8
Other	1	0.9
Ethnicity (N = 92)		
Hispanic or Latino	2	2.2
Not Hispanic or Latino	90	97.8

Table 3.2.136: Demographic profile (continued)

Race (N = 104)		
	Frequency	Percent
American Indian or Alaska Native	1	1.0
Asian	1	1.0
Black or African American	0	0
Native Hawaiian or other Pacific Islander	0	0
White	99	95.2
Other	1	1.0
Do not wish to answer	2	1.9

Indicators and Standards of Quality

A major section of the survey questionnaire contained a series of questions used to measure indicator variables and determine standards of quality for visitor-use related issues. One set of questions concerned how many people could visit Little Brewster Island without it being too crowded. Respondents were asked a series of questions about their standards of quality with respect to the number of people (PAOT) on Little Brewster Island.

Visitors were presented with a series of five photographs depicting a range of number of people on Little Brewster Island. Study photographs are shown in Appendix C. Respondents were asked to rate the acceptability of each photograph on a scale from –4 ("very unacceptable") to +4 ("very acceptable"). Findings are shown in Table 3.2.137 and Figure 3.16. Figure 3.16 represents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 2.7 (95 people at one time). This value is referred to as "acceptability (long form)."

Table 3.2.137: Acceptability for number of people at one time on Little Brewster Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	104	14.4	2.9	1.9	1.9	8.7	4.8	2.9	2.9	59.6	1.9
Photo 2	106	2.8	0	1.9	2.8	2.8	7.5	11.3	25.5	45.3	2.7
Photo 3	106	17.9	16.0	12.3	12.3	15.1	6.6	9.4	7.5	2.8	-1.0
Photo 4	105	58.1	21.9	11.4	4.8	1.0	0	1.9	0	1.0	-3.2
Photo 5	106	94.3	2.8	0	0	1.9	0	0	0	0.9	-3.8

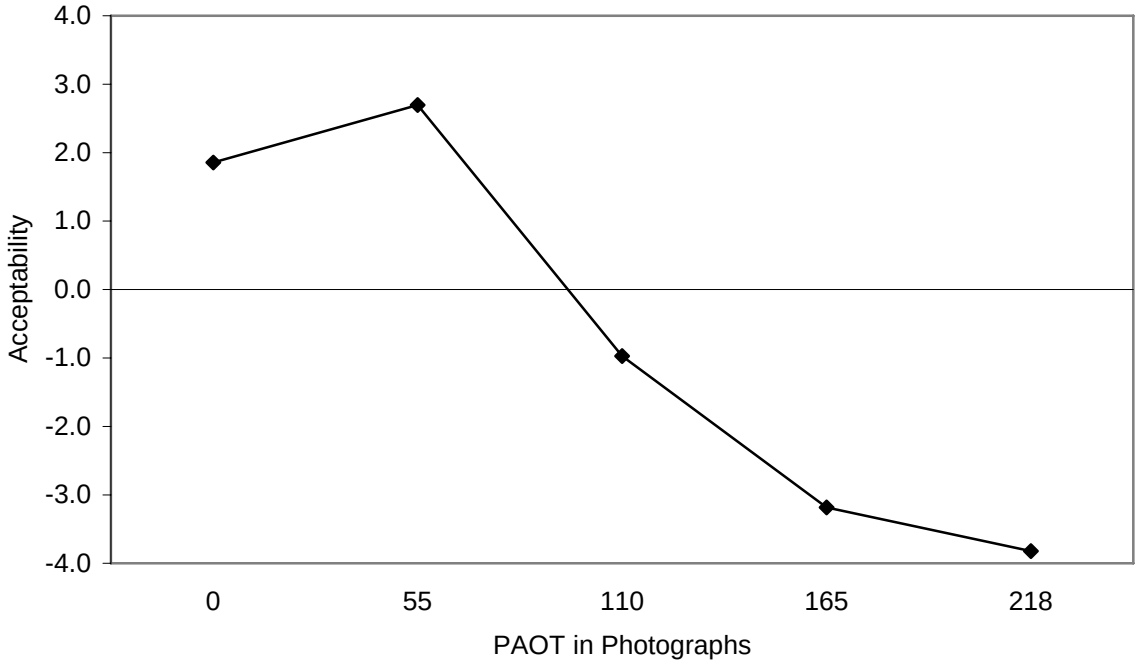

Figure 3.16: Norm curve for people at one time (PAOT) on Little Brewster Island

Respondents were asked to indicate the 1) maximum acceptable number of people at one time on Little Brewster (referred to as “acceptability”), 2) preferred number of people at one time (referred to as “preference”), 3) maximum number of people at one time on the island before they would no longer visit (referred to as “ displacement”), 4) highest number of people at one time that should be allowed on the island before visitor use is restricted (referred to as “management action”), and 5) number of people at one time seen by respondents on the day of the study (referred to as “existing conditions”). Where appropriate, visitors were allowed the options to indicate that they would continue to visit Little Brewster Island regardless of the number of other people at one time seen, or that the number of people at one time on Little Brewster Island should not be restricted. Findings for these questions are shown in Tables 3.2.138, 3.2.139, 3.2.140, 3.2.141, 3.2.142, and summarized in Table 3.2.143.

Respondents reported that 1) an average (mean) of 72 (median of 55) was the maximum acceptable PAOT 2) they prefer to see an average (mean) of 49 (median of 55) PAOT, 3) they would be displaced by an average (mean) of 174 (median of 165) PAOT, 4) that no more than an average (mean) of 89 or (median of 110) PAOT should be allowed, and 5) that they typically saw an average (mean) of 47 (median of 55) PAOT. The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of the number of people at one time or

that the number of people at one time on Little Brewster Island should not be restricted.

Table 3.2.138: Acceptability (PAOT)

Photo	Frequency	Percent
1	4	3.7
2	68	63.6
3	34	31.8
4	1	0.9
5	0	0
All the photographs are acceptable	0	0

N = 107; Mean = 2.3 (72 PAOT); Median = 2.0 (55 PAOT)

Table 3.2.139: Preference (PAOT)

Photo	Frequency	Percent
1	18	16.8
2	83	77.6
3	6	5.6
4	0	0
5	0	0

N = 107; Mean = 1.9 (49 PAOT) ; Median = 2.0 (55 PAOT)

Table 3.2.140: Displacement (PAOT)

Photo	Frequency	Percent
1	0	0
2	0	0
3	20	18.8
4	44	41.5
5	39	36.8
None of the photographs are so unacceptable	3	2.8

N = 106; Mean = 4.2 (174 PAOT); Median = 4.0 (165 PAOT)

Table 3.2.141: Management action (PAOT)

Photo	Frequency	Percent
1	4	3.7
2	44	41.1
3	42	39.3
4	13	12.2
5	0	0
People should not be restricted at any point in photos	2	1.9
People should not be restricted	2	1.9

N = 107; Mean = 2.6 (89 PAOT); Median = 3.0 (110 PAOT)

Table 3.2.142: Existing conditions (PAOT)

Photo	Frequency	Percent
1	17	16.8
2	82	81.2
3	1	1.0
4	1	1.0
5	0	0

N = 101; Mean = 1.9 (47 PAOT); Median = 2.0 (55 PAOT)

Table 3.2.143: Summary (PAOT)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		95 PAOT	
Acceptability (short form)	107	2.3	2.0
Preference	107	1.9	2.0
Displacement	103	4.2	4.0
Management action	103	2.6	3.0
Existing conditions	101	1.9	2.0

Respondents were then asked a series of questions about their standards of quality with respect to the number of visitors on conducted tours to Little Brewster Island. Respondents were asked to indicate the 1) maximum acceptable number of visitors on conducted tours (referred to as “acceptability”), 2) preferred number of visitors on conducted tours (referred to as “preference”), 3) maximum number of visitors that should be allowed on conducted tours before they would no longer recommend the tour to others (referred to as “displacement”), 4) highest number of visitors that should be allowed on conducted tours before visitor use is restricted (referred to as “management action”), and 5) number of visitors on the conducted tour on the day of the study (referred to as “existing conditions”).

Where appropriate, visitors were allowed the options to indicate that they would continue to visit Little Brewster Island regardless of the number of other visitors on the conducted tour, or that the number of visitors on Little Brewster Island should not be restricted. Findings for these questions are shown in Tables 3.2.144, 3.2.145, 3.2.146, 3.2.147, 3.2.148 and summarized in Table 3.2.149.

Respondents reported that 1) an average (mean) of 33.7 (median of 30.0) was the maximum acceptable number of hikers per hour 2) they prefer to see an average (mean) of 26.9 (median of 29.0) hikers per hour, 3) they would be displaced by an average (mean) of 46.3 (median of 40.0) hikers per hour, 4) no more than an average (mean) of 38.6 or (median of 35.0) hikers per hour should be allowed, and 5) they typically saw an average (mean) of 29.6 (median of 30.0) hikers per hour. The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to hike the trails regardless of the number of other hikers seen or that the number of hikers on Little Brewster Island should not be restricted.

Table 3.2.144: Acceptability (Number of visitors on conducted tours)

	Frequency	Percent
0-10	3	2.9
11-20	8	7.7
21-30	49	47.3
31-40	25	24.1
41-50	15	14.4
51-60	2	2.0
61-70	0	0
71-80	1	1.0
81-90	0	0
91-100	1	1.0
101 or more	0	0

N = 104; Mean = 33.7; Median = 30.0

Table 3.2.145: Preference (Number of visitors on conducted tours)

	Frequency	Percent
0-10	8	7.5
11-20	19	17.9
21-30	55	51.8
31-40	19	17.8
41-50	5	4.7

N = 106; Mean = 26.9; Median = 29.0

Table 3.2.146: Displacement (Number of hikers per hour)

	Frequency	Percent
0-10	1	1.0
11-20	4	4.0
21-30	21	20.1
31-40	31	29.6
41-50	19	18.1
51-60	11	10.6
61-70	2	2.0
71-80	6	5.8
81-90	1	1.0
91-100	4	3.8
101 or more	1	1.0
I would continue to recommend this tour regardless of the number of people on the tour	4	3.8

N = 101; Mean = 46.3; Median = 40.0

Table 3.2.147: Management action (Number of visitors on conducted tours)

	Frequency	Percent
0-10	1	1.0
11-20	9	8.6
21-30	32	30.6
31-40	32	30.5
41-50	25	23.9
51-60	3	3.0
61-70	2	2.0
71-80	2	2.0
81 or more	1	1.0
The number of visitors on Little Brewster Island should not be restricted	0	0

N = 105; Mean = 38.6; Median = 35.0

Table 3.2.148: Existing conditions (Number of visitors on conducted tours)

	Frequency	Percent
0-10	3	3.0
11-20	8	8.0
21-30	46	46.0
31-40	41	41.0
41 or more	2	2.0

N = 100; Mean = 29.6; Median = 30.0

Table 3.2.149: Summary (Number of visitors on conducted tours)

	N	Mean	Median
Acceptability	104	33.7	30.0
Preference	106	26.9	29.0
Displacement	97	46.3	40.0
Management action	105	38.6	35.0
Existing conditions	100	29.6	30.0

A next set of questions addressed the issue of litter on Little Brewster Island. Respondents were presented a series of photographs depicting increasing amounts of litter. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 ("very unacceptable") to +4 ("very acceptable"). Findings are shown in Table 3.2.150 and Figure 3.17. Figure 3.17 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.6. This value is referred to as "acceptability (long form)."

Table 3.2.150: Acceptability for litter on Little Brewster Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	102	1.0	0	0	0	0	2.9	1.0	2.0	93.1	3.8
Photo 2	99	60.6	7.1	8.1	4.0	7.1	4.0	4.0	3.0	2.0	-2.6
Photo 3	98	77.6	8.2	6.1	3.1	2.0	1.0	1.0	1.0	0	-3.4
Photo 4	99	90.9	5.1	3.0	0	1.0	0	0	0	0	-3.9
Photo 5	100	97	2	0	0	1	0	0	0	0	-3.9

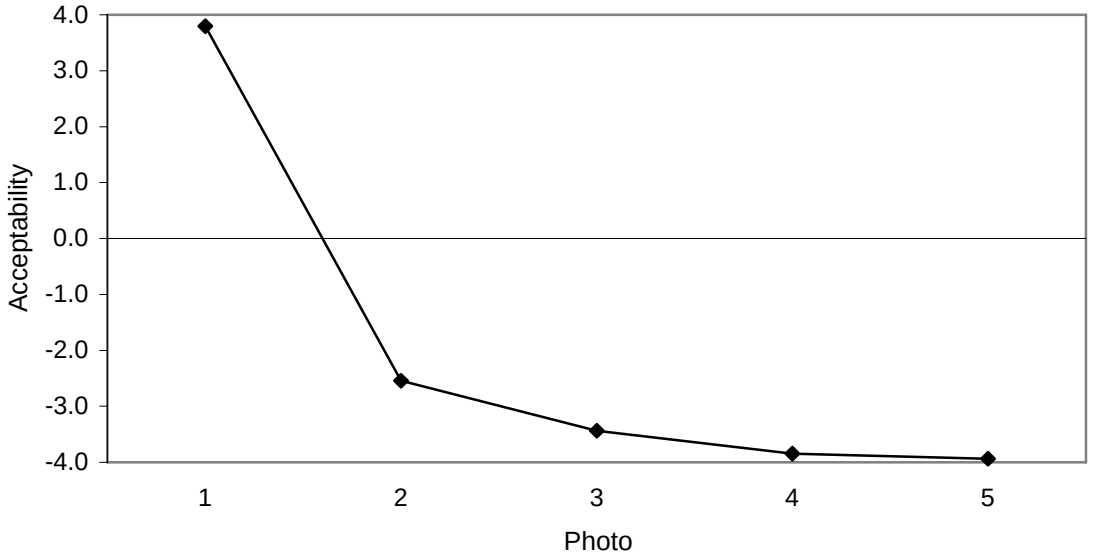

Figure 3.17: Norm curve for litter on Little Brewster Island

Respondents were also asked to indicate the photograph that depicts the 1) highest amount of litter that is acceptable (referred to as “acceptability (short form)”), 2) amount of litter preferred (referred to as “preference”), 3) amount of litter that is so unacceptable that respondents would no longer visit Little Brewster Island (referred to as “ displacement”), 4) highest amount of litter that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of litter typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Little Brewster Island regardless of litter, or that none of the photographs show a high enough amount of litter to restrict people from visiting Little Brewster Island. Findings for these questions are shown in Tables 3.2.151, 3.2.152, 3.2.153, 3.2.154, 3.2.155 and summarized in Table3.2.156.

Respondents reported that 1) acceptable amounts of litter were represented by an average (mean) photograph number of 1.2 (or a median photograph number of 1.0), 2) they prefer to see no litter as represented by an average (mean) photograph number of 1.0 (or a median photograph number of 1.0), 3) they would be displaced by amounts of litter represented by a mean photograph number of 2.8 (or a median photograph number of 2.0), 4) no more litter than represented by an average (mean) photograph number of 1.3 (or a median photograph number of 1.0) should be allowed, and 5) they typically saw litter represented by an average (mean) photograph number of 1.0 (or a median photograph number of 1.0). The displacement and management action standards are slightly underestimated as some respondents reported that either

they would continue to visit regardless of amounts of litter on Little Brewster Island, or that none of the photographs show a high enough level of litter to restrict people from visiting Little Brewster Island.

Table 3.2.151: Acceptability (Litter)

Photo	Frequency	Percent
1	85	81.7
2	16	15.4
3	2	1.9
4	0	0
5	1	1.0

N = 104; Mean = 1.2; Median = 1.0

Table 3.2.152: Preference (Litter)

Photo	Frequency	Percent
1	101	96.2
2	4	3.8
3	0	0
4	0	0
5	0	0

N = 105; Mean = 1.0; Median = 1.0

Table 3.2.153: Displacement (Litter)

Photo	Frequency	Percent
1	2	1.9
2	50	48.5
3	28	27.2
4	6	5.9
5	12	11.7
None of the photographs are so unacceptable	5	4.9

N = 103; Mean = 2.8; Median = 2.0

Table 3.2.154: Management action (Litter)

Photo	Frequency	Percent
1	75	70.1
2	23	21.1
3	6	5.6
4	0	0
5	0	0
People should not be restricted at any point in photos	3	2.8
People should not be restricted	0	0

N = 107; Mean = 1.3; Median = 1.0

Table 3.2.155: Existing conditions (Litter)

Photo	Frequency	Percent
1	100	99
2	1	1
3	0	0
4	0	0
5	0	0

N = 101; Mean = 1.0; Median = 1.0

Table 3.2.156: Summary (Litter)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		1.4	
Acceptability (short form)	104	1.2	1.0
Preference	105	1.0	1.0
Displacement	98	2.8	2.0
Management action	104	1.3	1.0
Existing conditions	101	1.0	1.0

The next set of questions focused on information provided to visitors to Boston Harbor Islands National Park Area. Respondents were asked to evaluate the amount and quality of information related to visitor opportunities and activities; ferry schedules and other means of access; the natural history of Boston Harbor Islands; and the human history of Boston Harbor Islands. Evaluation of amount of information was measured on a scale of 1 (“adequate”) and 2 (“inadequate”). Evaluation of quality of information was measured on a scale of 1 (“excellent”) to 5 (“very poor”). Findings are presented in Tables 3.2.157 through 3.2.160. The vast majority of respondents (90.8%) reported that the amount of information on visitor opportunities and activities at Boston Harbor Islands was adequate (mean

= 1.1) and that the quality of the same (82.6%) was good to excellent (mean = 1.9) (Table 3.2.157).

Table 3.2.157: Information on visitor opportunities and activities at Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	89	90.8
Inadequate (2)	9	9.2
Mean	1.1	
Quality of Information		
Excellent (1)	35	34.0
Good (2)	50	48.6
Fair (3)	11	10.7
Poor (4)	4	3.9
Very Poor (5)	3	2.9
Mean	1.9	

The vast majority of visitors (77.7%) reported that the amount of information on ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of the same (71.9%) was good to excellent (mean = 2.2) (Table 3.2.158).

Table 3.2.158: Information on ferry schedules and other means of access to Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	73	77.7
Inadequate (2)	21	22.3
Mean	1.2	
Quality of Information		
Excellent (1)	29	30.2
Good (2)	40	41.7
Fair (3)	15	15.6
Poor (4)	8	8.3
Very Poor (5)	4	4.2
Mean	2.2	

Findings regarding visitor evaluations of information on the natural history of Boston Harbor Islands are presented in Table 3.2.159. The vast majority of visitors 85.4%) reported the amount of information was adequate (mean = 1.1), and the quality of information (76.7%) was good to excellent (mean = 2.0).

Table 3.2.159: Information on the natural history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	82	85.4
Inadequate (2)	14	14.6
Mean	1.1	
Quality of Information		
Excellent (1)	34	34.3
Good (2)	42	42.4
Fair (3)	17	17.2
Poor (4)	4	4.0
Very Poor (5)	2	2.0
Mean	2.1	

Findings regarding visitor evaluations of information on the human history of Boston Harbor Islands are presented in Table 3.2.160. The vast majority of visitors (84.4%) reported the amount of information was adequate (mean = 1.2), and the quality of information (80.8%) was good to excellent (mean = 2.0).

Table 3.2.160: Information on the human history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	81	84.4
Inadequate (2)	15	15.6
Mean	1.2	
Quality of Information		
Excellent (1)	33	33.3
Good (2)	47	47.5
Fair (3)	11	11.1
Poor (4)	6	6.1
Very Poor (5)	2	2.0
Mean	2.0	

Summary

Visitors to Little Brewster Island can generally be described by the following characteristics:

- Most visitors (76.9%) come to Little Brewster Island in groups of 2 to 4.
- A majority of visitors (81.4%) come in groups comprised of family or friends.
- About 60.0% of visitors to Little Brewster Island had visited Boston Harbor Islands National Park Area before.
- A vast majority (91.7%) of visitors had not visited Little Brewster Island before.
- About two thirds of visitors (68.2%) were from Massachusetts.
- There were slightly more female (61.7%) than male (38.3%) respondents.
- The average (mean) age of visitors was 52 years.
- Visitors tended to be highly educated with about 86.8% of visitors reporting at least some college education or higher.
- A majority of visitors (73.0%) reported being employed.
- A majority of visitors (97.8%) reported being not being Hispanic or Latino. Also, the vast majority of visitors (90.0%) were white.

