

Cumberland Island Visitor Use Study

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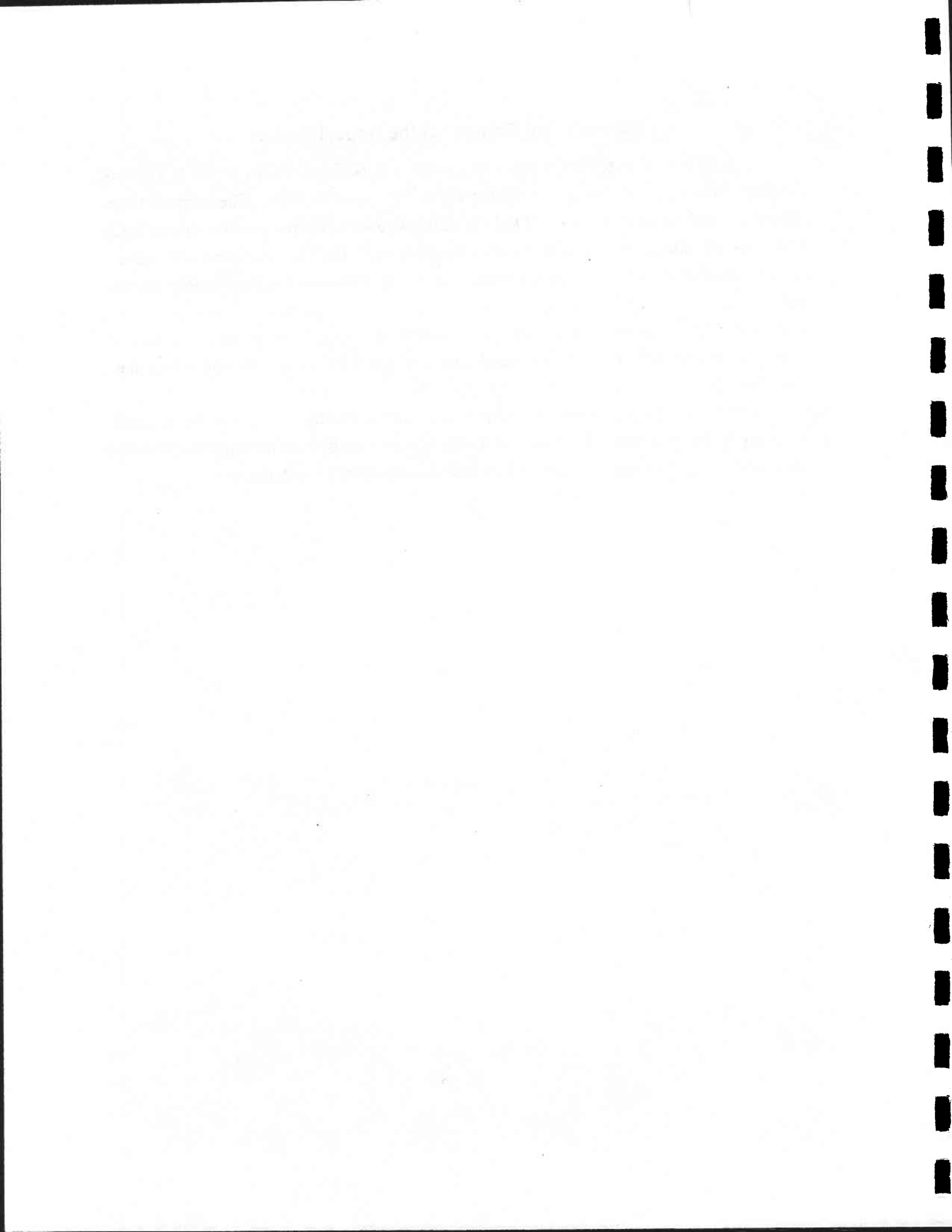
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CUMBERLAND ISLAND VISITOR USE STUDY

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ABSTRACT

The purpose of this study was to select random visitors from Cumberland Island National Seashore and to evaluate their travel patterns, their favored activities, and their knowledge and opinions about island conditions and management. During eight sampling blocks, at six week intervals, a total of 822 questionnaires were sent to visitors 16 years of age and older. Of these, 685 were returned, and 671 were useable for data analysis. Of the visitors surveyed, 62.7% were day users. Overnight use was about evenly split between developed camping at Sea Camp and backcountry camping at Stafford and in the wilderness. A minority of the visitors (7.5%) were from the local area. Many more (17.2%) came from urbanized areas around Savannah, GA or Jacksonville, FL, (41-100 miles) and 35.6% came from Atlanta, GA, Chattanooga, TN or Miami, FL (280-500 miles). About 14.9% came from 500 miles or more away. Thirty-seven percent of the visitors sampled had been to Cumberland Island at least once before.

Day users traveled primarily to Sea Camp and the south beach. Twenty-nine percent of campers staying at Sea Camp, 69.3% of the campers at Stafford, and 95.3% of the wilderness campers traveled to Plum Orchard. Less than one percent of the Seacampers, 18.9% of the Stafford campers and 29.9% of the wilderness campers traveled to Lake Whitney. The most popular activities were walking on the beach, visiting ruins and historic sites, day hiking, and looking for animals. Through the year, bird watching was as popular as sunbathing or swimming. Interpretation of natural and cultural resources is thus very important to island visitors.

The most important sources of loss of enjoyment for island visitors were motorized vehicles on the roads, vehicles on the beach, and industrial odors. These factors were somewhat of a concern (or more) for 25% or more of the visitors sampled. The least troubling factor was visitor behavior on the beaches, which was somewhat of a concern (or more) for about 5% of the visitors. Wilderness users were much more concerned about vehicles and low flying aircraft than were day users or Seacampers. The present level of visitor use does not seem to result in frequent disruptive visitor behavior or conflicts between visitor groups.

Nearly all respondents (93.9%) indicated they had seen some wildlife they considered to be significant. The most reported animals were horses, followed by turkeys, deer and armadillos. Of animals looked for and not seen the most frequently reported were deer, followed by horses, armadillos, sea turtles and turkeys.

INTRODUCTION

The determination of who comes to Cumberland Island National Seashore (CUIS), when they come, how often, for what reasons, and what they do while on the island have been identified as important topics for research. In the spring of 1985, the UGA Cooperative Park Studies Unit began a project addressing these issues one-by-one in a coordinated systematic fashion. For visitors, CUIS is accessible only by boat. The vast majority of visitors arrive and depart on the concessionnaire-run ferry operating between the mainland headquarters dock in St. Mary's, GA and two destination docks on CUIS (Sea Camp and Dungeness: see Figure 1).

