

FINAL REPORT

2010-2011 CUMBERLAND ISLAND NATIONAL SEASHORE VISITOR USE STUDY

(PHASE II RESULTS, PROJECT COMPLETION REPORT)



RESEARCH TO SUPPORT
VISITOR CARRYING CAPACITY DECISIONS AND
ALTERNATIVE TRANSPORTATION PLANNING

2010-2011 CUMBERLAND ISLAND NATIONAL SEASHORE VISITOR USE STUDY

(PHASE II RESULTS; PROJECT COMPLETION REPORT)

Final Report

Prepared By:

Jeffrey C. Hallo, Ph.D.¹
Robert E. Manning, Ph.D.²
Matthew T.J. Brownlee¹
Brandi L. Smith¹

¹Department of Parks, Recreation, and Tourism Management
Clemson University
Clemson, SC

²Rubenstein School of the Environment and Natural Resources
The University of Vermont
Burlington, VT

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Executive Summary

The overall purpose of this project was to gather information that will help guide visitor management and carrying capacity decisions at Cumberland Island National Seashore. The primary goal of Phase II was to identify and evaluate standards of quality for the visitor experience at Cumberland Island National Seashore. This research was guided by the National Park Service's Visitor Experience and Resource Protection (VERP) framework, which requires development of indicators and standards of the quality for the visitor experience. This report includes the 1) results from the Phase II survey, 2) a discussion of recreational carrying capacity of Cumberland Island National Seashore, and 3) implications of research findings for visitor use management and the quality of the visitor experience.

On-site and internet-based sampling resulted in 779 completed questionnaires from CUIS visitors. Sampling of CUIS visitors occurred during the Spring, Summer, and Fall of 2011. Two distinct groups of visitors participated in the study – day visitors and wilderness users. Day visitors were intercepted on-site and completed 617 questionnaires. Wilderness users were contacted using a postal mailing and 162 completed an internet-based questionnaire focused on standards for crowding.

General findings

- Substantial differences exist between day visitors' and wilderness users' experiential standards for crowding
- Wilderness users report standards for use levels that are associated with greater solitude and less use at the beach, Dungeness, Sea Camp, and the First African Baptist Church
- Both day visitors and wilderness users favor restricting use at some level at the beach, Dungeness, Sea Camp, and the First African Baptist Church (> 93.2% agree visitor use should be restricted)
- A comparison of visitor reported use conditions against experiential standards indicates that there is currently a high quality visitor experience on Cumberland Island.

Key Findings

Total visitors per day

- Both day visitors and wilderness users report the current visitation limit of 300 visitors per day as 'very acceptable'
- Visitation exceeding 400 persons per day is reported as unacceptable by both day visitors and wilderness users.

Vehicles seen on road

- Wilderness users report that 4 vehicles seen per day is the threshold of acceptability, but day visitors report the threshold of acceptability to be 8.
- Visitors reported typically seeing 3 vehicles on the road, on average.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Number of people within view at the beach

- Wilderness users report that 19 people within view is the threshold of acceptability, but day visitors report the threshold of acceptability to be 13.
- Visitors reported typically seeing 5 to 8 people with view at the beach, on average.

Number of people within view at Dungeness

- Wilderness users report that 22 people within view is the threshold of acceptability, but day visitors report the threshold of acceptability to be 18.
- Visitors reported typically seeing 8 people with view at Dungeness, on average.

Number of people within view at Sea Camp

- Wilderness users report that 55 people within view is the threshold of acceptability, but day visitors report the threshold of acceptability to be 60.
- Visitors reported typically seeing 30 to 35 people with view at Sea Camp, on average.

Number of people and vehicles within view at the First African Baptist Church (FABC)

- Wilderness users report that 9 people and 1.5 vehicles within view is the threshold of acceptability, but day visitors report the threshold of acceptability to be 12 people and 2 vehicles.
- Wilderness users reported typically seeing 1 person and no vehicles with view at the FABC, on average.

Perceptions of crowding at CUIS locations

- Respondents reported experiencing very little crowding at CUIS.
- Visitors reported feeling most crowded on the ferryboat and the least crowded on the main road that goes through the wilderness area.

Desired island amenities

- Kayak or canoe-accessible campsites, kayak or canoe rentals, and fire rings at designated campsites are the most desirable amenities.
- Less ferry access to the island and more commercial services are reported as the least desired amenities.

Desired vehicle features and amenities

- Visitors desired most a “historic or antique looking vehicle,” that was an “open-air vehicle”, powered using alternative fuel sources, was as quiet as possible, and included an informational tour on the natural and cultural history of CUIS.
- Respondents report a general willingness to pay approximately \$10.00 dollars (presumably more) for transportation in a vehicle that had their desired characteristics.

Experiences on the island

- A majority of respondents did not experience conflict, feel crowded, or feel stressed while traveling at CUIS.
- A majority of respondents agreed that their travel experience included connecting with the natural environment, hearing natural sounds, and experiencing a sense of freedom.
- Most respondents indicated they had easy access to sites, attractions and scenic locations.
- However, 48% of respondents agree that ‘it takes too long to get where you want to go.’

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1.0 Introduction and rationale

Cumberland Island National Seashore contains significant natural, cultural, and recreational resources, including more than nine thousand acres of designated wilderness and the Plum Orchard Mansion built by Lucy Carnegie. Recreation visitation to Cumberland Island has increased and it is now at an all-time high of more than 70,000 visits annually. This can result in significant resource and social impacts. How much and what types of visitor use can ultimately be accommodated in the park? How should this visitor use be managed?

Over the past decade, the National Park Service has developed a carrying capacity/visitor management framework titled Visitor Experience and Resource Protection (VERP). As the name suggests, this planning framework is aimed at maintaining the quality of the visitor experience and protecting natural and cultural resources in the face of increasing visitor use. VERP is built upon the same basic principles and concepts that drive other contemporary carrying capacity and related park planning/management frameworks, including Limits of Acceptable Change (Stankey et al., 1985) and Visitor Impact Management (Graefe et al., 1990).

VERP contains several critical steps that are supported by this research. The first is collecting baseline data on visitor use and associated resource and social impacts. How many and what types of visitor uses are occurring where, and what resource and social impacts are associated with such use? The second step is the identification of indicators and standards of quality for natural/cultural resources and the visitor experience. *Indicators* are measurable, manageable variables that help define the quality of desired natural/cultural resources conditions and the visitor experience. *Standards* define the minimum acceptable condition of indicator variables. Research suggests that visitors often have norms about the resource and social conditions acceptable in a park or related area, and that such norms can be useful as a means of formulating indicators and standards of quality. The third step is selecting and implementing management actions. Management of visitor use can take many forms, but management actions should be both effective and as acceptable as possible to visitors.

This report builds on work previously done that describes CUIS visitor use and users, experience indicators, and visitors' attitudes. This project completion report is intended to 1) help support the application of VERP to visitor management and related carrying capacity decisions at CUIS and 2) inform design and management of the transportation system to help ensure a high quality visitor experience.

1.1 Objectives

Study objectives focused on the three elements of the VERP framework that can benefit the most from empirical data: 1) collecting baseline data on visitor use, 2) identifying indicators and

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standards of quality, and 3) management of visitor use to ensure that the standards of quality are maintained. The study was conducted in two phases as described below.

Phase I – Baseline Data and Indicators

Phase I included 1) a workshop with park staff to design the quantitative survey and sampling plan, 2) administration of the quantitative survey, 3) data analysis, and 4) preparation of a Phase I progress report. A quantitative survey was conducted in Phase I to 1) develop baseline information about the levels, types, and distributions of visitor use occurring at this site, 2) provide an exploratory assessment of visitor opinions regarding existing and proposed transportation services, and 3) identify indicators of quality for the visitor experience. The survey was conducted in the Summer, Fall and Spring of 2010 with a representative sample of Cumberland Island National Seashore visitors.

A report was delivered at the end of this phase of research that 1) presented and discussed results from the Phase I survey, 2) explored implications of research findings for visitor use management and the visitor experience, and 3) provided recommendations for research in Phase II of the study.

Phase II – Standards and Visitor Attitudes towards Management Alternatives.

Phase II consisted of 1) a workshop with park staff to design the second quantitative visitor survey and sampling plan, 2) administration of the visitor survey, 3) data analysis, 4) preparation of a Phase II/Study Completion Report, and 5) a workshop with park staff to present study findings and discuss their management implications. Results from the first phase of research were used to inform development of a second quantitative visitor survey. This survey was conducted in Summer, Fall, and Spring of 2011 with a representative sample of Cumberland Island National Seashore visitors. The objectives of the survey were to determine 1) the relative importance of the indicator variables identified in Phase I, 2) normative standards of quality for selected indicators, and 3) attitudes toward alternative management practices, including visitor transportation services.

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2.0 Methods

2.1 Survey design

Day visitors and wilderness users completed a questionnaire focused on standards for crowding (Questionnaire Version A; see Appendix D) and a separate sample of day visitors completed a questionnaire pertaining to desires for transportation accommodations and island amenities (Questionnaire Version B; see Appendix E).

Data collected from quantitative surveys used both numerical and visual approaches. The researchers used standard best practices for survey construction, such as those set forth by Vaske (2008) and Dillman (2007). Visual approaches to measuring standards of quality (Questionnaire Version A; see Appendix D) were employed using computer-generated photographs to represent a range of people and vehicles within view. Photos were used in the study because they may better communicate or focus attention on the variables intended for evaluation by respondents, particularly when these variables are difficult or awkward to describe in a narrative format (Manning and Freimund 2004). (For a review of photo simulation methods for measuring park and carrying capacity-related standards see Manning 2007.)

Each respondent completing Questionnaire Version A was asked to evaluate a series of study photos (displayed in the results section) depicting four CUIS areas central to the visitor experience: 1) the beach, 2) Dungeness Ruins, 3) Sea Camp (ranger station area), and 4) the First African Baptist Church. Each photograph series for these specific areas displayed increasing levels of people or vehicles within view (photographs displayed in the results section). All respondents were asked to rate each photo by indicating how acceptable it was based on the number of people and vehicles shown. Respondents rated photos on a 9-point scale ranging from - 4 (“very unacceptable”) to + 4 (“very acceptable”), with a midpoint of 0. Survey respondents were also asked (if applicable) to indicate the photo showing the level of use that they (1) would prefer to see, (2) felt that NPS should allow before restricting visitors, (3) found so unacceptable that they would no longer use the area, and (4) felt showed the level of use that they typically saw during their visit.

2.2 Sampling design and locations

Respondents for this study were intercepted by two different methods.

Method 1 – On-site sampling: A stratified random sampling procedure (stratified across season, time of day, and days of the week; Vaske, 2008) was used to intercept day visitors at the Sea Camp Ranger Station at CUIS. Trained research assistants approached each day visitor, informed them about the study, and invited them to participate. Day visitors completed one of two paper questionnaires (Version A or Version B; see Appendix D and E) while waiting to board the ferryboat departing the island. The percentage of day visitors who agreed to complete

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(802) 656-3096

the questionnaire was recorded. A trained survey administrator was available to provide assistance or clarification to respondents. Sampling occurred in the Spring, Summer, and Fall of 2011.

Method 2 – Internet sampling: A modified Dillman mailing technique (Dillman, 2007) was used to contact wilderness users who held CUIS wilderness permits during 2010 and 2011. The investigators addressed the mail correspondence to the individual listed on the wilderness permit. The appropriate contact information was obtained from paper wilderness permits housed at CUIS. In the Spring of 2011, each 2010 and 2011 wilderness permit holder received an introductory letter (Appendix A), and a follow-up postcard (Appendix B), which directed them to an internet questionnaire. The internet questionnaire, which duplicated Questionnaire Version A (see Appendix D), was created and housed using SNAP Survey Software 10.0. Wilderness users who did not complete the internet questionnaire after the introductory letter and follow-up postcard, received a final reminder letter (Appendix C), which also included a paper questionnaire for completion and return. This form of repeat contact is referred to as a modified Dillman mailing technique (Dillman, 2007) and was used to increase the response rate. The mailings were:

Initial Contact: Early June 2011 - Survey Packet

Survey packets were mailed in white 9" x 12" envelopes and featured a Clemson University and NPS logo decal on the front, left, bottom corner to aid in gaining the attention of potential respondents while identifying the packet's source. Each survey packet consisted of a personalized cover letter, signed by a principal investigator and the CUIS Superintendent (see Appendix A). Response rates are improved by personalized correspondence (Dillman, 2007).

Second Contact: Mid July 2011 - Postcard Reminder

Respondents who had not completed the internet questionnaire by July 15th 2011 were sent a reminder postcard (See Appendix B). The postcard also featured the NPS and Clemson University logo.

Third Contact: End of August 2011 - Final Survey Packet

Respondents who had not completed the internet questionnaire by August 20th were mailed a final survey packet. The final survey packet included 1) a personalized reminder letter (see Appendix C), 2) a copy of the paper questionnaire (Questionnaire Version A; see Appendix D), and 3) a post-paid business reply envelope.

2.3 Data management and analysis

Responses from on-site paper questionnaires were manually entered into a Microsoft Excel database. Responses from the internet questionnaire were downloaded from the SNAP 10.0 server into a Microsoft Excel database. The Excel database from the on-site day visitor sample and the internet wilderness user sample were aggregated but maintained identifiers used to

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distinguish between user groups (i.e., day visitors vs. wilderness users). This aggregated database was then transferred into SPSS 18.0 Statistical Software Package for further analysis. Standard calculations for leverage, kurtosis, and skewness were used to identify statistical outliers and to verify univariate and multivariate normality of the data (Tabachnick & Fidell, 2001). Descriptive statistics (e.g., means and standard deviations) were calculated for responses to each question. Means testing (ANOVA and t-tests) was used to evaluate statistical differences between day visitors and wilderness users. When applicable social norm curves were calculated using the charting feature in Microsoft Excel to display responses for crowding standards. An alpha level of 0.05 was used for all statistical comparisons.

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3.0 Results

3.1 Response rate and representation

On site at CUIS, a total of 679 day visitors were approached and 617 elected to participate in the study, yielding a 91% response rate. Also, responses were collected ($N = 162$ out of 352 potential respondents; a 46% response rate) through the internet survey from wilderness users. Based on this sample results reported in this report are accurate to within 5.0% for day visitors and 7.7% for wilderness visitors (at the 95% confidence level). Observational and conversational data (e.g., gender, group size, opposition to park management) were recorded to evaluate non-response bias, with no significant patterns observed. Questions asked of respondents are provided in italics in the following subsection, and Appendices D and E show the questionnaire as implemented.