Study findings show that the following range of standards for indicator variables:

- Visitors indicated that they preferred seeing an average (median) of 55 people at one time and they would no longer visit Little Brewster Island if they saw an average (median) of 165 people at one time. Standards for other dimensions of visitor evaluation of number of hikers lay between this range.
- Visitors indicated that they preferred an average (median) of 29 people on conducted tours and they would no longer visit Little Brewster Island if there were an average (median) of 40 visitors on conducted tours. Standards for other dimensions of visitor evaluation of number of visitors on conducted tours lay between this range.
- Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.6.
- The vast majority of visitors (90.8%) reported that the amount of information of visitor opportunities and activities at Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of the same (82.6%) was good to excellent (mean = 1.9).
- The majority of visitors (77.7%) reported that the amount of information of ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of the same (71.9%) was good to excellent (mean = 2.2).
- The majority of visitors (85.4%) reported that the amount of information on the natural history of Boston Harbor Islands National Park Area was

adequate (mean = 1.1) and that the quality of information (76.7%) was good to excellent (mean = 2.1).

- The majority of visitors (84.4%) reported that the amount of information on the human history of Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of information (80.8%) was good to excellent (mean = 2.0).

Lovells Island: Use and Users

Respondents were asked several descriptive questions pertaining to their use of Boston Harbor Islands National Recreation Area. The first question asked respondents to report the number of people in their group. Table 3.2.161 indicates the frequency distribution of group size. A little over half of visitors (56.4%) come to Lovells Island in groups of 2 to 4. Average (mean) group size of visitors to Lovells Island was 6.1 people and median group size was 4.0 people. The next question asked respondents to report the composition of their group. Results are shown in Table 3.2.162. The majority of visitors (78.4%) come in groups comprised of family and/ or friends. Respondents were also given the opportunity to indicate an “other” type of group. “Other” types of groups included couples, a recreation dept. group and a Boy Scout Troop (Table 3.2.163).

Table 3.2.161: Group size

	Frequency	Percent
1	7	6.9
2	24	23.8
3	16	15.8
4	17	16.8
5	9	8.9
6	6	5.9
7	2	2.0
8	5	5.0
9	1	1.0
10 or more	14	14.0

N = 100; Mean = 6.1; Median = 4.0

Table 3.2.162: Group composition

	Frequency	Percent
Family	44	43.1
Friends	22	21.6
Family and friends	14	13.7
Organized group	10	9.8
Alone	7	6.9
Other	5	4.9

N = 102

Table 3.2.163: Other group type

	Frequency	Percent
Couple	2	50.0
Recreation dept.	1	25.0
Boy Scout troop	1	25.0

N = 4

Next, respondents were asked if they had been to any of the areas within Boston Harbor Islands National Park Area before. Results are shown in Table 3.2.164 and indicate that most visitors (65.7%) have visited Boston Harbor Islands National Park Area prior to their current visit. Respondents were also asked if they had been to Lovells Island before. A little over a third of the visitors (38.2%) had visited the island before (Table 3.2.165).

Table 3.2.164: Prior visits to any of the areas within Boston Harbor Islands National Park Area

	Frequency	Percent
Yes	67	65.7
No	34	33.3
Not sure	1	1.0

N = 102

Table 3.2.165: Prior visits to Lovells Island

	Frequency	Percent
Yes	39	38.2
No	62	60.8
Not sure	1	1.0

N = 93

The next set of questions focused on visitor demographics and selected socio-economic characteristics. Visitors were asked where they lived (Table 3.2.166). Most respondents (84.0%) were from Massachusetts.

Table 3.2.166: Residence

	Frequency	Percent
Massachusetts	84	84.0
Other State	14	14.0
Other Country	2	2.0

N = 100

Details regarding city or town of residence in Massachusetts, state of residence for non-Massachusetts residents and country of residence for international visitors are presented in Tables 3.2.167, 3.2.168 and 3.2.169. About a third of Massachusetts visitors (31.3%) were from Boston. Eleven other states and two other countries (U.K. and Japan) were represented among the sample.

Table 3.2.167: Town in Massachusetts

	Frequency	Percent
Weymouth	4	5
Quincy	6	7.5
Somerville	2	2.5
Cohasset	2	2.5
Boston	25	31.3
Everette	1	1.3
Charlestown	1	1.3
Newton	3	3.8
Dorchester	1	1.3
Brookline	3	3.8
Cambridge	4	5.0
Roxbury	1	1.3
Stoughton	1	1.3
Needham	1	1.3
Hull	2	2.5
Andover	2	2.5
Brookline	1	1.3
Winthrop	2	2.5
Braintree	1	1.3
Hannover	2	2.5
Hingham	3	3.8
Ashland	1	1.3
Brockton	1	1.3
Norwell	1	1.3
South Boston	2	2.5
Milton	1	1.3
Belmont	1	1.3
Revere	1	1.3
Medfield	2	2.5
Dedham	1	1.3
Roslimdale	1	1.3

N = 84

Table 3.2.168: Other state of residence

	Frequency	Percent
California	3	21.4
Connecticut	1	7.1
Maine	1	7.1
Minnesota	1	7.1
New Hampshire	1	7.1
New Jersey	1	7.1
New York	2	14.3
Pennsylvania	1	7.1
Texas	1	7.1
Vermont	1	7.1
Wisconsin	1	7.1

N = 14

Table 3.2.169: Country of residence

	Frequency	Percent
U.K	1	50.0
Japan	1	50.0

N = 2

Next, respondents were asked to indicate whether they were male or female. There were more female (64.0%) than male (36.0%) respondents (Table 3.2.170). Respondents were also asked to record the year in which they were born. Table 3.2.171 represents a frequency distribution of visitor reported age. Visitors reported a mean age of 41 years and median age of 40 years. A subsequent question addressed respondents' educational background. Results appear in Table 3.2.172. Overall, visitors to Lovells Island tend to be well educated with 85.9% having at least some college education or higher. Table 3.2.173 reports a frequency distribution of employment status of respondents. A majority of respondents (68.0%) reported being employed. Finally, respondents were asked to indicate their ethnicity and race. Results are presented in Tables 3.2.174 and 3.2.175. A majority of respondents (96.2%) reported being not Hispanic or Latino. Also, the vast majority of respondents (80.2%) were white.

Table 3.2.170: Demographic profile

	Frequency	Percent
Gender (N = 100)		
Female	64	64.0
Male	36	36.0
Respondent age (N = 97; Mean = 41.0; Median = 40.0)		
Under 20	6	6.2
20-29	14	14.4
30-39	26	26.8
40-49	28	28.9
50-59	12	12.4
60-69	9	9.3
70-79	2	2.1
80 and over	6	6.2
Education level in years (N = 99; Mean = 15.9; Median = 16.0)		
<12	4	4
13	10	10.1
14	6	6.1
15	5	5.1
16	7	7.1
17	33	33.3
18	5	5.1
19	15	15.2
20	5	5.1
21	1	1.0
Employment status (N = 100)		
Employed	68	68.0
Unemployed	1	1.0
Homemaker	8	8.0
Retired	11	11.0
Student	11	11.0
Other	1	1.0
Ethnicity (N = 78)		
Hispanic or Latino	3	3.9
Not Hispanic or Latino	75	96.2

Table 3.2.170: Demographic profile (continued)

Race (N = 91)		
	Frequency	Percent
American Indian or Alaska Native	0	0
Asian	4	4.4
Black or African American	2	2.2
Native Hawaiian or other Pacific Islander	2	2.2
White	73	80.2
Other	5	5.5
Do not wish to answer	5	5.5

Indicators and Standards of Quality

A major section of the survey questionnaire contained a series of questions used to measure indicator variables and determine standards of quality for visitor-use related issues. One set of questions concerned hiking on Lovells Island. Respondents were asked if they had hiked on any of the trails on Lovells Island. A little over half the visitors (52.5%) indicated that they had hiked the trails (Table 3.2.171).

Table 3.2.171: Hike on trails on Lovells Island

	Frequency	Percent
Yes	53	52.5
No	48	47.5

N = 101

Respondents were then asked a series of questions about their standards of quality with respect to the number of hikers per hour on the trails on Lovells Island. Respondents were asked to indicate the 1) maximum acceptable number of hikers per hour to see without the trails on Lovells Island being too crowded (referred to as “acceptability”), 2) preferred number of hikers per hour on the trails (referred to as “preference”), 3) maximum number of hikers per hour before they would no longer hike the trails (referred to as “displacement”), 4) highest number of hikers per hour that should be allowed before visitor use is restricted (referred to as “management action”), and 5) number of hikers per hour seen by respondents on the day of the study (referred to as “existing conditions”). Where appropriate, visitors were allowed the options to indicate that they would continue to hike the trails on Lovells Island regardless of the number of other hikers seen, or that the number of hikers on Lovells Island should not be restricted. Findings for these questions are shown in Tables 3.2.172, 3.2.173, 3.2.174, 3.2.175, 3.2.176, and summarized in Table 3.2.177.

Respondents reported that 1) an average (mean) of 27.5 (median of 19.0) was the maximum acceptable number of hikers per hour 2) they prefer to see an average (mean) of 18.1 (median of 10.0) hikers per hour, 3) they would be displaced by an average (mean) of 28.2 (median of 27.5.0) hikers per hour, 4) no more than an average (mean) of 26.6 or (median of 25.0) hikers per hour should be allowed, and 5) they typically saw an average (mean) of 8.5 (median of 4.5) hikers per hour. The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to hike the trails regardless of the number of other hikers seen or that the number of hikers on Lovells Island should not be restricted.

Table 3.2.172: Acceptability (Number of hikers per hour)

	Frequency	Percent
0-10	16	30.8
11-20	17	32.7
21-30	9	17.3
31-40	1	1.9
41-50	4	7.7
51-60	1	1.9
61-70	0	0
71-80	1	1.9
81 or more	3	5.7

N = 52; Mean = 27.5; Median = 19.0

Table 3.2.173: Preference (Number of hikers per hour)

	Frequency	Percent
0-10	34	69.4
11-20	6	12.2
21-30	3	6.1
31-40	1	2.0
41-50	3	6.1
51 or more	2	4.0

N = 49; Mean = 18.1; Median = 10.0

Table 3.2.174: Displacement (Number of hikers per hour)

	Frequency	Percent
0-10	5	10
11-20	5	10
21-30	8	16
31-40	2	4
41-50	3	6
51-60	1	2
I would continue to hike the trails regardless of the number of other hikers seen	24	48

N = 48; Mean = 28.2; Median = 27.5

Table 3.2.175: Management action (Number of hikers per hour)

	Frequency	Percent
0-10	5	10.1
11-20	6	12.3
21-30	6	12.2
31-40	2	4
41-50	3	6.1
51-60	1	2.0
The number of hikers on Lovells Island should not be restricted	26	53.1

N = 49; Mean = 26.6; Median = 25.0

Table 3.2.176: Existing conditions (Number of hikers per hour)

	Frequency	Percent
0-10	37	84.1
11-20	3	6.8
21-30	1	2.3
31-40	2	4.5
41 or more	1	2.3

N = 44; Mean = 8.5; Median = 4.5

Table 3.2.177: Summary (Number of hikers per hour)

	N	Mean	Median
Acceptability	52	27.5	19.0
Preference	49	18.1	10.0
Displacement	24	28.2	27.5
Management action	23	26.6	25.0
Existing conditions	44	8.5	4.5

The next set of questions focused on environmental impacts at campsites on Lovells Island. Respondents were asked if they had camped on Lovells Island during the time of the study. Most respondents (87.7%) were day use visitors (Table 3.2.178).

Table 3.2.178: Camp on Lovells Island

	Frequency	Percent
Yes	8	12.3
No	57	87.7

N = 65

Those who had camped on Lovells Island were presented a series of photographs depicting environmental impacts to soil and vegetation at campsites. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.179 and Figure 3.18. Figure 3.18 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that fewer impacts to the campsites are more acceptable than larger impacts and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.4. This value is referred to as “acceptability (long form).”

Table 3.2.179: Acceptability for campsite impacts on Lovells Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	12	0	0	0	0	0	0	0	0	100	4.0
Photo 2	12	8.3	0	0	0	16.7	8.3	8.3	16.7	41.7	2.1
Photo 3	12	16.7	16.7	8.3	0	0	8.3	16.7	16.7	16.7	0.3
Photo 4	12	33.3	8.3	0	0	8.3	16.7	8.3	16.7	8.3	-0.4
Photo 5	12	41.7	0	0	8.3	16.7	8.3	16.7	0	16.7	-1

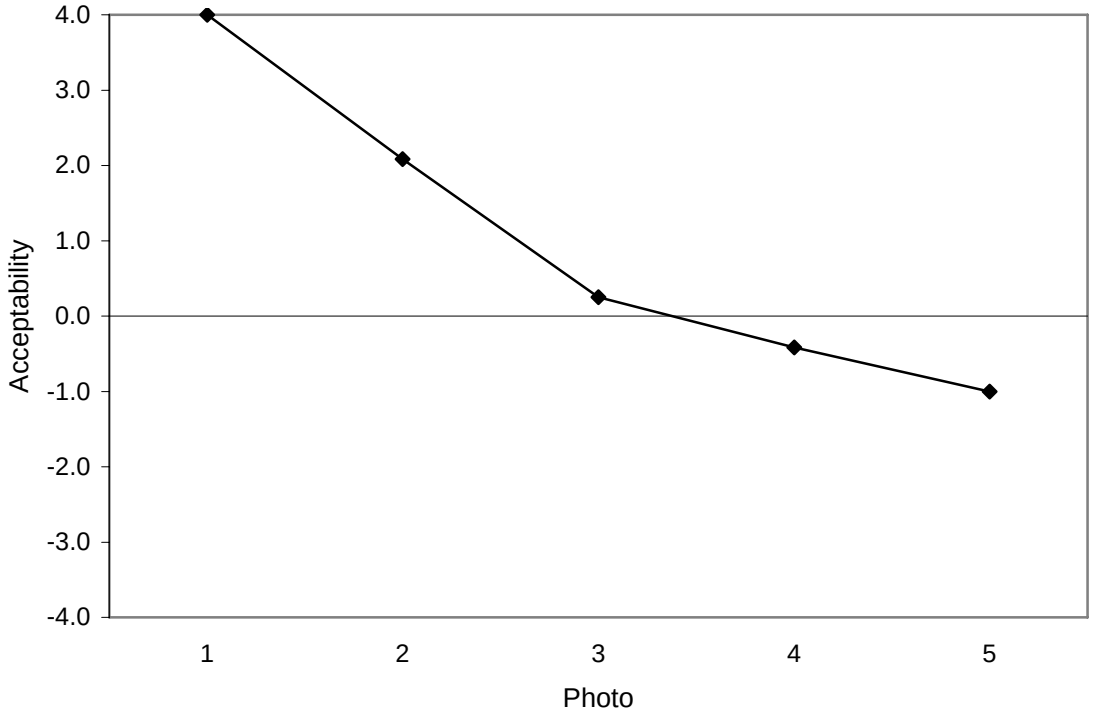

Figure 3.18: Norm curve for campsite impacts on Lovells Island

Respondents were also asked to indicate the photograph that depicts the 1) highest level of environmental impact that is acceptable (referred to as "acceptability (short form)"), 2) amount of environmental impact preferred (referred to as "preference"), 3) amount of environmental impact that is so unacceptable that respondents would no longer camp on Lovells Island (referred to as "displacement"), 4) highest level of environmental impact that should be allowed before visitor use is restricted (referred to as "management action"), and 5) amount of environmental impact typically seen (referred to as "existing conditions"). Where appropriate, visitors were allowed the option to indicate that they would continue to camp on Lovells Island regardless of environmental impacts at campsites, or that none of the photographs show a high enough level of environmental impact at campsites to restrict people from camping on Lovells Island. Findings for these questions are shown in Tables 3.2.180, 3.2.181, 3.2.182, 3.2.183, 3.2.184 and summarized in Table 3.2.185.

Respondents reported that 1) acceptable environmental impacts were represented by an average (mean) photograph number of 1.7 (or a median photograph number of 1.0), 2) they prefer to see environmental impacts represented by an average (mean) photograph number of 1.1 (or a median photograph number of 1.0), 3) they would be displaced by environmental impacts represented by an average (mean) photograph number of 3.8 (or a median photograph number of 4.0), 4) no more environmental impacts than represented

by an average (mean) photograph number of 2.3 (or a median photograph number of 2.0) should be allowed, and 5) they typically saw environmental impacts represented by an average (mean) photograph number of 1.8 (or a median photograph number of 1.5). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to camp regardless of environmental impacts on the campsites or that none of the photographs show a high enough level of environmental impact to restrict people from camping on Lovells Island.

Table 3.2.180: Acceptability (Campsite impacts)

Photo	Frequency	Percent
1	4	33.3
2	1	8.3
3	0	0
4	1	8.3
5	0	0
All the photographs are acceptable	6	50.0

N = 12; Mean = 1.7; Median = 1.0

Table 3.2.181: Preference (Campsite impacts)

Photo	Frequency	Percent
1	10	90.9
2	1	9.1
3	0	0
4	0	0
5	0	0

N = 11; Mean = 1.1; Median = 1.0

Table 3.2.182: Displacement (Campsite impacts)

Photo	Frequency	Percent
1	0	0
2	0	0
3	2	18.2
4	2	18.2
5	1	9.1
None of the photographs are so unacceptable	6	54.6

N = 11; Mean = 3.8; Median = 4.0

Table 3.2.183: Management action (Campsite impacts)

Photo	Frequency	Percent
1	2	16.7
2	2	16.7
3	2	16.7
4	1	8.3
5	0	0
People should not be restricted at any point in photos	3	25.0
People should not be restricted	2	16.7

N = 12; Mean = 2.3; Median = 2.0

Table 3.2.184: Existing conditions (Campsite impacts)

Photo	Frequency	Percent
1	5	50.0
2	3	30.0
3	1	10.0
4	1	10.0
5	0	0

N = 10; Mean = 1.8; Median = 1.5

Table 3.2.185: Summary (Campsite impacts)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		3.4	
Acceptability (short form)	12	1.7	1.0
Preference	11	1.1	1.0
Displacement	5	3.8	4.0
Management action	7	2.3	2.0
Existing conditions	10	1.8	1.5

A next set of questions addressed the issue of litter on Lovells Island. Respondents were presented a series of photographs depicting increasing amounts of litter. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.186 and Figure 3.19. Figure 3.19 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of the photographs fall out of the

acceptable range and into the unacceptable range at approximately photograph 1.5. This value is referred to as “acceptability (long form).”