Prior to this study, the proportion of day visitors, overnight visitors and backcountry/wilderness users was unknown. In addition, more detailed questions about who they are, their travel patterns, knowledge and opinions about island conditions or management, and their suggestions for improvements to visitor services or management were also unanswered. The study was a year-long effort to select a random sample of visitors and solicit input from them on these issues. The results of this study are still relatively general but provide a good foundation upon which to evaluate visitor use patterns on CUIS, and against which to consider existing and proposed management actions.

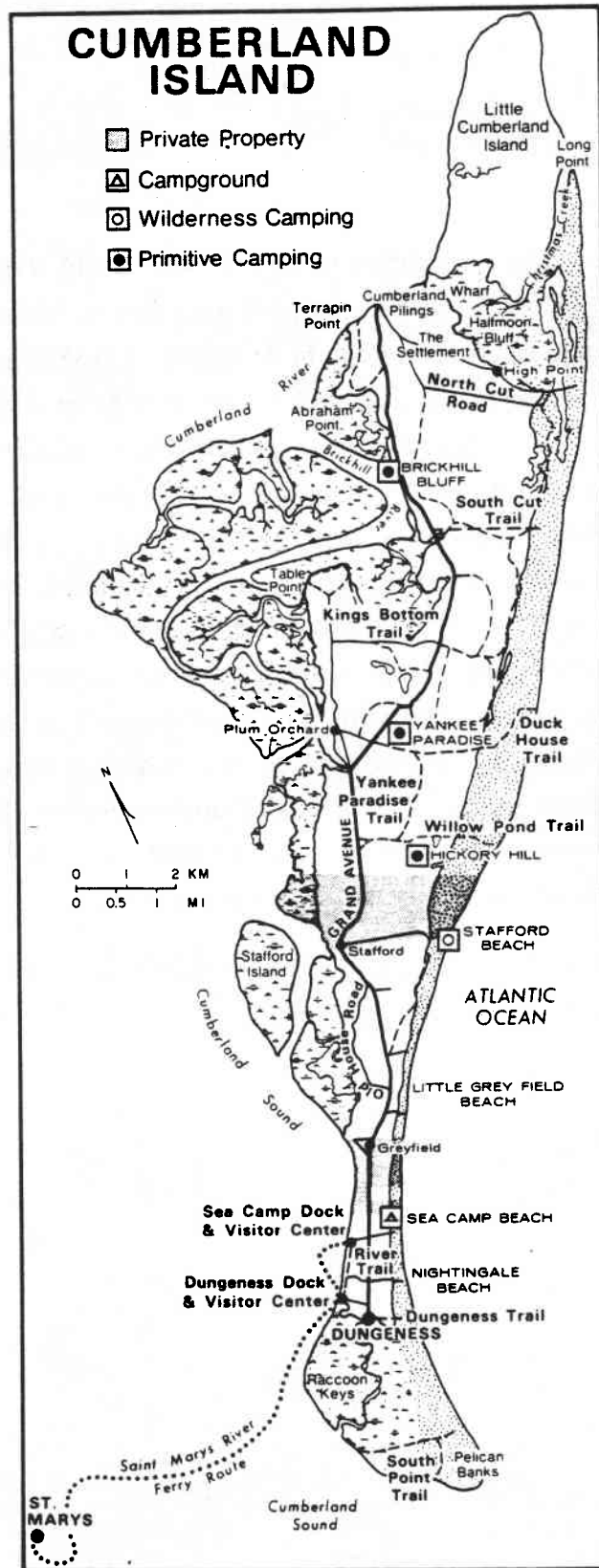


Figure 1. Map of Cumberland Island National Seashore showing main features, roads and trails.

METHODS

The object of the study was to obtain information that was a representative sample of all island visitors. Visitors are not required to register or leave their name and address when visiting the island, so the sampling scheme that was developed contacted people directly. In addition, it was important to assess visitor use on a year-round basis. Consequently, the sampling scheme did not require exact *a priori* listings of individuals nor exact estimates of visitation by month or season. An on-site exit contact method was developed that would utilize estimates of total visitation by season, yet yield more exact use information for the purposes of case weighting. Visitors were counted and a pre-determined systematic method was used to contact an appropriate sample of all visitors 16 years or older. Each person contacted was asked to participate in the survey. If they agreed, their name and address were recorded and they were subsequently mailed a booklet-type questionnaire with a preaddressed and prepaid mailback envelope. Two sampling blocks of four days each comprised a quarterly sample. The four days were always Thursday through Sunday. They were chosen in order to obtain response from both weekday and weekend visitors. (The ferry ceases operation on Tuesday and Wednesday during the winter.)

Eight sampling blocks spaced approximately six weeks apart resulted in a year-round sample. The first one was in June, 1985, the final one in May, 1986. Altogether, 822 questionnaires were mailed out, of which six (6) had bad addresses or were otherwise undeliverable. After one postcard reminder and one follow-up mailing of a questionnaire with a special cover letter, 685 questionnaires were returned for an 83.9 percent response rate. Of these, 14 were too incomplete or otherwise unusable. The final file for analysis contains 671 valid data records. It is necessary to reduce the impact of intentional over sampling during the slow winter months, thus case weighting was required to repropotion the data set. After weighting, the cases reported in the tables total a maximum of 626 cases. The actual number varies due to rounding error during computation and/or the varying number of responses to each question. These missing cases not withstanding, the weighted frequencies are generalizable to the visitor population as a whole with a tolerance of approximately plus or minus 3.4 percent. (See Table 1.)

Table 1. Sample size and return rates for visitor perception study, by season, Cumberland Island National Seashore.