3.1a Past use experience

Table 3.1. Visiting at least once in the last five years

Have you visited Cumberland Island National Seashore more than once in the last five years? (Please check one.)

	> than once in last five years	N	%
Day users	Yes	163	26.4%
	No	454	73.6%
Wilderness visitors	Yes	94	58.8%
	No	66	41.2%

In each questionnaire (Version A On-site, Version A Internet, and Version B On-site), respondents self-reported their number of past visits to CUIS. The aggregated sample from both day visitors and wilderness users indicates the minority of respondents (33%) visited more than once in the last five years. However, differences in past use experience between day visitors and wilderness users do exist. Specifically, only 26.4% of day visitors reported visiting CUIS more than once in the last five years compared to 58.8% of wilderness users.

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jhallo@clemson.edu
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3.2 Questionnaire results for total visitors per day at CUIS

Cumberland Island National Seashore currently limits the number of visitors on the island each day to 300. We would like to know how many visitors you think it is acceptable to have on Cumberland Island at one time.

Please circle one response for each of the following numbers of visitors on Cumberland Island per day. A rating of “-4” means the number of visitors is “very unacceptable”, and a rating of “+4” means the number visitors is “very acceptable”. (If use should not be restricted at all you may indicate that.)

Table 3.2. Distribution of responses for the acceptability of the number of people on the island

		Very unacceptable $\longleftrightarrow$ % of responses $\longleftrightarrow$ Very acceptable (-4) (+4)									Mean (SD)	t-value*
100 visitors per day	D	10.2	1.9	1.9	2.9	4.8	3.5	8.0	5.4	31.5	2.40 (2.7)	4.97*
	W	21.9	2.6	5.2	6.5	8.4	4.5	3.2	3.9	43.9	0.94 (3.3)	
200 visitors per day	D	7.3	1.6	1.9	3.5	5.4	5.4	9.8	13.6	51.6	2.44 (2.5)	3.28*
	W	10.4	4.5	3.9	5.2	11.7	3.2	7.1	16.9	37.0	1.68 (2.8)	
300 visitors per day	D	3.7	1.4	2.0	2.2	6.2	4.8	10.4	13.5	55.9	2.82 (2.1)	0.90
	W	1.9	0.6	0.6	4.4	10.7	6.3	14.5	17.0	44.0	2.77 (1.9)	
400 visitors per day	D	19.7	4.4	8.2	11.6	9.7	11.3	10.0	13.2	11.9	-0.02 (2.8)	4.52*
	W	32.7	6.5	11.8	11.8	11.1	8.5	5.9	3.9	7.8	-1.38 (2.6)	
500 visitors per day	D	33.0	10.2	14.6	8.9	11.1	5.7	7.3	4.4	4.8	-1.66 (2.5)	5.29*
	W	51.0	13.7	13.7	8.5	5.9	3.9	1.3	0.7	1.3	-2.84 (1.8)	
600 visitors per day	D	53.5	11.8	6.4	11.5	6.7	3.2	1.9	2.5	2.5	-2.67 (2.1)	4.73*
	W	69.1	15.8	5.3	5.9	2.0	0.7	1.3	0.0	0.0	-3.44 (1.2)	
More than 600 visitors per day	D	73.1	5.0	6.6	2.8	5.9	1.9	0.3	1.3	3.1	-3.24 (1.9)	4.78*
	W	93.4	2.0	2.0	2.0	0.7	0.0	0.0	0.0	0.0	-3.91 (0.8)	

D = day visitor ($N = 390$); W = wilderness user ($N = 162$); *indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

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The number of visitors on Cumberland Island National Seashore should not be restricted

Table 3.2b. Responses for visitor restriction

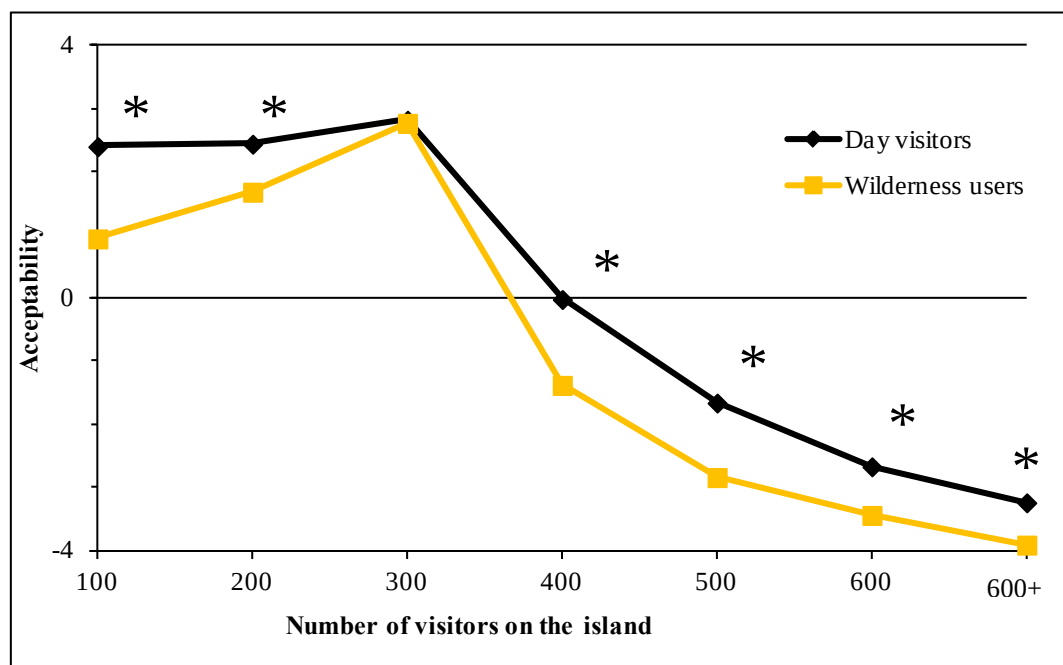
	Number of visitors should not be restricted	N	%
Day users	Agree	8	2.1%
	Disagree	380	97.9%
Wilderness visitors	Agree	0	0.0%
	Disagree	160	100.0%

Overall, day users and wilderness visitors agree that the number of visitors at CUIS should be restricted.

Cumberland Island National Seashore currently limits the number of visitors on the island each day to 300. We would like to know how many visitors you think it is acceptable to have on Cumberland Island at one time.

Please circle one response for each of the following numbers of visitors on Cumberland Island per day. A rating of “-4” means the number of visitors is “very unacceptable”, and a rating of “+4” means the number visitors is “very acceptable”. (If use should not be restricted at all you may indicate that.)

Figure 3.2. Social norm curve for the acceptability of the number of people on the island



*indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

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Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

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Robert.Manning@uvm.edu
(802) 656-3096

Overall, the results indicate that both day users and wilderness users report the current visitation limit of 300 visitors per day as the most acceptable. Reducing visitation to 100 or 200 visitors per day is also reported as acceptable to both user groups. However, visitation exceeding 400 persons per day is reported as unacceptable by both day visitors and wilderness users. Differences between the two populations differ among six levels of visitation. Overall, wilderness users report lower acceptability for increasing numbers of visitors.

3.3 Questionnaire results for total vehicles seen on roads

A vehicle-based transportation service is being planned and designed to offer visitors greater access to sites on Cumberland Island National Seashore. Tentatively, each of these vehicle trips will start and end at the ferry dock and take approximately three to five hours to complete. Also, a separate, unscheduled courtesy shuttle would be provided to sites on the south end of the island. The following questions pertain to the future vehicle transportation system on Cumberland Island.

We would like to know how many vehicles you think it is acceptable to see on the roads on Cumberland Island. Please rate the acceptability of each of the following numbers of other vehicles seen during a day. A rating of -4 means the number of other vehicles seen is “very unacceptable”, and a rating of +4 means the number of other vehicles seen is “very acceptable”. (Circle one number for each line.)

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

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(802) 656-3096

Table 3.3. Distribution of responses for the acceptability of the number of vehicles seen on roads

		Very unacceptable (-4) ← % of responses → Very acceptable (+4)									Mean (SD)	t-value*
No other vehicles	D	8.7	1.2	1.5	2.0	17.8	4.7	1.7	5.8	56.6	2.54 (2.7)	1.98*
	W	11.1	0.0	1.3	1.3	5.9	1.3	1.3	7.2	70.6	2.76 (2.7)	
2 vehicles per day	D	7.6	1.4	1.1	1.4	16.2	7.0	10.6	13.4	41.2	2.33 (2.5)	3.31*
	W	1.3	2.0	2.6	2.6	9.8	8.5	14.4	19.6	24.2	1.26 (2.9)	
4 vehicles per day	D	9.9	0.8	2.3	3.4	18.1	9.6	13.3	10.8	31.7	1.78 (2.7)	6.47*
	W	28.9	2.0	6.6	9.9	7.9	9.9	9.9	7.9	17.1	-0.25 (3.2)	
6 vehicles per day	D	16.4	2.5	7.6	7.1	20.9	7.6	11.0	9.0	17.8	0.41 (3.1)	6.18*
	W	39.5	5.9	10.5	7.9	6.6	8.6	7.2	3.3	10.5	-1.39 (2.9)	
8 vehicles per day	D	27.2	7.4	8.5	7.9	19.3	6.5	7.9	5.7	9.6	-0.96 (2.9)	6.26*
	W	54.2	9.2	8.5	6.5	6.5	5.2	3.9	3.3	2.6	-2.51 (2.3)	
10 vehicles per day	D	38.2	7.9	11.6	9.1	14.7	4.2	3.1	3.4	7.6	-1.85 (2.7)	5.99*
	W	69.9	8.5	4.6	3.3	4.6	3.9	2.0	0.7	2.6	-3.12 (1.9)	
15 vehicles per day	D	52.4	11.4	8.8	4.0	14.0	1.4	3.7	0.9	3.4	-2.79 (2.1)	6.10*
	W	85.6	3.3	3.3	2.0	2.6	2.0	0.7	0.7	0.0	-3.70 (1.14)	
More than 15 vehicles per day	D	71.7	4.8	2.8	1.4	13.3	2.3	0.8	0.6	2.3	-3.39 (1.7)	5.36*
	W	92.7	2.6	1.3	1.3	1.3	0.7	0.0	0.0	0.0	-3.87 (0.60)	

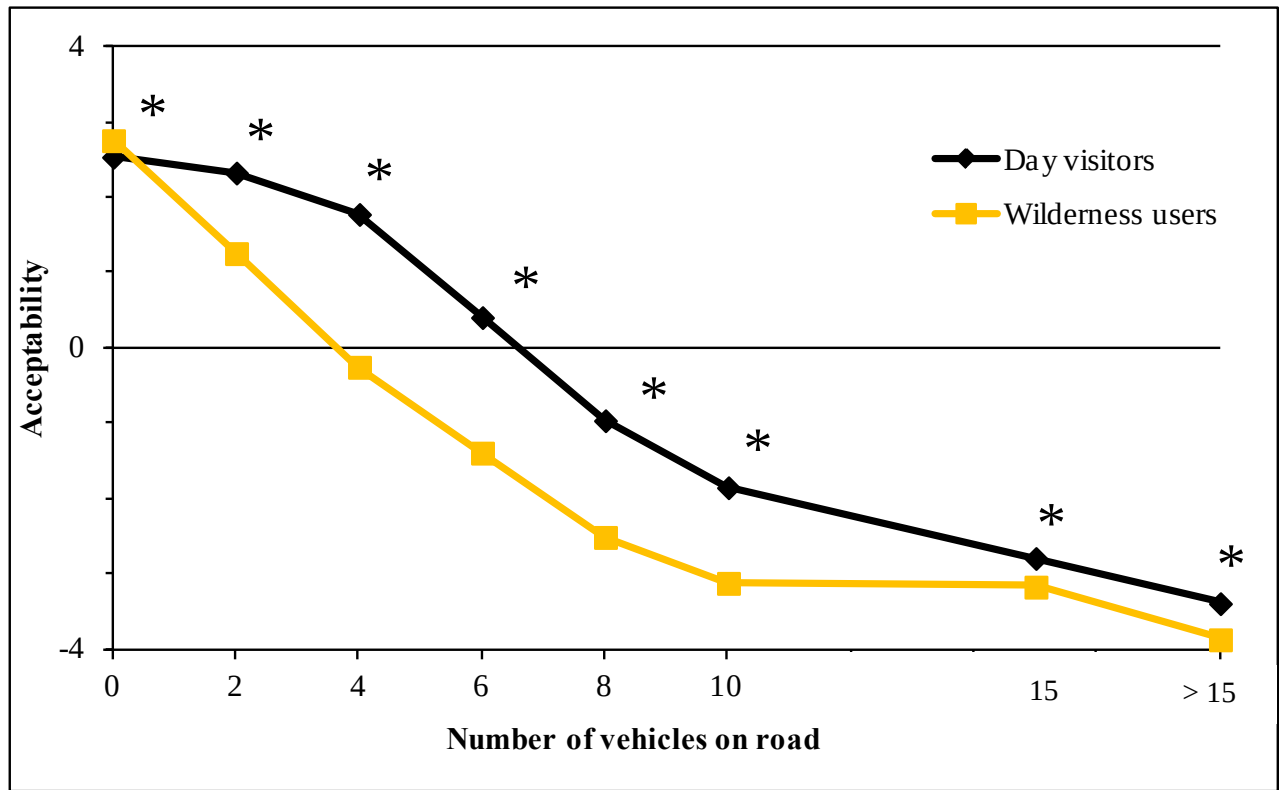
D = day visitor ($N = 390$); W = wilderness user ($N = 162$); *indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

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(802) 656-3096

Figure 3.3. Social norm curve for the acceptability of the number of vehicles to see on roads



*indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

The level of acceptability for the number of vehicles seen per day on the road differs between user groups across all measures. Specifically, day visitors reported higher levels of acceptability than wilderness users for more vehicles on the main road. Day visitors report that eight vehicles seen per day on the main road is unacceptable and wilderness users report that four vehicles seen per day on the main road is unacceptable. Both groups agree that no vehicles or two vehicles seen on the road per day are also acceptable. These findings indicate differences between user groups and suggest that there is limited tolerance from either group for increased traffic on the main road.