Table 3.2.186: Acceptability for litter on Lovells Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	99	0	0	0	1.0	0	1.0	1.0	5.1	91.9	3.9
Photo 2	95	50.5	8.4	11.6	4.2	4.2	0	6.3	11.6	3.2	-2.0
Photo 3	97	69.1	11.3	6.2	2.1	3.1	1.0	6.2	1.0	0	-3.1
Photo 4	97	85.6	4.1	4.1	1.0	1.0	2.1	1.0	1.0	0	-3.6
Photo 5	97	92.8	2.1	1.0	1.0	2.1	0	1.0	0	0	-3.8

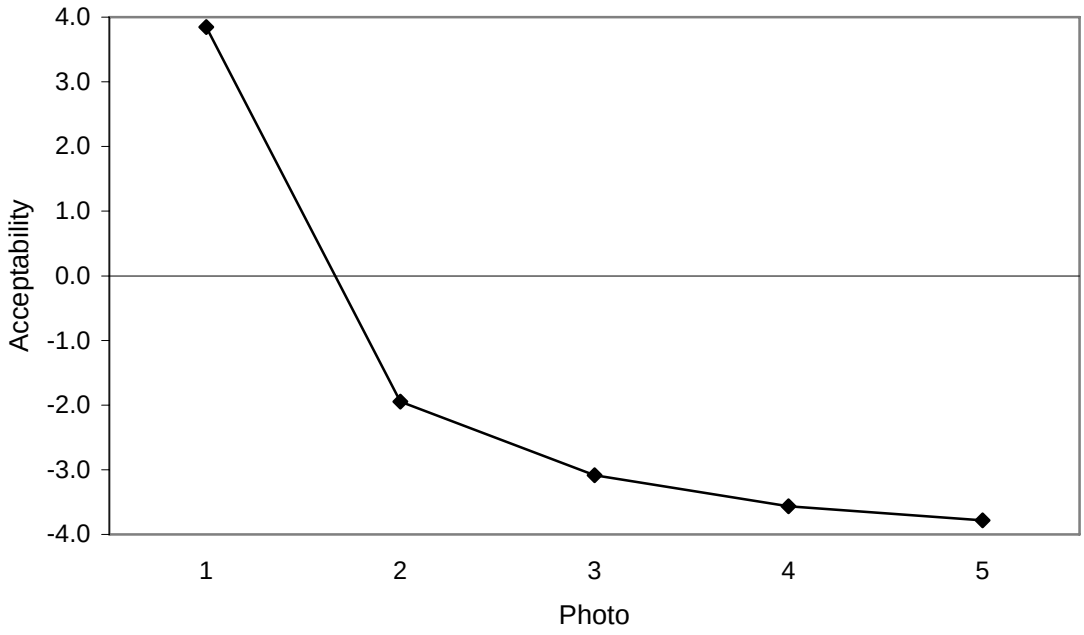

Figure 3.19: Norm curve for litter on Lovells Island

Respondents were also asked to indicate the photograph that depicts the 1) highest amount of litter that is acceptable (referred to as “acceptability (short form)”), 2) amount of litter preferred (referred to as “preference”), 3) amount of litter that is so unacceptable that respondents would no longer visit Lovells Island (referred to as “displacement”), 4) highest amount of litter that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of litter typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Lovells Island regardless of litter, or that none of the photographs show a high enough amount of litter to restrict people from visiting Lovells Island. Findings for these questions are shown in Tables 3.2.187, 3.2.188, 3.2.189, 3.2.190, 3.2.191 and summarized in Table 3.2.192.

Respondents reported that 1) acceptable amount of litter were represented by an average (mean) photograph number of 1.2 (or a median photograph number of 1.0), 2) they prefer to see no litter as represented by an average (mean) photograph number of 1.0 (or a median photograph number of 1.0), 3) they would be displaced by amounts of litter represented by a mean photograph number of 2.9 (or a median photograph number of 3.0), 4) no more litter than represented by an average (mean) photograph number of 1.7 (or a median photograph number of 1.0) should be allowed, and 5) they typically saw litter represented by an average (mean) photograph number of 1.2 (or a median photograph number of 1.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of amounts of litter on Lovells Island, or that none of the photographs show a high enough level of litter to restrict people from visiting Lovells Island.

Table 3.2.187: Acceptability (Litter)

Photo	Frequency	Percent
1	83	85.6
2	11	11.3
3	1	1.0
4	0	0
5	1	1.0
All of the photographs are acceptable	1	1.0

N = 97; Mean = 1.2; Median = 1.0

Table 3.2.188: Preference (Litter)

Photo	Frequency	Percent
1	95	97.9
2	2	2.1
3	0	0
4	0	0
5	0	0

N = 97; Mean = 1.0; Median = 1.0

Table 3.2.189: Displacement (Litter)

Photo	Frequency	Percent
1	3	3.1
2	38	39.6
3	34	35.4
4	5	5.2
5	13	13.5
None of the photographs are so unacceptable	3	3.1

N = 96; Mean = 2.9; Median = 3.0

Table 3.2.190: Management action (Litter)

Photo	Frequency	Percent
1	43	43.0
2	27	27.0
3	6	6.0
4	1	1.0
5	4	4.0
People should not be restricted at any point in photos	3	3.0
People should not be restricted	16	16.0

N = 100; Mean = 1.7; Median = 1.0

Table 3.2.191: Existing conditions (Litter)

Photo	Frequency	Percent
1	80	80.8
2	18	18.2
3	1	1.0
4	0	0
5	0	0

N = 99; Mean = 1.2; Median = 1.0

Table 3.2.192: Summary (Litter)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		1.5	
Acceptability (short form)	97	1.2	1.0
Preference	97	1.0	1.0
Displacement	93	2.9	3.0
Management action	81	1.7	1.0
Existing conditions	99	1.2	1.0

A next set of questions addressed the issue of graffiti on Lovells Island. Respondents were presented a series of photographs depicting increasing amounts of graffiti. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 ("very unacceptable") to +4 ("very acceptable"). Findings are shown in Table 3.2.193 and Figure 3.20. Figure 3.20 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that even small amounts of graffiti are evaluated as unacceptable and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 2.2. This value is referred to as "acceptability (long form)."

Table 3.2.193: Acceptability for graffiti on Lovells Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	96	0	0	0	0	0	2.1	1.0	7.3	89.6	3.8
Photo 2	94	23.4	4.3	2.1	4.3	10.6	8.5	14.9	20.2	11.7	0.3
Photo 3	94	41.5	10.6	7.4	10.6	5.3	8.5	8.5	3.2	4.3	-1.7
Photo 4	94	55.3	12.8	8.5	8.5	2.1	6.4	1.1	1.1	4.3	-2.6
Photo 5	93	71.0	8.6	6.5	3.2	4.3	1.1	0	1.1	4.3	-3.0

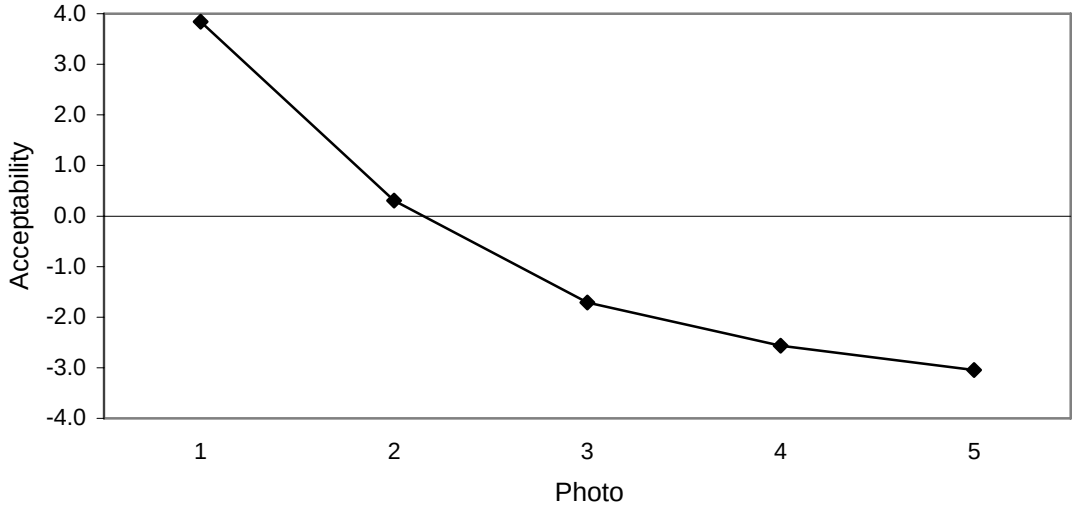

Figure 3.20: Norm curve for graffiti on Lovells Island

Respondents were also asked to indicate the photograph that depicts the 1) highest amount of graffiti that is acceptable (referred to as “acceptability (short form)”), 2) amount of graffiti preferred (referred to as “preference”), 3) amount of graffiti that is so unacceptable that respondents would no longer visit Lovells Island (referred to as “displacement”), 4) highest amount of graffiti that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of graffiti typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Lovells Island regardless of graffiti, or that none of the photographs show a high enough amount of graffiti to restrict people from visiting Lovells Island. Findings for these questions are shown in Tables 2.2.194, 2.2.195, 3.2.196, 3.2.197, 3.2.198 and summarized in Table 3.2.199.

Respondents reported that 1) acceptable amount of graffiti were represented by an average (mean) photograph number of 1.5 (or a median photograph number of 1.0), 2) they prefer to see no graffiti as represented by an average (mean) photograph number of 1.1 (or a median photograph number of 1.0), 3) they would be displaced by amounts of graffiti represented by a mean photograph number of 3.7 (or a median photograph number of 4.0), 4) no more graffiti than represented by an average (mean) photograph number of 2.0 (or a median photograph number of 1.0) should be allowed, and 5) they typically saw graffiti represented by an average (mean) photograph number of 1.6 (or a median photograph number of 1.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of amounts of graffiti on Lovells Island, or that none of the photographs show a high enough level of graffiti to restrict people from visiting Lovells Island.

Table 3.2.194: Acceptability (Graffiti)

Photo	Frequency	Percent
1	53	55.2
2	25	26.0
3	7	7.3
4	1	1.0
5	1	1.0
All of the photographs are acceptable	9	9.4

N = 96; Mean = 1.5; Median = 1.0

Table 3.2.195: Preference (Graffiti)

Photo	Frequency	Percent
1	91	94.8
2	5	5.2
3	0	0
4	0	0
5	0	0

N = 96; Mean = 1.1; Median = 1.0

Table 3.2.196: Displacement (Graffiti)

Photo	Frequency	Percent
1	1	1.0
2	10	10.2
3	16	16.3
4	8	8.2
5	23	23.5
None of the photographs are so unacceptable	40	40.8

N = 98; Mean = 3.7; Median = 4.0

Table 3.2.197: Management action (Graffiti)

Photo	Frequency	Percent
1	29	30.2
2	12	12.5
3	8	8.3
4	5	5.2
5	3	3.1
People should not be restricted at any point in photos	18	18.8
People should not be restricted	21	21.9

N = 96; Mean = 2.0; Median = 1.0

Table 3.2.198: Existing conditions (Graffiti)

Photo	Frequency	Percent
1	47	57.3
2	22	26.8
3	11	13.4
4	2	2.4
5	0	0

N = 82; Mean = 1.6; Median = 1.0

Table 3.2.199: Summary (Graffiti)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		2.2	
Acceptability (short form)	87	1.5	1.0
Preference	96	1.1	1.0
Displacement	58	3.7	4.0
Management action	57	2.0	1.0
Existing conditions	82	1.6	1.0

To measure visitor evaluations of the ferry service provided to Georges Island from Boston (Long Wharf), respondents were given a question containing a range of ferry frequencies from “every 15 minutes” to “every 2 hours” with 15 minute time intervals. Respondents were asked to rate each of these intervals on a scale of –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are presented in Table 3.2.200 and Figure 3.21. Figure 3.21 presents the norm curve associated with the mean acceptability rating for each time interval. Respondents rated a range of ferry intervals of 1 hr 15 minutes or less as acceptable, with a one hour interval as most acceptable.

Table 3.2.200: Acceptability for ferry service

Ferry service frequency	N	-4	-3	-2	-1	0	1	2	3	4	Mean
15 mins	82	25.6	6.1	6.1	1.2	13.4	1.2	6.1	2.4	37.8	0.4
30 mins	86	14.0	5.8	4.7	5.8	2.3	4.7	9.3	11.6	41.9	1.4
45 mins	82	15.9	3.7	2.4	4.9	8.5	9.8	19.5	18.3	17.1	0.9
1 hr	91	4.4	1.1	1.1	3.3	17.6	13.2	7.7	14.3	37.4	2.0
1 hr 15 mins	85	16.5	3.5	5.9	18.8	15.3	11.8	8.2	8.2	11.8	-0.1
1 hr 30 mins	86	16.3	7.0	11.6	15.1	16.3	8.1	8.1	8.1	9.3	-0.4
1 hr 45 mins	84	26.2	15.5	7.1	14.3	7.1	8.3	8.3	6.0	7.1	-1.1
2 hrs	88	36.4	11.4	5.7	9.1	14.8	5.7	3.4	4.5	9.1	-1.4

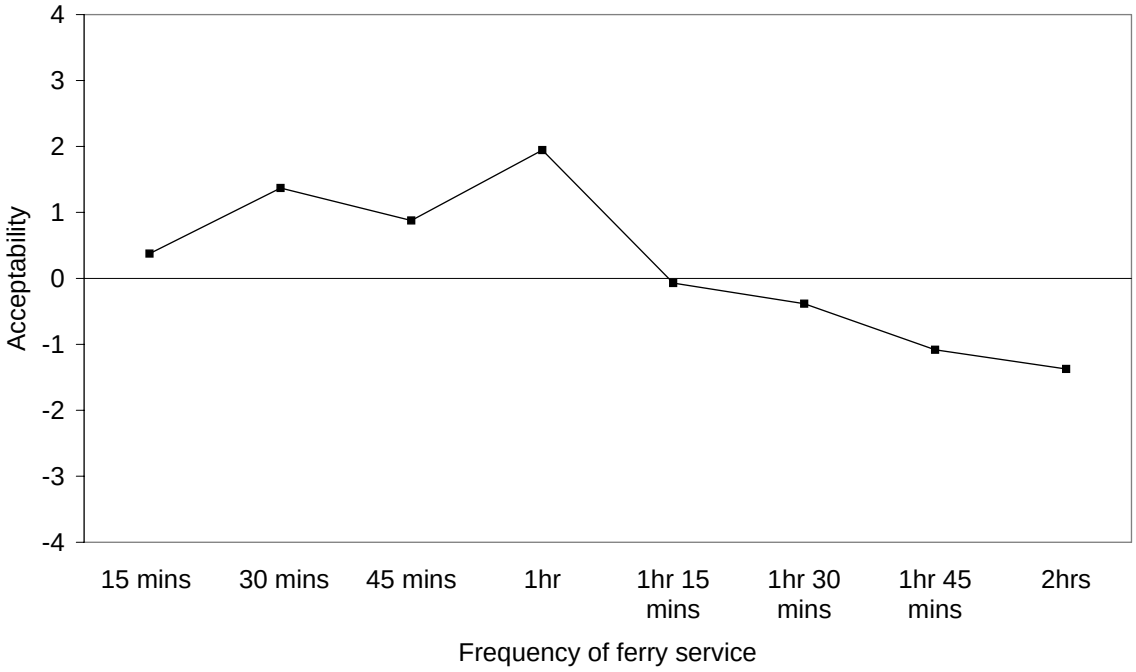

Figure 3.21: Norm curve for ferry service to Georges Island

Similarly, visitors were asked to evaluate the water shuttle service from Georges Island to other islands. Respondents were presented a question containing a range of water shuttle frequencies from “every 15 minutes” to “every 2 hours” with 15 minute time intervals. Respondents were asked to rate each of these time intervals on a scale of –4 (“very unacceptable”) to +4 (“very acceptable”). Study findings are shown in Table 3.2.201 and Figure 3.22. Figure 3.22 presents the norm curve associated with the mean acceptability rating for each time interval. Respondents rated a range of water shuttle intervals of 1 hr 15 minutes or less as acceptable, with an interval of 30 minutes as most acceptable.

Table 3.2.201: Acceptability for water shuttle service

Water shuttle service frequency	N	-4	-3	-2	-1	0	1	2	3	4	Mean
15 mins	87	18.4	8.0	0	1.1	14.9	4.6	3.4	5.7	43.7	1.1
30 mins	90	10.0	3.3	6.7	1.1	3.3	4.4	6.7	17.8	46.7	1.9
45 mins	85	12.9	1.2	2.4	4.7	9.4	10.6	18.8	17.6	22.4	1.3
1 hr	90	5.6	2.2	1.1	1.1	16.7	14.4	13.3	14.4	31.1	1.8
1 hr 15 mins	87	19.5	0	3.4	18.4	20.7	10.3	5.7	14.9	6.9	-0.1
1 hr 30 mins	88	20.5	1.1	18.2	15.9	12.5	6.8	13.6	5.7	5.7	-0.6
1 hr 45 mins	88	21.6	14.8	18.2	8.0	12.5	12.5	2.3	6.8	3.4	-1.2
2 hrs	89	38.2	10.1	13.5	7.9	10.1	9.0	3.4	2.2	5.6	-1.7

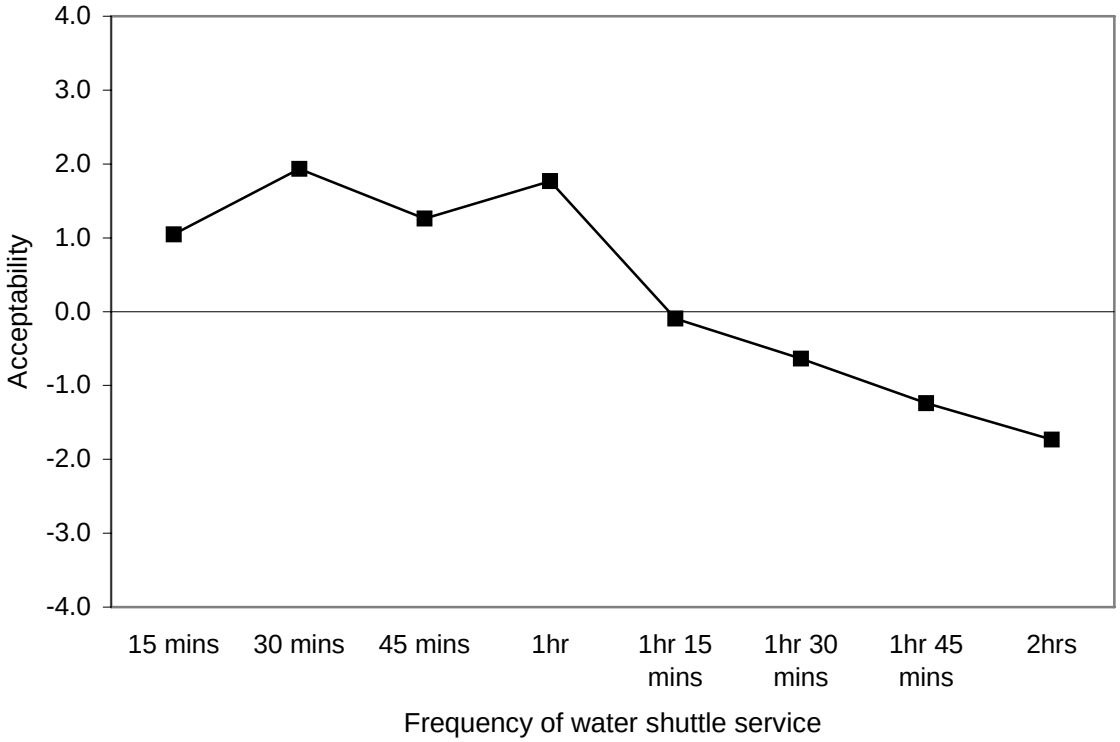

Figure 3.22: Norm curve for water shuttle service to Lovells Island

The next set of questions focused on information provided to visitors to Boston Harbor Islands National Park Area. Respondents were asked to evaluate the amount and quality of information related to visitor opportunities and activities; ferry schedules and other means of access; the natural history of Boston Harbor Islands; and the human history of Boston Harbor Islands. Evaluation of amount of information was measured on a scale of 1 (“adequate”) and 2 (“inadequate”). Evaluation of quality of information was measured on a scale of 1 (“excellent”) to 5 (“very poor”). Findings are presented in Tables 3.2.202 through 3.2.205. The vast majority of respondents (85.7%) reported that the amount of information on visitor opportunities and activities at Boston Harbor Islands was adequate (mean = 1.1) and that the quality of the same (82.9%) was good to excellent (mean = 1.8) (Table 3.2.202).

Table 3.2.202: Information on visitor opportunities and activities at Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	70	85.7
Inadequate (2)	12	14.6
Mean	1.1	
Quality of Information		
Excellent (1)	30	36.6
Good (2)	38	46.3
Fair (3)	11	13.4
Poor (4)	3	3.7
Very Poor (5)	0	0
Mean	1.8	

The vast majority of visitors (87.5%) reported that the amount of information on ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean of 1.1) and that the quality of the same (80.5%) was good to excellent (mean = 1.8) (Table 3.2.203).

Table 3.2.203: Information on ferry schedules and other means of access to Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	70	87.5
Inadequate (2)	10	12.5
Mean	1.1	
Quality of Information		
Excellent (1)	38	46.3
Good (2)	28	34.2
Fair (3)	13	15.9
Poor (4)	3	3.7
Very Poor (5)	0	0.0
Mean	1.8	

Findings regarding visitor evaluations of information on the natural history of Boston Harbor Islands are presented in Table 3.2. 204. The vast majority of visitors (85.1) reported the amount of information was adequate (mean = 1.1), and the quality of information (73.4%) was good to excellent (mean = 2.0).