Sample Selection:

<u>Sampling Period</u>	<u>Number Contacted</u>	<u>Refusals</u>	<u>Sample</u>
Summer	257	1	256
Fall	221	10	211
Winter	148	0	148
<u>Spring</u>	<u>207</u>	<u>0</u>	<u>207</u>
Total	833	11	822

Questionnaire Mailout and Return:

Mailed out	822	
<u>Undeliverable</u>	<u>6</u>	
Net mailing	816	
 <u>Returned</u>	 <u>685</u>	
Return rate		83.9%
 Unusable	 14	
<u>Total data base</u>	<u>671</u>	
Net return rate		82.2%
 Data base:		
before weighting	671	
after weighting	626	

ISSUES ADDRESSED

Four main issues were identified in the scope of work as most critical for resources management and visitor services planning. First, visitor perceptions about the social carrying capacity of CUIS are necessary to aid longterm resources planning. Even though the General Management Plan currently limits the total number of visitors to 300 per day, visitor reaction to this limit, and the distribution of these people to various activity zones is important. It may be that some areas are over-used while others are under-used, all within the existing use ceilings.

Second, the potential for conflicts exists between disparate user groups. In particular, concern over vehicle use and vehicle-hiker encounters has been previously documented¹. This study sought to clarify this issue by reporting data on visitors' perceptions of these encounters and to further specify the differences that may exist in this regard between wilderness and non-wilderness users.

A third major concern the park sought to address in this study was an evaluation of visitors' interaction with the wildlife populations. Wildlife viewing is an important activity, but documenting users' interest in specific animals, especially feral horses, native deer, or feral pigs, is necessary for better management of these resources.

A fourth area of specific concern is the negative impacts of intrusions from local industry and transportation patterns on the experience of park visitors. Sulfur odors from nearby paper mills have resulted in complaints and negative comments. Low flying aircraft are seen over the beach and may occasionally attempt to land where people are present. The extent to which these activities present a problem for park visitors in general was not known. Data are presented below which address this issue.

In order to set the context for the data relating to the above issues, additional basic information on visitors was developed. A general socio-demographic profile and some overall reactions to visitor services on CUIS were included in the survey. Since these are the most general they are presented first.

1. Bratton, Susan P. 1986. Foot and vehicle traffic patterns: Cumberland Island National Seashore. CPSU Technical Report 28. U.S. National Park Service CPSU, Institute of Ecology, University of Georgia, Athens, GA 3060

RESULTS

Demographic Profile

The visitors to CUIS are very diverse. All age groups are represented, covering a wide range of socioeconomic levels. Nonetheless, Table 2 suggests that a typical visitor group is a couple or a family group (51.7% of all visitors). Approximately half of the visitors are female (48.5%). The average group size is 6.4 persons with a predominance of groups of 3-6 people (39.9% of all visitors). A substantial amount of organized group use occurs (15.9%), especially during the winter months. This accounts for most of the 25.2 percent of all visitors who come in groups of seven (7) or more people.

Use Characteristics

Most of the visitors are day users (half or full day, 62.7%), with almost two-thirds of the visitation on the weekends (63.8%). In fact, the ferry ceases operation for two days mid-week during the winter season because of low passenger numbers. Of the 62.7 percent day visitors, about four-tenths of them (or 26.5% overall) come only for a half day visit. (Table 3). Table 3 also shows that Cumberland Island has an interesting pattern of visitor origins. Even though the local use (within 40 miles) is a minority (7.5%), many more (17.2%) come from the urbanized areas around Savannah, GA, or Jacksonville, FL (the 41-100 mile zone), and 35.6 percent from the Atlanta, GA, Chattanooga, TN or Miami, FL (the 280-500 mile zone). Another substantial minority (14.9%) represent the truly regional or nationwide visitors that come from more than a days drive away (500 miles or more). Underscoring this pattern the same data is displayed on a State by State basis in Figure 2. Befitting its National Park status, CUIS seems to function as a local, regional, and national attraction.

The data in Table 4a show that many people are first time visitors. In all, 71.9 percent are on their first visit to CUIS. Nonetheless, a very sizable minority are repeat visitors. Nearly one quarter (24.5%) come two or three times a year. Table 4b shows all previous visitors. One-third (33.1%) have come 1-6 times before, but only 4.0 percent have been there seven or more times. Taken together, the data in Tables 4a and 4b suggest that CUIS is predominantly used for a one time visit, but that a sizable proportion of the visitors return over a period of a year or two. This also suggests that there might be strongly different patterns of resource use for each of these subpopulations.

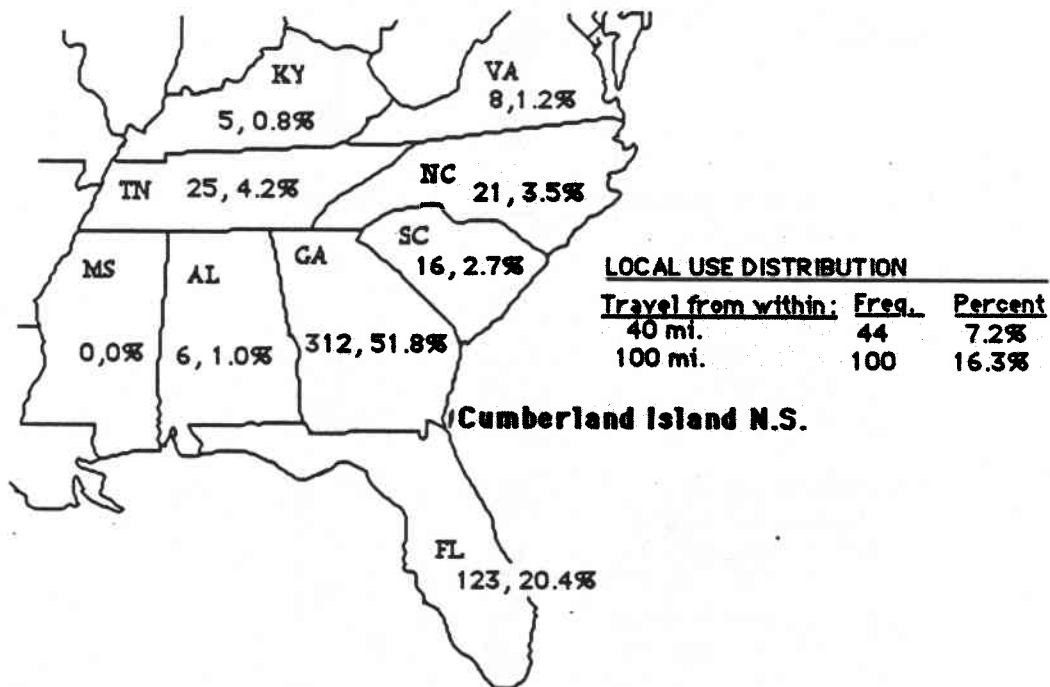


Figure 2. Visitor origins by state and selected travel zones, frequency and percent for each state or zone.