3b. What is the approximate number of vehicles you saw on this visit (or last visit for wilderness) on the roads?

Table 3.3b. Responses for the number of vehicles seen during the visit

	M (SD)	Mode	Median	Minimum - Maximum
Day users	3.27 (2.5)	2	3	0-12
Wilderness visitors	3.05 (1.9)	3	3	0-12

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3.4 Questionnaire results for number of people within view at the BEACH

We would like to know how many people you think could use the beaches at Cumberland Island without you feeling too crowded. To help judge this, we have a series of photographs that show different numbers of people on the beach. Please look at the photographs on **Poster 1 – People on Beaches**.

Figure 3.4. Poster 1 – People on beaches



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Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
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Please rate each photograph on Poster 1 – People on Beaches by indicating how acceptable you think it is based on the number of people shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each photograph.)

Table 3.4. Distribution of responses for the acceptability of the number of people within view at the BEACH

Number of people	Visitor type	Very unacceptable (-4) ← % of responses → Very acceptable (+4)										Mean (SD)	t-value*
0 people	D	3.7	1.1	0.6	1.7	9.6	2.8	2.0	4.8	73.9	2.96 (2.1)	-1.98*	
	W	3.1	0.0	0.0	0.6	0.6	1.3	0.6	3.8	90.0	3.60 (1.5)		
6 people	D	2.5	1.4	0.3	0.8	7.6	4.2	5.4	19.2	58.5	2.91 (1.9)	3.31*	
	W	4.4	1.3	0.6	3.8	5.6	5.6	10.0	28.1	40.6	2.46 (2.1)		
12 people	D	6.2	1.1	3.1	4.5	12.1	7.6	15.3	16.7	33.1	2.03 (4.5)	6.47*	
	W	17.0	5.0	7.5	6.3	13.2	10.7	13.2	11.9	15.1	0.29 (2.8)		
18 people	D	12.1	5.6	9.3	9.6	15.5	11.0	9.9	8.2	18.6	0.36 (2.7)	6.18*	
	W	37.7	9.4	11.9	11.9	14.5	3.8	5.7	3.1	1.9	-1.83 (2.2)		
24 people	D	26.5	15.5	11.8	6.2	13.0	6.2	5.6	6.2	9.0	-1.10 (2.7)	6.26*	
	W	61.3	16.3	8.8	3.8	5.0	1.3	1.9	0.6	1.3	-3.03 (1.7)		
30 people	D	50.4	9.9	4.8	6.2	8.2	4.0	5.1	2.8	8.5	-1.91 (2.7)	5.99*	
	W	78.6	10.1	3.8	1.3	2.5	1.9	0.6	0.0	1.3	-3.45 (1.4)		

D = day visitor ($N = 390$); W = wilderness user ($N = 162$); *indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

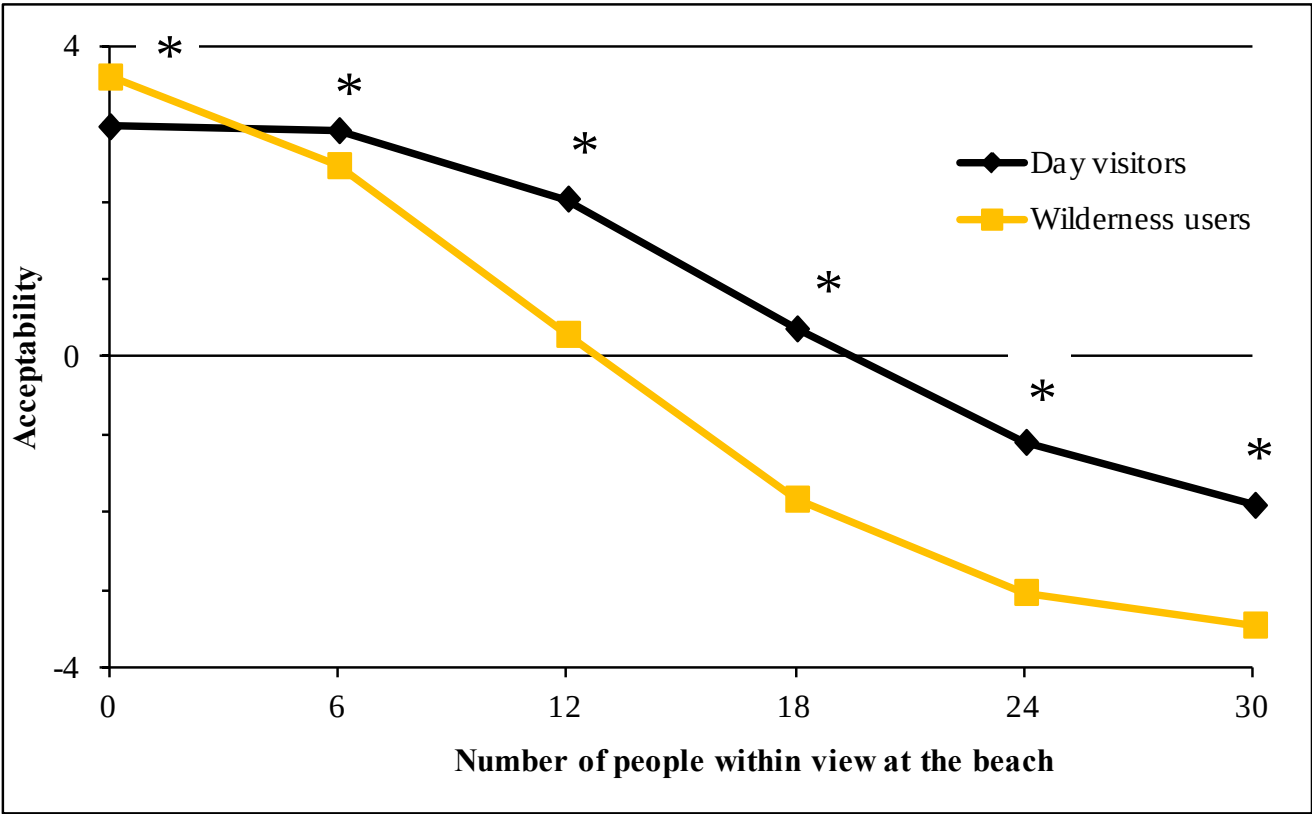
Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Please rate each photograph on Poster 1 – People on Beaches by indicating how acceptable you think it is based on the number of people shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each photograph.)

Figure 3.4b. Social norm curve for the acceptability of the number of people within view at the BEACH



*indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Table 3.4b. Distribution of responses for evaluative criteria for the number of people within view at the BEACH (mean response is displayed as the number of people)

BEACH - Questions		Number of people at the BEACH						χ^2	Mean (SD)	t *
		0	6	12	18	24	30			
4b. Which photograph shows the level of use you would <u>prefer</u> to see	D	23.2	33.3	25.1	12.2	3.1	3.1	59.9*	9 (6.2)	7.41*
	W	49.1	35.2	14.5	0.6	0.6	0.0		4 (4.7)	
4c. Which photograph shows the level of use that is so unacceptable that you would no longer use this area?	D	0.4	2.0	10.9	19.4	30.6	36.7	28.3*	23 (6.6)	4.64*
	W	0.0	2.3	22.7	34.8	20.5	19.7		20 (6.6)	
4d. Which photograph shows the highest level of use that the National Park Service should allow? In other words, at what point should visitors be restricted from using this area?	D	1.1	10.0	25.7	33.0	18.4	11.9	5.29	18 (7.1)	1.48
	W	0.7	12.5	25.7	40.4	13.2	7.4		17 (6.5)	
4e. Which photograph looks most like the number of people you typically saw on the beach on this visit to Cumberland Island?	D	20.3	47.5	20.0	8.5	3.0	0.7	34.0*	8 (2.7)	5.36*
	W	43.2	43.2	9.0	3.2	0.6	0.6		5 (2.2)	

D = day visitor (N = 390); W = wilderness user (N = 162); *indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

None of the photographs are so unacceptable that I would no longer use the BEACH

Table 3.4c. Agreement with none of the photographs are so unacceptable that I would no longer use the BEACH

Visitor type	Agreement	N	%
Day users	Agree	99	25.3
	Disagree	267	68.3
Wilderness visitors	Agree	28	17.5
	Disagree	132	82.5

None of the photographs show a high enough level of use to restrict visitors from using the BEACH

Table 3.4d. Agreement with none of the photos show a high enough level of use to restrict visitors from using the BEACH

Visitor type	Agreement	N	%
Day users	Agree	57	15.6
	Disagree	309	84.4
Wilderness visitors	Agree	22	13.8
	Disagree	138	86.3

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Visitor use should not be restricted

Table 3.4e. Agreement with visitor use should not be restricted (beach)

Visitor type	Agreement	N	%
Day users	Agree	26	7.1
	Disagree	340	92.9
Wilderness visitors	Agree	0	0.0
	Disagree	160	100.0

I did not visit the BEACH

Table 3.4f. Agreement with I did not visit the BEACH

Visitor type	Agreement	N	%
Day users	Agree	37	10.1
	Disagree	328	89.9
Wilderness visitors	Agree	4	2.5
	Disagree	156	97.5

3.5 Summary and Interpretation of responses to the number of people within view at the beach

Table 3.5. Summary of potential standards and the existing conditions at the beach

Evaluative Dimension	Wilderness Visitors (people)	Day Visitors (people)
Acceptability	13	19
Preference	4	9
Management action	18	17
Displacement	23	20
Typically seen	8	5

Results indicate that significant differences exist between day visitors and wilderness users in the acceptability of the conditions displayed in the beach photographs. Specifically, wilderness users, as compared to day visitors, report that lower use levels are more acceptable and higher use levels are less acceptable. Furthermore, wilderness users report 18 people within view as unacceptable but day visitors report this level of crowding as acceptable. Wilderness users and day visitors report 4 people and 9 people as their preference for people within view, respectively. However, 24 or more people within view at the beach is unacceptable to both groups. The groups also seem to agree that 0 people within view at the beach is most acceptable and that up to 12 people within view remains acceptable. Both groups also agree that management action

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

should occur when beach use reaches approximately 17-18 people within view and that they would no longer use the area when people within view reaches 20 (wilderness users) or 23 (day visitor). Both groups favor restricting use at some level (> 92.9% agree visitor use should be restricted).

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

3.6 Questionnaire results for number of people within view at DUNGENESS

We would like to know how many people you think could use the Dungeness area without you feeling too crowded. To help judge this, we have a series of photographs that show different numbers of people in this area. Please look at the photographs on **Poster 2 – People at Dungeness**.

Figure 3.6. Poster 2 – People at Dungeness



Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Please rate each photograph on Poster 2 – People at Dungeness by indicating how acceptable you think it is based on the number of people shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each photograph.)

Table 3.6. Distribution of responses for the acceptability of the number of people within view at DUNGENESS

Number of people	Visitor type	Very unacceptable (-4) ← % of responses → Very acceptable (+4)										Mean (SD)	t-value*
0 people	D	4.0	1.1	1.1	1.4	9.9	2.0	3.7	4.2	72.5	2.89 (2.1)	-3.44*	
	W	3.2	0.0	0.0	1.3	0.6	2.6	0.0	2.6	89.7	3.55 (1.6)		
7 people	D	1.7	0.6	0.6	0.6	9.3	3.4	8.2	23.8	51.8	2.88 (1.7)	-1.27	
	W	1.3	0.3	0.6	0.0	4.5	5.1	5.8	28.2	53.8	3.08 (1.5)		
14 people	D	5.6	1.7	2.3	5.4	14.1	7.9	18.1	16.4	28.5	1.70 (2.2)	2.49*	
	W	5.8	3.9	6.5	8.4	12.9	11.0	16.8	13.5	21.3	1.14 (2.4)		
21 people	D	14.0	4.3	8.6	11.4	16.3	11.7	10.3	8.9	14.6	0.20 (2.6)	4.28*	
	W	27.9	5.8	7.8	13.6	13.6	11.7	6.5	5.8	7.1	-0.88 (2.6)		
28 people	D	26.6	16.4	11.0	7.9	15.0	6.5	6.2	3.4	7.1	-1.28 (2.5)	5.67*	
	W	52.6	12.2	9.6	7.7	10.9	1.9	2.6	0.6	1.9	-2.57 (1.9)		
35 people	D	50.3	6.8	8.5	8.2	11.1	5.1	2.0	2.6	5.4	-2.09 (2.5)	5.01*	
	W	71.2	10.3	4.5	3.2	5.8	3.2	0.0	0.0	1.9	-3.17 (1.7)		

D = day visitor ($N = 390$); W = wilderness user ($N = 162$); *indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

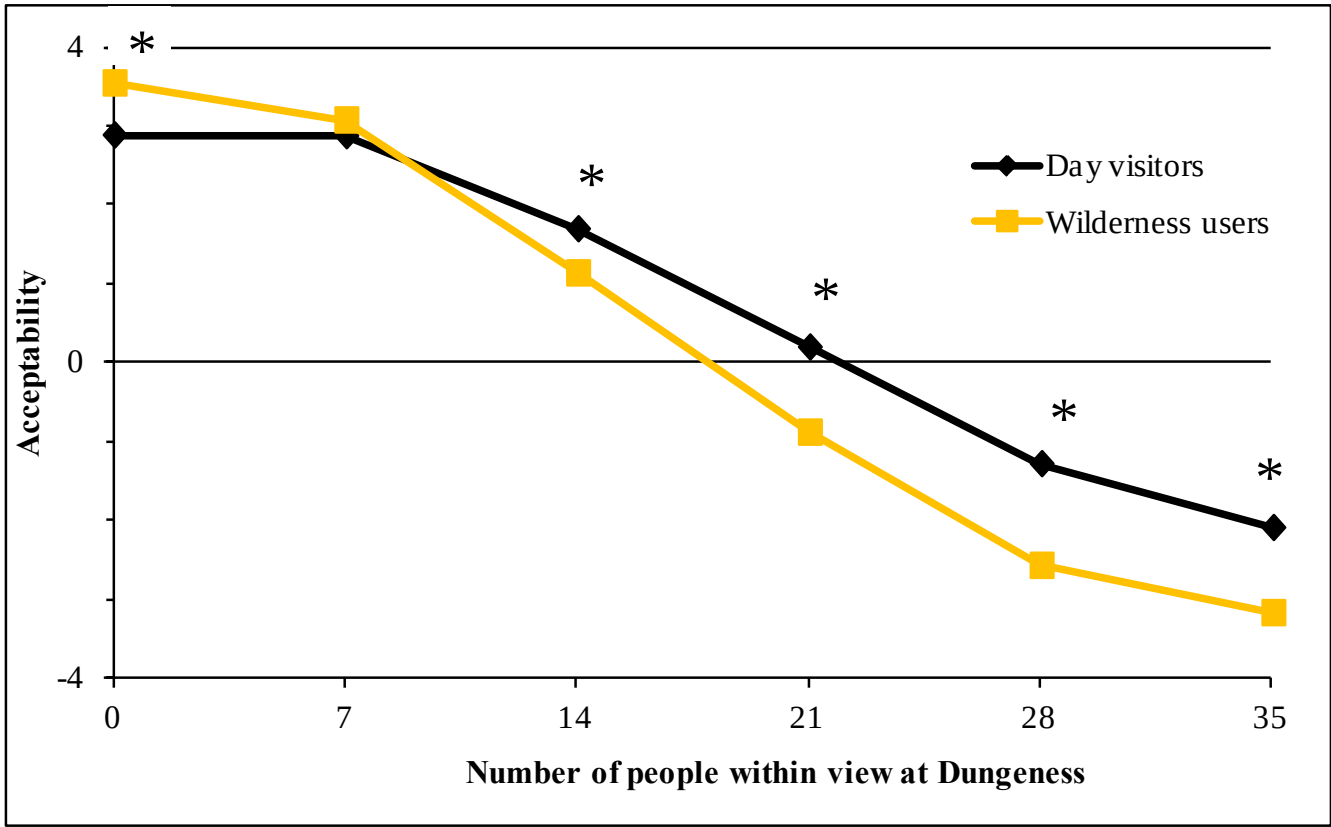
Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Please rate each photograph on Poster 2 – People at Dungeness by indicating how acceptable you think it is based on the number of people shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each photograph.)