Table 3.2.204: Information on the natural history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	63	85.1
Inadequate (2)	11	14.9
Mean	1.1	
Quality of Information		
Excellent (1)	31	39.2
Good (2)	27	34.2
Fair (3)	14	17.7
Poor (4)	6	7.6
Very Poor (5)	1	1.3
Mean	2.0	

Findings regarding visitor evaluations of information on the human history of Boston Harbor Islands are presented in Table 3.2.205. The vast majority of visitors (78.7%) reported the amount of information was adequate (mean = 1.2), and the quality of information (67.1%) was good to excellent (mean = 2.1).

Table 3.2.205: Information on the human history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	59	78.7
Inadequate (2)	16	21.3
Mean	1.2	
Quality of Information		
Excellent (1)	27	34.2
Good (2)	26	32.9
Fair (3)	19	24.1
Poor (4)	6	7.6
Very Poor (5)	1	1.3
Mean	2.1	

Summary

Visitors to Lovells Island can generally be described by the following characteristics:

- A little over half of the visitors (56.4%) come to Lovells Island in groups of 2 to 4.
- A majority of visitors (78.4%) come in groups comprised of family and/or friends.
- About two-thirds of visitors to Lovells Island had visited Boston Harbor Islands National Park Area before.
- About one-thirds (38.2%) of visitors had visited Lovells Island before.
- A majority of visitors (84.0%) were from Massachusetts.
- There were more female (64.0%) than male (36.0 %) respondents.
- The average (mean) age of visitors was 41 years.
- Visitors tended to be highly educated with about 85.9% of visitors reporting at least some college education or higher.
- A majority of visitors (68.0%) reported being employed.
- A majority of visitors (96.2%) reported being not being Hispanic or Latino. Also, the vast majority of visitors (80.2%) were white.

Study findings show that the following range of standards for indicator variables:

- Visitors indicated that they preferred seeing an average (median) of 10 hikers per hour and they would no longer visit Lovells Island if they saw an average (median) of 28 hikers per hour. Standards for other dimensions of visitor evaluation of number of hikers per hour lay between this range.
- Findings indicate that fewer environmental impacts to the campsites are more acceptable than greater impacts and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.4.
- Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.5.
- Findings indicate that even small amounts of graffiti are evaluated as unacceptable and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 2.2.
- When asked to evaluate the ferry service from Boston (Long Wharf) to Georges Island, respondents rated a range of ferry intervals of 1 hour 15 minutes or less as acceptable, with a one hour interval as most acceptable.
- When asked to evaluate the water shuttle service from Georges Island to other Islands, respondents rated a range of water shuttle intervals of 1 hour 15 minutes or less as acceptable, with an interval of 30 minutes as most acceptable.

- The vast majority of visitors (85.7%) reported that the amount of information of visitor opportunities and activities at Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of the same (82.9%) was good to excellent (mean = 1.8).
- The vast majority of visitors (87.5%) reported that the amount of information of ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of the same (80.5%) was good to excellent (mean = 1.8).
- The vast majority of visitors (85.1%) reported that the amount of information on the natural history of Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of information (73.4%) was good to excellent (mean = 2.0).
- The vast majority of visitors (78.7%) reported that the amount of information on the human history of Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of information (67.1%) was good to excellent (mean = 2.1).

Peddocks Island: Use and Users

Respondents were asked several descriptive questions pertaining to their use of Boston Harbor Islands National Recreation Area. The first question asked respondents to report the number of people in their group. Table 3.2.206 indicates the frequency distribution of group size. Most visitors (77.2%) come to Peddocks Island in groups of 1 to 4. Average (mean) group size of visitors to Peddocks Island was 4.3 people and median group size was 2.0 people. The next question asked respondents to report the composition of their group. Results are shown in Table 3.2.207. The majority of visitors (72.8%) come in groups comprised of family and/ or friends. Respondents were also given the opportunity to indicate an "other" type of group. "Other" types of groups included couples (Table 3.2.208).

Table 3.2.206: Group size

	Frequency	Percent
1	17	16.8
2	36	35.6
3	11	10.9
4	14	13.9
5	6	5.9
6	2	2.0
7	2	2.0
8	3	3.0
9	2	2.0
10 or more	8	7.9

N = 99; Mean = 4.3; Median = 2.0

Table 3.2.207: Group composition

	Frequency	Percent
Family	39	39.4
Friends	26	26.3
Family and friends	7	7.1
Organized group	12	12.1
Alone	12	12.1
Other	3	3.0

N = 99

Table 3.2.208: Other group type

	Frequency	Percent
Couple	2	66.6
FBHI	1	33.3

N = 3

Next, respondents were asked if they had been to any of the areas within Boston Harbor Islands National Park Area before. Results are shown in Table 3.2.209 and indicate that about two-third visitors (66.7%) have visited Boston Harbor Islands National Park Area prior to their current visit. Respondents were also asked if they had been to Peddocks Island before. A quarter of the visitors (25.5%) had visited before (Table 3.2.210).

Table 3.2.209: Prior visits to any of the areas within Boston Harbor Islands National Park Area

	Frequency	Percent
Yes	68	66.7
No	33	32.4
Not sure	1	1.0

N = 104

Table 3.2.210: Prior visits to Peddocks Island

	Frequency	Percent
Yes	26	25.5
No	76	74.5
Not sure	0	0

N = 102

The next set of questions focused on visitor demographics and selected socio-economic characteristics. Visitors were asked where they lived (Table 3.2.211). Most respondents (74.0%) were from Massachusetts.

Table 3.2.211: Residence

	Frequency	Percent
Massachusetts	74	74.0
Other State	20	20.0
Other Country	6	6.0

N = 100

Details regarding city or town of residence in Massachusetts, state of residence for non-Massachusetts residents and country of residence for international visitors are presented in Tables 3.2.212, 3.2.213 and 3.2.214. Slightly less than

a fifth of Massachusetts visitors (17.4%) were from Boston. Thirteen other states and six other countries were represented among the sample.

Table 3.2.212: Town in Massachusetts

	Frequency	Percent
Weymouth	3	4.4
Quincy	6	8.7
Shrewsbury	1	1.5
Somerville	2	2.9
Cohasset	1	1.5
Boston	12	17.4
Everette	1	1.5
Newton	1	1.5
Dorchester	2	2.9
Brookline	2	2.9
Waltham	2	2.9
Cambridge	3	4.4
Arlington	2	2.9
Hull	2	2.9
Andover	2	2.9
Winthrop	1	1.5
Marshfield	1	1.5
Reading	1	1.5
Watertown	1	1.5
Lynn	1	1.5
Hingham	1	1.5
Plymouth	2	2.9
Norwell	1	1.5
Jamaica Plain	1	1.5
South Boston	1	1.5
Wellesley	1	1.5
Wakefield	1	1.5
Carlisle	1	1.5
Lowell	1	1.5
Winchester	1	1.5
West Barnstable	1	1.5
Nahant	1	1.5
Dover	2	2.9
Fitchburg	1	1.5
Kingston	1	1.5
Groveland	1	1.5
Marion	1	1.5

Table 3.2.212: Town in Massachusetts (continued)

	Frequency	Percent
Cohasset	1	1.5
Woburn	1	1.5
Wayland	1	1.5

N = 100

Table 3.2.213: Other state of residence

	Frequency	Percent
California	1	5.0
Connecticut	3	15.0
Georgia	2	10.0
New Hampshire	2	10.0
New Jersey	1	5.0
New York	2	10.0
North Carolina	1	5.0
Oregon	2	10.0
Rhode Island	1	5.0
Texas	1	5.0
Virginia	1	5.0
Washington	1	5.0
Wisconsin	2	10.0

N = 20

Table 3.2.214: Country of residence

	Frequency	Percent
U.K.	1	16.7
Sweden	1	16.7
Canada	1	16.7
France	1	16.7
Mexico	1	16.7
Switzerland	1	16.7

N = 6

Next, respondents were asked to indicate whether they were male or female. There were an almost equal number of female (49.0%) and male (51.0%) respondents (Table 3.2.215). Respondents were also asked to record the year in which they were born. Visitors reported a mean age of 40 years and median age of 38 years. A subsequent question addressed respondents' educational background. Overall, visitors to Peddocks Island tend to be well educated with 92.9% having at least some college education or higher. Table 3.2.215 reports a frequency distribution of employment status of respondents. A majority of

respondents (68.0%) reported being employed. Finally, respondents were asked to indicate their ethnicity and race. A majority of respondents (90.8%) reported being not Hispanic or Latino. Also, the vast majority of respondents (86.5%) were white.

Table 3.2.215: Demographic profile

	Frequency	Percent
Gender (N = 99)		
Female	49	49.0
Male	50	51.0
Respondent age (N = 97; Mean = 40.0; Median = 38.0)		
Under 20	5	5.2
20-29	25	25.8
30-39	21	21.6
40-49	22	22.7
50-59	14	14.4
60-69	7	7.2
70-79	3	3.1
80 and over	0	0
Education level in years (N = 98; Mean = 16.6; Median = 16.0)		
<12	1	1.0
13	6	6.1
14	4	4.1
15	11	11.2
16	5	5.1
17	31	31.6
18	7	7.1
19	10	10.2
20	7	7.1
21	3	3.1
Employment status (N = 100)		
Employed	68	68.0
Unemployed	5	5.0
Homemaker	2	2.0
Retired	9	9.0
Student	10	10.0
Other	6	6.0
Ethnicity (N = 87)		
Hispanic or Latino	8	9.2
Not Hispanic or Latino	79	90.8

Table 3.2.215: Demographic profile (continued)

Race (N = 96)		
	Frequency	Percent
American Indian or Alaska Native	2	2.1
Asian	0	0
Black or African American	3	3.1
Native Hawaiian or other Pacific Islander	2	2.1
White	83	86.5
Other	4	4.3

Indicators and Standards of Quality

A major section of the survey questionnaire contained a series of questions used to measure indicator variables and determine standards of quality for visitor-use related issues. One set of questions concerned hiking on Peddocks Island. Respondents were asked if they had hiked on any of the trails on Peddocks Island. A majority of visitors (72.7%) indicated that they had hiked the trails (Table 3.2.216).

Table 3.2.216: Hike on trails on Peddocks Island

	Frequency	Percent
Yes	72	72.7
No	27	27.3

N = 99

Respondents were then asked a series of questions about their standards of quality with respect to number of hikers per hour on the trails on Peddocks Island. Respondents were asked to indicate the 1) maximum acceptable number of hikers per hour to see without the trails on Peddocks Island being too crowded (referred to as “acceptability”), 2) preferred number of hikers per hour on the trails (referred to as “preference”), 3) maximum number of hikers per hour before they would no longer hike the trails (referred to as “displacement”), 4) highest number of hikers per hour that should be allowed before visitor use is restricted (referred to as “management action”), and 5) number of hikers per hour seen by respondents on the day of the study (referred to as “existing conditions”). Where appropriate, visitors were allowed the options to indicate that they would continue to hike the trails on Peddocks Island regardless of the number of other hikers seen, or that the number of hikers on Peddocks Island should not be restricted. Findings for these questions are shown in Tables 3.2.217, 3.2.218, 3.2.219. 3.2.220. 3.2.221 and summarized in Table 3.2.222.

Respondents reported that 1) an average (mean) of 26.3 (median of 18.5) was the maximum acceptable number of hikers per hour 2) they prefer to see an average (mean) of 15.6 (median of 7.0) hikers per hour, 3) they would be displaced by an average (mean) of 27.3 (median of 25.0) hikers per hour, 4) no more than an average (mean) of 24.1 or (median of 20.0) hikers per hour should be allowed, and 5) they typically saw an average (mean) of 4.6 (median of 2.5) hikers per hour. The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to hike the trails regardless of the number of other hikers seen or that the number of hikers on Peddocks Island should not be restricted.

Table 3.2.217: Acceptability (Number of hikers per hour)

	Frequency	Percent
0-10	28	37.8
11-20	19	25.7
21-30	10	13.5
31-40	2	2.7
41-50	8	10.8
51-60	1	1.4
61 or more	6	8.2

N = 74; Mean = 26.3; Median = 18.5

Table 3.2.218: Preference (Number of hikers per hour)

	Frequency	Percent
0-10	51	67.1
11-20	7	9.2
21-30	9	11.8
31-40	1	1.3
41-50	5	6.6
51-60	1	1.3
61 or more	2	2.6

N = 76; Mean = 15.6; Median = 7.0

Table 3.2.219: Displacement (Number of hikers per hour)

	Frequency	Percent
0-10	14	20.3
11-20	10	14.5
21-30	8	11.5
31-40	5	7.2
41-50	12	17.4
51-60	1	1.4
I would continue to hike the trails regardless of the number of other hikers seen	19	27.5

N = 69; Mean = 27.3; Median = 25.0

Table 3.2.220: Management action (Number of hikers per hour)

	Frequency	Percent
0-10	12	16.9
11-20	11	15.5
21-30	8	11.3
31-40	2	2.8
41-50	5	7.0
51-60	2	2.4
The number of hikers on Peddocks Island should not be restricted	31	43.7

N = 71; Mean = 24.1; Median = 20.0

Table 3.2.221: Existing conditions (Number of hikers per hour)

	Frequency	Percent
0-10	65	92.9
11-20	4	5.7
21-30	1	1.4

N = 70; Mean = 4.6; Median = 2.5

Table 3.2.222: Summary (Number of hikers per hour)

	N	Mean	Median
Acceptability	74	26.3	18.5
Preference	57	15.6	7.0
Displacement	50	27.3	25.0
Management action	40	24.1	20.0
Existing conditions	70	4.6	2.5

The next set of questions presented visitors with a series of five photographs depicting a range of environmental impacts to soil and vegetation on hiking trails on Peddocks Island. Study photographs are shown in Appendix C. Respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.223 and Figure 3.23. Figure 3.23 represents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that fewer impacts to the trails are more acceptable than greater impacts and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 4.4. This value is referred to as “acceptability (long form).”

Table 3.2.223: Acceptability for trail impacts on Peddocks Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	75	1.3	0	1.3	1.3	2.7	2.7	5.3	8.0	77.3	3.8
Photo 2	75	1.3	0	0	2.7	2.7	10.7	16.0	30.7	36.0	2.7
Photo 3	74	1.4	0	6.8	4.1	9.5	12.2	24.3	21.6	20.3	1.8
Photo 4	75	8.0	12.0	5.3	16.0	1.3	14.7	18.7	13.3	10.7	0.4
Photo 5	75	26.7	4.0	16.0	2.7	9.3	10.7	12.0	8.0	10.7	-0.5

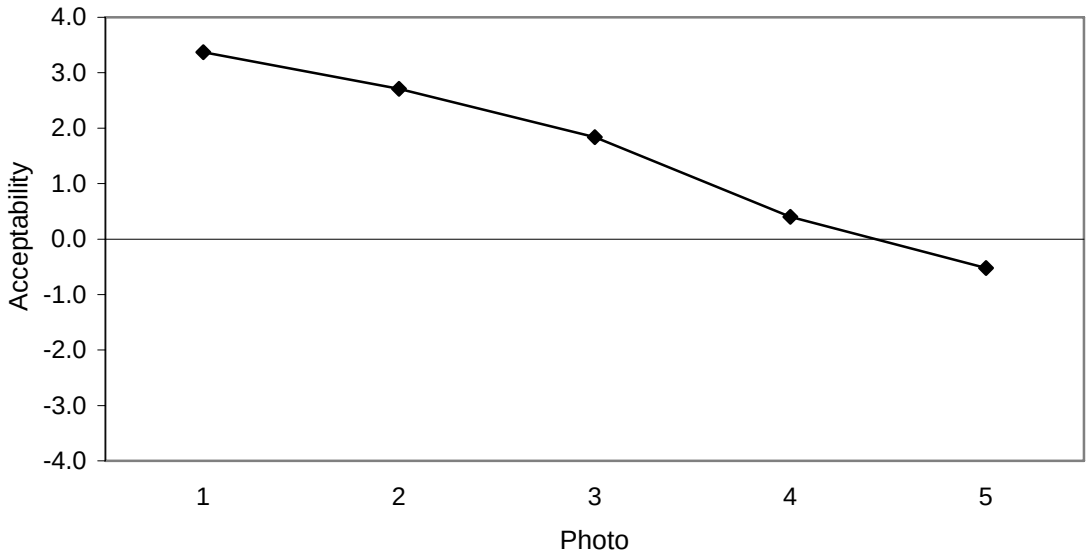

Figure 3.23: Norm curve for trail impacts on Peddocks Island

Respondents were also asked to indicate the photograph that depicts the 1) highest level of environmental impact that is acceptable (referred to as “acceptability (short form)”), 2) amount of environmental impact preferred (referred to as “preference”), 3) amount of environmental impact that is so unacceptable that respondents would no longer hike on the trails on Peddocks Island (referred to as “ displacement”), 4) highest level of environmental impact that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of environmental impact typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to hike the trails on Peddocks Island regardless of environmental impacts on the trails, or that none of the photographs show a high enough level of environmental impact to restrict people from hiking on Peddocks Island. Findings for these questions are shown in

Tables 3.2.224, 3.2.225, 3.2.226, 3.2.227, 3.2. 228 and summarized in Table 3.2.229.

Respondents reported that 1) acceptable environmental impacts were represented by an average (mean) photograph number of 2.9 (or a median photograph number of 3.0), 2) they prefer to see environmental impacts represented by an average (mean) photograph number of 2.1 (or a median photograph number of 2.0), 3) they would be displaced by environmental impacts represented by an average (mean) photograph number of 4.4 (or a median photograph number of 4.5), 4) no more environmental impacts than represented by an average (mean) photograph number of 3.1 (or a median photograph number of 3.0) should be allowed and 5) they typically saw environmental impacts represented by an average (mean) photograph number of 2.6 (or a median photograph number of 2.0). The displacement and management action values are slightly underestimated as some respondents reported that either they would continue to hike the trails regardless of environmental impacts on the trails or that none of the photographs show a high enough level of environmental impact to restrict people from hiking on Peddocks Island.

Table 3.2.224: Acceptability (Trail impacts)

Photo	Frequency	Percent
1	5	6.5
2	15	19.5
3	22	28.6
4	6	7.8
5	7	9.1
All the photographs are acceptable	22	28.6

N = 77; Mean = 2.9; Median = 3.0

Table 3.2.225: Preference (Trail impacts)

Photo	Frequency	Percent
1	30	39.0
2	22	28.6
3	19	24.7
4	1	1.3
5	5	6.5

N = 77; Mean = 2.1; Median = 2.0

Table 3.2.226: Displacement (Trail impacts)

Photo	Frequency	Percent
1	0	1.0
2	1	1.3
3	1	1.3
4	11	14.5
5	13	17.1
None of the photographs are so unacceptable	50	65.8

N = 76; Mean = 4.4; Median = 4.5

Table 3.2.227: Management action (Trail impacts)

Photo	Frequency	Percent
1	3	4.1
2	5	6.8
3	21	28.4
4	6	8.1
5	4	5.4
People should not be restricted at any point in photos	21	28.4
People should not be restricted	14	18.9

N = 74; Mean = 3.1; Median = 3.0

Table 3.2.228: Existing conditions (Trail impacts)

Photo	Frequency	Percent
1	18	29.1
2	17	27.4
3	8	12.9
4	11	17.7
5	8	12.9

N = 62; Mean = 2.6; Median = 2.0

Table 3.2.229: Summary (Trail impacts)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		4.4	
Acceptability (short form)	55	2.9	3.0
Preference	77	2.1	2.0
Displacement	26	4.4	4.5
Management action	39	2.9	3.0
Existing conditions	62	2.6	2.0

The next set of questions focused on environmental impacts at campsites on Peddocks Island. Respondents were asked if they had camped on Peddocks Island during the time of the study. Most respondents (75.0%) were day use visitors (Table 3.2.230).

Table 3.2.230: Camp on Peddocks Island

	Frequency	Percent
Yes	25	25.0
No	75	75.0

N = 100

Those who had camped on Peddocks Island were presented a series of photographs depicting environmental impacts to soil and vegetation at campsites. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.231 and Figure 3.24. Figure 3.24 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that fewer impacts to the campsites are more acceptable than larger impacts and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.6. This value is referred to as “acceptability (long form).”