Table 2. Basic characteristics of Cumberland Island National Seashore visitors.

Age (adult respondents):	<u>Freq.</u>	<u>Percent</u>
16-25 years	88	14.9
26-35 years	185	31.4
36-45 years	156	26.4
46-55 years	69	11.7
56-65 year	60	10.2
66 or more years	<u>32</u>	<u>5.4</u>
	590	100.0
Gender:	<u>Freq.</u>	<u>Percent</u>
Male	311	51.5
Female	<u>292</u>	<u>48.5</u>
	603	100.0
Gross Family Income:	<u>Freq.</u>	<u>Percent</u>
Under \$10,000	34	5.9
\$10,000-19,999	79	13.5
\$20,000-29,999	125	21.6
\$30,000-39,999	116	19.9
\$40,000-49,999	86	14.7
Over \$50,000	<u>142</u>	<u>24.4</u>
	582	100.0
Education Level:	<u>Freq.</u>	<u>Percent</u>
High school or less	99	16.3
Some college	122	20.1
College graduate	179	29.5
1-2 yrs. postgraduate	88	14.5
3-4 yrs. postgraduate	81	13.3
Doctorate	<u>38</u>	<u>6.3</u>
	607	100.0
Type of Goup:	<u>Freq.</u>	<u>Percent</u>
Alone	21	3.5
Family	203	33.7
Friends	171	28.4
Couple	108	18.0
Organized group	96	15.9
Other	<u>3</u>	<u>.5</u>
	602	100.0
Group Size:	<u>Freq.</u>	<u>Percent</u>
1 - 2	209	35.0
3 - 6	238	39.9
7 - 15	100	16.8
16 more	<u>50</u>	<u>8.4</u>
	597	100.1

Table 3. Distance travelled to Cumberland Island and length of stay on the island.

Time of Visit:	<u>Freq.</u>	<u>Percent</u>
Weekday	218	36.2
Weekend	385	63.8
	603	100.0

Length of Stay:	<u>Freq.</u>	<u>Percent</u>
Half day	160	26.5
Full day	218	36.2
Overnight	225	37.3
	603	100.0

Distance Travelled:	<u>Freq.</u>	<u>Percent</u>
0 - 40 miles ^a	44	7.5
41 - 100 miles ^a	100	17.2
101 - 280 miles	145	24.8
281 - 500 miles	208	35.6
501 or more mile	87	14.9
	584	100.0

Place of Origin:	<u>Freq.</u>	<u>Percent</u>
Georgia	312	50.7
Florida	123	20.0
Other SE ^b	81	13.2
Other US	97	15.8
Canada	2	.3
	615	100.0

a. Includes people from Florida and Georgia; see Figure 2.

b. See map for states included.

Table 4a. Number of visits to Cumberland Island in the past year.^a

Number of Visits	<u>Freq.</u>	<u>Percent</u>
First visit to CUIS this year	434	71.9
One - two visits	148	24.5
Three - four visits	18	2.9
Five or more visits	<u>4</u>	<u>.7</u>
	604	100.0

a. The sample was taken between July, 1985 and June, 1986. Thus, the "past year" may be between 1984 and 1986.

Table 4b. Number of previous trips to Cumberland Island.

Number of Previous Trips	<u>Freq.</u>	<u>Percent</u>
One - three	150	24.8
Four - six	50	8.3
Seven - nine	10	1.5
Ten - fifteen	7	1.2
Sixteen - twenty	6	1.0
More than twenty	<u>2</u>	<u>.3</u>
	225	37.4
First visit ever to Cumberland Island	<u>381</u>	<u>62.9</u>
	606	100.0

Distribution of Use on Island

The data in Table 5 show where different user groups go while on the island. In order to more accurately interpret the data in Table 5, refer to the zone boundaries in Figure 3. Some zones include more than one destination or travel pattern feature. In general, an attempt was made to dissociate road, trail, and beach from other major features such as Dungeness Ruins or Lake Whitney. However, note that in order to be parsimonious some lumping of destinations has occurred. For example, the road north of Stafford is included in zone 4 which also contains Plum Orchard Mansion. A person who walks the road may not visit the mansion or vice versa. There is no way to distinguish the two uses from this data.

Note that day users are strongly limited to the area around Dungeness and Sea Camp. This is expected because of the limited time available to them and their focus on the historical district. Fewer than 10 percent of these visitors go south from the Dungeness beach access (zone 7). Even fewer venture north of Sea Camp Beach or Dock (zones 1 and 2). Similarly, wilderness and backcountry users primarily visit the middle and northern zone (zones 3, 4, 5 or 6) with very few going to the south jetty (zone 7). Therefore, the greatest potential for intergroup crowding or interference with an activity logically occurs at or near Sea Camp Dock, the adjacent roads, and the beach area nearby, especially to the south toward the Dungeness Access (zones 1 or 2).