Figure 3.6b. Social norm curve for the acceptability of the number of people within view at DUNGENESS



*indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Table 3.6b. Distribution of responses for evaluative criteria for the number of people within view at Dungeness (mean response is displayed as the number of people)

DUNGENESS - Questions		Number of people at the DUNGENESS						χ^2	Mean (SD)	t *
		0	7	14	21	28	35			
5b. Which photograph shows the level of use you would <u>prefer</u> to see	D	20.6	39.1	22.4	12.8	3.0	1.8	13.9*	10 (8.2)	2.85*
	W	24.5	43.2	26.5	5.2	0.0	0.6		8 (6.2)	
5c. Which photograph shows the level of use that is so unacceptable that you would no longer use this area?	D	1.2	2.8	12.9	23.7	26.9	32.5	15.7*	26 (8.3)	1.67
	W	0.0	0.8	14.6	36.6	30.9	17.1		25 (6.8)	
5d. Which photograph shows the highest level of use that the National Park Service should allow? In other words, at what point should visitors be restricted from using this area?	D	1.1	10.0	23.8	33.0	20.3	11.9	20.7*	21 (8.3)	-4.21*
	W	0.0	0.8	14.6	36.6	30.9	17.1		24 (6.8)	
5e. Which photograph looks most like the number of people you typically saw at Dungeness on this visit to Cumberland Island?	D	21.2	52.6	18.6	5.5	1.5	0.7	2.9	8 (6.4)	0.09
	W	21.7	53.9	17.4	4.3	0.9	0.9		8 (6.4)	

D = day visitor (N = 390); W = wilderness user (N = 162); *indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

None of the photographs are so unacceptable that I would no longer use DUNGENESS

Table 3.6c. Agreement with none of the photographs are so unacceptable that I would no longer use DUNGENESS

Visitor type	Agreement	N	%
Day users	Agree	90	24.6
	Disagree	267	75.4
Wilderness visitors	Agree	32	20.0
	Disagree	128	80.0

None of the photographs show a high enough level of use to restrict visitors from using the DUNGENESS area

Table 3.6d. Agreement with none of the photos show a high enough level of use to restrict visitors from using the DUNGENESS area

Visitor type	Agreement	N	%
Day users	Agree	63	17.2
	Disagree	303	82.8
Wilderness visitors	Agree	32	20.0
	Disagree	128	80.0

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Visitor use should not be restricted

Table 3.6e. Agreement with visitor use should not be restricted (Dungeness)

Visitor type	Agreement	N	%
Day users	Agree	25	6.8
	Disagree	341	93.2
Wilderness visitors	Agree	0	0.0
	Disagree	160	100.0

I did not visit the DUNGENSESS

Table 3.6f. Agreement with I did not visit DUNGENSESS

Visitor type	Agreement	N	%
Day users	Agree	63	16.1
	Disagree	302	82.7
Wilderness visitors	Agree	45	28.1
	Disagree	115	71.9

3.7 Summary and interpretation of responses to the number of people within view at Dungeness

Table 3.7. Summary of potential standards and the existing conditions at Dungeness

Evaluative Dimension	Wilderness Visitors (people)	Day Visitors (people)
Acceptability	18	22
Preference	8	10
Management action	24	21
Displacement	25	26
Typically seen	8	8

Results indicate that significant differences exist between day visitors and wilderness users in the acceptability level of the conditions displayed in the Dungeness photographs. Similar to beach conditions, wilderness users report that low use levels (i.e., 0 people within view) at Dungeness are more acceptable and higher use levels at Dungeness are less acceptable. Furthermore, wilderness users report 21 people within view as unacceptable but day visitors report this level of crowding as acceptable. Wilderness users and day visitors report 8 people and 10 people as their preference for the amount of people within view at Dungeness, respectively. However, greater than 22 within view at the Dungeness is unacceptable to both groups. The groups also seem to agree that 0 people within view at Dungeness is most acceptable and that up to 14 people within view remains acceptable. Both groups also agree that management action should occur when use

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

reaches approximately 21-24 people within view and that they would no longer use the area when people within view reaches 25 (wilderness users) or 26 (day visitor). Both groups favor restricting use at some level (> 93.2% agree visitor use should be restricted), and report experiencing approximately 8 people within view at Dungeness. This finding suggests that current experiences (people within view) at Dungeness are within the acceptable range to both groups.

Study Contacts:

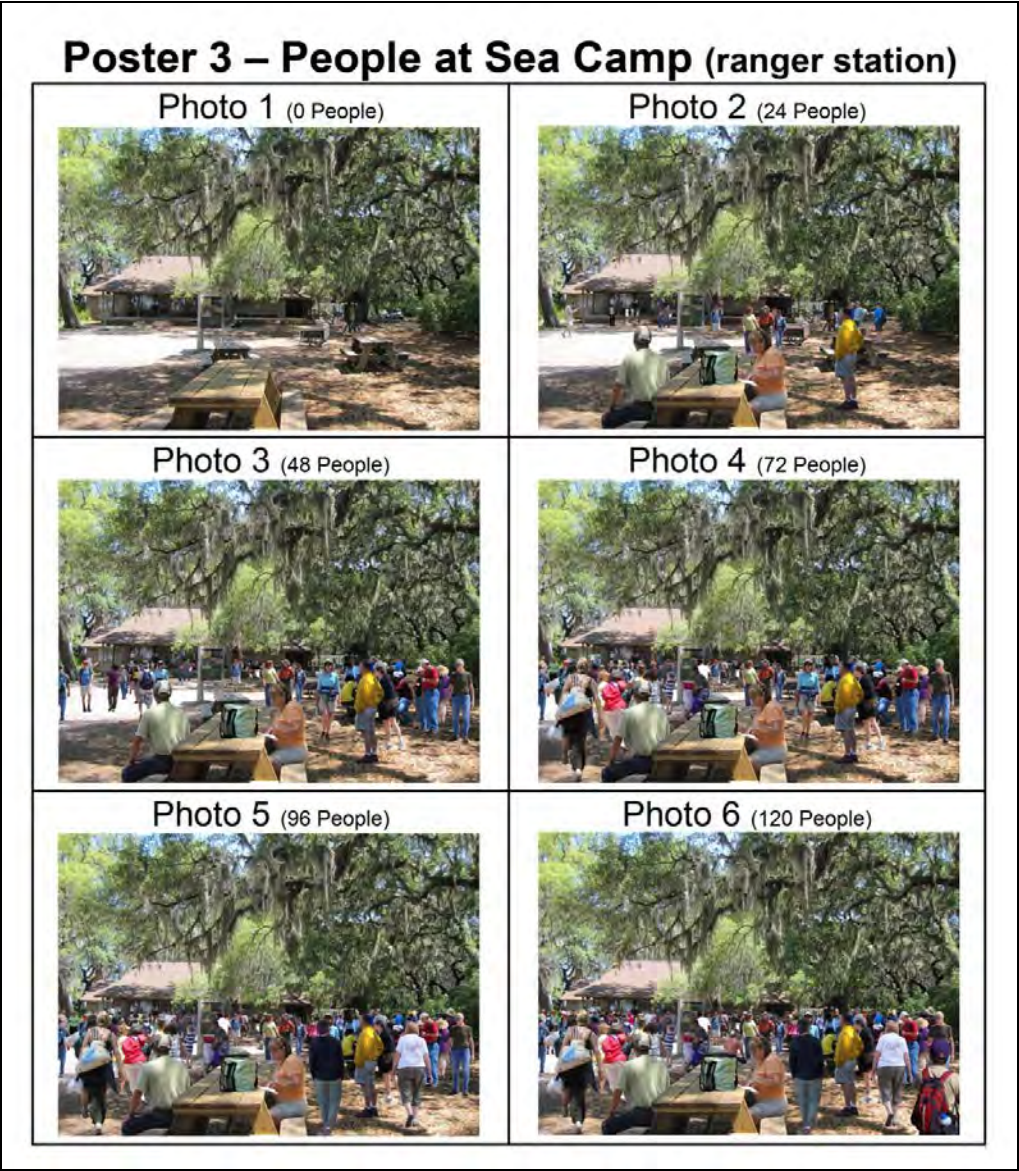
Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

3.8 Questionnaire results for number of people within view at SEA CAMP

We would like to know how many people you think could use the Sea Camp Ranger Station and Ferry Landing without you feeling too crowded. To help judge this, we have a series of photographs that show different numbers of people in this area. Please look at the photographs on **Poster 3 – People at Sea Camp**.

Figure 3.8. Poster 3 – People at Sea Camp



Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Please rate each photograph **Poster 3 – People at Sea Camp** by indicating how acceptable you think it is based on the number of people shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each photograph.)

Table 3.8. Distribution of responses for the acceptability of the number of people within view at SEA CAMP

Number of people	Visitor type	Very unacceptable (-4) ← % of responses → Very acceptable (+4)										Mean (SD)	t-value*
0 people	D	4.1	0.6	0.9	1.7	12.2	3.2	4.1	4.9	68.3	2.78 (2.2)	-3.03*	
	W	3.8	0.6	0.6	0.6	2.5	1.9	0.6	4.4	85.0	3.38 (1.8)		
24 people	D	1.4	0.0	0.3	0.9	10.1	3.7	7.8	25.1	50.7	2.90 (1.6)	-2.57*	
	W	1.3	0.0	0.6	0.6	1.9	1.9	8.2	25.2	60.4	3.28 (1.4)		
48 people	D	9.7	2.6	3.4	10.6	19.4	10.9	15.1	11.4	16.9	0.79 (2.4)	1.29	
	W	12.0	5.1	7.6	7.0	15.8	12.7	13.9	10.8	15.2	0.48 (2.6)		
72 people	D	23.7	13.5	12.9	10.2	17.3	8.5	6.1	4.1	3.8	-1.23 (2.3)	3.31*	
	W	37.3	12.4	12.4	14.4	9.2	5.2	5.9	0.7	2.6	-1.96 (2.6)		
96 people	D	43.2	19.7	8.4	6.1	13.6	1.4	4.3	0.9	2.3	-2.33 (2.1)	4.68*	
	W	65.2	16.5	6.3	3.8	5.1	1.3	0.0	1.3	0.6	-3.19 (1.5)		
120 people	D	66.1	8.1	3.2	4.3	10.7	1.7	2.3	0.3	3.2	-2.79 (2.1)	4.60*	
	W	86.3	6.3	1.3	1.3	2.5	0.6	0.6	0.6	0.6	-3.61 (1.3)		

D = day visitor ($N = 390$); W = wilderness user ($N = 162$); *indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

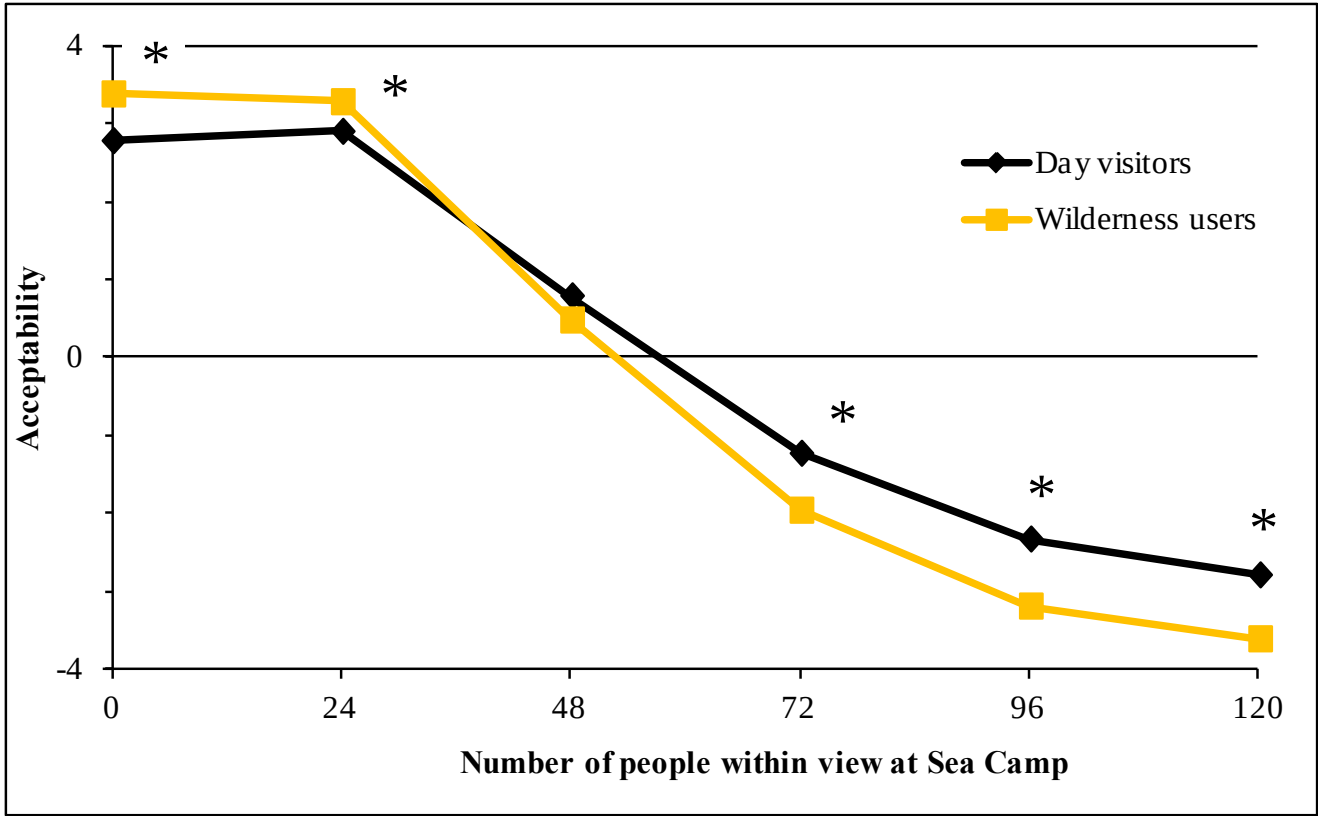
Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Please rate each photograph **Poster 3 – People at Sea Camp** by indicating how acceptable you think it is based on the number of people shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each photograph.)

