
Deer, People, and Parks:

Perspectives of Residents in Communities Near Fire Island National Seashore



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EXECUTIVE SUMMARY

Study Background and Purpose

We established a research project to clarify human dimensions of white-tailed deer (*Odocoileus virginianus*) issues in National Park Service (NPS) units in the northeastern U.S. as part of a cooperative agreement between the NPS Biological Resource Management Division (BRMD) and Cornell University's Human Dimensions Research Unit (HDRU) in the Department of Natural Resources. The project was completed in three phases; this report details findings from research phase IIIB at Fire Island National Seashore (FINS).

Methods

HDRU staff conducted a series of mail surveys specific to each of five NPS parks for the purpose of describing and understanding the views of local residents with respect to deer issues and suggesting how NPS staff might utilize this understanding to enhance management practices, including stakeholder engagement activities.

We developed a 16-page questionnaire with sections focused on perceptions about and use of Fire Island National Seashore (FINS) lands, perceptions of and concerns about deer, opinions about NPS decision making and land management, and information about the backgrounds of respondents. Our sampling universe was divided into three strata. The first stratum consisted of residents, aged 18 and older, living in communities within the FINS administrative boundary. The second stratum consisted of residents who live slightly further away, in surrounding communities within a few miles of FINS. The third stratum consisted of year-round residents living in communities within the FINS administrative boundary. We mailed questionnaires to 1,434 households (600 in the first two strata, 234 in the Year-Round Resident stratum). We mailed all members of the sample a cover letter, questionnaire, and postage-paid return envelope on April 19, 2007. We contacted nonrespondents up to three additional times, with the last reminder mailing taking place on May 18, 2007.

Key Findings

We received 461 completed questionnaires, for an adjusted response rate of 37.2% (49.8% in adjacent communities stratum; 25.3% in surrounding communities stratum; 40.6% in year-round FINS resident). We compared respondents and nonrespondents on 12 variables measured in a telephone follow-up of nonrespondents. Though we found some differences between nonrespondents and respondents, we also found many similarities. Nonrespondent and respondent groups were similar in gender and age composition. Nonrespondents and respondents also visited FINS with similar frequency and encountered deer in FINS and their communities at similar frequencies. Nonrespondents did not differ from respondents on their attitudes toward deer in FINS or in their communities. Given those similarities, we decided not to weight the data based on nonrespondent information.

The following bullets summarize key findings and conclusions.

- Residents living near FINS use and appreciate the seashore for its amenity values (e.g., as open space, as a leisure resource, as natural habitats). They visit FINS frequently to spend time outdoors, enjoy nature, or spend time with family or friends.
- Most year-round and adjacent community residents of FINS interact with deer regularly. They believe deer use both FINS-administered lands and adjacent communities as their habitat—they recognize that FINS and local communities share a common deer herd. Most year-round and adjacent or surrounding community residents of FINS are very concerned about two categories of negative impacts associated with the presence of deer: impacts associated with deer accessing unsecured trash and disease transmission from deer to humans.
- Half of year-round and adjacent community respondents believe deer seriously damage plants and other resources in FINS, but fewer believe deer present health or safety risks in FINS.
- The majority of respondents believe NPS should be managing deer-related impacts in FINS. A majority of residents believe NPS actions to manage deer-related impacts would affect local communities. A majority of responding adjacent residents and a plurality of year-round residents believe action by NPS to manage deer-related impacts would affect them positively.
- While not reflected in responses from all local residents, a base of general credibility and trust exists for FINS decision makers. However, a substantial proportion of residents in all strata are uncertain about the beliefs of NPS managers regarding deer and deer management in the park.
- Most residents have heard or read news stories about FINS, but few residents of surrounding communities have participated in activities where they provided input to decisions about park management activities. Year-round residents were more likely than residents in other community categories to have: talked with FINS staff or other public officials about the park, attended a public meeting about the park, or participated in a community group or activity related to a park issue.
- Substantial numbers of year-round and adjacent community residents are interested in providing input if NPS addresses deer-related impacts in FINS in the future (residents of surrounding communities showed relatively lower interest in providing input). However, many residents of adjacent and surrounding communities do not believe they have enough information to provide meaningful input.
- A substantial proportion of residents in all community categories are skeptical about the degree to which NPS decision makers listen to community residents or consider their input in decisions.
- An ongoing public issues education program would be beneficial as a means to improve: community understanding of NPS beliefs regarding deer and deer management; the quality of

input received from the public; and community understanding of NPS procedures and regulations regarding public involvement on natural resource management issues.

- Experience with deer, concern about deer damage to vegetation, and interest in providing input is stronger in adjacent communities than in surrounding communities, indicating that these two strata represent different publics. Communication intended to reach one or the other strata will have different fundamental objectives and thus may call for somewhat different implementation strategies.
- This study provides NPS decision makers with information about community interests related to deer impacts and management of NPS lands. Insights from this study can be used to guide ongoing communication about deer management between NPS personnel and residents of neighboring communities. Findings should be especially useful to park managers as they think about tailoring communication toward communities of place and communities of interest.

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INTRODUCTION

White-tailed deer (*Odocoileus virginianus*) have been a major concern in units of the National Park Service (NPS) in the northeastern U.S. for over two decades, and biological studies have been undertaken at a number of parks to determine deer population density, movement, and impact on park resources (e.g., Frost et al. 1997, Lovallo and Tzilkowski 2003, Porter and Underwood 1999, Shafer-Nolan 1997, Underwood 2005, Underwood and Porter 1991, Warren 1991). To reduce adverse impacts of deer to park resources, the NPS may propose actions that are consistent with NPS policy and the park's enabling legislation. Deer can have profound impacts not only on a park's natural and cultural resources, but also on the residents of local communities. In addition, any management actions considered by a park also may impact stakeholders (i.e., may cause collateral impacts [Decker et al. 2006]), either tangibly or intangibly. Likewise, actions taken by park neighbors can exacerbate or diminish impacts experienced in the park that are associated with deer.

Management decisions for park resources are guided by the fundamental purpose of the NPS, which includes "...providing for the enjoyment of park resources and values by the people of the United States," with types of activities and use level that avoid impairment of the resource condition or value (National Park Service 2006:10). In addition, the NPS has adopted a civic engagement philosophy "... that will help ensure the relevance of NPS resources and programs to people, as well as ensure NPS responsiveness to diverse public viewpoints, values, and concerns" (National Park Service 2007:2). NPS policies also recognize that "...parks are integral parts of larger regional environments...the service will work cooperatively with others to anticipate, avoid and resolve potential conflicts...and address mutual interests in the quality of life of community residents" (National Park Service 2006:13). Local stakeholders often are crucial to the initial identification and articulation of wildlife issues at parks, such as those related to deer, although park management objectives and policy influence the degree to which NPS becomes involved in management of those issues (Leong and Decker 2005). After the NPS formally identifies, defines, publicizes and is in the process of planning actions, regional or national stakeholder groups may become involved in management planning. In addition, NPS policies place emphasis on public participation in wildlife management planning, especially local stakeholders (National Park Service 2006, 2007). Federal agencies also are required to engage stakeholders whenever any action is considered that may significantly impact the environment (National Environmental Policy Act 1969). In addition to these policy directives, a growing body of literature recognizes the role of deliberative stakeholder engagement in resolving conflicts, improving the quality of decisions, and building relationships (e.g., Beierle and Cayford 2002, Halvorsen 2003, Wondolleck and Yaffee 2000). Yet few studies have addressed the ways in which human values and attitudes affect wildlife management planning in national parks and land units managed by NPS. The research we report here addressed those information needs in Fire Island National Seashore (FINS).

Context for Deer Management in Fire Island National Seashore

Fire Island is a 32-mile long barrier island that runs along the southern coast of Long Island, New York, separating the Great South Bay from the Atlantic Ocean. In 1964, Congress created Fire Island National Seashore (FINS) "...for the purpose of conserving and preserving

for the use of future generations certain relatively unspoiled and undeveloped beaches, dunes, and other natural features...which poses high values to the Nation as examples of unspoiled areas of great natural beauty in close proximity to large concentrations of urban population (Public Law 88-586, September 11, 1964). FINS encompasses approximately 26 miles of Fire Island (including the 17 communities that were already established at the time of the designation) and 24 smaller barrier islands (Figure 1).

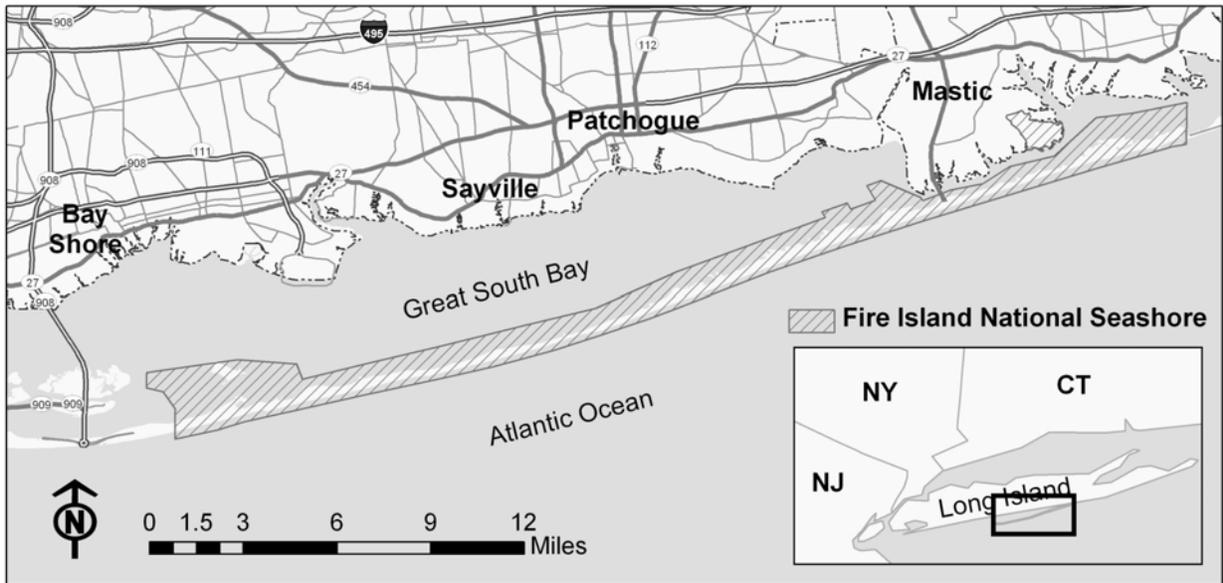


Figure 3. Geographic location of Fire Island National Seashore (FINS).