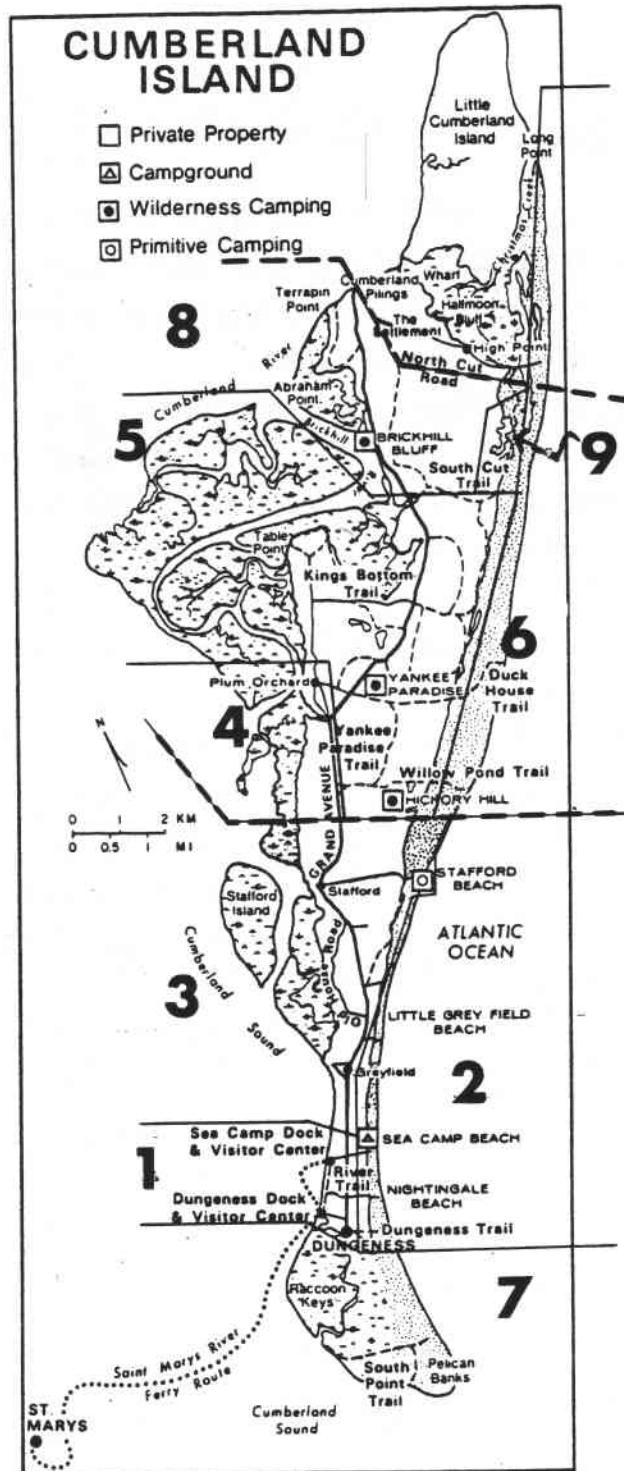


Figure 3. Cumberland Island National Seashore travel pattern zones used in the analysis.

Table 5. Distribution of visitors by map zone and non-exclusive user groups.¹

MAP ZONE	DAY USER		SEA CAMPER		B/C CAMPER		W. CAMPER	
	n	%	n	%	n	%	n	%
1 Sea Camp	349	100.0	113	100.0	64	100.0	64	100.0
2 South Beach	310	88.8	112	99.1	47	73.2	44	68.5
3 Mid-interior	67	19.1	68	60.4	60	94.5	60	94.5
4 Plum Orchard	15	4.3	33	28.9	44	69.3	61	95.3
5 Western interior	10	2.9	37	32.9	49	77.2	64	100.0
6 North Beach	7	1.9	33	29.3	44	68.5	53	82.7
7 South Point	32	9.2	43	38.2	3	4.7	2	2.4
8 North End	4	1.0	12	10.2	20	31.5	33	51.2
9 Lake Whitney	<u>2</u>	<u>.6</u>	<u>8</u>	<u>7.2</u>	<u>12</u>	<u>18.9</u>	<u>19</u>	<u>29.9</u>
Total in group	349		113		64		64	
As % of all visitors		63.7		20.6		11.6		11.6

N=547

1. Multiple responses possible: not a mutually exclusive, only exhaustive, categorization for overnight visitors (campers may be in two types on one trip).
2. All visitors enter/exit from this zone, hence it is always 100 percent, and is the same as the user group total at bottom of column.

Table 6a displays the responses to the question that asked respondents to indicate the primary activities in which they engaged while on CUIS. Because an individual could check off numerous items, the data are presented as both number of responses and as percent of all respondents who checked that item. At the bottom of the table the total "percent of respondents" is 526.5 which means that in general, each respondent checked off 5 or 6 activities in which they engaged. The most frequently listed activity is also the one listed by the highest percentage of people: beach walk/beachcombing (17.0% and 89.3%). Next comes visits to the historical ruins (14.9% and 78.3%), followed by a virtual tie between looking for animals (11.1% and 58.9%) and day-hiking (11.1% and 59.0%).

Much of this activity pattern is influenced heavily by the fact that nearly two-thirds of the visitors are day users. Day users naturally focus their limited time on the historic ruins and the immediately adjacent beach areas. In order to catch the ferry, and thereby avoid being stranded overnight, they stay close to Sea Camp or Dungeness Dock. This is true even though it is quite possible to go as far as Stafford on a day hike (about a 7 mile trip over flat terrain). There are scattered reports of day hikes all the way to the Wilderness, but clearly such a 10-15 mile day is beyond most visitors' motivations and/or abilities. To accurately reflect the overnight users' activities the responses were broken out by group type (Table 6b). Overall, campers also dayhike, sunbathe and tour the historic ruins, but usually in lesser percentages than day users. Beach use is also important to overnight visitors, although clearly not as strongly as for the dayusers.

Attendance at naturalist talks is primarily by dayhikers (8.4%) or Sea Campers (4.7%). The reason for this is clear. Backcountry and wilderness visitors are usually far removed from these services except perhaps as they wait for the last ferry from Sea Camp dock at 4:15 p.m. Generally, birdwatching is reported only slightly more often than sunbathing, although this varies by group. This balance between leisure groups further underscores the idea that CUIS is not only a recreation/historic area, but functions equally as a place to enjoy nature.

Table 6a Primary activities while on Cumberland Island, percent of responses and respondents.

<u>Activity</u>	<u>Number of Responses</u>	<u>Percent of Responses</u>	<u>Percent of Respondents</u>
Visit ruins, hist. sites	465	14.9	78.3
Beach walk/beachcomb	530	17.0	89.3
Sunbathing	206	6.6	34.7
Bird watching	216	6.9	36.4
Day hiking	350	11.2	59.0
Backpacking	110	3.5	18.5
Camping	193	6.2	32.5
Visit wilderness	156	5.0	26.2
Attend talk	185	5.9	31.1
Visit friends/resids/staff	31	1.0	5.2
Fish	32	1.0	5.4
Look for animals	350	11.1	58.9
Swimming	209	6.7	35.2
Other (specified)	<u>92</u>	<u>3.0</u>	<u>15.5</u>
	3125	100.0	526.5

Table 6b. Primary activities by group type, (multiple responses possible), in percent.