Figure 3.8b. Social norm curve for the acceptability of the number of people within view at SEA CAMP



*indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Table 3.8b. Distribution of responses for evaluative criteria for the number of people within view at SEA CAMP (mean response is displayed as the number of people)

SEA CAMP - Questions		Number of people at the SEA CAMP						χ^2	Mean (SD)	t *
		0	24	48	72	96	120			
6b. Which photograph shows the highest level of use that the National Park Service should allow? In other words, at what point should visitors be restricted from using this area?	D	1.3	27.0	42.0	19.3	4.0	6.3	15.4*	52 (26.4)	-2.57*
	W	0.7	14.9	41.9	29.1	8.8	4.7		59 (24.7)	
6c. Which photograph looks most like the number of people you typically saw at Sea Camp on this visit to Cumberland Island?	D	7.0	69.9	17.1	4.0	0.7	1.0	26.6*	30 (18.0)	-2.95*
	W	21.7	53.9	17.4	4.3	0.9	0.9		35 (19.1)	

D = day visitor (N = 390); W = wilderness user (N = 162); *indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

None of the photographs show a high enough level of use to restrict visitors from using the SEA CAMP area

Table 3.8c. Agreement with none of the photos show a high enough level of use to restrict visitors from using the SEA CAMP area

Visitor type	Agreement	N	%
Day users	Agree	16	4.4
	Disagree	348	95.6
Wilderness visitors	Agree	17	10.6
	Disagree	143	89.4

Visitor use should not be restricted

Table 3.8d. Agreement with visitor use should not be restricted (Sea Camp)

Visitor type	Agreement	N	%
Day users	Agree	19	5.2
	Disagree	345	94.8
Wilderness visitors	Agree	0	0.0
	Disagree	160	100.0

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

I did not visit the SEA CAMP

Table 3.8e. Agreement with I did not visit SEA CAMP

Visitor type	Agreement	N	%
Day users	Agree	29	8.0
	Disagree	332	92.0
Wilderness visitors	Agree	8	5.0
	Disagree	152	95.0

3.9 Summary and interpretation of responses to the number of people within view at Sea Camp

Table 3.9. Summary of potential standards and the existing conditions at Sea Camp

Evaluative Dimension	Wilderness Visitors (people)	Day Visitors (people)
Acceptability	55	60
Management action	59	52
Typically seen	35	30

Following the same pattern reported by responses for the beach and Dungeness, results indicate that significant differences exist between day visitors and wilderness users in the acceptability of the conditions displayed in the Sea Camp photographs. For example, wilderness users report that lower use levels (i.e., 0 people within view) are more acceptable and higher use levels at Sea Camp are less acceptable. Furthermore, wilderness users report 0 people within view as the most acceptable condition but day visitors report 24 people as most acceptable. However, more than 48 people within view at Sea Camp is unacceptable to both groups. Both groups also agree that management action should occur when use levels reach approximately 52-59 people within view. Both groups favor restricting use at some level (> 94.8% of respondent agree visitor use should be restricted). Additionally, respondents report experiencing 30 (day visitors) to 35 (wilderness users) people within view at Sea Camp, which suggests that respondents' experiences are within the acceptable range to both groups.

Study Contacts:

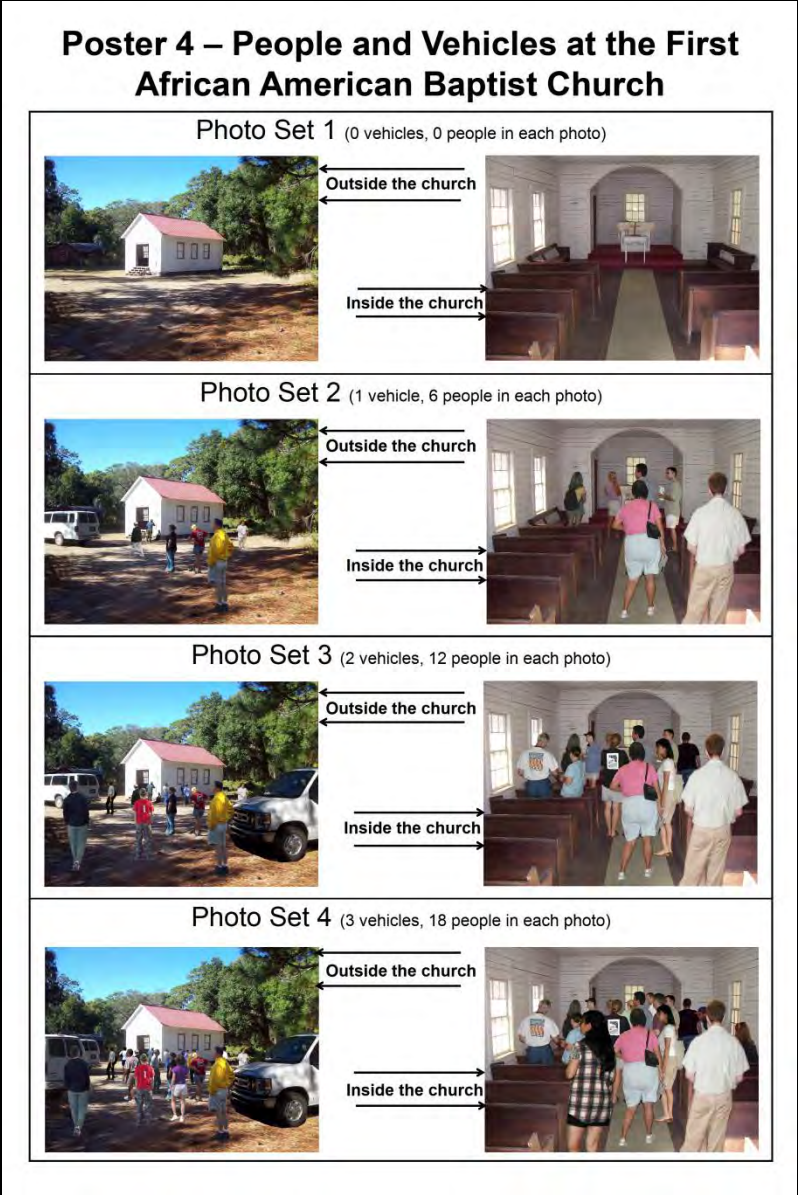
Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

3.10 Questionnaire results for number of people and vehicles within view at the FIRST AFRICAN BAPTIST CHURCH (FABC)

We would like to know how many people and vehicles you think could use the **First African Baptist Church in the settlement** area at the north end of the island without you feeling too crowded. To help judge this, we have a series of photographs that show different numbers of people in this area. Please look at the photographs on **Poster 4 – People and Vehicles at First African Baptist Church**.

Figure 3.10. Poster 4 – People and vehicles at the First African Baptist Church



Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Please rate each set of photographs on Poster 4 – People and Vehicles at First African Baptist Church by indicating how acceptable you think it is based on the number of people and vehicles shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each set of photographs)

Table 3.10. Distribution of responses for the acceptability of the number of people and vehicles within view at FABC

Number of people and vehicles	Visitor type	Very unacceptable (-4) % of responses Very acceptable (+4)										Mean (SD)	t-value*
0 people 0 vehicles	D	4.9	0.6	0.3	2.1	17.5	2.5	2.5	5.2	64.4	2.56 (2.3)	-3.65*	
	W	3.4	0.0	0.0	1.4	4.8	1.4	0.7	2.8	85.5	3.35 (1.9)		
6 people 1 vehicle	D	1.5	0.6	0.6	1.5	16.1	5.5	8.5	22.5	43.2	2.52 (1.8)	2.43*	
	W	7.6	2.8	0.7	3.4	7.6	5.5	13.8	21.4	37.2	2.03 (2.4)		
12 people 2 vehicles	D	10.2	9.9	6.9	11.4	19.9	10.8	11.4	5.4	13.9	0.09 (2.5)	7.15*	
	W	40.1	8.2	11.6	8.2	12.2	6.1	4.8	2.7	6.1	-1.68 (2.5)		
18 people 3 vehicles	D	40.8	9.8	9.5	4.6	17.5	4.9	3.4	3.4	6.1	-1.70 (2.5)	6.74*	
	W	71.4	10.2	7.5	2.0	4.8	1.4	0.7	0.7	1.4	-3.23 (1.6)		

D = day visitor ($N = 390$); W = wilderness user ($N = 162$); *indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

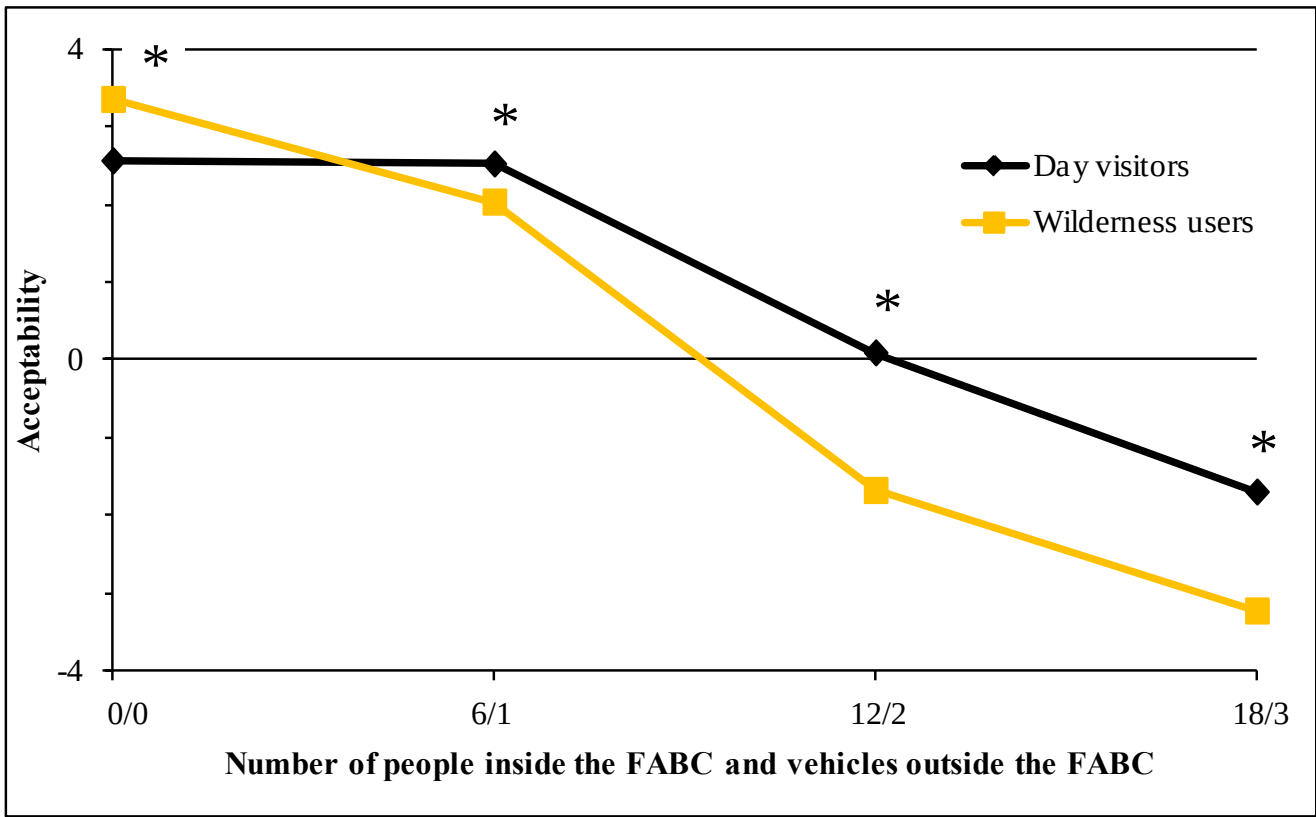
Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Please rate each set of photographs on Poster 4 – People and Vehicles at First African Baptist Church by indicating how acceptable you think it is based on the number of people and vehicles shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each set of photographs)

Figure 3.10b. Social norm curve for the acceptability of the number of people and vehicles within view at FABC (listed on the horizontal axis as people/vehicle; 0/0, 6/1, 12/2, 18/3)



*indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Table 3.10b. Distribution of responses for evaluative criteria for the number of people and vehicles within view at FABC (mean response is displayed as the number of people inside/number of vehicles outside)