Table 3.2.231 Acceptability for campsite impacts on Peddocks Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	29	0	0	0	0	6.9	0	6.9	10.3	75.9	3.5
Photo 2	28	3.6	0	0	0	3.6	7.1	21.4	50.0	14.3	2.4
Photo 3	26	3.8	0	7.7	11.5	7.7	19.2	26.9	19.2	3.8	1.0
Photo 4	28	10.7	17.9	7.1	14.3	7.1	28.6	10.7	3.6	0	-0.6
Photo 5	28	25.0	14.3	21.4	10.7	17.9	7.1	0	3.6	0	-1.8

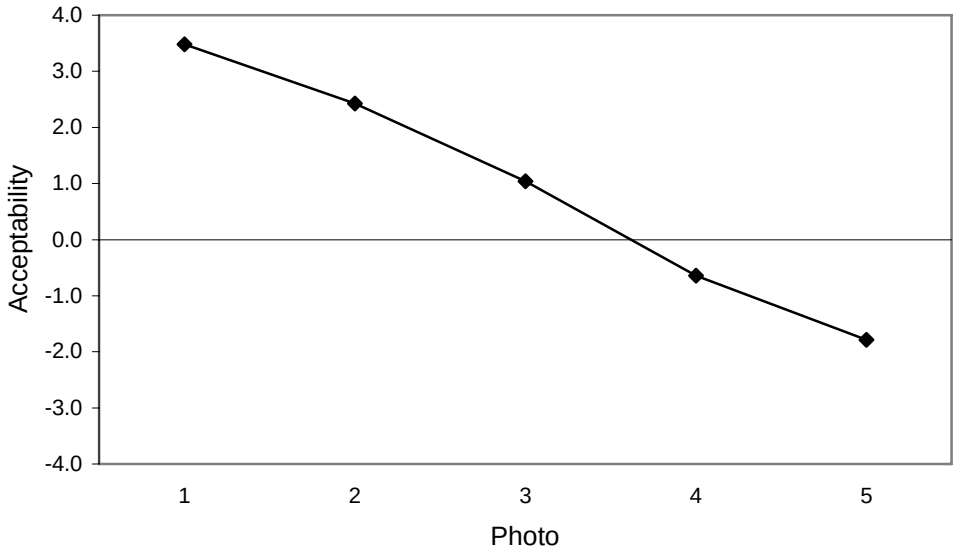

Figure 3.24: Norm curve for campsite impacts on Peddocks Island

Respondents were also asked to indicate the photograph that depicts the 1) highest level of environmental impact that is acceptable (referred to as “acceptability (short form)”), 2) amount of environmental impact preferred (referred to as “preference”), 3) amount of environmental impact that is so unacceptable that respondents would no longer camp on Peddocks Island (referred to as “displacement”), 4) highest level of environmental impact that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of environmental impact typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to camp on Peddocks Island regardless of environmental impacts at campsites, or that none of the photographs show a high enough level of environmental impact at campsites to restrict people from camping on Peddocks Island. Findings for these questions are shown in Tables 3.2.232, 3.2.233, 3.2.234, 3.2.235, 3.2.236 and summarized in Table 3.2.237.

Respondents reported that 1) acceptable environmental impacts were represented by an average (mean) photograph number of 2.5 (or a median

photograph number of 2.0), 2) they prefer to see environmental impacts represented by an average (mean) photograph number of 1.7 (or a median photograph number of 2.0), 3) they would be displaced by environmental impacts represented by an average (mean) photograph number of 4.4 (or a median photograph number of 5.0), 4) no more environmental impacts than represented by an average (mean) photograph number of 2.9 (or a median photograph number of 3.0) should be allowed, and 5) they typically saw environmental impacts represented by an average (mean) photograph number of 1.8 (or a median photograph number of 2.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to camp regardless of environmental impacts on the campsites or that none of the photographs show a high enough level of environmental impact to restrict people from camping on Peddocks Island.

Table 3.2.232: Acceptability (Campsite impacts)

Photo	Frequency	Percent
1	5	16.7
2	10	33
3	9	30.0
4	3	10.0
5	1	.3.3
All the photographs are acceptable	2	6.7

N = 30; Mean = 2.5; Median = 2.0

Table 3.2.233: Preference (Campsite impacts)

Photo	Frequency	Percent
1	15	48.4
2	11	35.5
3	5	16.1
4	0	0
5	0	0

N = 31; Mean = 1.7; Median = 2.0

Table 3.2.234: Displacement (Campsite impacts)

Photo	Frequency	Percent
1	0	0
2	3	10.3
3	0	0
4	3	10.3
5	11	37.9
None of the photographs are so unacceptable	12	41.4

N = 29; Mean = 4.4; Median = 5.0

Table 3.2.235: Management action (Campsite impacts)

Photo	Frequency	Percent
1	5	16.1
2	4	12.9
3	7	22.6
4	6	19.4
5	3	9.7
People should not be restricted at any point in photos	5	16.1
People should not be restricted	1	3.2

N = 31; Mean = 2.9; Median = 3.0

Table 3.2.236: Existing conditions (Campsite impacts)

Photo	Frequency	Percent
1	15	44.1
2	15	44.1
3	1	2.9
4	3	8.8
5	0	0

N = 34; Mean = 1.8; Median = 2.0

Table 3.2.237: Summary (Campsite impacts)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		3.6	
Acceptability (short form)	28	2.5	2.0
Preference	31	1.7	2.0
Displacement	17	4.4	5.0
Management action	25	2.9	3.0
Existing conditions	34	1.8	2.0

A next set of questions addressed the issue of litter on Peddocks Island. Respondents were presented a series of photographs depicting increasing amounts of litter. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.238 and Figure 3.25. Figure 3.25 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of the photographs fall out of the

acceptable range and into the unacceptable range at approximately photograph 1.6. This value is referred to as “acceptability (long form).”

Table 3.2.238: Acceptability for litter on Peddocks Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	99	1.0	0	1.0	0	1.0	1.0	2.0	2.0	91.9	3.7
Photo 2	99	49.5	10.1	12.1	12.1	2.0	6.1	7.1	1.0	0	-2.4
Photo 3	98	76.5	7.1	8.2	1.0	4.1	1.0	2.0	0	0	-3.4
Photo 4	99	85.9	11.1	1.0	0	0	1.0	1.0	0	0	-3.8
Photo 5	99	98.0	0	0	1.0	0	0	1.0	0	0	-3.9

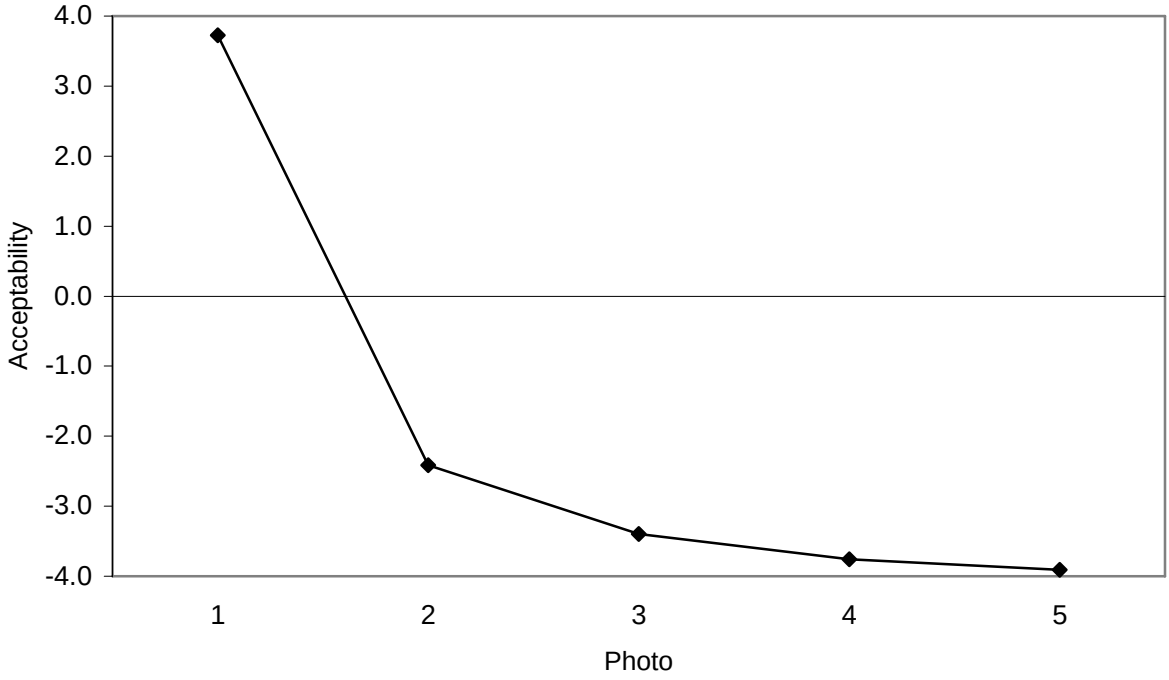

Figure 3.25: Norm curve for litter on Peddocks Island

Respondents were also asked to indicate the photograph that depicts the 1) highest amount of litter that is acceptable (referred to as “acceptability (short form)”), 2) amount of litter preferred (referred to as “preference”), 3) amount of litter that is so unacceptable that respondents would no longer visit Peddocks Island (referred to as “displacement”), 4) highest amount of litter that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of litter typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Peddocks Island regardless of litter, or that none of the photographs show a high enough amount of litter to restrict people from visiting Peddocks Island.

Findings for these questions are shown in Tables 3.2.239, 3.2.240, 3.2.241, 3.2.242, 3.2.243 and summarized in Table 3.2.244.

Respondents reported that 1) acceptable amount of litter were represented by an average (mean) photograph number of 1.3 (or a median photograph number of 1.0), 2) they prefer to see no litter as represented by an average (mean) photograph number of 1.1 (or a median photograph number of 1.0), 3) they would be displaced by amounts of litter represented by a mean photograph number of 2.9 (or a median photograph number of 3.0), 4) no more litter than represented by an average (mean) photograph number of 1.6 (or a median photograph number of 1.0) should be allowed, and 5) they typically saw litter represented by an average (mean) photograph number of 1.2 (or a median photograph number of 1.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of amounts of litter on Peddocks Island, or that none of the photographs show a high enough level of litter to restrict people from visiting Peddocks Island.

Table 3.2.239: Acceptability (Litter)

Photo	Frequency	Percent
1	80	78.4
2	17	16.7
3	3	2.9
4	2	2.0
5	0	0
All of the photographs are acceptable	0	0

N = 102; Mean = 1.3; Median = 1.0

Table 3.2.240: Preference (Litter)

Photo	Frequency	Percent
1	97	96.0
2	1	1.0
3	0	0
4	1	1.0
5	2	2.0

N = 101; Mean = 1.1; Median = 1.0

Table 3.2.241: Displacement (Litter)

Photo	Frequency	Percent
1	1	1.0
2	47	46.5
3	27	26.7
4	8	7.9
5	14	13.9
None of the photographs are so unacceptable	4	4.0

N = 101; Mean = 2.9; Median = 3.0

Table 3.2.242: Management action (Litter)

Photo	Frequency	Percent
1	54	54.5
2	21	21.2
3	14	14.1
4	0	0
5	2	2.0
People should not be restricted at any point in photos	2	2.0
People should not be restricted	6	6.1

N = 99; Mean = 1.6; Median = 1.0

Table 3.2.243: Existing conditions (Litter)

Photo	Frequency	Percent
1	80	82.5
2	14	14.4
3	2	2.1
4	0	0
5	1	1.1

N = 97; Mean = 1.2; Median = 1.0

Table 3.2.244: Summary (Litter)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		1.6	
Acceptability (short form)	102	1.3	1.0
Preference	101	1.1	1.0
Displacement	97	2.9	3.0
Management action	91	1.6	1.0
Existing conditions	97	1.2	1.0

A next set of questions addressed the issue of graffiti on Peddocks Island. Respondents were presented a series of photographs depicting increasing amounts of graffiti. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 ("very unacceptable") to +4 ("very acceptable"). Findings are shown in Table 3.2.245 and Figure 3.26. Figure 3.26 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that even small amounts of graffiti are evaluated as unacceptable and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 2.2. This value is referred to as "acceptability (long form)."

Table 3.2.245: Acceptability for graffiti on Peddocks Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	98	1.0	2.0	0	1.0	0	8.2	1.0	4.1	82.7	3.4
Photo 2	97	17.5	2.1	3.1	7.2	11.3	13.4	13.4	22.7	9.3	0.6
Photo 3	95	37.9	5.3	15.8	8.4	7.4	11.6	11.6	2.1	0	-1.7
Photo 4	96	45.8	20.8	9.4	5.2	6.3	9.4	2.1	1.0	0	-2.5
Photo 5	97	71.1	9.3	2.1	4.1	7.2	4.1	1.0	1.0	0	-3.1

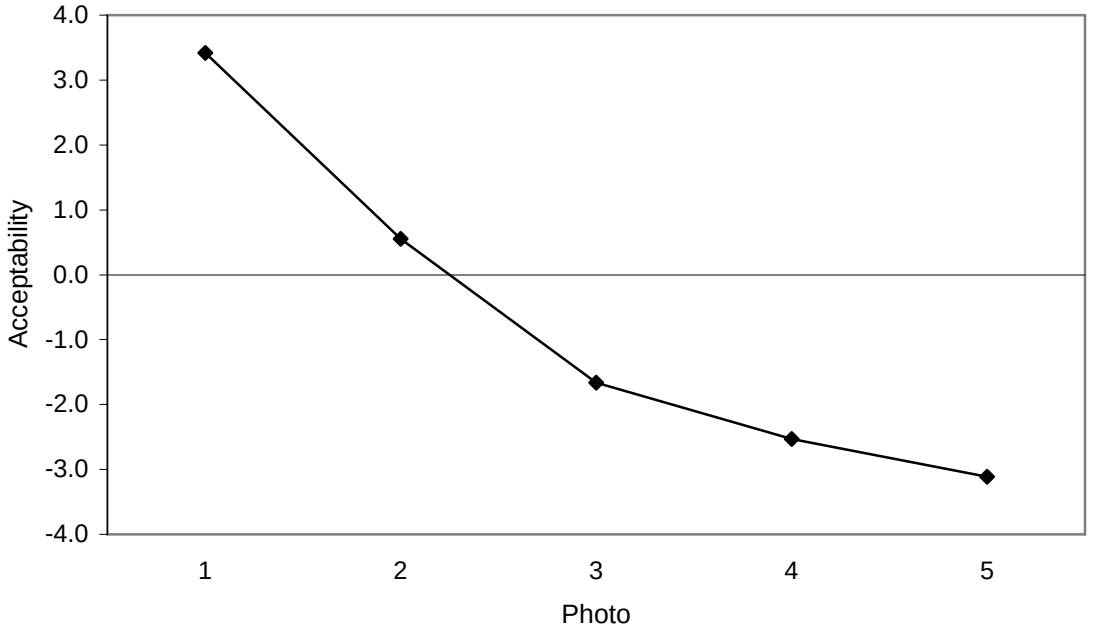

Figure 3.26: Norm curve for graffiti on Peddocks Island

Respondents were also asked to indicate the photograph that depicts the 1) highest amount of graffiti that is acceptable (referred to as "acceptability (short

form)”), 2) amount of graffiti preferred (referred to as “preference”), 3) amount of graffiti that is so unacceptable that respondents would no longer visit Peddocks Island (referred to as “displacement”), 4) highest amount of graffiti that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of graffiti typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Peddocks Island regardless of graffiti, or that none of the photographs show a high enough amount of graffiti to restrict people from visiting Peddocks Island. Findings for these questions are shown in Tables 3.2.246, 3.2.247, 3.2.248, 3.2.249, 3.2.250 and summarized in Table 3.2.251.

Respondents reported that 1) acceptable amount of graffiti were represented by an average (mean) photograph number of 1.5 (or a median photograph number of 1.0), 2) they prefer to see no graffiti as represented by an average (mean) photograph number of 1.1 (or a median photograph number of 1.0), 3) they would be displaced by amounts of graffiti represented by a mean photograph number of 3.7 (or a median photograph number of 4.0), 4) no more graffiti than represented by an average (mean) photograph number of 2.0 (or a median photograph number of 1.0) should be allowed, and 5) they typically saw graffiti represented by an average (mean) photograph number of 1.6 (or a median photograph number of 1.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of amounts of graffiti on Peddocks Island, or that none of the photographs show a high enough level of graffiti to restrict people from visiting Peddocks Island.

Table 3.2.246: Acceptability (Graffiti)

Photo	Frequency	Percent
1	38	39.2
2	41	42.3
3	14	14.4
4	0	0
5	2	2.1
All of the photographs are acceptable	2	2.1

N = 97; Mean = 1.8; Median = 2.0

Table 3.2.247: Preference (Graffiti)

Photo	Frequency	Percent
1	89	93.7
2	5	5.3
3	1	1.1
4	0	0
5	0	0

N = 95; Mean = 1.1; Median = 1.0

Table 3.2.248: Displacement (Graffiti)

Photo	Frequency	Percent
1	4	4.2
2	10	10.4
3	17	17.7
4	16	16.7
5	16	16.7
None of the photographs are so unacceptable	33	34.4

N = 96; Mean = 3.5; Median = 4.0

Table 3.2.249: Management action (Graffiti)

Photo	Frequency	Percent
1	36	36.6
2	24	24.2
3	14	14.1
4	4	4.0
5	2	2.0
People should not be restricted at any point in photos	9	9.1
People should not be restricted	10	10.1

N = 99; Mean = 1.9; Median = 2.0

Table 3.2.250: Existing conditions (Graffiti)

Photo	Frequency	Percent
1	52	54.7
2	36	37.9
3	7	7.4
4	0	0
5	0	0

N = 95; Mean = 1.5; Median = 1.0

Table 3.2.251: Summary (Graffiti)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		2.2	
Acceptability (short form)	95	1.5	1.0
Preference	95	1.1	1.0
Displacement	63	3.7	4.0
Management action	80	2.0	1.0
Existing conditions	95	1.6	1.0

To measure visitor evaluations of the ferry service provided to Georges Island from Boston (Long Wharf), respondents were given a question containing a range of ferry frequencies from “every 15 minutes” to “every 2 hours” with 15 minute time intervals. Respondents were asked to rate each of these intervals on a scale of –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are presented in Table 3.2.252 and Figure 3.27. Figure 3.27 presents the norm curve associated with the mean acceptability rating for each time interval. Respondents rated a range of ferry intervals of 18 minutes to 1 hr 26 minutes as acceptable, with a one hour interval as most acceptable.