<u>Activity</u>	<u>GROUP TYPES</u>				
	<u>Day User</u>	<u>Sea Camper</u>	<u>B/C Camper</u>	<u>Wilderness Camper</u>	<u>All Responses</u>
Visit ruins,hist. sites	19.0	12.7	8.2	7.3	14.9
Beach walk/beachcomb	20.3	13.9	14.4	11.0	17.0
Sunbathing	6.9	7.5	5.6	4.9	6.6
Birdwatching	7.7	6.0	4.1	6.9	6.9
Day hiking	11.0	11.6	10.9	11.5	11.2
Backpacking	.7	1.3	12.1	11.7	3.5
Camping	.1	14.1	13.6	12.1	6.2
Visit wilderness	2.8	4.2	8.2	12.0	5.0
Attend talks	<u>8.4</u>	<u>4.7</u>	<u>.4</u>	<u>1.9</u>	<u>5.9</u>
No. of responses	1684	696	243	497	3122

Visitor Perceptions and Satisfaction

Visitor perception of Cumberland Island's capacity related issues is important to the resource managers' need to regulate distribution of use on the island. The 300 persons per day visitor limit presumably serves as a strong damper on the amount of contact between individuals while on the island. Only on peak season weekends is the 300 person limit routinely reached. Typically, less than 300 persons are on the island at any one time even though the campgrounds at Sea Camp and Stafford may be full, and because over 60 percent of the visitors are day use only, visitors' criticism due to the number of people encountered is probably less than if greater overall numbers were allowed. As a result of this pattern of use, strong or generalized negative reactions to use levels was not expected. Instead, the management focus is upon appropriate amounts of use for a given place and/or time. In Table 7 the data suggest that there is, in fact, a general agreement that group size should be limited: overall, 69.3% agree, with a higher percentage of backcountry or wilderness visitors expressing a desire to limit group size (78.6%). The strongest support for this idea comes from those who stayed at Sea Camp (84.4%).

As was noted above, in order to more accurately assess the individual causes of cross-use impacts, the respondents were not asked directly about the 300 person per day limit. Instead, they were asked to evaluate some of the actual conditions they encountered at various places on the island. This information coupled to a general sense of where the different groups go while on the island allows a basic inference to be made about the 300 person limit as it affects each major use group.

Table 7. Response to question: "Do you think that group size should be limited on the Island?" by group type.

User Group	LIMIT SIZE?			
	No		Yes	
	<u>Freq.</u>	<u>%</u>	<u>Freq.</u>	<u>%</u>
Day Users	140	37.1	237	62.9
Sea Campers	15	15.6	81	84.4
Backcountry and Wilderness Campers	<u>22</u>	<u>21.4</u>	<u>81</u>	<u>78.6</u>
All Visitors	177	30.7	399	69.3

In order to address the question of the impacts of island uses on visitor groups, the data in Tables 8a and 8b report loss of enjoyment by location/condition. Table 8a presents the loss of enjoyment data for all visitors by response category and overall average. Substantial proportions of the visitors report none to very little loss for every item. Only three items have an overall average greater than 2.0. This suggests that the two vehicle use items and the water supply in the backcountry item are the major individual causes of visitor dissatisfaction. Next on the list are industrial odors and low flying aircraft with average scores just under 2.0.

When the last two columns are added together the highest percentage of visitors reporting "a lot" or a "great deal" of loss comes from vehicles on the beach (15.6 percent), industrial odors (10.0 percent) and low flying aircraft (8.8 percent) followed by cars/trucks on the roads (8.6 percent) and water supply in the backcountry (7.8 percent). By comparison with the other data from this table it is clear that it makes little difference whether you look at the items from the standpoint of "none" to "very little" loss or make conclusions based on the other end of the scale by lumping "a lot" and a "great deal." The top five items are consistent, only the ranking shifts.

The next table (8b) shows the same loss of enjoyment items broken out by major user group. Presumably some of these items impact the wilderness visitor differently than the dayhikers and so on across the various combinations of visitors. If you focus on the top five concerns identified in Table 8a the pattern of affected groups is clearer. For instance, dayusers are less bothered by cars/trucks on the roads than are the overnight visitors. Similarly they are not as sensitive to vehicles on the beach. Wilderness campers legitimately expect more pristine conditions and are most impacted by the sulfur content in the well water, and thus react more negatively to low flying aircraft and water quality issues. Note that 27.5 percent and 23.3 percent of the wilderness visitors reported "a lot" or a "great deal" of loss of satisfaction due to vehicles on the beach and aircraft, respectively. These two items have the most difference in response when compared to the dayhikers, e.g. 3.5 versus 23.3 percent for aircraft overflights.

Looking at the conditions that most impacted the dayusers we find that no item reaches 10.0 percent "lot" to "great deal" of loss. Industrial odors (9.9 percent) and vehicles on the beach (9.7 percent) have the highest totals. If anything, the day-visitors appear to be the least bothered by people (as opposed to vehicles) or other conditions they encountered. In Table 8b the data also suggest that the overnight visitors are also highly satisfied with most aspects of their visit: 41.4 to 89.7 percent report no loss of enjoyment depending on the item.

Table 8a. Loss of enjoyment due to selected conditions on Cumberland Island; average score and percent by response category, for all visitors in aggregate.

<u>CONDITION</u>	LOSS OF ENJOYMENT, PERCENT					<u>Ave.</u> ¹
	<u>None</u>	<u>Very Little</u>	<u>Some-what</u>	<u>A lot</u>	<u>Great Deal</u>	
Inappropriate/poor behavior by other visitors	63.6	20.6	10.9	1.8	3.1	1.6
Cars/trucks on the roads	34.7	35.4	21.3	5.6	3.0	2.1
Visitor behavior on beaches	82.2	12.7	3.1	1.4	.6	1.3
Litter/trash in general	60.3	20.5	13.3	3.8	2.1	1.7
Low flying aircraft	54.2	22.9	14.1	4.7	4.1	1.8
Vehicles on beach	40.5	23.7	20.2	8.5	7.1	2.2
Animals in campgrounds	72.6	18.6	6.4	1.5	.9	1.4
Water supply in backcountry	45.6	22.2	24.4	5.5	2.3	2.0
Industrial Odors	50.2	21.7	18.1	4.5	5.5	1.9

1. Question was worded: 1=none, 2=very little, 3=somewhat, 4=a lot, 5=great deal.

Table 8b. Loss of enjoyment due to selected conditions on Cumberland Island by visitor group, n=626.