FABC - Questions		Number of people/vehicles at the FABC				χ^2	Mean people (SD)/ Mean vehicle (SD)	t *
		0/0	6/1	12/2	18/3			
7b. Which photograph shows the level of use you would <u>prefer</u> to see	D	21.1	60.5	14.6	3.4	17.0*	6 (4.4)/ 1 (0.7)	3.91*
	W	38.6	51.0	9.0	1.4		4 (4.1)/ 1 (0.7)	
7c. Which photograph shows the level of use that is so unacceptable that you would no longer use this area?	D	1.4	6.1	40.7	50.0	10.0*	15 (4.5)/ 2 (0.8)	2.51*
	W	0.8	8.7	55.6	34.1		14 (4.1)/ 2 (0.7)	
7d. Which photograph shows the highest level of use that the National Park Service should allow? In other words, at what point should visitors be restricted from using this area?	D	0.8	34.3	47.7	15.5	19.1*	11 (4.6)/ 2 (0.8)	2.47*
	W	7.9	39.6	35.3	17.3		10 (5.2)/ 2 (0.9)	
7e. Which photograph looks most like the number of people you typically saw at FABC on this visit to Cumberland Island?	D	-	-	-	-	-	-	-
	W	77.8	22.2	0.0	0.0		1 (2.4)/ 0 (0.4)	

D = day visitor (N = 390); W = wilderness user (N = 162); *indicates the mean differences in responses between user groups are statistically significant at $p < 0.05$

None of the photographs are so unacceptable that I would no longer use FABC

Table 3.10c. Agreement with none of the photographs are so unacceptable that I would no longer use FABC

Visitor type	Agreement	N	%
Day users	Agree	75	21.1
	Disagree	281	78.9
Wilderness visitors	Agree	20	12.5
	Disagree	140	87.5

None of the photographs show a high enough level of use to restrict visitors from using the FABC area

Table 3.10d. Agreement with none of the photos show a high enough level of use to restrict visitors from using the FABC area

Visitor type	Agreement	N	%
Day users	Agree	37	9.5
	Disagree	319	81.6
Wilderness visitors	Agree	9	5.6
	Disagree	151	94.4

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Visitor use should not be restricted

Table 3.10e. Agreement with visitor use should not be restricted (FABC)

Visitor type	Agreement	N	%
Day users	Agree	27	7.6
	Disagree	329	92.4
Wilderness visitors	Agree	0	0.0
	Disagree	160	100.0

I did not visit the FABC

Table 3.10f. Agreement with I did not visit FABC

Visitor type	Agreement	N	%
Day users	Agree	383	100.0
	Disagree	0	0.0
Wilderness visitors	Agree	97	60.6
	Disagree	63	39.4

3.11 Summary and interpretation of responses to the number of people within view at the FABC

Table 3.11. Summary of potential standards and the existing conditions at the FABC

Evaluative Dimension	Wilderness Visitors (people/vehicles)	Day Visitors (people/vehicles)
Acceptability	9/1.5	12/2
Preference	4/1	6/1
Management action	10/2	11/2
Displacement	14/2	15/2
Typically seen	1/0	--

Consistent with previous findings, results indicate that significant differences exist between day visitors and wilderness users in the acceptability level of most of the FABC photographs. Wilderness users report that lower use levels at the FABC are more acceptable and that higher use levels at the FABC are less acceptable. Approximately 85% of wilderness users reported that 0 people and 0 vehicles within view at the FABC as ‘very acceptable.’ Furthermore, wilderness users report 12 people and 2 vehicles within view as unacceptable but day visitors report this level of crowding as acceptable. Wilderness users report that 4 people/1 vehicle and day visitors report that 6 people/1 vehicle as their preference. However, both groups seem to agree that management action should occur when use reaches approximately 10-11 people and 2

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

vehicles within view and that they would no longer use the area when people within view reaches 14 (wilderness users) or 15 (day visitor) people. Both groups favor restricting use at some level (> 92.4% of respondents agree visitor use should be restricted). Wilderness users report experiencing approximately 1 person and 0 vehicles within view at the FABC, which suggests that their experiences are within the acceptable range. A very limited number of day visitors reported visiting FABC, and therefore are not included in the table above.

3.12 – Questionnaire results for experiencing crowding at CUIS locations

(the following questions were answered only by day visitors, $N = 227$)

VB2. *How crowded did you feel at the following locations on this trip to Cumberland Island National Seashore? (Circle one number for each location.)*

Table 3.12. Distribution of responses for experiencing crowding at CUIS locations (**ranked by highest mean**)

Location	Not at all crowded (1) ← % of responses → Extremely crowded (9)										Mean (SD)	N
On the ferry coming to the island	20.2	21.1	18.8	11.7	8.9	9.9	6.1	1.4	1.9	3.40 (2.10)	213	
At the ferry dock	24.4	27.2	18.9	12.0	4.1	6.0	5.5	0.9	0.9	2.94 (1.89)	217	
At the campground	45.7	24.8	16.2	6.7	2.9	1.9	1.0	1.0	0.0	2.10 (1.43)	105	
At historic or cultural sites	52.5	25.3	11.1	7.6	1.5	1.5	0.5	0.0	0.0	1.87 (1.19)	198	
On the beach	58.8	24.0	9.8	4.4	1.0	1.0	0.5	0.0	0.5	1.73 (1.18)	204	
On the Main Road that goes through the wilderness	58.6	28.3	8.4	2.6	1.6	0.0	0.5	0.0	0.0	1.62 (0.95)	191	

Respondents reported experiencing very little crowding at CUIS. Specifically, average crowding scores for all study sites ranged towards “not at all crowded” as evidenced by item means of less than 4.0. Visitors reported the most crowding on the ferryboat and the least crowding on the main road that goes through the wilderness area. Specifically, only 2.1% of visitors reported experiencing some level of crowding ‘on the main road that goes through the wilderness.’ Respondents who did not visit these areas were not included in the responses displayed above.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

3.13 Questionnaire results for desired amenities

(the following questions were answered only by day visitors, $N = 227$)

Please rate how much you would want each of the following on Cumberland Island. A rating of 1 means that you would not want it, and a rating of 9 means would want it. (Please circle one number for each statement.)

Table 3.13. Distribution of responses for desired amenities (ranked by highest mean)

Amenity	Do not want (1) % of responses Want (9)										Mean (SD)	N
Kayak or canoe-accessible campsites	7.0	1.3	1.9	1.3	8.3	10.8	16.6	16.6	36.3	7.02 (2.31)	157	
Kayak or canoe rentals	11.8	1.1	2.2	2.8	6.2	11.2	16.9	11.8	36.0	6.66 (2.64)	178	
Fires and designated fire rings at wilderness campsites	16.7	1.4	2.1	0.7	6.9	10.4	13.2	12.5	36.1	6.43 (2.90)	144	
Picnic tables at Stafford campsites	11.9	4.8	0.8	3.2	14.3	12.7	16.7	12.7	23.0	6.10 (2.62)	126	
Composting toilets at wilderness campsites	21.0	2.2	0.7	1.4	14.5	5.8	12.3	16.7	25.4	5.88 (2.99)	138	
More directional signs	10.7	6.8	3.4	2.4	17.0	12.1	18.4	13.1	16.0	5.80 (2.54)	206	
More trail markings	9.1	7.2	3.4	2.4	22.1	11.5	16.8	11.1	16.3	5.76 (2.47)	208	
Lantern pole at Stafford campsites	17.9	3.3	1.6	1.6	17.9	11.4	16.3	11.4	18.7	5.67 (2.76)	123	
More walking trails on south end of the island	12.0	5.4	1.6	3.3	26.1	14.7	13.0	12.0	12.0	5.54 (2.43)	184	
Wilderness trails that have boardwalks or planks to keep you out of muddy or wet places	21.9	3.0	4.5	4.5	18.9	12.9	12.9	7.5	13.9	5.07 (2.75)	201	
A geocaching route	23.5	6.1	3.0	2.3	22.7	9.1	12.1	6.1	15.2	4.92 (2.84)	132	
A narrated or optional interpretive program on the ferry	28.9	3.5	4.5	5.0	17.9	10.9	12.4	8.5	8.5	4.55 (2.78)	201	
More ferry access to the island for you and others; more people would be on the island but a ferry reservation would be easier to get	33.3	8.7	4.8	5.3	14.5	8.2	10.6	5.3	9.2	4.08 (2.83)	207	
More commercial services (e.g., a store, food services)	40.1	7.2	3.9	2.9	10.1	7.2	10.6	2.9	15.0	4.04 (3.09)	207	
Less ferry access to the island; there would be fewer people on the island but ferry reservations would be more difficult to get	28.2	6.2	10.3	5.6	36.4	2.1	4.1	1.5	5.6	3.08 (2.31)	195	

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Visitors report a high desire for kayak or canoe-accessible campsites, kayak or canoe rentals, and fire rings at designated campsites. Conversely, less ferry access to the island that would decrease the number of visitors and more commercial services are reported as least desirable. The reduced sample size for each question (N) is because some visitors chose to answer “don’t know” to many of the questions. This suggests visitors may need additional information to make a decision regarding the amenity. Approximately 40% of visitors reported a desire for ‘a narrated or optional interpretive program on the ferry.’ More directional signs and more trail markers were both reported as moderately desirable to respondents.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

3.14 Questionnaire results for desired vehicle features and amenities

(the following questions were answered only by day visitors, $N = 227$)

A vehicle-based transportation service is being planned and designed to offer visitors greater access to sites on Cumberland Island National Seashore. Tentatively, each of these vehicle trips will start and end at the ferry dock and take approximately three to five hours to complete. Also, a separate, unscheduled courtesy shuttle would be provided to sites on the south end of the island. The following questions pertain to the future vehicle transportation system on Cumberland Island.

Please rate how much you would want each of the following for the vehicle transportation system on Cumberland Island. A rating of 1 means that you would not want it, and a rating of 9 means would want it. (Please circle one number for each statement.)

Table 3.14. Distribution of responses for desired vehicle features and amenities (ranked by highest mean within category)

Amenity	Do not want (1) % of responses Want (9)									Mean (SD)	N
Type of vehicle											
Historic or antique looking vehicle	36.5	3.0	3.0	3.0	12.0	7.0	10.5	6.5	18.5	4.58 (3.18)	200
Carts or tram towed by a vehicle	47.2	2.5	3.6	3.0	8.1	7.6	9.6	6.1	12.2	3.87 (3.11)	197
Passenger van	51.5	2.0	3.5	4.5	5.4	7.9	5.9	5.0	14.4	3.69 (3.16)	202
A track or rail-style vehicle	60.6	3.6	3.6	2.6	5.2	6.7	6.2	4.1	7.3	2.97 (2.82)	193
Passenger bus	63.6	4.5	4.5	3.5	4.5	4.0	4.0	3.5	7.6	2.72 (2.72)	198
Newer-style school bus	68.0	3.6	4.6	5.1	6.1	2.0	4.6	2.5	3.6	2.36 (2.35)	197
Older-style school bus	70.5	4.2	5.3	4.2	6.3	2.6	2.6	2.1	2.1	2.13 (2.09)	190
Vehicle power or fuel											
Electric hybrid	26.0	0.5	0.5	0.5	9.2	5.1	12.2	10.2	35.7	5.96 (3.25)	196
Natural gas	39.3	1.7	0.6	3.5	13.3	7.5	10.4	8.7	15.0	4.47 (3.16)	173
Biodiesel	41.0	1.7	3.5	1.7	15.6	8.1	9.8	5.2	13.3	4.18 (3.06)	173
Propane	46.7	3.0	3.0	3.0	20.0	6.1	6.7	4.2	7.3	3.56 (2.78)	165
Ethanol	50.9	1.8	4.1	2.3	16.4	7.0	5.3	5.3	7.0	3.42 (2.81)	171
Gasoline	58.9	3.9	3.3	1.7	15.0	4.4	2.8	2.2	7.8	2.92 (2.69)	180

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Continued...

Please rate how much you would want each of the following for the vehicle transportation system on Cumberland Island. A rating of -4 means that you would not want it, and a rating of +4 means would want it. (Please circle one number for each statement.)

Amenity	Do not want (1) % of responses Want (9)										Mean (SD)	Don't know
Vehicle features												
An open-air vehicle	19.7	1.5	0.0	0.0	6.6	7.6	12.6	7.1	44.9	6.51 (3.08)	198	
An informational tour based on the natural history of Cumberland Island	20.4	0.5	1.0	0.0	8.5	9.5	8.5	11.9	39.8	6.36 (3.07)	201	
An informational tour based on the history and culture of Cumberland Island	22.7	0.5	1.0	0.0	8.6	9.1	9.6	8.6	39.9	6.19 (3.16)	198	
Extra large windows	23.8	1.1	1.1	0.5	7.9	3.7	12.7	10.1	39.2	6.15 (3.23)	189	
Wheelchair access	23.9	0.5	0.5	0.5	8.7	8.2	7.6	11.4	38.6	6.13 (3.20)	184	
Windows that open	26.2	1.6	0.5	0.5	8.4	7.3	9.4	7.3	38.7	5.92 (3.30)	191	
A place to store equipment (e.g., bikes, coolers, daypacks)	25.8	1.1	0.0	1.1	7.9	8.4	15.3	8.9	31.6	5.85 (3.12)	190	
Extra cushioned seats	27.5	2.1	1.1	3.2	16.4	9.0	7.9	9.0	23.8	5.25 (3.11)	189	
Fans	29.8	1.6	0.0	1.1	16.0	9.6	13.8	10.1	18.1	5.15 (3.07)	188	
A live audio tour	31.9	2.1	3.7	0.0	13.1	7.3	11.5	9.4	20.9	5.01 (3.19)	191	
Air conditioning	40.9	2.6	1.0	0.5	14.0	5.2	11.9	5.7	18.1	4.45 (3.24)	193	
A recorded audio tour	42.8	6.2	3.6	5.2	13.4	3.6	5.7	6.7	12.9	3.85 (3.04)	194	
Unpadded bench seats	41.4	4.4	3.9	2.8	20.4	9.9	5.5	5.0	6.6	3.73 (2.73)	181	
A video tour played on screens	51.6	4.2	4.2	3.2	15.8	6.3	6.3	2.1	6.3	3.20 (2.67)	190	
Vehicle sound												
A vehicle engine that makes almost no sound	16.0	1.5	0.5	1.0	3.0	4.5	6.0	11.5	56.0	7.05 (2.98)	200	
A vehicle engine that would allow you to converse without raising your voice	20.0	1.0	2.1	3.1	8.7	9.7	8.2	9.2	37.9	6.15 (3.07)	195	
A vehicle engine that you would have to raise your voice to converse over	74.9	5.2	4.7	3.1	5.2	2.1	1.6	1.0	2.1	1.89 (1.88)	191	

Study Contacts:

Jeffrey C. Hallo, Ph.D.
 jhallo@clemson.edu
 (864) 656-3237

Robert E. Manning, Ph.D.
 Robert.Manning@uvm.edu
 (802) 656-3096

Overall respondents report moderate to low desires for any vehicle, regardless of type. However, a “historic or antique looking vehicle” is reported as the most favorable ($M = 4.58$ on a 9 point scale), and an “older-style school bus” was reported as the least desired by respondents. Regarding vehicle power or fuel, study participants indicate the highest desire for an “electric hybrid” and the least desire for “gasoline.” An “open-air vehicle” was reported as the most desirable. The majority of respondents report a desire for an informational tour based on the natural history and the cultural history of CUIS. However, visitors report a low desire for a ‘video tour played on screens.’ Extra large windows and wheelchair access are also reported as desirable. Concerning vehicle sound, visitors report a strong desire for “a vehicle that makes almost no sound.”