The population of white-tailed deer on FINS has grown dramatically in the last two decades, causing concerns about: impacts to native vegetation, Lyme disease, habituation of deer, and complaints from community members, among others. In response, FINS conducted research hunts in 1988 and 1989 to assess the physical condition of the deer and the effectiveness of public hunting as a means of reducing deer populations. The hunt generated considerable controversy, and in 1993 the Humane Society of the United States (HSUS) began a long-term research project to explore the efficacy of using a remotely administered procine zona pellucida (PZP) immunocontraception vaccine as a management tool (Naugle and Rutberg 2005). This project was largely driven by community members and continues today, with FINS more recently assuming a more active role in the study. In 1998 FINS, HSUS, and the United States Geological Survey (USGS) developed an interdisciplinary outreach project to discourage deer feeding and decrease human-deer conflicts. A team consisting of a law enforcement ranger, biologist, and interpreter distributed brochures and bumper stickers, visited school groups and other end-user groups, and undertook daily education/enforcement patrols. FINS currently lacks funding to sustain such an effort, but provides outreach where possible; for example they recently developed a Junior Ranger program about deer where children earn a pin after completing a series of activities.

The Fire Island National Seashore Deer Management Study

FINS has engaged in a number of different approaches to manage deer issues, from research on different forms of population control to education and human behavior change (Underwood 2005). While biological studies can help assess physical impacts to the environment, sociological studies are necessary to determine impacts to stakeholders. We established a research project to clarify human dimensions of white-tailed deer issues in NPS units in the northeastern U.S. as part of a cooperative agreement between the NPS Biological Resource Management Division (BRMD) and Cornell University's Human Dimensions Research Unit (HDRU) in the Department of Natural Resources. Information from the overall research project is intended to help NPS decision makers better understand community interests related to deer impacts and management of NPS lands. Findings from each research area provide insights to guide ongoing communication between NPS personnel and residents of communities near parks. The data reported herein will be especially useful to park managers as they think about tailoring communication toward communities of place and communities of interest. This study also will help park managers better understand factors associated with intention to participate in deer management planning opportunities.

The project was completed in three phases.

In phase I of our research project, Leong and Decker (2005) used a web-based survey and semi-structured in-depth discussions with NPS natural resource managers and staff describe the deer situation in northeastern parks and develop an approach for inquiry to aid in management practice and policy interpretation, resulting in a study plan. Managers described a multi-tiered complex of influences shaping a park's management environment and identified five key elements for the foundation of successful management plans: understanding the park's unique management environment, internal NPS coordination, coordination with external stakeholders, effective planning processes, and adequate resources. For each of these elements, local communities were seen as significantly affecting management activity and so became the focal point for additional inquiry.

In research phase II, Leong (2007) conducted in-depth semi-structured interviews with 20 public participation practitioners to determine how public participation and civic engagement methods fit within NPS wildlife management, including (but not limited to) NPS policies that fulfill the purposes of the National Environmental Policy Act (1969). Interviewees included: natural resource managers, superintendents, rangers, and scientists with the NPS, USDA Forest Service, U.S. Fish and Wildlife Service, Bureau of Land Management, and US Geological Survey, and; specialists in community planning, dispute resolution, and public participation who regularly provide their services to federal land management agencies. Practitioners identified participatory strategies that integrate the substance of negotiations, relationships between stakeholders, and process design.

In research phase IIIA, HDRU staff conducted qualitative interviews with a total of 267 local community residents living near three suburban NPS units (i.e., FINS [Leong and Decker 2007a], Valley Forge National Historical Park [Leong and Decker 2007b], and Prince William Forest Park [Leong and Decker 2007c]). Interviews with residents of communities near parks

were used as an orientation to community members' understanding of park wildlife management, expectations for public input in management planning, and experiences with the park related to wildlife management. Capacity needs were identified to improve future public participation efforts in wildlife management planning. Insights from study phase IIIA informed development of a mail-back survey to NPS managers and residents of communities near parks (phase IIIB).

Purpose of this report:

This report focuses on results of the final phase of research (phase IIIB), conducted in FINS. The goal of phase IIIB research was to gain an in-depth understanding of a variety of stakeholder beliefs and attitudes regarding deer-related impacts. This phase of research focused on comparisons of residents living in communities adjacent to an NPS unit with residents living in surrounding communities near an NPS unit (i.e. the study compared communities with a different potential to experience direct impacts from deer or deer management at parks, due to their relative distance from a park). The sociological research conducted during this phase of the project uncovers a range of local community members' opinions and experiences related to: deer issues and deer management at FINS, the role of FINS in deer and other wildlife management, and the influence of public input in wildlife management at FINS.

METHODS

Study areas

Potential study areas were identified based on discussions with BRMD staff, Regional Chief Scientists from the Northeast and National Capital Regions of NPS, and Natural Resource Managers at NPS units throughout the northeast. Seven NPS units volunteered to participate in the project; five sites ultimately were chosen to represent various stages of maturity of their deer issues and amount of outreach effort related to these issues. Fire Island National Seashore was the only park identified with a long history of deer issues and experience with outreach activities with communities and visitors about deer. Valley Forge National Historic Park (NHP), in southeastern Pennsylvania, and Morristown NHP, in New Jersey, represent parks with a long history of deer issues and limited public outreach activities about deer. Chesapeake and Ohio Canal NHP (Great Falls area), in Maryland, and Prince William Forest Park, in Virginia, represent parks where deer issues are emerging only recently and relatively few outreach activities have occurred related to deer. No parks were identified that were experiencing recently emerging deer issues yet had engaged in many outreach activities about deer.

Phase IIIB survey instrument

As described above, the phase III survey instrument is the product of a multi-step process, including our previous research experience on community-based deer management and insights gained through study phases I and II. Many of the items used in our survey instrument were pilot tested in a community-based deer management survey instrument used in central New York in 2006 (Siemer et al. 2007).

The data collection instrument for study phase IIIB was a 16-page questionnaire with sections focused on perceptions about and use of NPS lands, perceptions of and concerns about deer, opinions about NPS decision making and land management, and information about the backgrounds of respondents (Appendix A). We designed the instrument to assess key beliefs held by residents of local communities with respect to issues related to deer and deer management. In addition, we designed the survey instrument to help determine whether the perspectives of interviewees in phase IIIA are representative of a random sample of local residents and whether responses differ for parks with longer histories of deer impacts.

Survey implementation

Our sampling universe was stratified into three groups of residents aged 18 or older. The first stratum consisted of individuals who owned homes in one of the 17 communities on Fire Island, all of which are within the FINS administrative boundary and are interspersed with land administered directly by FINS. We labeled this stratum “adjacent communities.” The second stratum consisted of residents of owner-occupied homes in surrounding communities. The boundaries for the surrounding communities stratum were the Robert Moses Causeway and Islip Township line on the west, Sunrise Highway on the north, the Forge River on the west, and Fire Island on the south (Figure 2). Because many homes on Fire Island are summer residences, we included a third stratum of people who live year-round in one of the adjacent communities.

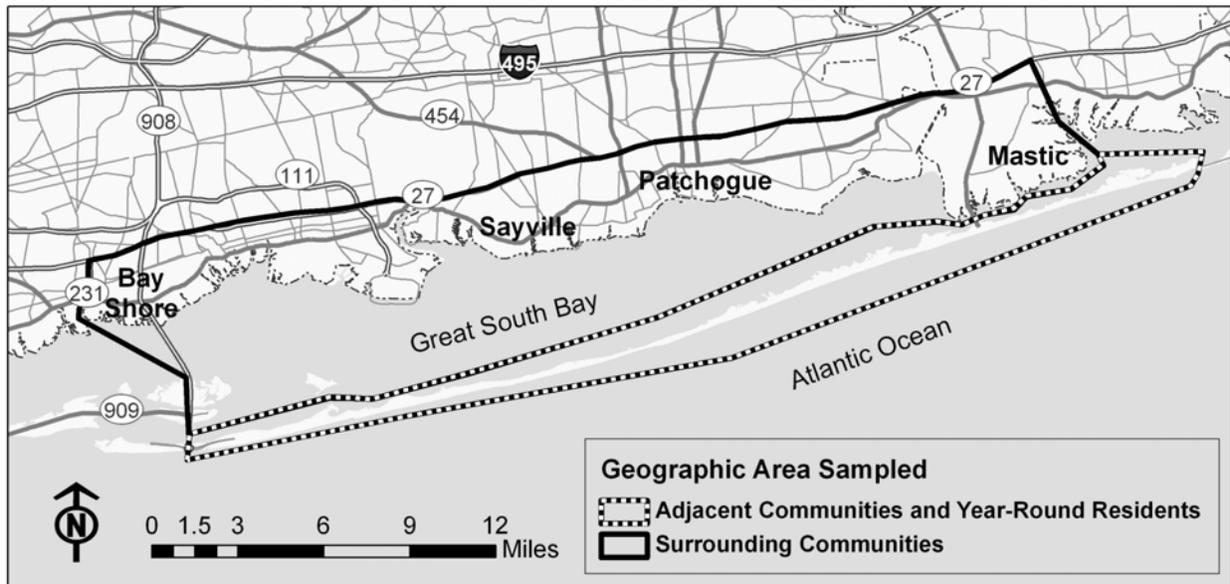


Figure 4. Geographic boundaries used to assign households to a community.