Condition and amount of Loss	VISITOR GROUP		
	Day User	Sea Camper	Wild./BC User
Industrial odors			
None	59.8	36.1	34.1
Little to some	30.4	51.9	57.3
Lot or great deal	<u>9.9</u>	<u>12.0</u>	<u>9.8</u>
	100.1	100.0	100.0
Inappropriate/poor behavior of others			
None	71.1	46.8	57.8
Little to some	25.4	42.7	40.0
Lot or great deal	<u>3.4</u>	<u>10.5</u>	<u>3.3</u>
	99.9	100.01	100.0
Cars/trucks on the roads			
None	41.4	32.3	14.9
Little to some	52.5	59.4	68.5
Lot or great deal	<u>6.2</u>	<u>8.3</u>	<u>16.7</u>
	100.1	100.0	100.1
Visitor behavior on beach			
None	84.7	83.8	74.0
Little to some	13.7	14.3	23.0
Lot or great deal	<u>1.6</u>	<u>2.0</u>	<u>3.0</u>
	100.0	100.1	100.0
Litter/trash in general			
None	67.8	58.9	39.2
Little to some	28.6	33.7	49.0
Lot or great deal	<u>3.6</u>	<u>7.4</u>	<u>11.8</u>
	100.0	100.0	100.0
Low flying aircraft			
None	67.5	44.3	28.2
Little to some	28.9	46.9	48.5
Lot or great deal	<u>3.5</u>	<u>8.5</u>	<u>23.3</u>
	99.9	99.7	100.0
Vehicles on beach			
None	49.6	28.9	26.5
Little to some	40.6	50.6	46.1
Lot or great deal	<u>9.7</u>	<u>20.6</u>	<u>27.5</u>
	99.9	100.1	100.1

Table 8b (Continued). Loss of enjoyment due to selected conditions on Cumberland Island by visitor group, n=626.

Condition and amount of Loss	VISITOR GROUP		
	Day User	Sea Camper	Wild./BC User
Animals in campgrounds			
None	89.7	62.5	60.0
Little to some	8.8	34.4	37.0
Lot or a great deal	<u>1.6</u>	<u>3.1</u>	<u>3.0</u>
	100.1	100.0	100.0
Water supply in the BC			
None	61.5	52.7	32.1
Little to some	31.7	40.0	59.6
Lot or great deal	<u>6.8</u>	<u>7.3</u>	<u>8.3</u>
	100.0	100.0	100.0

In summary, the data in Tables 8a and 8b indicate that vehicles are the major cause of loss of enjoyment, whether on the roads or on the beach. Water supply quality in the backcountry, low flying aircraft, and industrial odors are significant problems also.

Table 9 reports satisfaction with numbers of people encountered by location. As would be hoped, people are generally very satisfied. Between 48.1 and 62.5 percent of the people are "very satisfied," with the number of others encountered in various places. The "grumble level" (dissatisfied percentage) is greatest in the wilderness zone with 6.0 percent indicating they were "dissatisfied" or "extremely dissatisfied" with the number of people encountered there. The Dungeness-Sea Camp Beach zone is next highest with 5.5 percent expressing dissatisfaction. It is not clear to what extent these percentages are influenced by particular instances when a few people behaved inappropriately in front of many others or if some of the non-CUIS visitors (residents, NPS staff, retained rights visitors) are responsible for these apparent intrusions. In any event, such disruptive occurrences are not common and the general pattern is probably a very acceptable one.

The data in Tables 7, 8 and 9, suggest that the 300 per day limit serves as a screening device to keep the amount of interaction at or below disfunctional levels for the wilderness or backcountry zones, but leaves room for more use in the predominantly day-use southern zone. Only at high use times and at the more congested areas is the situation likely to require additional management attention. At these places or times, or as special user groups can be identified, satisfaction levels can be enhanced by specific actions for those places or times. (Some of these will be addressed to a limited extent below.) The data as presented do not allow us to make inferences about what might happen if the overall use is increased. This is a policy issue that was addressed in the General Management Plan, and this analysis is not directed at assessing this, per se. Nonetheless, it seems that for groups with specific preferences to be away from others, or for those 'crossroads' situations on high use weekends, higher use limits might negatively impact them unless any increased use can be clearly directed away from these places and times.

Table 9. Visitor satisfaction with the number of people encountered at sites on Cumberland Island.

Sites	DEGREE OF SATISFACTION											Mean
	V.Satis.		Satis.		No opin.		Unsatis.		V.unsatis.			
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>		
BEACH AREAS												
Dungeness/Sea Camp	277	54.6	181	35.7	21	4.2	23	4.5	5	1.0	1.6	
Stafford Beach	84	50.0	70	41.7	13	7.7	0	0.0	1	.6	1.6	
North of Stafford	83	59.3	50	35.7	6	4.3	1	.7	0	0.0	1.5	
HISTORIC AREAS												
Dungeness	274	58.9	160	34.4	16	3.4	11	2.4	4	.9	1.5	
Plum Orchard	96	61.5	50	32.1	6	3.8	1	.6	3	2.0	1.5	
Trails/Old roads	135	62.5	66	30.5	11	5.1	3	1.4	1	.5	1.5	
OLDROADS/TRAILS												
Dungeness/Sea Camp	286	56.8	173	34.4	17	3.4	22	4.4	5	1.0	1.6	
Sea Camp to Stafford	141	55.9	91	36.1	13	5.2	5	2.0	2	.8	1.6	
Wilderness Zone (Hickory/Brickhill)	73	54.1	46	34.0	8	5.9	4	3.0	4	3.0	1.7	
Lake Whitney	39	58.2	20	30.0	7	10.4	0	0.0	1	1.5	1.6	
MAIN ROAD												
South/SeaCamp-Staff	127	48.1	107	40.5	16	6.1	13	4.9	1	.4	1.7	
North of Stafford	78	51.7	56	37.1	11	7.2	6	4.0	0	0.0	1.6	

1. Response format is 1=very satisfied, 2=satisfied, 3=no opinion, 4=unsatisfied, 5=very unsatisfied.

Wildlife Observations

Table 10 contains responses to two questions about the role of wildlife to visitors. For these questions, respondents were allowed to list more than one response. All responses are tabulated into one table with the percent of all responses and the percent of respondents for that item in separate columns. Nearly half of the visitors (49.7%) consider the opportunity to see wildlife "very important" or "extremely important" to their visit. By contrast, 11.7 percent consider wildlife viewing opportunities to be of "little importance" or "not at all important."