Table 3.2.252: Acceptability for ferry service

Ferry service frequency	N	-4	-3	-2	-1	0	1	2	3	4	Mean
15 mins	84	32.1	8.3	3.6	3.6	8.3	3.6	8.3	3.6	28.6	-0.2
30 mins	87	17.2	11.5	3.4	5.7	6.9	3.4	6.9	8.0	36.8	0.7
45 mins	85	11.8	4.7	7.1	2.4	8.2	5.9	15.3	27.1	17.6	1.1
1 hr	89	4.5	6.7	2.2	6.7	3.4	11.2	12.4	18.0	34.8	1.8
1 hr 15 mins	82	13.4	9.8	2.4	6.1	13.4	15.9	13.4	15.9	9.8	0.4
1 hr 30 mins	83	18.1	6.0	10.8	9.6	13.3	8.4	14.5	6.0	13.3	-0.1
1 hr 45 mins	84	29.8	10.7	9.5	11.9	2.4	13.1	9.5	7.1	6.0	-1.1
2 hrs	87	39.1	8.0	6.9	9.2	9.2	8.0	6.9	3.4	9.2	-1.3

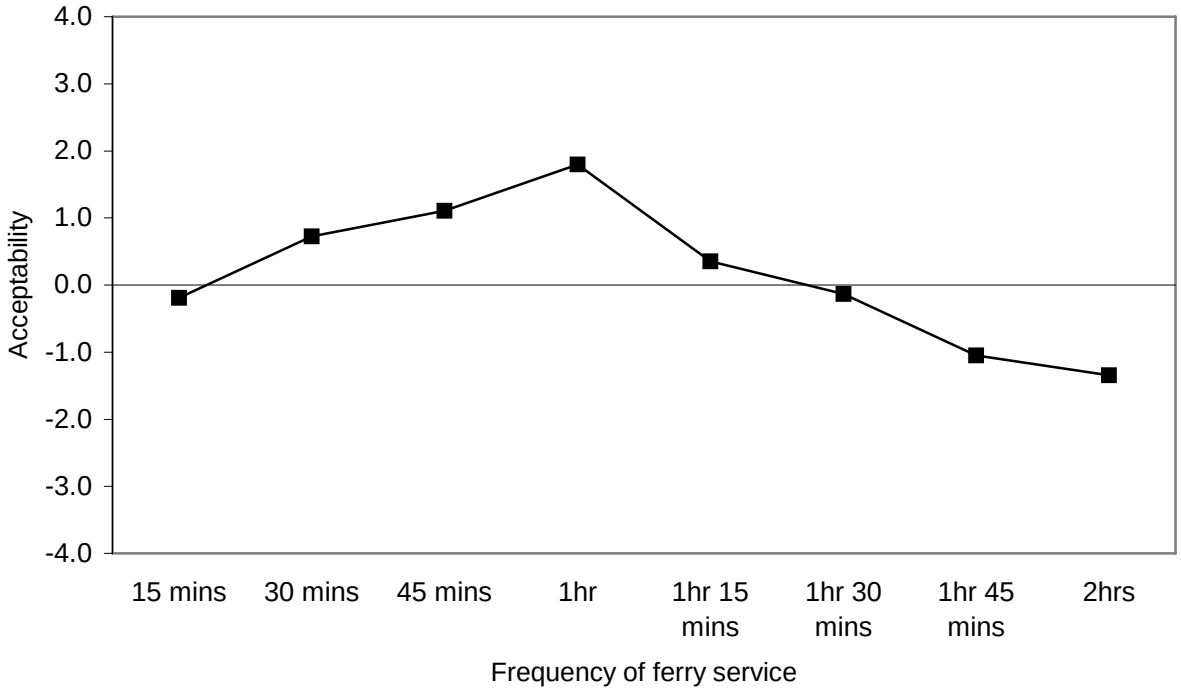

Figure 3.27: Norm curve for ferry service to Georges Island

Similarly, visitors were asked to evaluate the water shuttle service from Georges Island to other islands. Respondents were presented a question containing a range of water shuttle frequencies from “every 15 minutes” to “every 2 hours” with 15 minute time intervals. Respondents were asked to rate each of these time intervals on a scale of –4 (“very unacceptable”) to +4 (“very acceptable”). Study findings are shown in Table 3.2.253 and Figure 3.28. Figure 3.28 presents the norm curve associated with the mean acceptability rating for each time interval. Respondents rated a range of water shuttle intervals of 15 minutes to 1 hr 27 minutes as acceptable, with an interval of one hour as most acceptable.

Table 3.2.253: Acceptability for water shuttle service

Water shuttle service frequency	N	-4	-3	-2	-1	0	1	2	3	4	Mean
15 mins	85	30.6	5.9	4.7	1.2	11.8	5.9	4.7	7.1	28.2	0
30 mins	89	16.9	10.1	5.6	1.1	9.0	1.1	10.1	10.1	36.0	0.9
45 mins	85	11.8	2.4	3.5	7.1	9.4	8.2	7.1	27.1	23.5	1.3
1 hr	90	3.3	2.2	3.3	5.6	11.1	13.3	11.1	11.1	38.9	1.9
1 hr 15 mins	83	9.6	7.2	7.2	7.2	10.8	12.0	14.5	22.9	8.4	0.6
1 hr 30 mins	86	17.4	5.8	12.8	7.0	12.8	12.8	11.6	10.5	9.3	-0.2
1 hr 45 mins	82	26.8	13.4	11.0	8.5	6.1	14.6	11.0	6.1	2.4	-1.1
2 hrs	86	36.0	12.8	8.1	7.0	8.1	11.6	4.7	4.7	7.0	-1.4

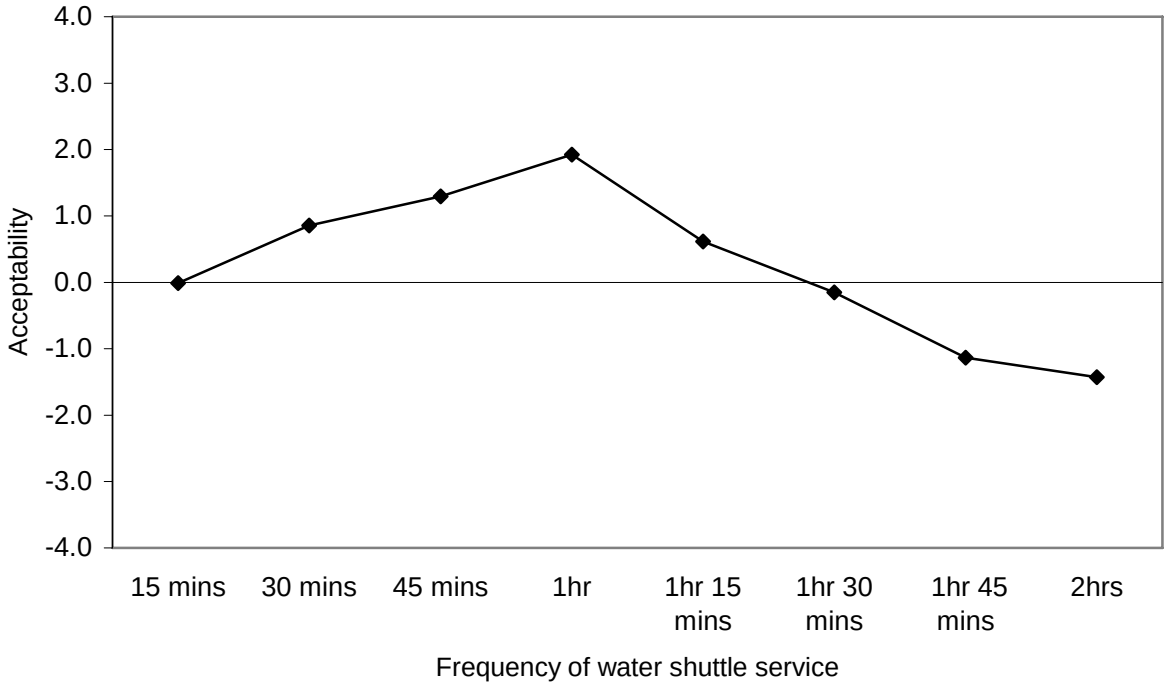

Figure 3.28: Norm curve for water shuttle service to Peddocks Island

The next set of questions focused on information provided to visitors to Boston Harbor Islands National Park Area. Respondents were asked to evaluate the amount and quality of information related to visitor opportunities and activities; ferry schedules and other means of access; the natural history of Boston Harbor Islands; and the human history of Boston Harbor Islands. Evaluation of amount of information was measured on a scale of 1 (“adequate”) and 2 (“inadequate”). Evaluation of quality of information was measured on a scale of 1 (“excellent”) to 5 (“very poor”). Findings are presented in Tables 3.2.254 through 3.2.257. The vast majority of respondents (75.8%) reported that the amount of information on visitor opportunities and activities at Boston Harbor Islands was adequate (mean = 1.2) and that the quality of the same (71.0%) was good to excellent (mean = 2.1) (Table 3.2.285).

Table 3.2.254: Information on visitor opportunities and activities at Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	69	75.8
Inadequate (2)	22	24.1
Mean	1.2	
Quality of Information		
Excellent (1)	29	31.2
Good (2)	37	39.8
Fair (3)	19	20.4
Poor (4)	6	6.5
Very Poor (5)	2	2.2
Mean	2.1	

The vast majority of visitors (79.1%) reported that the amount of information on ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of the same (66.4%) was good to excellent (mean = 2.1) (Table 3.2.286).

Table 3.2.255: Information on ferry schedules and other means of access to Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	72	79.1
Inadequate (2)	19	20.9
Mean	1.2	
Quality of Information		
Excellent (1)	27	29.4
Good (2)	34	37.0
Fair (3)	23	25.0
Poor (4)	7	7.6
Very Poor (5)	1	1.1
Mean	2.1	

Findings regarding visitor evaluations of information on the natural history of Boston Harbor Islands are presented in Table 3.2.287. The vast majority of visitors (73.3%) reported the amount of information was adequate (mean = 1.3), and the quality of information (62.3%) was good to excellent (mean = 2.3).

Table 3.2.256: Information on the natural history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	66	73.3
Inadequate (2)	24	26.7
Mean	1.3	
Quality of Information		
Excellent (1)	23	24.7
Good (2)	35	37.6
Fair (3)	23	24.7
Poor (4)	11	11.8
Very Poor (5)	1	1.1
Mean	2.3	

Findings regarding visitor evaluations of information on the human history of Boston Harbor Islands are presented in Table 3.2.288. The vast majority of visitors (72.2%) reported the amount of information was adequate (mean = 1.3), and the quality of information (62.4%) was good to excellent (mean = 2.3).

Table 3.2.257: Information on the human history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	65	72.2
Inadequate (2)	25	27.8
Mean	1.3	
Quality of Information		
Excellent (1)	26	28.0
Good (2)	32	34.4
Fair (3)	22	23.7
Poor (4)	11	11.8
Very Poor (5)	2	2.2
Mean	2.3	

Summary

Visitors to Peddocks Island can generally be described by the following characteristics:

- Most visitors (77.2%) come to Peddocks Island in groups of 1 to 4.
- A majority of visitors (72.8%) come in groups comprised of family and/or friends.
- About two-thirds of visitors to Peddocks Island had visited Boston Harbor Islands National Park Area before.
- About one-fourths of visitors (25.5%) had visited Peddocks Island before.
- Three fourths of visitors (74.0%) were from Massachusetts.
- There were about equal female (49.0%) and male (51.0 %) respondents.
- The average (mean) age of visitors was 40 years.
- Visitors tended to be highly educated with about 92.9% of visitors reporting at least some college education or higher.
- A majority of visitors (68.0%) reported being employed.
- A majority of visitors (90.8%) reported being not being Hispanic or Latino. Also, the vast majority of visitors (86.5%) were white.

Study findings show that the following range of standards for indicator variables:

- Visitors indicated that they preferred seeing an average (median) of 7 hikers per hour and they would no longer visit Peddocks Island if they saw an average (median) of 25 hikers per hour. Standards for other dimensions of visitor evaluation of number of hikers per hour lay between this range.
- Findings indicate that fewer environmental impacts to the trails are more acceptable than greater impacts and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 4.4.
- Findings indicate that fewer environmental impacts to the campsites are more acceptable than greater impacts and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 3.6.
- Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.6.
- Findings indicate that even small amounts of graffiti are evaluated as unacceptable and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 2.2.
- When asked to evaluate the ferry service from Boston (Long Wharf) to Georges Island, respondents rated a range of ferry intervals of 18

minutes to 1 hour 26 minutes as acceptable, with a one hour interval as most acceptable.

- When asked to evaluate the water shuttle service from Georges Island to other Islands, respondents rated a range of water shuttle intervals of 15 minutes to 1 hour 27 minutes or less as acceptable, with an interval of one hour as most acceptable.
- The vast majority of visitors (75.8%) reported that the amount of information of visitor opportunities and activities at Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of the same (71.0%) was good to excellent (mean = 2.1).
- The vast majority of visitors (79.1%) reported that the amount of information of ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of the same (66.4%) was good to excellent (mean = 2.1).
- The vast majority of visitors (73.3%) reported that the amount of information on the natural history of Boston Harbor Islands National Park Area was adequate (mean = 1.3) and that the quality of information (62.3%) was good to excellent (mean = 2.3).
- The vast majority of visitors (72.2%) reported that the amount of information on the human history of Boston Harbor Islands National Park Area was adequate (mean = 1.3) and that the quality of information (62.4%) was good to excellent (mean = 2.3).

Worlds End: Use and Users

Respondents were asked several descriptive questions pertaining to their use of Boston Harbor Islands National Recreation Area. The first question asked respondents to report the number of people in their group. Table 3.2.258 indicates the frequency distribution of group size. Most visitors (77.3%) come to Worlds End in groups of 1 to 2. Average (mean) group size of visitors to Worlds End was 2.3 people and median group size was 2.0 people. The next question asked respondents to report the composition of their group. Results are shown in Table 3.2.259. The majority of visitors (91%) come in groups comprised of family (56.6%), friends (13.2%) or alone (21.2%). Respondents were also given the opportunity to indicate an "other" type of group. "Other" types of groups included "a couple" and "platonic ex-lovers" (Table 3.2.260).

Table 3.2.258: Group size

	Frequency	Percent
1	25	24.8
2	53	52.5
3	7	6.9
4	10	9.9
5	2	2.0
6	2	2.0
7	0	0
8	0	0
9	0	0
10 or more	2	2.0

N = 101; Mean = 2.3; Median = 2.0

Table 3.2.259: Group composition

	Frequency	Percent
Family	56	56.6
Friends	13	13.2
Family and friends	4	4.0
Organized group	3	3.0
Alone	21	21.2
Other	2	2.0

N = 99

Table 3.2.260: Other group type

	Frequency	Percent
Couple	1	50.0
Platonic ex-lovers	1	50.0

N = 2

Next, respondents were asked if they had been to any of the areas within Boston Harbor Islands National Park Area before. Results are shown in Table 3.2.261 and indicate that most visitors (81.2%) have visited Boston Harbor Islands National Park Area prior to their current visit. Respondents were also asked if they had been to Worlds End before. A little over three-fourths of visitors (77.2%) had visited Worlds End before (Table 3.2.262).

Table 3.2.261: Prior visits to any of the areas within Boston Harbor Islands National Park Area

	Frequency	Percent
Yes	82	81.2
No	17	16.8
Not sure	2	2.0

N = 101

Table 3.2.262: Prior visits to Worlds End

	Frequency	Percent
Yes	78	77.2
No	23	22.8
Not sure	0	0

N = 101

The next set of questions focused on visitor demographics and selected socio-economic characteristics. Visitors were asked where they lived (Table 3.2.263). Most respondents (91.8%) were from Massachusetts.

Table 3.2.263: Residence

	Frequency	Percent
Massachusetts	90	91.8
Other State	8	8.2
Other Country	0	0

N = 98

Details regarding city or town of residence in Massachusetts, and state of residence for non-Massachusetts visitors are presented in Tables 3.2.264 and

3.2.265. About a tenth of Massachusetts visitors (10.5%) were from Boston. Six other states were represented among the sample.

Table 3.2.264: Town in Massachusetts

	Frequency	Percent
Weymouth	3	3.5
Quincy	3	3.5
Somerville	1	1.2
Cohasset	3	3.5
Boston	9	10.5
Scituate	2	2.3
Framingham	1	1.2
Newton	3	3.5
Dorchester	1	1.2
Cambridge	2	2.3
Hull	2	2.3
Middleborough	1	1.2
Whitman	1	1.2
Braintree	2	2.3
Marshfield	1	1.2
Hannover	1	1.2
Hingham	27	31.4
Bedford	1	1.2
Plymouth	1	1.2
Norwell	2	2.3
South Boston	1	1.2
Wellesley	1	1.2
Milton	5	5.8
Brighton	1	1.2
Lowell	1	1.2
Cohasset	3	3.5
Easton	1	1.2
Bridgewater	1	1.2
Lunenburg	2	2.3
East Bridgewater	1	1.2
Rockland	1	1.2
Falmouth	1	1.2

N=101

Table 3.2.265: Other state of residence

	Frequency	Percent
Minnesota	1	12.5
New Hampshire	1	12.5
New Jersey	1	12.5
New York	3	37.5
North Carolina	1	12.5
Rhode Island	1	12.5

N = 8

Next, respondents were asked to indicate whether they were male or female. There were slightly more female (56.6%) than male (43.4%) respondents (Table 3.2.266). Respondents were also asked to record the year in which they were born. Visitors reported a mean age of 46 years and median age of 45 years. A subsequent question addressed respondents' educational background. Overall, visitors to Worlds End tend to be well educated with 94.9% having at least some college education or higher. A majority of respondents (71.1%) reported being employed. Finally, respondents were asked to indicate their ethnicity and race. All respondents (100%) reported being not Hispanic or Latino. Also, the vast majority of respondents (91.3%) were white.

Table 3.2.266: Demographic profile

	Frequency	Percent
Gender (N = 99)		
Female	56	56.6
Male	43	43.4
Respondent age (N = 123; Mean = 46; Median = 45)		
Under 20	2	2.1
20-29	29	8.3
30-39	8	28.1
40-49	27	19.8
50-59	19	24.0
60-69	23	14.6
70-79	14	2.1
80 and over	1	1.0

Table 3.2.266: Demographic profile (continued)

Education level in years (N = 98; Mean = 17.4; Median = 17.0)		
	Frequency	Percent
<12	2	2.0
13	3	3.1
14	3	3.1
15	5	5.1
16	3	3.1
17	27	27.6
18	11	11.2
19	10	10.2
20	10	10.2
21	2	2.0
Employment status (N = 97)		
Employed	69	71.1
Unemployed	1	1.0
Homemaker	8	8.3
Retired	9	9.3
Student	7	7.2
Other	3	3.1
Ethnicity (N = 79)		
Hispanic or Latino	0	0
Not Hispanic or Latino	79	100
Race (N = 89)		
American Indian or Alaska Native	0	0
Asian	2	2.2
Black or African American	0	0
Native Hawaiian or other Pacific Islander	0	0
White	84	91.3
Other	0	0
Do not wish to answer	3	3.3

Indicators and Standards of Quality

A major section of the survey questionnaire contained a series of questions used to measure indicator variables and determine standards of quality for visitor-use related issues. One set of questions concerned hiking on Worlds End. Respondents were asked if they had hiked on any of the trails on Worlds End. All visitors (100%) indicated that they had hiked the trails (Table 3.2.267).

Table 3.2.267: Hike on trails on Worlds End

	Frequency	Percent
Yes	101	100
No	0	0

N = 101

Respondents were then asked a series of questions about their standards of quality with respect to the number of hikers per hour on the trails on Worlds End. Respondents were asked to indicate the 1) maximum acceptable number of hikers per hour to see without the trails on Worlds End being too crowded (referred to as “acceptability”), 2) preferred number of hikers per hour on the trails (referred to as “preference”), 3) maximum number of hikers per hour before they would no longer hike the trails (referred to as “displacement”), 4) highest number of hikers per hour that should be allowed before visitor use is restricted (referred to as “management action”), and 5) number of hikers per hour seen by respondents on the day of the study (referred to as “existing conditions”). Where appropriate, visitors were allowed the options to indicate that they would continue to hike the trails on Worlds End regardless of the number of other hikers seen, or that the number of hikers on Worlds End should not be restricted. Findings for these questions are shown in Tables 3.2.268, 3.2.269, 3.2.270, 3.2.271, 3.2.272 and summarized in Table 3.2.273.

Respondents reported that 1) an average (mean) of 19.2 (median of 15.0) was the maximum acceptable number of hikers per hour 2) they prefer to see an average (mean) of 10.4 (median of 10.0) hikers per hour, 3) they would be displaced by an average (mean) of 32.9 (median of 27.5) hikers per hour, 4) no more than an average (mean) of 26.6 or (median of 24.5) hikers per hour should be allowed, and 5) they typically saw an average (mean) of 9.3 (median of 6.0) hikers per hour. The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to hike the trails regardless of the number of other hikers seen or that the number of hikers on Worlds End should not be restricted.