We mailed questionnaires to 1,434 households (600 in each community stratum; 234 year-round residents living within the FINS administrative boundary). We used a four-wave mailing approach, similar to the total design approach advocated by Dillman (2000). We mailed all members of the sample a cover letter, questionnaire, and postage-paid return envelope on

April 19, 2007. We contacted nonrespondents up to three additional times, with the last reminder mailing taking place on May 18, 2007.

Nonrespondent follow-up survey

To assess potential for nonresponse bias in the data, we conducted a follow-up study with nonrespondents. The purpose of the follow-up study was to determine if non-respondents differed significantly from respondents on key questions. We developed a 12-item telephone interview instrument and contracted with Cornell University’s Survey Research Institute (SRI) to use the instrument in a telephone survey with a random sample of nonrespondents. SRI staff set a target of completing 50 interviews in each stratum. They reached that target in two strata; they completed fewer interviews in the year-round resident stratum due to limitations associated with the small overall sample for that stratum (Box 1). Follow-up telephone interviews began on June 18, 2007 and were completed on July 8, 2007.

Box 1. Outcome of follow-up telephone interviews after 2007 FINS Deer, Parks, and People mail survey.	Overall	Adjacent community strata	Surrounding community strata	Year-round resident strata
			(n)	
Completed telephone interview	142	50	50	42
Bad phone number	133	12	67	54
Too Ill; Deceased; Incapable of responding	10	2	6	2
Language problem	2	0	2	0
Did not call	222	83	139	0
Refused	16	5	8	3
Pending (called, but not able to conduct interview)	256	83	154	19
Total	781	235	426	120

Analysis

In this report we provide descriptive study highlights using a set of tables with frequencies of response from residents in three geographic strata: (1) adjacent communities; (2) surrounding communities; and (3) year-round residents living within the FINS administrative boundary. We used chi square tests to identify whether statistically different results had occurred among any of the three community strata. When differences were identified for a given variable, we conducted collapsed response categories as necessary and conducted chi square tests with pairs of stratum to isolate differences between specific strata. Differences are reported at the $p < 0.05$ level of significance.

We used factor analysis as a technique to reduce data from individual items into scales. We were able to develop multi-item scales for: (1) community importance of FINS; (2)

perceptions of deer behavior; (3) concerns about deer; and (4) public image of FINS management. We used univariate analysis of variance (ANOVA) and Tukey's HSD post hoc tests to assess differences between factor means at the $p < 0.05$ level of significance. All data analysis was conducted using SPSS version 15.0.0 (SPSS Inc., Chicago IL).

Community importance of Fire Island National Seashore:

We developed 12 items to assess community residents' held values for FINS as a community asset. We used those 12 items to create a multi-item index of community importance placed on FINS. Dropping one item yielded a 9-item scale with high reliability ($\alpha = 0.869$). Principal axis factoring identified two factors with an eigen value above 1. These factors accounted for 54.67% of the variance between items. Factor loadings ranged from 0.562 to 0.848. We labeled the factors "amenity and economic values" and "ecological values," although the ecological values dimension showed low internal consistency (Appendix B, Table B1).

Perceptions of deer behavior:

We developed 12 items to assess community residents' perceptions of deer within FINS and in neighboring communities. Dropping three items yielded a 9-item scale with high reliability ($\alpha = 0.846$ for perceptions of deer within FINS; $\alpha = 0.862$ for perceptions of deer in local communities). Principal axis factoring identified one factor with an eigen value above 1. That factor accounted for 45.55% of the variance between items in the park scale (48.37% of variance on the community scale). Factor loadings ranged from 0.584 to 0.744 in the park scale and from 0.626 to 0.768 in the community scale. We labeled the factor "perceived naturalness" of deer behavior (Appendix B, Table B2).

Concerns about deer:

We developed 12 items to assess community residents' concerns about deer within FINS and in neighboring communities. Dropping four items yielded an 8-item scale with high reliability ($\alpha = 0.878$ for concerns within FINS; $\alpha = 0.869$ for concerns in local communities). Principal axis factoring identified two factors with an eigen value above 1. The factors accounted for 67.4% of the variance between items in the park scale and 67.3% of variance in the community scale). Factor loadings ranged from 0.509 to 0.902 in the park scale and 0.508 to 0.920 in the community scale. We labeled the factors "primary concerns" and "other concerns" (Appendix B, Table B3).

Public image of Fire Island National Seashore management:

We developed 8 items to assess community residents' image of FINS management. These items yielded a scale with high reliability ($\alpha = 0.861$). Principal axis factoring identified two factors with an eigen value above 1. Those factors accounted for 64.59% of the variance between items. Factor loadings ranged from 0.646 to 0.798. We labeled the factors "professionalism" and "community affiliation" (Appendix B, Table B4).

RESULTS

We received 461 completed questionnaires, for an adjusted response rate of 37.2% (49.8% in adjacent communities stratum; 25.3% in surrounding communities stratum; 40.6% in year-round FINS resident) (Table 1). We compared respondents and nonrespondents on 12 variables measured in a telephone follow-up of nonrespondents (Appendix C). We found some differences between nonrespondents and respondents. Nonrespondents in the surrounding community and year-round resident strata were less likely to think they could influence decisions within FINS and less likely to agree that FINS staff were trustworthy. Nonrespondent year-round residents were less likely than respondent year-round residents to show interest in talking with FINS staff, providing written comments, or attending public meetings if those opportunities were provided by FINS. However, nonrespondents did not differ from respondents on gender and were similar in age (mean age for respondents and nonrespondents was 59 and 56, respectively). Nonrespondents and respondents also visited FINS with similar frequency and encountered deer in FINS and their communities at similar frequencies. Nonrespondents did not differ from respondents on their attitudes toward deer in FINS or in their communities. Given those similarities, we decided not to weight the data based on nonrespondent information.

Table 1. Response rates by stratum for the 2007 Fire Island National Seashore (FINS) Deer, People and Parks survey.

Community	Sample	Returns	Not deliverable	Not usable	Adjusted response rate (%)
Adjacent communities	600	233	132	2	49.8
Surrounding communities	600	146	24	7	25.3
Year round residents	234	80	37	3	40.6
Total (*includes 2 with no ID No.)	1,434	461*	193	12	37.2

The following sections summarize study results within all the major categories of questions in the mail survey instrument. We note differences between strata that have practical implications for gathering input from or communicating with residents of communities near FINS.

Respondent characteristics

The majority of respondents in the surrounding community stratum (61%) were female. Men and women responded at equal rates in the other stratum. Mean age was 59 years old. On average, respondents had lived near FINS or within the FINS administrative boundary for 32 years. The majority of respondents in all strata participated in walking/hiking and viewing wildlife. Over half of adjacent community and year round residents participated in biking, and over half of year-round residents participated in boating and fishing (Table 2). Year-round residents were more likely than adjacent community respondents to participate in boating, fishing, and hunting (Table 2).

Table 2. Rates of participation in outdoor activities reported by respondents to the 2007 FINS Deer, People and Parks survey. Numbers represent percent of respondents who indicated each activity.

Activity	Strata			Chi-square	P-value
	Adjacent communities (n=232)	Surrounding communities (n=143)	Year round residents (n=79)		
Hiked /Walked	93.5	81.8	87.3	12.37	0.002
Viewing wildlife	71.1	59.4	72.2	6.40	0.041
Biked	62.9	41.3	72.2	25.20	<0.001
Boating	47.0	53.8	63.3	6.57	0.037
Picnicking	44.0	51.0	31.6	7.77	0.020
Fishing	40.9	40.6	53.2	4.07	NS ¹
Photo/sketch	40.5	26.6	41.8	8.65	0.013
Camping	7.8	18.9	7.6	12.24	0.002
Horse riding	4.7	6.3	3.8	0.76	NS
Hunting	0.9	2.1	7.6	11.39	0.003

¹ Not significant.

Use of Fire Island National Seashore

Nearly everyone in the study sample (94% or more of respondents and nonrespondents in all strata) had visited FINS at some time. The majority of those who visited FINS stayed for a day or more on each visit. Most (80%) adjacent community and year-round residents had visited FINS more than 10 times in the past 12 months (only 33% of surrounding community residents visited FINS 10 or more times during the past 12 months) (Appendix C, Table C2).

The most common reasons for visiting FINS for residents of adjacent and surrounding communities was to spend time with family and friends, view scenery, be outside, get away from everyday demands, and enjoy nature (Table 3). When asked to describe why they visit FINS, many respondents used the “other” response option to indicate that they visit FINS because they own a home within the FINS administrative boundary, live part time on Fire Island, or take summer vacations on Fire Island. Residents of adjacent communities were more likely than year-round residents to utilize FINS as a place to spend time with family and friends, view the scenery, spend time outside, get away from demands, enjoy nature, get exercise, or view wildlife (Table 3).

Table 3. Reasons for visiting lands administered by FINS offered by the 75% of residents who visited FINS for a purpose other than passing through on the way to another destination. Numbers represent percent of respondents who indicated each reason.