Also, visitors generally were not frustrated by their inability to see certain wildlife. Nearly all respondents (93.9%) indicated that they had seen some wildlife that they considered to be significant, and just over half (50.6%) further specified that they have looked for one type of wildlife or another but had not seen it. The major species that visitors reported they had looked for and seen are shown in Table 11. By far the most reported animal is the horse (number 1). Nearly two-thirds (66.4%) of all visitors reported seeing it, and horses account for over one-quarter (26.1%) of all wildlife observations recorded. Next there are four categories of wildlife that each comprise about ten percent of all observations from between 25.0 to 29.5 percent of the visitors. These are, in order of importance, turkey, deer, armadillo, and a general category, birds. One reason for this pattern might be that the horses are especially visible: they graze in the open near many visitor attractions and are not particularly afraid of having people around them. The other four animals are much more timid or wary even though more numerous than horses. Only the armadillos are a rather unexpected species. Perhaps they are still rare enough in people's experiences to have an exotic value.

An additional question asked respondents to list any wildlife they wanted to see, but were not able. (See Table 11.) Deer were most often listed (24.0% of responses) by just over one-third of the respondents (34.0%). Horses were second (13.5% of responses, 18.7% of respondents). The next three, in order, were armadillos (11.9 and 16.7%), sea turtles (7.5, 10.5%), and turkey (7.0, 9.7%). Once again the results are consistent with those animals seen. Only the desire to see sea turtles is likely to be frustrating. They are only visible in the middle of the night on a few nights each year, and then in areas far away from where most people travel. In fact, the best chance of seeing a turtle is likely to be one that has drowned in a shrimp net and washed ashore.

Table 10. The importance of wildlife observation to Cumberland Island visitors.

How important was wildlife to your Island visit?	<u>Freq.</u>	<u>Percent</u>
Not at all	18	3.0
Little importance	52	8.7
Moderately important	230	38.6
Very important	160	26.9
Extremely important	<u>136</u>	<u>22.8</u>
	596	100.0

Respondents that had:

seen significant wildlife	539	93.9
seen none/"no"	<u>36</u>	<u>6.1</u>
	574	100.0

Respondents that looked for,

but did not see wildlife.	268	50.6
Other responses	<u>262</u>	<u>49.4</u>
	530	100.0

Table 11. Wildlife that visitors saw or would like to have seen; top five categories, n=608.

<u>Wildlife Category</u>	<u>Number of Responses</u> ¹	<u>Percent of Responses</u>	<u>Percent of Respondents</u>
Significant wildlife seen:			
Horse	358	26.1	66.0
Turkey	160	11.7	29.5
Deer	148	10.8	27.3
Armadillo	143	10.4	26.3
Birds	136	9.9	25.0
All others	<u>431</u>	<u>31.7</u>	<u>0.0</u>
	1367	100.0	174.1
Looked for but not seen:			
Deer	93	24.1	34.0
Horses	52	13.5	18.7
Armadillo	46	11.9	16.7
Sea Turtle	29	7.5	10.5
Turkey	27	7.0	9.7
All others	<u>139</u>	<u>36.0</u>	<u>0.0</u>
	386	100.0	89.6

1. Multiple responses were given for each sub-table.

In summary, wildlife are an important part of a visit to CUIS for the vast majority of the users. Virtually all of these people were able to enjoy one type of wildlife or another that they considered significant. Many people listed two or three significant types of sightings. Nonetheless, fully a third were frustrated in their attempts to see more wildlife, especially deer. Since the NPS is not likely to hold deer in pens, perhaps better information on wildlife viewing opportunities or the reasons why they're all around but "invisible" would be helpful. Overall, the wildlife data suggest that even though CUIS is a beach-oriented park, nature involvement is still crucial to the existing use pattern.

SUMMARY AND MANAGEMENT RECOMMENDATIONS

The introduction to this report stated that the purpose of this study was to provide both descriptive and inferential data. The survey methods employed yielded reliable estimates of the proportions of overnight visitors, wilderness users, and other basic socioeconomic and use descriptors. Many other questions were asked about specific issues to obtain preference and opinion data that could be used to infer management strategies. More detail on both of these aspects can also be found in the Appendix, which gives basic weighted frequencies for all variables in the questionnaire.

As a summary, we can say that the visitation is about 60 percent day use and 40 per cent overnight use. The overnight use is about evenly split between developed camping (Sea Camp) and backcountry camping (Stafford and Wilderness sites). No dispersed, or open, camping is allowed. The main activities also reflect diversity. Many people come for wilderness and peaceful immersion in natural surroundings. These people enjoy the natural history: they birdwatch, look for other animals, and visit the Wilderness zone. Another main group is more interested in walking the beach, picnicing, and sunbathing. A third distinct group wants to visit the ruins and enjoy the human history of the island.

Second, managing such a diverse user population requires a better understanding of why they come. The data tell us that they encompass a wide range of socioeconomic backgrounds and age groups, and that they travel in many types of groups and have various combinations of motivations for a visit. Satisfying these diverse expectations requires managers to balance the needs and desires of one group against the potential impact that satisfying them might have on other subpopulations. And, clearly, because many people are first time visitors to CUIS their expectations may be vague or generalized in nature. This presents both problems and opportunities for the CUIS staff. The visitors need to be told basic regulations and appropriate behavior patterns. They must also be clearly warned about potential problems whether it be insects, weather, or other uses of the island. This places an increased importance on information services and interpretive efforts while at CUIS.

Fortunately, the data on the distribution of users also reveals that there already exists some segregation of potentially incompatible uses. In particular, the Wilderness users usually strike off to the north upon landing on the island, whereas the historically oriented dayusers turn south, and "fun oriented" recreationists head straight for the beach. Thus, incompatibilities tend to exist only where travel patterns cross (e.g. Sea Camp area) or where

otherwise incompatible uses occur (e.g. cars along the road or beach). Therefore, the NPS staff is limited in its ability to avert user conflicts. A separation between vehicle and foot traffic on the main road and the beach is clearly one of the first steps. This may require construction of trails, enforcement of use regulations, or better information to visitors as to what to do and what to expect.

A final, though major, area of concern was the importance of the wildlife populations. Again, the data tell us that wildlife are very important to almost all visitors. Horses are especially valued, followed by native species such as deer, turkey, or armadillo. Almost everyone who wanted to see some wildlife was able to do so. Perhaps the only major management recommendation that needs to be made is that the visitors would benefit from better information on how, when or where to see wildlife, or on the natural history of the more common species.