Table 3.2.268: Acceptability (Number of hikers per hour)

	Frequency	Percent
0-10	37	40.2
11-20	29	31.5
21-30	16	17.4
31-40	1	1.1
41-50	7	7.6
51 or more	2	2.2

N = 92; Mean = 19.2; Median = 15.0

Table 3.2.269: Preference (Number of hikers per hour)

	Frequency	Percent
0-10	71	78
11-20	10	11
21-30	7	7.7
31 or more	3	3.3

N = 91; Mean = 10.4; Median = 10.0

Table 3.2.270: Displacement (Number of hikers per hour)

	Frequency	Percent
0-10	6	6.9
11-20	17	19.5
21-30	9	10.3
31-40	1	1.1
41-50	14	16.1
51-60	1	1.1
61-70	4	4.6
I would continue to hike the trails regardless of the number of other hikers seen	35	40.2

N = 87; Mean = 32.9; Median = 27.5

Table 3.2.271: Management action (Number of hikers per hour)

	Frequency	Percent
0-10	11	12.5
11-20	6	6.8
21-30	10	11.4
31-40	0	0
41-50	7	8.0
51-60	1	1.1
61-70	0	0
71 or more	1	1.1
The number of hikers on Worlds End should not be restricted	52	59.1

N = 88; Mean = 26.6; Median = 24.5

Table 3.2.272: Existing conditions (Number of hikers per hour)

	Frequency	Percent
0-10	62	71.3
11-20	20	23.0
21-30	3	3.4
31-40	1	1.1
41 or more	1	1.1

N = 87; Mean = 9.3; Median = 6.0

Table 3.2.273: Summary (Number of hikers per hour)

	N	Mean	Median
Acceptability	92	19.2	15.0
Preference	91	10.4	10.0
Displacement	52	32.9	27.5
Management action	36	26.6	24.5
Existing conditions	87	9.3	6.0

The next set of questions presented visitors with a series of five photographs depicting a range of environmental impacts to soil and vegetation on hiking trails on Worlds End. Study photographs are shown in Appendix C. Respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.274 and Figure 3.29. Figure 3.29 represents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that fewer impacts to the trails are more acceptable than greater impacts and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 4.8. This value is referred to as “acceptability (long form).”

Table 3.2.274: Acceptability for trail impacts on Worlds End

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	93	1.1	0	1.1	0	2.2	0	4.3	6.5	84.9	3.6
Photo 2	91	2.2	1.1	1.1	0	1.1	6.6	17.6	36.3	34.1	2.7
Photo 3	92	1.1	1.1	2.2	3.3	15.2	7.6	29.3	15.2	25.0	2.0
Photo 4	92	5.4	0	15.2	10.9	12.0	13.0	10.9	13.0	19.6	0.9
Photo 5	91	11.0	17.6	15.4	5.5	7.7	12.1	5.5	6.6	18.7	-0.2

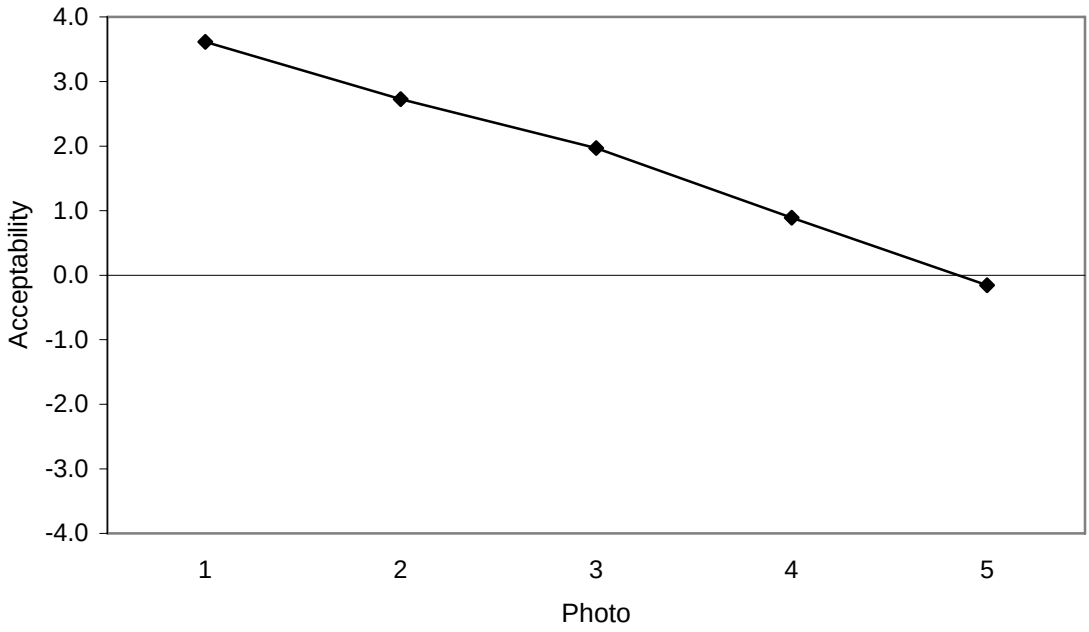

Figure 3.29: Norm curve for trail impacts at Worlds End

Respondents were also asked to indicate the photograph that depicts the 1) highest level of environmental impact that is acceptable (referred to as “acceptability (short form)”), 2) amount of environmental impact preferred (referred to as “preference”), 3) amount of environmental impact that is so unacceptable that respondents would no longer hike on the trails on Worlds End (referred to as “displacement”), 4) highest level of environmental impact that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of environmental impact typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to hike the trails on Worlds End regardless of environmental impacts on the trails, or that none of the photographs show a high enough level of environmental impact to restrict people from hiking on Worlds End. Findings for these questions are shown in Tables 3.2.275, 3.2.276, 3.2.277, 3.2.278, 3.2.279 and summarized in Table 3.2.280.

Respondents reported that 1) acceptable environmental impacts were represented by an average (mean) photograph number of 3.1 (or a median photograph number of 3.0), 2) they prefer to see environmental impacts represented by an average (mean) photograph number of 2.1 (or a median photograph number of 1.0), 3) they would be displaced by environmental impacts represented by an average (mean) photograph number of 4.1(or a median photograph number of 5.0), 4) no more environmental impacts than represented by an average (mean) photograph number of 3.3 (or a median photograph number of 3.0) should be allowed and 5) they typically saw environmental impacts represented by an average (mean) photograph number of 2.7 (or a median photograph number of 3.0). The displacement and management action values are slightly underestimated as some respondents reported that either they would continue to hike the trails regardless of environmental impacts on the trails or that none of the photographs show a high enough level of environmental impact to restrict people from hiking on Worlds End.

Table 3.2.275: Acceptability (Trail impacts)

Photo	Frequency	Percent
1	4	4.0
2	11	11.1
3	30	30.3
4	12	12.1
5	7	7.1
All the photographs are acceptable	35	35.4

N = 99; Mean = 3.1; Median = 3.0

Table 3.2.276: Preference (Trail impacts)

Photo	Frequency	Percent
1	48	52.8
2	12	13.2
3	14	15.4
4	11	12.1
5	6	6.6

N = 91; Mean = 2.1; Median =1.0

Table 3.2.277: Displacement (Trail impacts)

Photo	Frequency	Percent
1	3	3.1
2	1	1.1
3	4	4.1
4	0	0
5	17	17.5
None of the photographs are so unacceptable	72	74.2

N = 97; Mean = 4.1; Median = 5.0

Table 3.2.278: Management action (Trail impacts)

Photo	Frequency	Percent
1	3	3.1
2	11	11.2
3	17	17.4
4	8	8.2
5	13	13.7
People should not be restricted at any point in photos	31	31.6
People should not be restricted	15	15.3

N = 98; Mean = 3.3; Median = 3.0

Table 3.2.279: Existing conditions (Trail impacts)

Photo	Frequency	Percent
1	15	17.4
2	25	29.1
3	25	29.1
4	13	15.1
5	8	9.3

N = 86; Mean = 2.7; Median = 3.0

Table 3.2.280: Summary (Trail impacts)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		4.8	
Acceptability (short form)	64	3.1	3.0
Preference	91	2.1	1.0
Displacement	25	4.1	5.0
Management action	52	3.3	3.0
Existing conditions	86	2.7	3.0

A next set of questions addressed the issue of litter on Worlds End. Respondents were presented a series of photographs depicting increasing amounts of litter. Study photographs are shown in Appendix C. Respondents were asked to evaluate these photographs using the same evaluative scales previously described. First, respondents were asked to rate the acceptability of each photograph on a scale from –4 (“very unacceptable”) to +4 (“very acceptable”). Findings are shown in Table 3.2.281 and Figure 3.30. Figure 3.30 presents the norm curve associated with the mean acceptability rating for each photograph. Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of the photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.5. This value is referred to as “acceptability (long form).”

Table 3.2.281: Acceptability for litter on Worlds End Island

Photo number	N	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	98	2.0	0	0	1.0	2.0	6.1	2.0	5.1	81.6	3.4
Photo 2	97	66.0	14.4	4.1	5.2	3.1	4.1	1.0	2.1	0	-3.1
Photo 3	99	79.8	9.1	5.1	3.0	1.0	0	2.0	0	0	-3.6
Photo 4	99	89.9	7.1	2.0	0	0	0	0	1.0	0	-3.8
Photo 5	99	98.0	1.0	0	0	1.0	0	0	0	0	-4.0

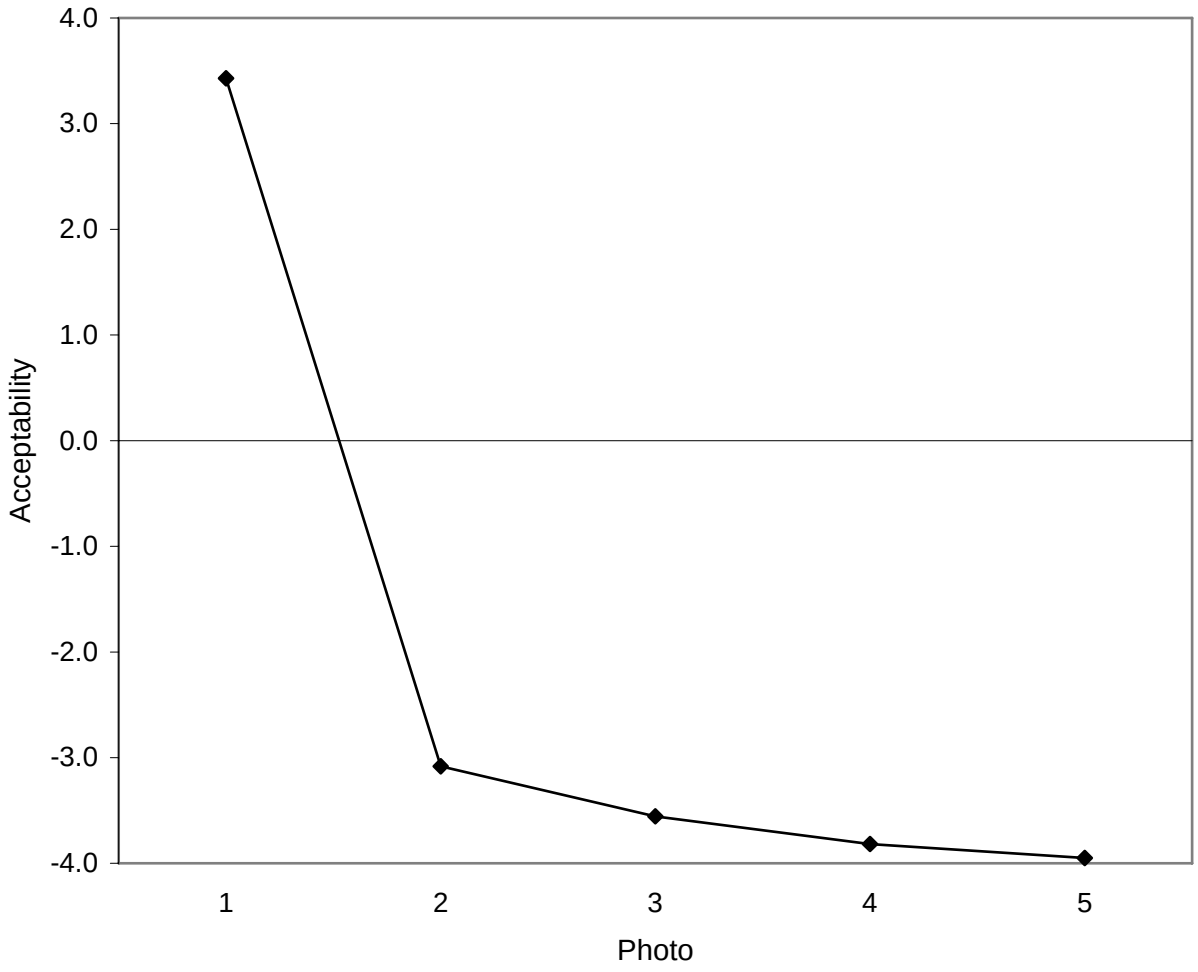

Figure 3.30: Norm curve for litter at Worlds End

Respondents were also asked to indicate the photograph that depicts the 1) highest amount of litter that is acceptable (referred to as “acceptability (short form)”), 2) amount of litter preferred (referred to as “preference”), 3) amount of litter that is so unacceptable that respondents would no longer visit Worlds End (referred to as “displacement”), 4) highest amount of litter that should be allowed before visitor use is restricted (referred to as “management action”), and 5) amount of litter typically seen (referred to as “existing conditions”). Where appropriate, visitors were allowed the option to indicate that they would continue to visit Worlds End regardless of litter, or that none of the photographs show a high enough amount of litter to restrict people from visiting Worlds End. Findings for these questions are shown in Tables 3.2.282, 3.2.283, 3.2.284, 3.2.285, 3.2.286 and summarized in Table 3.2.287.

Respondents reported that 1) acceptable amount of litter were represented by an average (mean) photograph number of 1.2 (or a median photograph number of

1.0), 2) they prefer to see no litter as represented by an average (mean) photograph number of 1.0 (or a median photograph number of 1.0), 3) they would be displaced by amounts of litter represented by a mean photograph number of 2.8 (or a median photograph number of 2.0), 4) no more litter than represented by an average (mean) photograph number of 1.4 (or a median photograph number of 1.0) should be allowed, and 5) they typically saw litter represented by an average (mean) photograph number of 1.2 (or a median photograph number of 1.0). The displacement and management action standards are slightly underestimated as some respondents reported that either they would continue to visit regardless of amounts of litter on Worlds End, or that none of the photographs show a high enough level of litter to restrict people from visiting Worlds End.

Table 3.2.282: Acceptability (Litter)

Photo	Frequency	Percent
1	87	89.7
2	6	6.2
3	0	0
4	0	0
5	3	3.1
All of the photographs are acceptable	1	1.0

N = 97; Mean = 1.2; Median = 1.0

Table 3.2.283: Preference (Litter)

Photo	Frequency	Percent
1	97	100.0
2	0	0
3	0	0
4	0	0
5	0	0

N = 97; Mean = 1.0; Median = 1.0

Table 3.2.284: Displacement (Litter)

Photo	Frequency	Percent
1	0	0
2	46	48.4
3	26	27.4
4	8	8.4
5	10	10.5
None of the photographs are so unacceptable	5	5.3

N = 95; Mean = 2.8; Median = 2.0

Table 3.2.285: Management action (Litter)

Photo	Frequency	Percent
1	68	69.4
2	11	11.2
3	7	7.1
4	0	0
5	2	2.0
People should not be restricted at any point in photos	3	3.1
People should not be restricted	7	7.1

N = 98; Mean = 1.4; Median = 1.0

Table 3.2.286: Existing conditions (Litter)

Photo	Frequency	Percent
1	84	88.4
2	8	8.4
3	2	2.1
4	0	0
5	1	1.1

N = 95; Mean = 1.2; Median = 1.0

Table 3.2.287: Summary (Litter)

	N	Photo Number (Mean)	Photo Number (Median)
Acceptability (long form)		1.5	
Acceptability (short form)	96	1.2	1.0
Preference	97	1.0	1.0
Displacement	90	2.8	2.0
Management action	88	1.4	1.0
Existing conditions	95	1.2	1.0

The next set of questions focused on information provided to visitors to Boston Harbor Islands National Park Area. Respondents were asked to evaluate the amount and quality of information related to visitor opportunities and activities; ferry schedules and other means of access; the natural history of Boston Harbor Islands; and the human history of Boston Harbor Islands. Evaluation of amount of information was measured on a scale of 1 (“adequate”) and 2 (“inadequate”). Evaluation of quality of information was measured on a scale of 1 (“excellent”) to 5 (“very poor”). Findings are presented in Tables 3.2.288 through 3.2.291. The vast majority of respondents (93.8%) reported that the amount of information on visitor opportunities and activities at Boston Harbor Islands was adequate (mean

= 1.1) and that the quality of the same (92.2%) was good to excellent (mean = 1.7) (Table 3.2.288).

Table 3.2.288: Information on visitor opportunities and activities at Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	60	93.8
Inadequate (2)	4	6.3
Mean	1.1	
Quality of Information		
Excellent (1)	25	39.1
Good (2)	34	53.1
Fair (3)	5	7.8
Poor (4)	0	0
Very Poor (5)	0	0
Mean	1.7	

The vast majority of visitors (81.8%) reported that the amount of information on ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean of 1.2) and that the quality of the same (86.3%) was good to excellent (mean = 1.9) (Table 3.2.289).

Table 3.2.289: Information on ferry schedules and other means of access to Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	45	81.8
Inadequate (2)	10	18.2
Mean	1.2	
Quality of Information		
Excellent (1)	19	37.3
Good (2)	25	49.0
Fair (3)	2	3.9
Poor (4)	2	3.9
Very Poor (5)	3	5.9
Mean	1.9	

Findings regarding visitor evaluations of information on the natural history of Boston Harbor Islands are presented in Table 3.2.290. The vast majority of visitors (81.4%) reported the amount of information was adequate (mean = 1.2),

and the quality of information (77.4%) was generally good to excellent (mean = 2.0).

Table 3.2.290: Information on the natural history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	48	81.4
Inadequate (2)	11	18.6
Mean	1.2	
Quality of Information		
Excellent (1)	17	32.1
Good (2)	24	45.3
Fair (3)	9	17.0
Poor (4)	2	3.8
Very Poor (5)	1	1.9
Mean	2.0	

Findings regarding visitor evaluations of information on the human history of Boston Harbor Islands are presented in Table 3.2.291. The vast majority of visitors (71.9%) reported the amount of information was adequate (mean = 1.3), and the quality of information (78.4%) was good to excellent (mean = 2.0).

Table 3.2.291: Information on the human history of Boston Harbor Islands

	Frequency	Percent
Amount of Information		
Adequate (1)	41	71.9
Inadequate (2)	16	28.1
Mean	1.3	
Quality of Information		
Excellent (1)	15	29.4
Good (2)	25	49.0
Fair (3)	9	17.6
Poor (4)	1	2.0
Very Poor (5)	1	2.0
Mean	2.0	

Summary

Visitors to Worlds End can generally be described by the following characteristics:

- Most visitors (77.3%) come to Worlds End in groups of 1 to 2.
- A majority of visitors (91.0%) come with family, friends, or alone.
- About four-fifths of visitors to Worlds End had visited Boston Harbor Islands National Park Area before.
- A little over three-fourths of visitors (77.2%) had visited Worlds End before.
- A majority of visitors (91.8%) were from Massachusetts.
- There were slightly more female (56.6%) than male (43.4 %) respondents.
- The average (mean) age of visitors was 46 years.
- Visitors tended to be highly educated with about 94.9% of visitors reporting at least some college education or higher.
- A majority of visitors (71.1%) reported being employed.
- All visitors (100%) reported being not being Hispanic or Latino. Also, the vast majority of visitors (91.3%) were white.

Study findings show that the following range of standards for indicator variables:

- Visitors indicated that they preferred seeing an average (median) of 10 hikers per hour and they would no longer visit Worlds End if they saw an average (median) of 28 hikers per hour. Standards for other dimensions of visitor evaluation of number of hikers per hour lay between this range.
- Findings indicate that fewer environmental impacts to the trails are more acceptable than greater impacts and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 4.8.
- Findings indicate that even small amounts of litter are evaluated as unacceptable and that aggregate evaluations of photographs fall out of the acceptable range and into the unacceptable range at approximately photograph 1.5.
- The vast majority of visitors (93.8%) reported that the amount of information of visitor opportunities and activities at Boston Harbor Islands National Park Area was adequate (mean = 1.1) and that the quality of the same (92.2%) was good to excellent (mean = 1.7).
- The vast majority of visitors (81.8%) reported that the amount of information on ferry schedules and other means of access to Boston Harbor Islands National Park Area was adequate (mean = 1.2) and that the quality of the same (86.3%) was good to excellent (mean = 1.9).
- The vast majority of visitors (81.4%) reported that the amount of information on the natural history of Boston Harbor Islands National

Park Area was adequate (mean = 1.2) and that the quality of information (77.4%) was good to excellent (mean = 2.0).

- The vast majority of visitors (71.9%) reported that the amount of information on the human history of Boston Harbor Islands National Park Area was adequate (mean = 1.3) and that the quality of information (78.4%) was good to excellent (mean = 2.0).

Phase 2.