What is the maximum you would be willing to pay per person to ride in the vehicle that has the characteristics from each category above that you want most?

Table 3.14b. Responses for dollar amount willing to pay for transportation

	M (SD)	Mode	Median	Minimum - Maximum
Dollar amount (U.S.)	\$11.12 (\$8.04)	\$10.00	\$10.00	\$0.00-\$50.00

OR

Table 3.14c. Responses for willingness to pay and ride to the northern end of the island

	Agreement	N	%
I would <u>not</u> pay to ride to the northern end of the island.	Agree	23	10.1
I would <u>not</u> ride a vehicle to the northern end of the island.	Agree	49	21.8

Respondents report a general willingness to pay approximately \$10.00 dollars for transportation at CUIS if the vehicle has the characteristics they desire. Some respondents indicated they would pay as much as \$50.00 for transportation with the desired characteristics. Additionally, a minority of visitors report that they would not pay (10.1%) or ride (21.8%) to the northern end of the island on the transportation system.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

3.15 Questionnaire results for experiences on the island

(the following questions were answered only by day visitors)

We would like to know how you felt about traveling around Cumberland Island National Seashore on this visit. For each item below please rate how much you think it describes your travel experience on Cumberland Island. (Please circle one number for each statement.)

Table 3.15. Distribution of responses for experiences while traveling around CUIS

Experiences	Strongly agree (1)	% of responses				Strongly disagree (5)	Mean (SD)
You experience conflict	3.3	1.9	9	30.2	55.7		4.33 (0.96)
You feel crowded	3.7	1.4	7.9	34.6	51.9		4.32 (1.00)
You feel stressed while traveling	4.3	7.6	10.9	28.4	48.8		4.10 (1.13)
It takes too long to get where you want to go	9	14.2	28.8	30.7	17.5		3.33 (1.18)
It is easy to access scenic overlooks, vistas, or locations	29.5	65.7	23.3	10	1.4		2.18 (1.02)
You have little impact on the area's natural environment	36	40.3	11.8	7.1	4.7		2.04 (1.09)
You have easy access to important sites and attractions	35.8	39.2	14.2	8.5	2.4		2.02 (1.03)
You could go "where you want, when you want"	47.9	28.2	13.6	7.5	2.8		1.89 (1.08)
You experience a sense of freedom	62.1	25.2	7	2.8	2.8		1.59 (0.94)
You hear natural sounds	63.4	25.9	4.2	1.9	4.6		1.58 (0.99)
You connect with the natural environment	63.2	26.4	6.6	1.4	2.4		1.53 (0.87)

A majority of respondents did not experience conflict, feel crowded, or feel stressed while traveling at CUIS. Also, a majority of respondents agreed that their travel experience included connecting with the natural environment, hearing natural sounds, and experiencing a sense of freedom. Most respondents indicated they had easy access to sites, attractions and scenic locations. Furthermore, 76.3% of visitors reported having little impact on the area's natural environment during their travel. However, 48% of respondents agree that 'it takes too long to get where you want to go.'

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

4.0 Limitations

A few limitations should be noted regarding this study. First, the response rate (44%) for the internet sample (wilderness visitors) may indicate that the responses are not entirely representative of *all* wilderness visitors to CUIS. Second, wilderness visitors completed Questionnaire Version A *after* and away from CUIS (e.g., their home), which was temporally and spatially separated from their CUIS experience. Conversely, the day users completed Questionnaire Version A on-site at the conclusion but *during* their experience. This difference in sampling and response periods may influence the recollections of the visit and potentially the reported standards for crowding. Third, a number of other important CUIS visitor locations were not evaluated in this study. For example, crowding standards for the Plum Orchard Mansion or the Ferry Boat were not evaluated. Visitors' may likely have different standards for crowding based on the differences in locales and therefore, standards for one location (e.g., Dungeness Ruins) should not be assumed equivalent for a similar but physically different location (e.g., Plum Orchard Mansion). Fourth, some questions – particularly those about the current carrying capacity and desired attributes of the new transportation system – seem to be heavily influence by the status quo and by respondents' broad beliefs and values (as opposed to detailed and informed attitudes). Responses to these questions should be interpreted with some caution.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

5.0 Management implications and recommendations

The findings from this study provide numerous implications for management of the visitor experience at CUIS. First, results suggest that the current number of people within view at the beach, Dungeness, Sea Camp, and the First African Baptist Church (FABC) are within the acceptable range reported by most day visitors and wilderness users. Additionally, respondents report that the number of people they *experienced* at each of these sites was equal to, or less than, the number of people they preferred to see. This finding aligns well with the result that the majority of visitors also reported that they did not feel crowded on the ferryboat, the ferry dock, the campground, cultural sites, the beach, or on the main road. Therefore, we conclude the conditions experienced by visitors are at, or below, their reported standards for crowding at the four locations evaluated in this study.

This finding suggests that a range of options exist for managers based on the selected management objectives. For example, managers may choose to manage for near solitude conditions, characterized by very low levels of crowding. This project's results suggest that the current visitor use level and distributions are producing high quality experiences that would match this objective. Therefore, maintaining the current visitor capacity and distribution may help ensure the continued provision of high quality visitor experiences and opportunities to experience solitude. If the management objective is to increase access to CUIS, then results from the project suggest that visitor numbers on the island could be increased somewhat without the experience being perceived by visitors (on average) as either unacceptable or in need of management attention. Any increases in visitation would need to be implemented incrementally while monitoring conditions (at Dungeness, Sea Camp, the beach, the main road, and the First African Baptist Church) to ensure that standards suggested by this project are not violated. If standards for 'acceptability' or 'management action' are violated then an experiential carrying capacity has been reached.

Another access-oriented option may be to increase overall visitor numbers but redistribute visitors using the ferry or the new transportation systems. By properly timing (i.e., drop-offs and pick-ups) and distributing visitor use, more visitors per day may be able to come to CUIS without changes in existing conditions at important visitor use sites. In other words, the ferry or the new transportation system could help disperse visitors so that experiential standards for crowding were not violated. Examples of transportation-related options to redistribute visitor use could include differently timed or more frequent service, changes in service locations, changes in the proportion of people who disembark at locations, altered signage/routing, or variations in vehicle sizes

A consistent pattern of differences in standards for crowding between day users and wilderness visitors was observed. In general, wilderness users are more tolerant of solitude and less tolerant of higher visitor use levels. Additionally, the range of acceptable conditions was lower for

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

wilderness visitors compared to day visitors. Therefore, this finding suggests that standards for both user groups should be taken into consideration when managing visitor use at the four sites evaluated in this study. Specifically, depending on management objectives, it may be worthwhile to manage for a range of standards that may best accommodate both user groups without violating standards for either group. Furthermore, day users did not report objections to fewer people at sites, and solitude-type conditions (fewer people) were generally more desirable than increased crowding. Therefore, the identified standards for wilderness users may be a relatively conservative standard to help inform management decisions because it is likely that these standards are acceptable for day users as well.

Another management-based finding is that visitors generally reported a low desire for any type of vehicle on the island. However, visitors most want a transportation system with a vehicle type, power source, and features that match their current experiences on the island. Specifically, visitors report wanting a historic or antique type of vehicle, which would match the existing visitor experience of interacting with historical aspects of CUIS. Furthermore, since much of CUIS is in a natural/undisturbed state relative to more developed nearby coastal areas (e.g., Jacksonville, FL), visitors want a vehicle that makes almost no sound and is powered by alternative fuel sources. This also makes sense since visitors additionally report they can currently hear natural sounds on the island and it seems they do not want a vehicle that may interrupt the natural soundscapes they currently experience. In addition, visitors desire an open-air vehicle that matches the manner that most visitors currently experience CUIS (e.g., walking around in the open air). Therefore, in general, it seems visitors desire a type of vehicle with features that closely match their existing experiences on the island, such as experiencing history, nature, and connections with natural, cultural, and historic resources not found in metropolitan areas.

6.0 Future research and actions

A well-implemented and defensible plan to manage for high quality visitor experiences and a visitor carrying capacity requires that indicators (such as use levels at sites) be regularly monitored and compared to standards. If standards are violated, then a carrying capacity has been reached, the visitor experience has been unacceptably degraded, and management action should be taken. However, in many cases both objective use level data (i.e., non-visitor reported) and the effectiveness of a particular management action for protecting the visitor experience may be unknown. To properly apply VERP to visitor management, carrying capacity, and transportation-related decision at Cumberland Island National Seashore the following actions are recommend:

1. Collect objective (non-visitor based) data on existing use levels at Dungeness, the beach, the main road, Sea Camp, and (if appropriate) the First African Baptist Church
2. Develop a long-term visitor use monitoring protocol, including an investigation of how visitor numbers at the ferry docks relate to use levels at specific attraction sites

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

3. Develop a simulation model of visitor use and distributions based on the ferries and the new transportation system. This simulation model will permit testing of the effectiveness of various management alternatives before their on-the-ground implementation.
4. Conduct an evaluation of the new transit system after it is fully implemented.
5. Implement an adaptive management program for the transit system and carrying capacity decisions by assessing visitor evaluations/satisfaction with different types of vehicles, different lengths of tours, different frequency of tours, and changes in visitor use numbers or distributions.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Appendices

Study Contacts:

Jeffrey C. Hallo, Ph.D. jhallo@clemson.edu (864) 656-3237	Robert E. Manning, Ph.D. Robert.Manning@uvm.edu (802) 656-3096
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Appendix A. Initial letter to wilderness permit holders



Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Appendix B. Follow up post card to wilderness permit holders

July 2011

Dear «First Name»«Last Name»,

Recently, we mailed you an internet link to a questionnaire regarding your visit to **Cumberland Island National Seashore**. If you have already completed the internet questionnaire, please accept our thanks. If not, please use the directions below to complete the questionnaire at your earliest convenience.

Since you are one of only a select number of Cumberland Island visitors receiving the questionnaire, it is extremely important that you complete the survey so that your opinions and attitudes about the management of Cumberland Island National Seashore are accurately represented.

Please type the following internet address into your web browser address bar <http://www.clemson.edu/centers-institutes/tourism/research/research2011.html>. Once the page opens, please click on the link titled "Cumberland Island National Seashore – Visitor Survey." To begin the questionnaire you must first enter ID number «ID» into the space provided at the beginning of the survey.

If you have any questions or concerns about this study or if any problems arise, please contact Dr. Jeffrey Hallo at Clemson University at 864.656.3237 or jhallo@clemson.edu. Thank you for your assistance!



Jeffrey C. Hallo, Ph.D.
Assistant Professor
Clemson University



Fred Boyles
Superintendent
Cumberland Island National Seashore

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Appendix C. Final letter to wilderness permit holders



Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Appendix D. Questionnaire Version A (completed by day visitors and wilderness visitors)ID _____
Version AOMB Number: 1024-0224
Expiration Date: 6/30/2011**Cumberland Island National Seashore – Visitor Survey
2011-2012**

1. Have you visited Cumberland Island National Seashore more than once in the last five years?
(Please check one.)

- ☐ Yes → how many times have you visited Cumberland Island National Seashore in the last five years? _____
- ☐ No → Go to Question 2.

2. Cumberland Island National Seashore currently limits the number of visitors on the island each day to 300. We would like to know how many visitors you think it is acceptable to have on Cumberland Island at one time.

Please circle one response for each of the following numbers of visitors on Cumberland Island per day. A rating of -4 means the number of visitors is "very unacceptable", and a rating of +4 means the number visitors is "very acceptable". (If use should not be restricted at all you may indicate that.)

	Very Unacceptable					Very Acceptable			
100 visitors per day	-4	-3	-2	-1	0	+1	+2	+3	+4
200 visitors per day	-4	-3	-2	-1	0	+1	+2	+3	+4
300 visitors per day	-4	-3	-2	-1	0	+1	+2	+3	+4
400 visitors per day	-4	-3	-2	-1	0	+1	+2	+3	+4
500 visitors per day	-4	-3	-2	-1	0	+1	+2	+3	+4
600 visitors per day	-4	-3	-2	-1	0	+1	+2	+3	+4
More than 600 visitors per day	-4	-3	-2	-1	0	+1	+2	+3	+4

OR

- ☐ The number of visitors on Cumberland Island National Seashore should not be restricted.

A vehicle-based transportation service is being planned and designed to offer visitors greater access to sites on Cumberland Island National Seashore. Tentatively, each of these vehicle trips will start and end at the ferry dock and take approximately three to five hours to complete. Also, a separate, unscheduled courtesy shuttle would be provided to sites on the south end of the island. The following questions pertain to the future vehicle transportation system on Cumberland Island.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

ID _____
Version AOMB Number: 1024-0224
Expiration Date: 6/30/2011

3. a. We would like to know how many vehicles you think it is acceptable to see on the roads on Cumberland Island. Please rate the acceptability of each of the following numbers of other vehicles seen during a day. A rating of -4 means the number of other vehicles seen is "very unacceptable", and a rating of +4 means the number of other vehicles seen is "very acceptable". (Circle one number for each line.)