Reason for visiting FINS	Strata			Chi-square	P-value
	Adjacent communities (n=208)	Surrounding Communities (n=130)	Year-round residents (n=63)		
Spend time with family or friends	66.8	79.2	39.7	29.84	<0.001
View the scenery	64.4	80.0	36.5	35.40	<0.001
Be outside	63.9	76.2	38.1	26.62	<0.001
Get away from demands	63.9	71.5	34.9	24.91	<0.001
Enjoy nature	59.6	69.2	34.9	20.73	<0.001
Other	46.2	16.9	74.6	62.77	<0.001
Exercise	43.3	36.9	27.0	5.65	NS ¹
View wildlife	40.9	51.5	19.0	18.53	<0.001
Learn about history	13.5	16.2	11.1	0.98	NS
Volunteer in park	2.4	0.8	0.0	2.58	NS

¹ Not Significant.

Deer-related experiences, attitudes, perceptions, and concerns

Visitors to FINS saw deer frequently. Eighty-eight percent of year-round residents, 69% of adjacent community residents, and 28% of surrounding community residents reportedly saw deer every visit (all year-round and 95% of adjacent community residents saw deer on half or more of their visits). Similar encounter rates were reported in neighboring communities (i.e., most adjacent community and year-round residents encountered deer every day or a few times a week in their community). Year-round residents were more likely than members of other strata to encounter deer on a daily basis (Appendix C, Table C3).

The majority of respondents in adjacent communities, and a plurality of respondents in other strata reportedly enjoy deer, but worry about deer-related problems in FINS-administered lands (Table 4). Adjacent residents were more likely than respondents from other strata to report that they do not enjoy deer in their community. Surrounding community residents were more likely than respondents from other strata to have no particular feelings about deer or enjoy them without worry in their community (Table 4).

Table 4. Attitude toward deer in FINS and local communities expressed by respondents to the 2007 FINS Deer, People and Parks survey, by stratum.

		(Percent)				Chi-square	P-value
	n	No particular feelings	Enjoy and do not worry	Enjoy BUT worry	Do not enjoy		
Attitude toward Deer in FINS							
Adjacent ^a	201	9.0	21.9	55.2	13.9	22.597	0.001
Surrounding ^a	131	16.0	37.4	41.2	5.3		
YR Residents ^b	72	13.9	33.3	48.6	4.2		
Attitude toward Deer in your community							
Adjacent ^a	220	1.4	18.6	50.0	30.0	69.123	<0.001
Surrounding ^b	132	22.7	25.0	43.2	9.1		
YR Residents ^c	74	4.1	29.7	50.0	16.2		

^a Community strata with different superscripts (a, b, or c) have different item means at p<0.05

Respondents from all three strata held relatively similar perceptions of deer behavior in the park and in neighboring communities. Members of all strata generally regarded typical deer behavior as normal, natural, peaceful, and unthreatening (Tables 5 and 6). Responses were inconsistent as to whether deer were wild, tame, or timid. Year-round residents had lower mean scores than surrounding community residents on the 9-item scale of perceived naturalness of deer in the park (Table 7). Both year-round residents and adjacent community residents had lower mean scores than respondents from surrounding communities on the 9-item scale of perceived naturalness of deer in their community (Table 7).

Table 5. Perceptions of deer in FINS administered areas, expressed by respondents to the 2007 FINS Deer, People and Parks survey, by stratum.

In FINS areas deer, in general are...	Strata	n	(Percent)			Chi- square	P- value
			Rarely	Some times	Almost Always		
wild	Adjacent	155	40.6	27.1	32.3	3.44	NS ¹
	Surrounding	111	36.0	30.6	33.3		
	YR Residents	65	40.0	36.9	23.1		
peaceful	Adjacent	155	2.6	14.8	82.6	3.07	NS
	Surrounding	115	0.0	15.7	84.3		
	YR Residents	67	1.5	16.4	82.1		
behaving strangely	Adjacent	155	75.5	17.4	7.1	8.66	NS
	Surrounding	113	82.3	15.9	1.8		
	YR Residents	64	67.2	28.1	4.7		
dangerous	Adjacent	160	75.0	20.0	5.0	9.50	0.050
	Surrounding	114	88.6	10.5	0.9		
	YR Residents	66	75.8	18.2	6.1		
tame	Adjacent	153	13.7	35.9	50.3	5.85	NS
	Surrounding	115	7.0	37.4	55.7		
	YR Residents	66	6.1	31.8	62.1		
behaving normally	Adjacent	153	13.7	35.9	50.3	2.67	NS
	Surrounding	156	3.2	21.2	75.6		
	YR Residents	66	6.1	18.2	75.8		

¹ Not Significant.

Table 5. Continued.

In FINS areas deer, in general are...	Strata	n	(Percent)			Chi- square	P- value
			Rarely	Some times	Almost Always		
aggressive	Adjacent	158	79.7	17.7	2.5	8.98	NS ¹
	Surrounding	116	89.7	9.5	0.9		
	YR Residents	65	76.9	23.1	0.0		
timid	Adjacent	156	14.1	46.2	39.7	4.67	NS
	Surrounding	116	8.6	48.3	43.1		
	YR Residents	67	13.4	35.8	50.7		
acting naturally	Adjacent	155	5.2	28.4	66.5	6.74	NS
	Surrounding	117	3.4	23.9	72.6		
	YR Residents	67	11.9	25.4	62.7		
harmless	Adjacent	156	13.5	23.1	63.5	9.44	0.050
	Surrounding	115	3.5	20.9	75.7		
	YR Residents	67	7.5	25.4	67.2		
threatening	Adjacent	157	77.1	19.7	3.2	7.44	NS
	Surrounding	116	86.2	12.1	1.7		
	YR Residents	67	74.6	17.9	7.5		
acting unnaturally	Adjacent	154	71.4	20.1	8.4	8.15	NS
	Surrounding	115	76.5	20.0	3.5		
	YR Residents	65	64.6	20.0	15.4		

¹ Not significant.

Table 6. Perceptions of deer in communities on Fire Island, expressed by respondents to the 2007 FINS Deer, People and Parks survey, by stratum.

In communities on Fire Island, deer, in general are...	Strata	n	(Percent)			Chi- square	P- value
			Rarely	Some times	Almost Always		
wild	Adjacent	200	49.0	25.5	25.5	2.02	NS ¹
	Surrounding	95	45.3	29.5	25.3		
	YR Residents	70	51.4	30.0	18.6		
peaceful	Adjacent	209	1.9	18.7	79.4	5.50	NS
	Surrounding	101	1.0	8.9	90.1		
	YR Residents	72	1.4	16.7	81.9		
behaving strangely	Adjacent	204	72.1	20.6	7.4	9.51	0.049
	Surrounding	100	79.0	18.0	3.0		
	YR Residents	69	63.8	33.3	2.9		
dangerous	Adjacent	212	70.3	23.1	6.6	8.24	NS
	Surrounding	102	84.3	10.8	4.9		
	YR Residents	71	70.4	23.9	5.6		
tame	Adjacent	209	8.6	31.6	59.8	3.46	NS
	Surrounding	102	4.9	32.4	62.7		
	YR Residents	71	4.2	26.8	69.0		
behaving normally	Adjacent	210	5.7	21.9	72.4	3.03	NS
	Surrounding	101	3.0	18.8	78.2		
	YR Residents	71	8.5	19.7	71.8		
aggressive	Adjacent	207	75.8	18.4	5.8	8.53	NS
	Surrounding	102	85.3	11.8	2.9		
	YR Residents	70	70.0	27.1	2.9		
timid	Adjacent	209	20.6	45.0	34.4	9.80	0.044
	Surrounding	101	6.9	49.5	43.6		
	YR Residents	72	18.1	43.1	38.9		

¹ Not significant.

Table 6. Continued.

In communities on Fire Island, deer, in general are...	Strata	n	(Percent)			Chi- square	P- value
			Rarely	Some times	Almost Always		
acting naturally	Adjacent	206	8.7	30.6	60.7	17.88	0.001
	Surrounding	102	2.9	25.5	71.6		
	YR Residents	72	20.8	22.2	56.9		
harmless	Adjacent	209	15.3	24.9	59.8	13.18	0.010
	Surrounding	103	5.8	19.4	74.8		
	YR Residents	72	4.2	27.8	68.1		
threatening	Adjacent	209	75.1	21.1	3.8	7.12	NS ¹
	Surrounding	103	87.4	11.7	1.0		
	YR Residents	72	75.0	20.8	4.2		
acting unnaturally	Adjacent	204	67.2	20.6	12.3	8.16	NS
	Surrounding	102	77.5	17.6	4.9		
	YR Residents	70	61.4	21.4	17.1		

¹ Not significant.

Table 7. A comparison of mean scores on factors within a perception of deer scale (in the park and in communities) obtained by community stratum, for respondents to the 2007 FINS Deer, People and Parks survey.

Factor Label	Community Strata	n	“In FINS”		“In your community”		
			Mean ¹	F (P-value)	n	Mean ¹	F (P-value)
Naturalness	Adjacent	164	2.68 ^{ab}	3.856	217	2.62 ^a	5.166
	Surrounding	117	2.78 ^b	0.022	103	2.77 ^b	0.006
	Year-round	68	2.63 ^a		73	2.60 ^a	

Wildlife-related impacts have been generically defined as socially-determined important effects (e.g., ecological, economic, psychological, health, safety, etc.) of events or interactions involving (a) wildlife and other natural resources, (b) humans and wildlife, and (c) wildlife management interventions (Riley et al. 2002). We assessed resident’s concerns about a range of deer-related impacts. A majority of respondents in all strata were very concerned about diseases and/or parasites carried by deer, and deer accessing unsecured garbage in FINS and in their communities (Tables 8-9). Respondents from surrounding communities were less likely than other respondents to express high levels of concern about browsing on natural vegetation in the park (Table 8). Respondents from adjacent communities were most likely to express high levels of concern about diseases/parasites carried by deer in the park, while year-round residents were least concerned about this potential impact (Table 8). Residents of adjacent communities were more likely than those of surrounding communities to express concern about deer browsing, deer accessing unsecured trash, and diseases/parasites carried by deer in their communities (Table 9), a finding echoed in the differences in mean score for the primary concerns scale (Table 10).