Visitor Counts

Visitor counts of people at one time in the picnic area on Georges Island were conducted at 15 minute intervals over a period of eight randomly selected days during the months of July and August 2001. These counts were averaged to provide average hourly counts of visitors at the picnic area. Next, data on the number of visitors embarking and debarking the ferries to Georges Island on the eight randomly selected days were gathered from Boston Harbor Cruise records. These data were used to estimate hourly number of visitors on Georges Island on the eight selected days.

Average hourly number of visitors were statistically regressed with average hourly counts of visitors at the picnic area ($R^2 = 0.68$). The resulting regression equation is as follows:

# of people on Georges Island = 2.8 (# of people in the picnic area) + 95.5

This equation was used to predict number of people on Georges Island on an average summer day (Table 3.2.292).

Table 3.2.292: Predicted average number of people on Georges Island

Time	Average number of people on Georges Island (from ferry records)	Average counts in the picnic area	Predicted average number of people on Georges Island based on the regression
10:50 - 11:50	186	49	235
11:50 - 12:50	303	64	277
12:50 - 1:50	300	70	292
1:50 - 2:50	232	39	205
2:50 - 3:50	178	22	158
3:30 - 4:50	119	16	140
4:50 - 5:50	49	12	130
5:50 - 6:50	15	0	96

Next, the equation was used to estimate the maximum number of visitors that can be accommodated on Georges Island without violating selected standards of quality derived from survey data. (Table 3.2.293)

Table 3.2.293: Estimated number of visitors on Georges Island based on selected standards of quality

	Standard of Quality (Mean)	Estimated # of people on Georges Island	Standard of Quality (Median)	Estimated # of people on Georges Island
Acceptability (long form)	185 (Standard of quality) or 614 people on Georges Island			
Acceptability (short form)	156	532	145	501
Preference	110	404	110	404
Displacement	252	801	290	908
Management action	185	614	145	501
Existing conditions	102	381	73	300

Chapter 4. Summary and Conclusions

The program of research described in this report was designed to support application of the VERP framework to Boston Harbor Islands National Park Area. In particular, research objectives were to 1) collect baseline data on park use and users and associated impacts, 2) identify potential indicators of quality for the visitor experience, and 3) identify potential standards of quality for selected indicator variables. Supporting research methods included two surveys of park visitors conducted on-site, and counts of visitors at the picnic area on Georges Island. A companion study of resource-related impacts at Boston Harbor Islands National Park Area was conducted by Dr. Yu-Fai Leung and is reported in a separate volume.

Visitors to Boston Harbor Islands National Park Area can generally be described by the following characteristics:

- About two-thirds of visitors knew that Boston Harbor Islands was a National Park Area
- A majority of visitors (80.0%) arrived at the ferry terminal by car or subway
- Visitors tend to come to the area in family and friendship groups of two-to-four persons
- About two-thirds of visitors have visited Boston Harbor Islands National Park Area before
- The sample of visitors was about equally split between males and females
- The average (mean) age of visitors was 41 years
- Visitors tend to be very highly educated with about 90% of visitors reporting at least some college education or higher
- A majority of visitors (76.3%) reported being employed
- The majority of visitors were from the United States with Massachusetts being the most commonly represented state
- A majority of respondents reported being not Hispanic or Latino. Also, the vast majority of visitors were white
- Walking/hiking was overwhelmingly the most common recreation activity, with over 80% participating

Visitors were asked a series of open and close-ended questions to explore for potential indicators of quality of the visitor experience at Boston Harbor Islands National Park Area. Indicators of quality are measurable, manageable variables that can help define the quality of the visitor experience. Study findings suggest that the following variables may be good indicators of quality:

- Number of visitors encountered along hiking trails
- Number of visitors encountered at attraction sites
- Depreciative impacts of visitor use such as litter and graffiti

- Resource impacts such as vegetation loss and soil erosion on trails and at campsites
- Amount and quality of information and education
- Frequency of ferry and shuttle service

Visitors to Bumpkin, Georges, Grape, Little Brewster, Lovells, and Peddocks Islands, and Worlds End were also asked a series of questions to determine a range of potential standards of quality for eleven indicator variables: people at one time at attraction sites, tour group size, trail encounters, trail impacts, campsite impacts, litter, graffiti, ferry service, shuttle service, amount of information and quality of information (Table 4.1).

Respondents were asked to evaluate a range of conditions for each indicator variable using evaluative dimensions defined as “preference”, “acceptability”, ”management action”, and “displacement.” Respondents were also asked to report the condition of each of the indicator variables that were “typically seen” or experienced. Where appropriate, the range of conditions for indicator variables was presented through a series of computer-edited photographs. Study findings for Bumpkin Island are summarized in Tables 4.2 and 4.3; for Georges Island in Tables 4.4 and 4.5; for Grape Island in Tables 4.6 and 4.7; for Little Brewster Island in Tables 4.8 and 4.9; for Lovells Island in Tables 4.10 and 4.11; for Peddocks Island in Tables 4.12 and 4.13; and for Worlds End in Tables 4.14 and 4.15.

These data represent a potential range of standards of quality for each indicator variable. This range is anchored at “preference” (the highest quality experience) and “displacement” (the point at which respondents would no longer visit the Island). It should be noted that the “displacement” dimension of evaluation, and to a lesser degree the “management action” dimension, are underestimated because certain percentages of respondents reported that none of the conditions represented in the study photographs would cause them not to return or that none of the photographs represented conditions bad enough to restrict visitor use.

These data were presented to the Boston Harbor Island partnership working committee during a series of workshops in Winter 2002 and Spring 2003. The committee set standards of quality for relevant indicator variables on all seven Islands, based on findings from the study, findings from the resource component of the study as reported by Dr Yu-Fai Leung, and management objectives for each Island as described in the Boston Harbor Islands General Management Plan.

Table 4.1: Islands and respective indicators of quality of the visitor experience

Island	People at one time (PAOT)	Tour group size	Trail encounters	Trail impacts	Campsite impacts	Litter	Graffiti	Ferry service	Shuttle service	Amount of information	Quality of information
Bumpkin			X	X	X	X		X	X	X	X
Georges	X					X	X	X	X	X	X
Grape			X	X	X	X		X	X	X	X
Little Brewster	X	X				X				X	X
Lovells			X		X	X	X	X	X	X	X
Peddocks			X	X	X	X	X	X	X	X	X
Worlds End			X	X		X				X	X

Table 4.2: Bumpkin Island

	Preference		Acceptability (short form)		Acceptability (long form)	Management action		Displacement		Existing conditions	
	Mean	Median	Mean	Median		Mean	Median	Mean	Median	Mean	Median
PAOT	-	-	-	-	-	-	-	-	-	-	-
Tour group size	-	-	-	-	-	-	-	-	-	-	-
Trail encounters per hour	9.6	8.0	18.7	12.0	-	26.6	21.0	31.0	26.6	5.1	4.0
Trail impacts (photo #)	1.5	1.0	2.5	3.0	3.6	3.3	3.0	4.2	4.0	2.0	1.0
Campsite impacts (photo #)	1.4	1.0	2.3	2.0	3.2	2.8	3.0	4.0	4.0	1.8	2.0
Litter (photo #)	1.0	1.0	1.2	1.0	1.4	1.4	1.0	2.5	2.0	1.1	1.0
Graffiti (photo #)	-	-	-	-	-	-	-	-	-	-	-
Frequency of ferry service to Georges Island	-	-	-	-	36 minutes to 95 minutes	-	-	-	-	-	-
Frequency of shuttle service from Georges Island	-	-	-	-	28 minutes to 92 minutes	-	-	-	-	-	-

Table 4.3: Amount and Quality of Information

	Amount of information				Quality of information						
	Adequate (1) (%)	Inadequate (2) (%)	Mean	Median	Excellent (1) (%)	Good (2) (%)	Fair (3) (%)	Poor (4) (%)	Very poor (5) (%)	Mean	Median
On visitor opportunities	90.3	9.7	1.1	1.0	37.3	46.7	10.7	1.3	4.0	1.9	2.0
On ferry schedules and other means of access	84.1	15.9	1.2	1.2	33.3	38.7	16.0	10.7	1.3	2.1	2.0
On the natural history of Boston Harbor Islands	86.1	13.9	1.1	1.0	22.7	54.7	16.0	5.3	1.3	2.1	2.0
On the human history of Boston Harbor Islands	84.9	15.1	1.2	1.0	23.0	48.7	17.6	9.5	1.4	2.2	2.0

Table 4.4: Georges Island

	Preference		Acceptability (short form)		Acceptability (long form)	Management action		Displacement		Existing conditions	
	Mean	Median	Mean	Median		Mean	Median	Mean	Median	Mean	Median
PAOT	110	109	156	145	185	185	145	252	290	102	73
Tour group size	-	-	-	-	-	-	-	-	-	-	-
Trail encounters per hour	-	-	-	-	-	-	-	-	-	-	-
Trail impacts (photo #)	-	-	-	-	-	-	-	-	-	-	-
Campsite impacts (photo #)	-	-	-	-	-	-	-	-	-	-	-
Litter (photo #)	1.0	1.0	1.2	1.0	1.6	1.7	1.0	3.0	3.0	1.2	1.0
Graffiti (photo #)	1.1	1.0	1.9	2.0	2.0	2.0	2.0	3.9	4.0	1.8	1.0
Frequency of ferry service to Georges Island	-	-	-	-	78 minutes or less	-	-	-	-	-	-
Frequency of shuttle service from Georges Island	-	-	-	-	78 minutes or less	-	-	-	-	-	-

Table 4.5: Amount and Quality of Information

	Amount of information				Quality of information						
	Adequate (1) (%)	Inadequate (2) (%)	Mean	Median	Excellent (1) (%)	Good (2) (%)	Fair (3) (%)	Poor (4) (%)	Very poor (5) (%)	Mean	Median
On visitor opportunities	87.7	12.3	1.1	1.0	22.5	59.6	13.5	3.4	1.1	2.0	2.0
On ferry schedules and other means of access	88.0	12.0	1.1	1.0	31.1	51.1	10.0	5.6	2.2	2.0	2.0
On the natural history of Boston Harbor Islands	77.2	22.8	1.2	1.0	27.1	49.4	14.1	7.1	2.4	2.1	2.0
On the human history of Boston Harbor Islands	77.9	22.1	1.2	1.0	21.7	50.6	18.1	7.2	2.4	2.2	2.0

Table 4.6: Grape Island

	Preference		Acceptability (short form)		Acceptability (long form)	Management action		Displacement		Existing conditions	
	Mean	Median	Mean	Median		Mean	Median	Mean	Median	Mean	Median
PAOT	-	-	-	-	-	-	-	-	-	-	-
Tour group size	-	-	-	-	-	-	-	-	-	-	-
Trail encounters per hour	8.4	5.0	13.5	10.0	-	20.1	12.0	27.2	24.5	4.1	2.0
Trail impacts (photo #)	1.2	1.0	2.2	2.0	3.3	2.9	3.0	4.0	4.0	1.3	1.0
Campsite impacts (photo #)	1.4	1.0	2.3	2.0	3.0	2.7	3.0	4.4	4.5	1.9	2.0
Litter (photo #)	1.1	1.0	1.0	1.0	1.6	1.5	1.0	2.6	2.0	1.1	1.0
Graffiti (photo #)	-	-	-	-	-	-	-	-	-	-	-
Frequency of ferry service to Georges Island	-	-	-	-	45 minutes or more	-	-	-	-	-	-
Frequency of shuttle service from Georges Island	-	-	-	-	30 minutes or more	-	-	-	-	-	-

Table 4.7: Amount and Quality of Information

	Amount of information				Quality of information						
	Adequate (1) (%)	Inadequate (2) (%)	Mean	Median	Excellent (1) (%)	Good (2) (%)	Fair (3) (%)	Poor (4) (%)	Very poor (5) (%)	Mean	Median
On visitor opportunities	85.6	14.4	1.1	1.0	26.7	46.7	20.0	6.7	0.0	2.1	2.0
On ferry schedules and other means of access	75.9	24.7	1.3	1.0	19.8	43.0	22.1	14.0	1.2	2.3	2.0
On the natural history of Boston Harbor Islands	82.0	18.0	1.2	1.0	19.1	50.6	24.7	4.5	1.1	2.2	2.0
On the human history of Boston Harbor Islands	77.3	22.7	1.2	1.0	20.2	47.2	25.8	6.7	0.0	2.2	2.0

Table 4.8: Little Brewster Island

	Preference		Acceptability (short form)		Acceptability (long form)	Management action		Displacement		Existing conditions	
	Mean	Median	Mean	Median		Mean	Median	Mean	Median	Mean	Median
PAOT	49	55	72	55	95	89	110	174	165	47	55
Tour group size	26.9	29.0	33.7	30.0	-	38.6	35.0	48.3	40.0	29.6	30.0
Trail encounters per hour	-	-	-	-	-	-	-	-	-	-	-
Trail impacts (photo #)	-	-	-	-	-	-	-	-	-	-	-
Campsite impacts (photo #)	-	-	-	-	-	-	-	-	-	-	-
Litter (photo #)	1.0	1.0	1.2	1.0	1.6	1.3	1.0	2.8	2.0	1.0	1.0
Graffiti (photo #)	-	-	-	-	-	-	-	-	-	-	-
Frequency of ferry service to Georges	-	-	-	-	-	-	-	-	-	-	-
Frequency of shuttle service from Georges Island	-	-	-	-	-	-	-	-	-	-	-

Table 4.9: Amount and Quality of Information

	Amount of information				Quality of information						
	Adequate (1) (%)	Inadequate (2) (%)	Mean	Median	Excellent (1) (%)	Good (2) (%)	Fair (3) (%)	Poor (4) (%)	Very poor (5) (%)	Mean	Median
On visitor opportunities	90.8	9.2	1.1	1.0	34.0	48.6	10.7	3.9	2.9	1.9	2.0
On ferry schedules and other means of access	77.7	22.3	1.2	1.0	30.2	41.7	15.6	8.3	4.2	2.2	2.0
On the natural history of Boston Harbor Islands	85.4	14.6	1.1	1.0	34.3	42.4	17.2	4.0	2.0	2.0	2.0
On the human history of Boston Harbor Islands	84.4	15.6	1.2	1.0	33.3	47.5	11.1	6.1	2.0	2.0	2.0

Table 4.10: Lovells Island

	Preference		Acceptability (short form)		Acceptability (long form)	Management action		Displacement		Existing conditions	
	Mean	Median	Mean	Median		Mean	Median	Mean	Median	Mean	Median
PAOT	-	-	-	-	-	-	-	-	-	-	-
Tour group size	-	-	-	-	-	-	-	-	-	-	-
Trail encounters per hour	18.1	10.0	27.5	19.0	-	26.6	25.0	28.2	27.5	8.5	4.5
Trail impacts (photo #)	-	-	-	-	-	-	-	-	-	-	-
Campsite impacts (photo #)	1.1	1.0	1.7	1.0	3.4	2.3	2.0	3.8	4.0	1.8	1.5
Litter (photo #)	1.0	1.0	1.2	1.0	1.5	1.7	1.0	2.9	3.0	1.2	1.0
Graffiti (photo #)	1.1	1.0	1.5	1.0	2.2	2.0	1.0	3.7	4.0	1.6	1.0
Frequency of ferry service to Georges	-	-	-	-	75 minutes or less	-	-	-	-	-	-
Frequency of shuttle service from Georges Island	-	-	-	-	75 minutes or less	-	-	-	-	-	-

Table 4.11: Amount and Quality of Information

	Amount of information				Quality of information						
	Adequate (1) (%)	Inadequate (2) (%)	Mean	Median	Excellent (1) (%)	Good (2) (%)	Fair (3) (%)	Poor (4) (%)	Very poor (5) (%)	Mean	Median
On visitor opportunities	85.7	14.6	1.1	1.0	36.6	46.3	13.4	3.7	0.0	1.8	2.0
On ferry schedules and other means of access	87.5	12.5	1.1	1.0	46.3	34.2	15.9	3.7	0.0	1.8	2.0
On the natural history of Boston Harbor Islands	85.1	14.9	1.1	1.0	39.2	34.2	17.7	7.6	1.3	2.0	2.0
On the human history of Boston Harbor Islands	78.7	21.3	1.2	1.0	34.2	32.9	24.1	7.6	1.3	2.1	2.0

Table 4.12: Peddocks

	Preference		Acceptability (short form)		Acceptability (long form)	Management action		Displacement		Existing conditions	
	Mean	Median	Mean	Median		Mean	Median	Mean	Median	Mean	Median
PAOT	-	-	-	-	-	-	-	-	-	-	-
Tour group size	-	-	-	-	-	-	-	-	-	-	-
Trail encounters per hour	15.6	7.0	26.3	18.5		24.1	20.0	27.3	25.0	4.6	2.5
Trail impacts (photo #)	2.1	2.0	2.9	3.0	4.4	3.1	3.0	4.4	4.5	2.6	2.0
Campsite impacts (photo #)	1.7	2.0	2.5	2.0	3.6	2.9	3.0	4.4	5.0	1.8	2.0
Litter (photo #)	1.1	1.0	1.3	1.0	1.6	1.6	1.0	2.9	3.0	1.2	1.0
Graffiti (photo #)	1.1	1.0	1.5	1.0	2.2	2.0	1.0	3.7	4.0	1.6	1.0
Frequency of ferry service to Georges	-	-	-	-	15 minutes to 86 minutes	-	-	-	-	-	-
Frequency of shuttle service from Georges Island	-	-	-	-	15 minutes to 87 minutes	-	-	-	-	-	-

Table 4.13: Amount and Quality of Information

	Amount of information				Quality of information						
	Adequate (1) (%)	Inadequate (2) (%)	Mean	Median	Excellent (1) (%)	Good (2) (%)	Fair (3) (%)	Poor (4) (%)	Very poor (5) (%)	Mean	Median
On visitor opportunities	75.8	24.1	1.2	1.0	31.2	39.8	20.4	6.5	2.2	2.1	2.0
On ferry schedules and other means of access	79.1	20.9	1.2	1.0	29.4	37.0	25.0	7.6	1.1	2.1	2.0
On the natural history of Boston Harbor Islands	73.3	26.7	1.3	1.0	24.7	37.6	24.7	11.8	1.1	2.3	2.0
On the human history of Boston Harbor Islands	72.2	27.8	1.3	1.0	28.0	34.4	23.7	11.8	2.2	2.3	2.0

Table 4.14: Worlds End

	Preference		Acceptability (short form)		Acceptability (long form)	Management action		Displacement		Existing conditions	
	Mean	Median	Mean	Median		Mean	Median	Mean	Median	Mean	Median
PAOT	-	-	-	-	-	-	-	-	-	-	-
Tour group size	-	-	-	-	-	-	-	-	-	-	-
Trail encounters per hour	10.4	10.0	19.2	15.0	-	26.6	24.5	32.9	27.5	9.3	6.0
Trail impacts (photo #)	2.1	1.0	3.1	3.0	4.8	3.3	3.0	4.1	5.0	2.7	3.0
Campsite impacts (photo #)	-	-	-	-	-	-	-	-	-	-	-
Litter (photo #)	1.0	1.0	1.2	1.0	1.5	1.4	1.0	2.8	2.0	1.2	1.0
Graffiti (photo #)	-	-	-	-	-	-	-	-	-	-	-
Frequency of ferry service to Georges Island	-	-	-	-	-	-	-	-	-	-	-
Frequency of shuttle service from Georges Island	-	-	-	-	-	-	-	-	-	-	-

Table 4.15: Amount and Quality of Information

	Amount of information				Quality of information						
	Adequate (1) (%)	Inadequate (2) (%)	Mean	Median	Excellent (1) (%)	Good (2) (%)	Fair (3) (%)	Poor (4) (%)	Very poor (5) (%)	Mean	Median
On visitor opportunities	93.8	6.3	1.1	1.0	39.1	53.1	7.8	0.0	0.0	1.7	2.0
On ferry schedules and other means of access	81.8	18.2	1.2	1.0	37.3	49.0	3.9	3.9	5.9	1.9	2.0
On the natural history of Boston Harbor Islands	81.4	18.6	1.2	1.0	32.1	45.3	17.0	3.8	1.9	2.0	2.0
On the human history of Boston Harbor Islands	71.9	28.1	1.3	1.0	29.4	49.0	17.6	2.0	2.0	2.0	2.0

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