	Very Unacceptable					Very Acceptable			
No other vehicles	-4	-3	-2	-1	0	+1	+2	+3	+4
2 vehicles per day	-4	-3	-2	-1	0	+1	+2	+3	+4
4 vehicles per day	-4	-3	-2	-1	0	+1	+2	+3	+4
6 vehicles per day	-4	-3	-2	-1	0	+1	+2	+3	+4
8 vehicles per day	-4	-3	-2	-1	0	+1	+2	+3	+4
10 vehicles per day	-4	-3	-2	-1	0	+1	+2	+3	+4
15 vehicles per day	-4	-3	-2	-1	0	+1	+2	+3	+4
More than 15 vehicles per day	-4	-3	-2	-1	0	+1	+2	+3	+4

- b. What is the approximate number of vehicles you saw on this visit on the roads?

Approximate number of vehicles seen: _____

OR

☐ I did not visit the main road.

The following questions ask you to evaluate several series of photographs. Please view these photos when answering the questions below.

4. We would like to know how many people you think could use the beaches at Cumberland Island without you feeling too crowded. To help judge this, we have a series of photographs that show different numbers of people on the beach. Please look at the photographs on Poster 1 – People on Beaches.
- a. Please rate each photograph on Poster 1 – People on Beaches by indicating how acceptable you think it is based on the number of people shown. A rating of -4 means the number of people is "very unacceptable", and a rating of +4 means the number of people is "very acceptable". (Circle one number for each photograph.)

	Very Unacceptable					Very Acceptable			
Photo 1	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 2	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 3	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 4	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 5	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 6	-4	-3	-2	-1	0	+1	+2	+3	+4

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

ID _____
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OMB Number: 1024-0224
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b. Which photograph shows the level of use you would prefer to see?

Photo number: _____

c. Which photograph shows the level of use that is so unacceptable that you would no longer use this area? (If none of the photographs represent this condition, you may indicate that.)

Photo number: _____

OR

☐ None of the photographs are so unacceptable that I would no longer use this area.

d. Which photograph shows the highest level of use that the National Park Service should allow? In other words, at what point should visitors be restricted from using this area? (If use should not be restricted at any point represented by the photographs, or not restricted at all, you may indicate that.)

Photo number: _____

OR

☐ None of the photographs show a high enough level of use to restrict visitors from using this area.

OR

☐ Visitor use should not be restricted.

e. Which photograph looks most like the number of people you typically saw on the beach on this visit to Cumberland Island?

Photo number: _____

OR

☐ I did not visit the beach.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

ID _____
Version A

OMB Number: 1024-0224
Expiration Date: 6/30/2011

5. We would like to know how many people you think could use the Dungeness area without you feeling too crowded. To help judge this, we have a series of photographs that show different numbers of people in this area. Please look at the photographs on Poster 2 – People at Dungeness.

a. Please rate each photograph on Poster 2 – People at Dungeness by indicating how acceptable you think it is based on the number of people shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each photograph.)

	Very Unacceptable					Very Acceptable			
Photo 1	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 2	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 3	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 4	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 5	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 6	-4	-3	-2	-1	0	+1	+2	+3	+4

- b. Which photograph shows the level of use you would prefer to see?

Photo number: _____

- c. Which photograph shows the level of use that is so unacceptable that you would no longer use the Dungeness area? (If none of the photographs represent this condition, you may indicate that.)

Photo number: _____

OR

☐ None of the photographs are so unacceptable that I would no longer use this area.

- d. Which photograph shows the highest level of use that the National Park Service should allow? In other words, at what point should visitors be restricted from using the Dungeness area? (If use should not be restricted at any point represented by the photographs, or not restricted at all, you may indicate that.)

Photo number: _____

OR

☐ None of the photographs show a high enough level of use to restrict visitors from using this area.

OR

☐ Visitor use should not be restricted.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

ID _____
Version A

OMB Number: 1024-0224
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e. Which photograph looks most like the number of people you typically saw in the Dungeness area during this visit?

Photo number: _____

OR

☐ I did not visit the Dungeness area.

6. We would like to know how many people you think could use the Sea Camp Ranger Station and Ferry Landing without you feeling too crowded. To help judge this, we have a series of photographs that show different numbers of people in this area. Please look at the photographs on Poster 3 – People at Sea Camp.

a. Please rate each photograph Poster 3 – People at Sea Camp by indicating how acceptable you think it is based on the number of people shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each photograph.)

	Very Unacceptable					Very Acceptable			
Photo 1	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 2	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 3	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 4	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 5	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo 6	-4	-3	-2	-1	0	+1	+2	+3	+4

b. Which photograph shows the highest level of use that the National Park Service should allow? In other words, at what point should visitors be restricted from using this area? (If use should not be restricted at any point represented by the photographs, or not restricted at all, you may indicate that.)

Photo number: _____

OR

☐ None of the photographs show a high enough level of use to restrict visitors from using this area.

OR

☐ Visitor use should not be restricted.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

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c. Which photograph looks most like the number of people you typically saw at the Sea Camp area during this visit?

Photo number: _____

OR

☐ I did not visit the Sea Camp area.

7. We would like to know how many people and vehicles you think could use the **First African Baptist Church in the settlement** area at the north end of the island without you feeling too crowded. To help judge this, we have a series of photographs that show different numbers of people in this area. Please look at the photographs on **Poster 4 – People and Vehicles at First African Baptist Church**.

a. Please rate each set of photographs on **Poster 4 – People and Vehicles at First African Baptist Church** by indicating how acceptable you think it is based on the number of people and vehicles shown. A rating of -4 means the number of people is “very unacceptable”, and a rating of +4 means the number of people is “very acceptable”. (Circle one number for each set of photographs)

	Very Unacceptable					Very Acceptable			
Photo Set 1	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo Set 2	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo Set 3	-4	-3	-2	-1	0	+1	+2	+3	+4
Photo Set 4	-4	-3	-2	-1	0	+1	+2	+3	+4

b. Which set of photographs shows the level of use you would prefer to see?

Photo number: _____

c. Which set of photographs shows the level of use that is so unacceptable that you would no longer use the First African Baptist Church? (If none of the photographs represent this condition, you may indicate that.)

Photo number: _____

OR

☐ None of the photographs are so unacceptable that I would no longer use this area.

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

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d. Which set of photographs shows the highest level of use that the National Park Service should allow? In other words, at what point should visitors be restricted from using the First African Baptist Church? (If use should not be restricted at any point represented by the photographs, or not restricted at all, you may indicate that.)

Photo number: _____

OR

☐ None of the photographs show a high enough level of use to restrict visitors from using this area.

OR

☐ Visitor use should not be restricted.

e. Which set of photographs looks most like the number of people and vehicles you typically saw at the First African Baptist Church during this visit?

Photo number: _____

OR

☐ I did not visit the First African Baptist Church.

Thank you for your help with this survey! Please return it to the person who gave it to you.

PRIVACY ACT and PAPERWORK REDUCTION ACT statement:

16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by park managers to better serve the public. Response to this request is voluntary and anonymous. Your name will never be associated with your answers, and all contact information will be destroyed when the data collection is concluded. No action may be taken against you for refusing to supply the information requested. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

BURDEN ESTIMATE STATEMENT: Public reporting burden for this form is estimated to average 20 minutes per response. Direct comments regarding the burden estimate or any other aspect of this form to:

John Fry, Chief Resource Management, Cumberland Island National Seashore
107 St. Marys Road
St. Marys, GA 31558

Ph: 912 882-5469; e-mail: john_fry@nps.gov

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

Appendix E. Questionnaire Version B (completed by day visitors)

ID _____

OMB Number: 1024-0224 Version B
Expiration Date: 6/30/2011

**Cumberland Island National Seashore – Visitor Survey
2011-2012**

1. Have you visited Cumberland Island National Seashore more than once in the last five years? *(Please check one.)*

☐ Yes → how many times have you visited Cumberland Island National Seashore in the last five years? _____

☐ No → Go to Question 2.

2. How crowded did you feel at the following locations on this trip to Cumberland Island National Seashore? *(Circle one number for each location.)*

	Not at all Crowded		Slightly Crowded		Moderately Crowded		Extremely Crowded		Not Applicable
	1	2	3	4	5	6	7	8	9
While hiking in the wilderness area	1	2	3	4	5	6	7	8	9
While camping in the wilderness area	1	2	3	4	5	6	7	8	9
On the Main Road that goes through the wilderness	1	2	3	4	5	6	7	8	9
At historic or cultural sites	1	2	3	4	5	6	7	8	9
On the ferry coming to the island	1	2	3	4	5	6	7	8	9
At the ferry dock	1	2	3	4	5	6	7	8	9
At the campground	1	2	3	4	5	6	7	8	9
On the beach	1	2	3	4	5	6	7	8	9

3. Please rate how much you would want each of the following on Cumberland Island. A rating of -4 means that you would not want it, and a rating of +4 means would want it. *(Please circle one number for each statement.)*

	Do not want								Want				Don't Know
	-4	-3	-2	-1	0	+1	+2	+3	+4				
Composting toilets at wilderness campsites	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
Fires and designated fire rings at wilderness campsites	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
Picnic tables at Stafford campsites	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
Lantern pole at Stafford campsites	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
Kayak or canoe-accessible campsites	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
Kayak or canoe rentals	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
More commercial services (e.g., a store, food services)	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
A geocaching route	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
More walking trails on south end of the island	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
More trail markings	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
More directional signs	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	
Wilderness trails that have boardwalks or planks to keep you out of muddy or wet places	-4	-3	-2	-1	0	+1	+2	+3	+4			DK	

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

	Do not want									Want	Don't Know
A narrated or optional interpretive program on the ferry	-4	-3	-2	-1	0	+1	+2	+3	+4		DK
More ferry access to the island for you and others; more people would be on the island but a ferry reservation would be easier to get	-4	-3	-2	-1	0	+1	+2	+3	+4		DK
Less ferry access to the island; there would be fewer people on the island but ferry reservations would be more difficult to get	-4	-3	-2	-1	0	+1	+2	+3	+4		DK

4. Where would you prefer to camp at in the wilderness area of Cumberland Island National Seashore? *(Please check one)*

- ☐ I prefer camping at established campsites at specific places (Hickory Hill, Yankee Paradise, or Brickhill Bluff camping sites) in the wilderness
- ☐ I prefer being allowed to camp anywhere in the wilderness
- ☐ I prefer being allowed to camp either anywhere or at established campsites in the wilderness
- ☐ I have no preference about where I camp at in the wilderness

A vehicle-based transportation service is being planned and designed to offer visitors greater access to sites on Cumberland Island National Seashore. Tentatively, each of these vehicle trips will start and end at the ferry dock and take approximately three to five hours to complete. Also, a separate, unscheduled courtesy shuttle would be provided to sites on the south end of the island. The following questions pertain to the future vehicle transportation system on Cumberland Island.

5. a. Please rate how much you would want each of the following for the vehicle transportation system on Cumberland Island. A rating of -4 means that you would not want it, and a rating of +4 means would want it. *(Please circle one number for each statement.)*

	Do not want									Want	Don't Know
Type of vehicle											
Passenger van	-4	-3	-2	-1	0	+1	+2	+3	+4		DK
Passenger bus	-4	-3	-2	-1	0	+1	+2	+3	+4		DK
Newer-style school bus	-4	-3	-2	-1	0	+1	+2	+3	+4		DK
Older-style school bus	-4	-3	-2	-1	0	+1	+2	+3	+4		DK
Carts or tram towed by a vehicle	-4	-3	-2	-1	0	+1	+2	+3	+4		DK
A track or rail-style vehicle	-4	-3	-2	-1	0	+1	+2	+3	+4		DK
Historic or antique looking vehicle	-4	-3	-2	-1	0	+1	+2	+3	+4		DK

Study Contacts:

Jeffrey C. Hallo, Ph.D.
jhallo@clemson.edu
(864) 656-3237

Robert E. Manning, Ph.D.
Robert.Manning@uvm.edu
(802) 656-3096

	Do not want									Want	Don't Know
Vehicle power or fuel											
Gasoline	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Electric hybrid	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Natural gas	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Biodiesel	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Propane	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Ethanol	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Vehicle features and amenities											
Windows that open	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Extra large windows	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
An open-air vehicle	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
An informational tour based on the history and culture of Cumberland Island	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
An informational tour based on the natural history of Cumberland Island	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
A recorded audio tour	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
A live audio tour	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
A video tour played on screens	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Air conditioning	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
A place to store equipment (e.g., bikes, coolers, daypacks)	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Fans	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Unpadded bench seats	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Extra cushioned seats	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Wheelchair access	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
Vehicle sound											
A vehicle engine that makes almost no sound	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
A vehicle engine that would allow you to converse without raising your voice	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	
A vehicle engine that you would have to raise your voice to converse over	-4	-3	-2	-1	0	+1	+2	+3	+4	DK	

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b. What is the maximum you would be willing to pay per person to ride in the vehicle that has the characteristics from each category above that you want most?

Maximum amount: _____ dollars

OR

☐ I would not pay to ride to the northern end of the island.

OR

☐ I would not ride a vehicle to the northern end of the island.

6. We would like to know how you felt about traveling around Cumberland Island National Seashore on this visit. For each item below please rate how much you think it describes your travel experience on Cumberland Island. *(Please circle one number for each statement.)*

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
You have easy access to important sites and attractions	1	2	3	4	5
You have little impact on the area's natural environment	1	2	3	4	5
It takes too long to get where you want to go	1	2	3	4	5
It is easy to access scenic overlooks, vistas, or locations	1	2	3	4	5
You hear natural sounds	1	2	3	4	5
You feel stressed while traveling	1	2	3	4	5
You experience a sense of freedom	1	2	3	4	5
You connect with the natural environment	1	2	3	4	5
You could go "where you want, when you want"	1	2	3	4	5
You experience conflict	1	2	3	4	5
You feel crowded	1	2	3	4	5

Thank you for your help with this survey! Please return it to the person who gave it to you.

PRIVACY ACT and PAPERWORK REDUCTION ACT statement:

16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by park managers to better serve the public. Response to this request is voluntary and anonymous. Your name will never be associated with your answers, and all contact information will be destroyed when the data collection is concluded. No action may be taken against you for refusing to supply the information requested. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

BURDEN ESTIMATE STATEMENT: Public reporting burden for this form is estimated to average 20 minutes per response. Direct comments regarding the burden estimate or any other aspect of this form to:

John Fry, Chief Resource Management, Cumberland Island National Seashore
107 St. Marys Road
St. Marys, GA 31558
Ph: 912 882-5469; e-mail: john_fry@nps.gov

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