¹ Item measured on a three-point scale where 1=rarely, 2=sometimes, 3=almost always.

^a Community strata with different superscripts (a, b, or c) have different item means at $p < 0.05$

Table 8. Concerns about deer-related impacts in FINS expressed by respondents to the 2007 FINS Deer, People and Parks survey, by stratum.

Concern	Strata	n	Level of concern (Percent)			Chi-square	P-value
			Not at all	Some what	Very		
Having seen unhealthy deer	Adjacent	169	18.3	45.0	36.7	3.78	NS ¹
	Surrounding	116	25.9	42.2	31.9		
	YR Residents	61	19.7	37.7	42.6		
Fawns that are born to late to survive winter	Adjacent	161	23.6	35.4	41.0	3.09	NS
	Surrounding	115	25.2	39.1	35.7		
	YR Residents	62	30.6	40.3	29.0		
Presence of deer feces	Adjacent	165	49.7	19.4	30.9	8.07	NS
	Surrounding	114	49.1	29.8	21.1		
	YR Residents	63	49.2	31.7	19.0		
Deer browsing on naturally growing flowers, trees, shrubs	Adjacent	170	42.9	22.9	34.1	15.06	0.005
	Surrounding	117	59.0	26.5	14.5		
	YR Residents	64	42.2	26.6	31.3		
Deer browsing on landscaped flowers, trees, shrubs	Adjacent	170	28.8	27.1	44.1	8.31	NS
	Surrounding	117	38.5	31.6	29.9		
	YR Residents	64	42.2	26.6	31.3		
Deer browsing on vegetable gardens	Adjacent	165	29.7	26.1	44.2	8.99	NS
	Surrounding	117	31.6	36.8	31.6		
	YR Residents	61	42.6	26.2	31.1		
Deer accessing unsecured trash	Adjacent	167	14.4	21.6	64.1	4.20	NS
	Surrounding	117	16.2	29.9	53.8		
	YR Residents	61	14.8	19.7	65.6		
Deer interacting with pets	Adjacent	165	38.2	29.7	32.1	4.72	NS
	Surrounding	116	26.7	33.6	39.7		
	YR Residents	61	32.8	36.1	31.1		

¹ Not significant.

Table 8. Continued.

Concern	Strata	n	Level of concern (Percent)			Chi-square	P-value
			Not at all	Some what	Very		
Deer behavior around people	Adjacent	168	42.9	35.1	22.0	2.52	NS ¹
	Surrounding	117	37.6	41.0	21.4		
	YR Residents	62	48.4	30.6	21.0		
People's behavior Around deer	Adjacent	168	23.8	36.3	39.9	9.04	NS
	Surrounding	116	11.2	38.8	50.0		
	YR Residents	62	16.1	45.2	38.7		
Diseases and/or Parasites carried by deer	Adjacent	171	9.4	17.5	73.1	13.34	0.010
	Surrounding	119	7.6	31.1	61.3		
	YR Residents	63	19.0	20.6	60.3		
Car accidents involving deer	Adjacent	159	40.9	25.2	34.0	26.92	<0.001
	Surrounding	117	12.8	34.2	53.0		
	YR Residents	62	30.6	33.9	35.5		
Other	Adjacent	16	6.3	12.5	81.3	1.64	NS
	Surrounding	3	0.0	0.0	100		
	YR Residents	9	11.1	22.2	66.7		

¹ Not significant.

Table 9. Concerns about deer-related impacts “in communities on Fire Island,” expressed by respondents to the 2007 FINS Deer, People and Parks survey, by stratum.

Concern	Strata	n	Level of concern (Percent)			Chi-square	P-value
			Not at all	Some what	Very		
Having seen unhealthy deer	Adjacent	207	14.0	43.0	43.0	4.76	NS ¹
	Surrounding	106	23.6	38.7	37.7		
	YR Residents	70	17.1	38.6	44.3		
Fawns that are born to late to survive winter	Adjacent	197	24.4	33.5	42.1	2.56	NS
	Surrounding	105	22.9	37.1	40.0		
	YR Residents	72	27.8	40.3	31.9		
Presence of deer feces	Adjacent	207	42.0	41.5	40.3	5.82	NS
	Surrounding	106	41.5	27.4	31.1		
	YR Residents	72	40.3	37.5	22.2		
Deer browsing on naturally growing flowers, trees, shrubs	Adjacent	216	36.1	19.4	44.4	22.71	<0.001
	Surrounding	106	50.0	31.1	18.9		
	YR Residents	73	34.2	31.5	34.2		
Deer browsing on landscaped flowers, trees shrubs	Adjacent	216	19.9	19.9	60.2	25.88	<0.001
	Surrounding	108	29.6	38.0	32.4		
	YR Residents	73	28.8	31.5	39.7		
Deer browsing on vegetable gardens	Adjacent	213	19.7	20.7	59.6	22.26	<0.001
	Surrounding	108	23.1	40.7	36.1		
	YR Residents	71	28.2	32.4	39.4		
Deer accessing unsecured trash	Adjacent	217	10.1	15.2	74.7	11.82	0.019
	Surrounding	109	12.8	28.4	58.7		
	YR Residents	71	7.0	15.5	77.5		
Deer interacting with pets	Adjacent	214	34.6	32.7	32.7	5.67	NS
	Surrounding	107	22.4	34.6	43.0		
	YR Residents	71	32.4	32.4	35.2		

¹ Not significant.

Table 9. Continued.

Concern	Strata	n	Level of concern (Percent)			Chi-square	P-value
			Not at all	Some what	Very		
Deer behavior around people	Adjacent	214	39.3	36.9	23.8	4.96	NS ¹
	Surrounding	108	31.5	38.9	29.6		
	YR Residents	72	47.2	31.9	20.8		
People's behavior Around deer	Adjacent	215	20.5	42.3	37.2	10.09	0.039
	Surrounding	109	11.0	35.8	53.2		
	YR Residents	71	14.1	46.5	39.4		
Diseases and/or parasites carried by deer	Adjacent	219	6.4	17.8	75.8	16.77	0.002
	Surrounding	111	4.5	30.6	64.9		
	YR Residents	73	16.4	20.5	63.0		
Car accidents involving deer	Adjacent	200	45.0	26.0	29.0	45.99	<0.001
	Surrounding	109	8.3	35.8	56.0		
	YR Residents	71	33.8	31.0	35.2		
Other	Adjacent	19	0.0	0.0	100	7.28	NS
	Surrounding	3	0.0	0.0	100		
	YR Residents	10	10.0	20.0	70.0		

¹ Not significant.

Table 10. A comparison of mean scores on factors within a deer-related impacts scale obtained by community stratum, for respondents to the 2007 FINS Deer, People and Parks survey.

Factor Label	Community Strata	n	“In FINS”		“In your community”		
			Mean ¹	F (P-value)	n	Mean	F (P-value)
Primary Concerns	Adjacent	171	2.06	3.798 (0.023)	219	2.44 ^a	7.099 (0.001)
	Surrounding	118	1.82		111	2.19 ^b	
	Year-round	64	1.89		73	2.27 ^{ab}	
Other Concerns	Adjacent	172	2.13	0.263 NS ²	218	1.91	1.673 NS
	Surrounding	119	2.13		109	2.03	
	Year-round	64	2.07		72	1.86	

Perceptions of FINS staff and land management

Most community residents valued VFNHP as a community asset. Most respondents agreed that FINS provides open space and wildlife habitat, preserves natural resources, and provides an important leisure resource that makes their community a special place to live (Table 11). Respondents from all strata tended to agree that FINS provides habitat for plants and animals and preserves natural resources (i.e., ecological values) (Table 12). Respondents from surrounding communities were more likely than adjacent community or year-round residents to agree that FINS provides amenity and economic value to local communities (Table 12). Respondents from surrounding communities were more likely than adjacent community residents to agree that FINS provides ecological value to local communities (Table 12).

¹ Item measured on a three-point scale where 1=not at all concerned, 2=somewhat concerned, 3=very concerned.

^a Community strata with different superscripts (a, b, or c) have different item means at $p < 0.05$

² Not significant.

Table 11. Attitudes about benefits that FINS provides to people living within or near lands administered by FINS, expressed in the 2007 FINS Deer, People and Parks survey.

Fire Island NS...	Strata	n	(Percent)				Chi-square	P-value
			Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not sure		
makes my community a special place to live.	Adjacent	220	7.3	11.4	78.6	2.7	12.281	NS ¹
	Surrounding	138	1.4	7.2	88.4	2.9		
	YR Residents	75	9.3	6.7	84.0	0.0		
is not an important place for recreation for my community.	Adjacent	220	62.3	12.7	22.7	2.3	17.346	0.008
	Surrounding	138	81.2	4.3	12.3	2.2		
	YR Residents	77	70.1	11.7	18.2	0.0		
provides habitat for plants and animals.	Adjacent	217	3.2	3.7	90.3	2.8	2.054	NS
	Surrounding	139	1.4	3.6	92.1	2.9		
	YR Residents	77	2.6	5.2	90.9	1.3		
does not help the local economy.	Adjacent	220	60.5	14.5	15.9	9.1	18.889	0.004
	Surrounding	138	79.0	9.4	9.4	2.2		
	YR Residents	78	60.3	16.7	19.2	3.8		
does not protect the landscape from development.	Adjacent	217	55.3	13.4	24.4	6.9	8.186	NS
	Surrounding	137	65.0	12.4	13.1	9.5		
	YR Residents	76	61.8	14.5	17.1	6.6		
provides open space for my community.	Adjacent	221	13.6	12.7	68.8	5.0	17.021	0.009
	Surrounding	137	4.4	9.5	84.7	1.5		
	YR Residents	77	18.2	9.1	68.8	3.9		

¹ Not significant.

Table 11. Continued.

Fire Island NS...	Strata	n	(Percent)				Chi-square	P-value
			Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not Sure		
plays a significant role in my community.	Adjacent	220	13.6	14.5	68.2	3.6	11.046	NS ¹
	Surrounding	138	5.8	10.9	79.7	3.6		
	YR Residents	77	15.6	18.2	64.9	1.3		
Attracts tourism dollars to my community.	Adjacent	219	26.5	15.5	49.3	8.7	49.720	<0.001
	Surrounding	139	5.0	7.2	79.1	8.6		
	YR Residents	77	14.3	26.0	55.8	3.9		
is not a good neighbor.	Adjacent	217	60.4	18.0	17.1	4.6	37.300	<0.001
	Surrounding	138	87.0	5.1	5.1	2.9		
	YR Residents	76	53.9	22.4	15.8	7.9		
increases the job opportunities in my community.	Adjacent	220	34.1	25.0	23.6	17.3	61.723	<0.001
	Surrounding	137	7.3	31.4	54.7	6.6		
	YR Residents	77	35.1	28.6	27.3	9.1		
preserves natural resources.	Adjacent	221	8.6	8.6	77.4	5.4	9.987	NS
	Surrounding	139	2.2	10.1	84.9	2.9		
	YR Residents	77	9.1	13.0	75.3	2.6		
is a place where people in my community spend leisure time.	Adjacent	222	12.2	10.4	72.1	5.4	38.617	<0.001
	Surrounding	138	1.4	0.0	96.4	2.2		
	YR Residents	77	11.7	10.4	77.9	0.0		

¹ Not significant.

Table 12. A comparison of mean scores on factors within a scale to assess values created by FINS, expressed by respondents to the 2007 Deer, People and Parks survey.

Factor Label	Community Strata	n	mean¹⁶	F	P-value
Amenity and economic values	Adjacent	223	3.78 ^a	17.013	<0.001
	Surrounding	139	4.23 ^b		
	YR Residents	78	3.70 ^a		
Ecological values	Adjacent	223	4.06 ^a	4.529	0.011
	Surrounding	137	4.30 ^b		
	YR Residents	77	4.06 ^{ab}		

The majority of residents recognized that deer cross jurisdictional boundaries (such recognition was lower among respondents from surrounding communities, Table 13). Although more than half of respondents in all strata believe the habitat inside the park is better than outside, the over half of surrounding community respondents (and over 80% of adjacent and year-round community respondents) also believe that local deer use habitat inside and outside the park (Table 13). Fifty percent of adjacent and year-round residents believed deer are seriously damaging plants in FINS. Adjacent community respondents were more likely than respondents from other strata to believe that deer create a serious nuisance for people visiting FINS-administered lands (Table 13).

Over half of respondents agreed with the statement, “The park should start now to address deer-related impacts.” The majority of respondents believed actions to address deer-related impacts would affect communities outside the park. Adjacent community respondents were more likely than others to expect communities to be affected positively (Table 13). Year-round residents were most likely to expect that action by FINS would affect them negatively (Table 13).

We repeated the questions asked in Table 13 and asked residents how they thought FINS staff would respond. Depending on the item and stratum, 17-45% of residents responded “not sure” (Table 14). In aggregate, this pattern suggests unfamiliarity with park staff and their views on deer and deer management.

¹⁶ Item measured on a five-point scale where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

^a Community strata with different superscripts (a, b) have different item means at p<0.05

Table 13. Beliefs about deer-related impacts and impacts management in FINS expressed by respondents to the 2007 FINS Deer, People and Parks survey, by strata.

	Strata	n	(Percent)				Chi-square	P-value
			Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not Sure		
It is reasonable to have deer in the park	Adjacent	221	13.6	12.2	73.3	0.9	12.67	0.049
	Surrounding	139	6.5	7.9	84.9	0.7		
	YR Residents	78	3.8	10.3	83.3	2.6		
The habitat for deer is better in the park than in communities outside the park	Adjacent	218	13.3	14.7	56.4	15.6	12.30	NS
	Surrounding	136	2.9	19.1	57.4	20.6		
	YR Residents	77	10.4	15.6	59.7	14.3		
The local deer herd uses habitat both in the park and in communities outside the park	Adjacent	221	1.8	4.1	88.7	5.4	49.77	<0.001
	Surrounding	135	2.2	18.5	59.3	20.0		
	YR Residents	78	3.8	5.1	83.3	7.7		
Deer seriously damage plants and other resources in the park	Adjacent	224	17.4	21.4	50.0	11.2	15.4	0.017
	Surrounding	137	27.7	29.2	31.4	11.7		
	YR Residents	78	23.1	19.2	50.0	7.7		
Deer create a serious nuisance for people visiting the park	Adjacent	223	48.9	16.6	26.0	8.5	16.50	0.011
	Surrounding	137	65.7	16.1	13.9	4.4		
	YR Residents	77	57.1	23.4	15.6	3.9		
Deer create a serious health risk in the park	Adjacent	222	33.3	15.3	42.3	9.0	12.4	NS
	Surrounding	139	44.6	20.1	28.1	7.2		
	YR Residents	78	47.4	17.9	28.2	6.4		

Table 13. Continued.

	Strata	n	(Percent)				Chi-square	P-value
			Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not Sure		
Deer present a serious safety risk in the park	Adjacent	222	54.1	16.7	20.3	9.0	6.19	NS
	Surrounding	137	58.4	19.7	13.9	8.0		
	YR Residents	77	58.4	23.4	10.4	7.8		
The park should start now to address deer-related impacts in the park	Adjacent	222	13.5	17.6	64.4	4.5	13.38	0.037
	Surrounding	139	9.4	29.5	54.0	7.2		
	YR Residents	77	16.9	15.6	58.4	9.1		
Addressing deer-related impacts in the park would affect communities outside the park	Adjacent	222	6.3	6.3	74.3	13.1	31.45	<0.001
	Surrounding	136	10.3	25.0	51.5	13.2		
	YR Residents	77	5.2	13.0	70.1	11.7		
Addressing deer-related impacts in the park would affect me positively	Adjacent	222	7.7	23.0	53.6	15.8	29.57	<0.001
	Surrounding	137	15.3	38.7	25.5	20.4		
	YR Residents	76	14.5	26.3	40.8	18.4		
Addressing deer-related impacts in the park would affect me negatively	Adjacent	221	54.8	21.3	6.3	17.6	26.00	<0.001
	Surrounding	136	35.3	39.0	4.4	21.3		
	YR Residents	76	36.8	27.6	14.5	21.1		
It is important to understand other people's views about deer-related impacts	Adjacent	219	8.2	19.6	69.4	2.7	14.11	0.028
	Surrounding	139	3.6	13.7	80.6	2.2		
	YR Residents	76	6.6	17.1	67.1	9.2		
The park is part of the local community	Adjacent	220	11.8	9.5	73.6	5.0	6.50	NS
	Surrounding	139	9.4	5.0	83.5	2.2		
	YR Residents	77	10.4	9.1	74.0	6.5		

Table 14. Beliefs about FINS staff perceptions of deer deer-related impacts and impacts management in FINS, expressed by respondents to the 2007 FINS Deer, People and Parks survey, by strata.

“NPS managers think ...”	Strata	n	(Percent)				Chi-square	P-value
			Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not Sure		
it is reasonable to have deer in the park	Adjacent	215	4.2	13.5	48.4	34.0	8.02	NS
	Surrounding	136	4.4	9.6	61.0	25.0		
	YR Residents	77	3.9	10.4	62.3	23.4		
the habitat for deer is better in the park than in communities outside	Adjacent	209	5.7	18.2	38.3	37.8	6.04	NS
	Surrounding	134	1.5	19.4	45.5	33.6		
	YR Residents	76	6.6	19.7	42.1	31.6		
the local deer herd uses habitat in FINS and communities outside FINS	Adjacent	212	0.9	8.5	60.4	30.2	10.52	NS
	Surrounding	135	0.7	15.6	51.9	31.9		
	YR Residents	76	1.3	13.2	68.4	17.1		
deer seriously damage plants and other resources in the park	Adjacent	210	14.8	16.7	25.2	43.3	13.21	0.040
	Surrounding	135	23.0	23.0	20.0	34.1		
	YR Residents	77	23.4	19.5	31.2	26.0		
deer create a serious Nuisance for people visiting the park	Adjacent	209	25.8	21.1	11.5	41.6	8.07	NS
	Surrounding	135	36.3	17.0	12.6	34.1		
	YR Residents	76	36.8	23.7	10.5	28.9		
deer create a serious health risk in the park	Adjacent	209	19.6	17.7	22.0	40.7	7.19	NS
	Surrounding	135	28.1	15.6	20.0	36.3		
	YR Residents	77	31.2	20.8	18.2	29.9		

Table 14. Continued.

“NPS managers think ...”	Strata	n	(Percent)				Chi-square	P-value
			Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not Sure		
deer present a serious safety risk in the park	Adjacent	209	27.3	20.1	10.5	42.1	9.10	NS
	Surrounding	134	35.1	17.2	13.4	34.3		
	YR Residents	76	39.5	23.7	10.5	26.3		
the park should start now to address deer impacts in the park	Adjacent	209	9.6	16.7	34.4	39.2	4.69	NS
	Surrounding	135	7.4	23.7	36.3	32.6		
	YR Residents	75	12.0	21.3	34.7	32.0		
addressing deer impacts in the park would affect communities	Adjacent	209	7.2	13.4	39.2	40.2	6.51	NS
	Surrounding	135	6.7	16.3	43.0	34.1		
	YR Residents	76	11.8	18.4	43.4	26.3		
addressing deer impacts in the park would affect me positively	Adjacent	208	8.7	19.7	29.3	42.3	6.12	NS
	Surrounding	134	9.0	26.1	26.1	38.8		
	YR Residents	76	15.8	19.7	30.3	34.2		
addressing deer impacts in the park would affect me negatively	Adjacent	208	29.8	20.2	5.3	44.7	4.23	NS
	Surrounding	134	31.3	26.1	2.2	40.3		
	YR Residents	76	34.2	23.7	3.9	38.2		
it is important to understand other people’s views about deer	Adjacent	208	10.1	18.3	35.6	36.1	17.64	0.007
	Surrounding	134	3.0	14.2	53.7	29.1		
	YR Residents	76	10.5	15.8	51.3	22.4		
the park is part of the local community	Adjacent	209	17.7	11.5	37.3	33.5	20.68	0.002
	Surrounding	135	5.2	11.1	54.1	29.6		
	YR Residents	76	14.5	7.9	56.6	21.1		

Findings suggest that residents of neighboring communities have a number of positive attitudes towards FINS and FINS staff. Most residents believe NPS employees are dedicated to preserving and protecting FINS, feel welcome at FINS, and regard FINS as an educational resource for their community. However, some also are skeptical that FINS managers listen to opinions from “people like me” and some disagreed with the statement, “I usually trust management at FINS to make good decisions about resource management” (Table 15). Respondents of adjacent and year-round communities expressed more skepticism than respondents from surrounding communities (Table 15). A plurality of respondents in all strata agreed with all items in the professionalism scale, reflected in the high overall mean for this index (Tables 16, 17). Year-round residents were more likely to agree that management at FINS is trustworthy (Table 16). Surrounding community residents were more likely to agree that management at FINS is concerned about their community and watches out for their community’s interests (Table 16). Mean scores for community affiliation were slightly negative (below neutral) for adjacent communities and year-round residents, and slightly positive (above neutral) for surrounding communities (Table 17).

Interest in opportunities to provide input to Fire Island on deer management

The majority of residents agreed that public input usually leads to better management decisions (Table 18). Less than one-third of respondents in any stratum agreed with the statement “I usually have enough opportunities to provide input on park management decisions” (Table 18). A majority of respondents from surrounding communities and a plurality of respondents from adjacent communities believed they did not have enough information to provide meaningful input on deer management in the park. A plurality of respondents from all strata agreed with the statement, “I do not believe my input typically is (or would be) taken seriously by park management” (Table 18).

The majority of residents had learned about park news from mass media sources during the previous 12 months. Many adjacent community and year-round residents also had obtained information about FINS by talking with local park staff or participating in a community group or activity related to a park issue (Table 19). However, residents of surrounding communities were less likely to have participated in public involvement activities associated with FINS (Table 19).

A majority of adjacent community and year-round respondents expressed an interest in participating in several input formats (i.e., talking with FINS staff or other officials, attending public meetings, or participating in community input groups) if NPS addresses deer-related impacts in the future. Interest in providing input was stronger in adjacent communities than in surrounding communities (Table 20). However, even among adjacent community and year-round residents, there was some skepticism about whether local community members can have an influence of management decisions in FINS (Table 21).

Table 15. Perceptions of FINS as a land manager and community partner, expressed by respondents to the 2007 FINS Deer, People and Parks survey, by strata.

Fire Island NS...	Strata	n	(Percent)				Chi-square	P-value
			Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not Sure		
NPS employees are dedicated to preserving, protecting park.	Adjacent	209	7.2	9.6	72.2	11.0	20.566	0.002
	Surrounding	126	0.0	5.6	86.5	7.9		
	YR Residents	68	13.2	8.8	73.5	4.4		
FINS is an educational resource for my community	Adjacent	208	8.2	12.5	76.0	3.4	26.949	<0.001
	Surrounding	127	0.0	3.1	95.3	1.6		
	YR Residents	68	10.3	16.2	72.1	1.5		
I do not feel welcome at FINS	Adjacent	206	84.0	9.7	4.9	1.5	24.568	<0.001
	Surrounding	126	88.9	6.3	3.2	1.6		
	YR Residents	67	61.2	22.4	13.4	3.0		
FINS works with local Communities for shared purposes	Adjacent	207	22.7	22.2	30.9	24.2	37.457	<0.001
	Surrounding	125	4.0	22.4	44.8	28.8		
	YR Residents	67	23.9	9.0	55.2	11.9		
The rules and regulations at FINS do not help preserve and protect the future.	Adjacent	207	51.7	16.4	16.4	15.5	30.048	<0.001
	Surrounding	126	64.3	12.7	5.6	17.5		
	YR Residents	68	47.1	26.5	25.0	1.5		

Table 15. Continued.

Fire Island NS...	Strata	n	(Percent)				Chi-square	P-value
			Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not Sure		
My community typically does not help care for FINS	Adjacent	207	71.5	7.7	11.1	9.7	35.610	<0.001
	Surrounding	126	42.9	16.7	15.1	25.4		
	YR Residents	66	63.6	16.7	13.6	6.1		
Managers at FINS listen to opinions from people like me	Adjacent	207	26.1	24.2	19.8	30.0	23.903	0.001
	Surrounding	126	10.3	29.4	23.8	36.5		
	YR Residents	68	29.4	22.1	33.8	14.7		
I usually do not support the resource management decisions made at FINS.	Adjacent	204	31.9	35.8	14.2	18.1	11.478	NS ¹
	Surrounding	126	33.3	39.7	4.8	22.2		
	YR Residents	67	32.8	40.3	16.4	10.4		
I usually trust management at FINS to make good decisions about resource management.	Adjacent	207	23.7	23.7	37.7	15.0	24.291	<0.001
	Surrounding	127	6.3	24.4	52.8	16.5		
	YR Residents	67	25.4	25.4	44.8	4.5		

¹ Not significant.

Table 16. Perceptions of FINS management public image, expressed by respondents to the 2007 FINS Deer, People and Parks survey in three community strata.

Management at FINS typically is...	Strata	n	(Percent)				Chi-square	P-value
			Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not Sure		
trustworthy	Adjacent	206	12.1	20.9	49.0	18.0	17.15	0.009
	Surrounding	125	3.2	21.6	47.2	28.0		
	YR Residents	68	10.3	17.6	61.8	10.3		
not knowledgeable	Adjacent	204	58.3	16.7	8.3	16.7	11.65	NS
	Surrounding	125	56.8	16.0	4.8	22.4		
	YR Residents	69	62.3	18.8	13.0	5.8		
not fair	Adjacent	199	38.2	27.1	14.6	20.1	18.02	0.006
	Surrounding	123	44.7	25.2	4.1	26.0		
	YR Residents	69	43.5	29.0	18.8	8.7		
telling the whole story	Adjacent	204	21.1	26.5	23.5	28.9	14.04	0.029
	Surrounding	124	9.7	28.2	24.2	37.9		
	YR Residents	69	20.3	33.3	29.0	17.4		
unbiased	Adjacent	203	33.0	26.1	15.8	25.1	16.05	0.013
	Surrounding	122	16.4	27.9	22.1	33.6		
	YR Residents	68	32.4	27.9	23.5	16.2		
concerned about my community's well-being	Adjacent	206	30.6	19.9	27.7	21.8	32.7	<0.001
	Surrounding	124	5.6	26.6	43.5	24.2		
	YR Residents	69	26.1	29.0	29.0	15.9		
unconcerned about the public interest	Adjacent	204	50.0	17.6	16.7	15.7	14.25	0.027
	Surrounding	124	46.0	19.4	9.7	25.0		
	YR Residents	69	44.9	29.0	17.4	8.7		
watching out for my community's interests	Adjacent	204	34.8	17.6	26.5	21.1	49.21	<0.001
	Surrounding	124	2.4	27.4	41.1	29.0		
	YR Residents	69	34.8	17.4	31.9	15.9		

Table 17. A comparison of mean scores on factors within a FINS public image scale, expressed by respondents to the 2007 FINS Deer, People and Parks survey in three community strata.

Factor Label	Community Strata	n	mean¹	F	P-value
Professionalism	Adjacent	183	3.53	2.540	NS ²
	Surrounding	99	3.71		
	YR Residents	68	3.49		
Community Affiliation	Adjacent	180	2.87 ^a	16.916	<0.001
	Surrounding	94	3.45 ^b		
	YR Residents	62	2.90 ^a		

¹ Item measured on a five-point scale where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

² Not significant.

^a Community strata with different superscripts (a, b) have different item means at $p < 0.05$

Table 18. Perceptions about FINS use of public input for land management decisions, expressed by respondents to the 2007 FINS Deer, People and Parks survey, by strata.

Fire Island NS...	Strata	n	(Percent)				Chi-Square	P-value
			Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not Sure		
I usually have enough opportunities to provide input on park management decisions.	Adjacent	216	54.2	22.7	12.0	11.1	28.638	<0.001
	Surrounding	127	33.1	28.3	17.3	21.3		
	YR Residents	75	36.0	22.7	30.7	10.7		
I do not believe my input typically is (or would be) taken seriously by park management.	Adjacent	216	20.8	14.8	47.2	17.1	11.505	NS
	Surrounding	128	24.2	25.8	32.8	17.2		
	YR Residents	75	28.0	20.0	40.0	12.0		
I do not have enough information to provide meaningful input on deer management.	Adjacent	218	34.9	15.1	42.7	7.3	33.370	<0.001
	Surrounding	129	13.2	17.1	61.2	8.5		
	YR Residents	74	48.6	14.9	32.4	4.1		
The different ways the park asks for my opinion encourages me to provide input.	Adjacent	214	41.1	24.3	25.2	9.3	25.248	<0.001
	Surrounding	124	17.7	29.0	38.7	14.5		
	YR Residents	74	29.7	32.4	33.8	4.1		
I am not comfortable voicing my opinion about park mgt. decisions	Adjacent	215	60.0	19.1	15.8	5.1	9.933	NS
	Surrounding	126	45.2	27.0	19.8	7.9		
	YR Residents	75	57.3	16.0	22.7	4.0		
Public input usually leads to Better management decisions	Adjacent	218	8.7	14.7	66.1	10.6	3.089	NS
	Surrounding	127	13.4	16.5	59.1	11.0		
	YR Residents	75	12.0	14.7	65.3	8.0		
For the most part, interactions between myself, park managers, and people with different ideas helps build future relationships.	Adjacent	214	7.0	19.2	65.4	8.4	7.601	NS
	Surrounding	126	4.0	27.0	61.1	7.9		
	YR Residents	73	6.8	15.1	74.0	4.1		

Table 19. Actions taken in the previous 12 months to obtain information about FINS, reported by respondents to the 2007 FINS deer management survey in three community strata.

Actions in past 12 months	Strata	n	(Percent)			Chi-square	P-value
			No	Yes	Not Sure		
Read or listened to news about park	Adjacent	218	22.0	74.8	3.2	13.351	0.010
	Surrounding	131	30.5	62.6	6.9		
	YR Residents	76	11.8	84.2	3.9		
Talked with local park staff	Adjacent	218	66.1	32.6	1.4	57.020	<0.001
	Surrounding	132	78.8	21.2	0.0		
	YR Residents	76	28.9	71.1	0.0		
Talked with other public officials about the park.	Adjacent	217	70.0	27.2	2.8	42.077	<0.001
	Surrounding	130	90.8	8.5	0.8		
	YR Residents	76	50.0	46.1	3.9		
Provided written comments to a park plan, impact statement, survey.	Adjacent	219	94.1	5.5	0.5	21.180	<0.001
	Surrounding	132	99.2	0.8	0.0		
	YR Residents	75	84.0	16.0	0.0		
Written a letter to a newspaper about the park	Adjacent	219	99.5	0.5	0.0	1.821	NS
	Surrounding	132	100	0.0	0.0		
	YR Residents	75	98.7	1.3	0.0		
Attended a public meeting about the park	Adjacent	220	74.1	25.0	0.9	45.471	<0.001
	Surrounding	132	97.7	2.3	0.0		
	YR Residents	75	61.3	37.3	1.3		
Participated in a community group or activity related to a park issue	Adjacent	220	52.7	41.8	5.5	80.055	<0.001
	Surrounding	132	92.4	7.6	0.0		
	YR Residents	74	43.2	56.8	0.0		

Table 20. Likelihood of participating in involvement opportunities if those opportunities were provided by FINS, expressed by respondents to the 2007 FINS Deer, People and Parks survey, by strata.

Actions	Strata	n	(Percent)			Chi-square	P-value
			Very unlikely, Unlikely	Very likely, Likely	Not Sure		
Read or listen to news about park actions to address deer impacts	Adjacent	219	4.6	94.1	1.4	7.912	NS
	Surrounding	130	12.3	86.2	1.5		
	YR Residents	75	5.3	93.3	1.3		
Talk with local park staff about deer-related impacts	Adjacent	220	30.9	59.1	10.0	48.948	<0.001
	Surrounding	130	54.6	32.3	13.1		
	YR Residents	74	12.2	79.7	8.1		
Talk with other public officials about deer-related impacts	Adjacent	219	33.8	54.3	11.9	48.641	<0.001
	Surrounding	129	60.5	28.7	10.9		
	YR Residents	74	18.9	75.7	5.4		
Provide written comments to a park plan, impact statement, survey related to deer impacts.	Adjacent	220	38.2	49.1	12.7	28.247	<0.001
	Surrounding	130	57.7	31.5	10.8		
	YR Residents	74	21.6	64.9	13.5		
Write a letter to a newspaper about deer impacts	Adjacent	220	72.3	15.0	12.7	10.492	0.033
	Surrounding	130	80.8	9.2	10.0		
	YR Residents	74	60.8	17.6	21.6		
Attend a public meeting about deer impacts	Adjacent	220	28.2	61.4	10.5	51.623	<0.001
	Surrounding	130	56.9	34.6	8.5		
	YR Residents	75	13.3	80.0	6.7		
Participate in a community groups or activity related to deer impacts	Adjacent	218	24.8	65.1	10.1	54.880	<0.001
	Surrounding	130	59.2	30.8	10.0		
	YR Residents	74	20.3	71.6	8.1		

Table 21. Level of influence respondents perceive they have to influence management of FINS or communities surrounding FINS, expressed by respondents to the 2007 FINS Deer, People and Parks survey, by strata.

How much influence do you think people like yourself can have ...	n	(Percent)				Chi-square	P-value
		a lot	Some	Very little	None at all		
on the management of Fire Island NS?							
Adjacent	223	10.3	37.7	41.3	10.8	13.258	0.039
Surrounding	131	9.2	55.7	30.5	4.6		
YR Residents	75	12.0	40.0	37.3	10.7		
in making communities surrounding the park a better place to live?							
Adjacent	223	28.3	50.2	17.5	4.0	23.833	0.001
Surrounding	131	13.7	64.1	19.8	2.3		
YR Residents	75	36.0	37.3	17.3	9.3		

SUMMARY AND CONCLUSIONS

This study examined local community members' perceptions about and use of NPS lands, perceptions of and concerns about deer, and opinions about NPS decision making and land management. Most respondents agreed or strongly agreed that FINS is part of the local community. They regularly use and appreciate the seashore for its amenity values (e.g., as open space, as a leisure resource, as natural habitats) and visit FINS frequently to be outdoors, enjoy nature, or spend time with family or friends.

Most residents of local communities interact with deer regularly. They believe deer use both park lands and communities as their habitat, i.e., they recognize that the park and communities share a common deer herd. Most year-round and adjacent or surrounding community residents of FINS are very concerned about two categories of negative impacts associated with the presence of deer: impacts associated with deer accessing unsecured trash and disease transmission from deer to humans. Although the majority of local residents do not perceive deer to be a serious health or safety risk to FINS visitors, half of adjacent community and year-round residents agree that deer are having negative impacts on park resources. The majority of local residents believe NPS should be managing deer-related impacts on FINS, and a majority of adjacent residents and a plurality of year-round residents believe action by NPS to manage deer-related impacts would affect them positively.

We did not ask respondents how they believed action by NPS would benefit their community; however, given that highest concerns were related to deer accessing unsecured trash and diseases/parasites carried by deer, we conclude that future communication with communities should address expectations for management actions on public health and safety. Our findings also indicate that many community concerns may be addressed by managing impacts related to deer, rather than by managing deer populations. FINS has initiated some efforts to these ends, through their “Deer and People” education program that includes actions community members can take to reduce impacts from deer and help keep wildlife wild (Fire Island National Seashore, National Park Service n.d.), as well as a new study examining the efficacy of a device that applies an acaricide directly to deer (as a means to reduce tick abundance). Coordination with communities also may relieve impacts of high concern, via efforts such as enforcement of garbage ordinances (Leong and Decker, 2007a).

Previous research in other NPS units has revealed that different problem frames exist for deer issues in national parks. That is, the topics that individuals perceive as salient affect the way they think about the scope of the problem and the appropriate means, time frame and geographic scope of potential solutions (Leong and Decker 2007b). Concerns about deer accessing trash and reduction of disease/parasites were as or more salient for respondents as damage to vegetation. Without specific communication from NPS that explicitly states expectations for these concerns, community members may assume different metrics of success for deer management interventions than the natural resource indicators typically associated with NPS deer management plans.

We did not ask any questions related to means for managing deer-related impacts. Assumptions about means may have affected respondents’ evaluation of whether they would be positively or negatively affected by efforts to address deer-related impacts in FINS, especially given the history of studies that address deer populations at FINS. Future communication with the public about means to address deer-related impacts should include discussion of actions local communities can take or are taking to address public concerns about deer, which may be outside the scope of management actions taken by FINS. For example, mechanisms for ongoing dialogue about NPS-community partnerships to address concerns about management of disease transmission from deer to people and deer access to trash may be helpful.

While not reflected in responses from all community residents, a base of general credibility and trust exists for FINS decision makers. However, a substantial proportion of residents in local communities are uncertain about the beliefs of NPS managers regarding deer and deer management in the park. Most residents of local communities have heard or read news stories about the park, and a relatively high proportion of year-round residents have participated in public input processes at FINS, but fewer part-time residents and visitors from local communities have participated in activities where they provided input to decisions about park management activities. Substantial numbers of local residents are interested in providing input on managing deer-related impacts in FINS, although many residents also indicated that they did not believe they had enough information to provide meaningful input. Many local residents also are skeptical about the degree to which NPS decision makers listen to community residents or consider their input in decisions. These results indicate the need for public issues education, that is, an effort to build the capacity of the public to provide informed input on decisions (Dale and

Hahn 1994, Leong et al. 2006). Community members also may be offered training in community-based planning and the NEPA process, as outlined in the Department of the Interior Environmental Statement Memorandum that discusses public participation and community-based training (Department of the Interior 2003).

Because of their proximity to FINS, year-round and part-time residents of adjacent communities have greater potential to experience direct impacts from deer associated with the park or deer management initiated by FINS than do visitors from surrounding communities. We expected deer management to be a more salient issue in adjacent communities and data from this study were consistent with that expectation. Experience with deer, concern about deer-related impacts, and interest in providing input to FINS about managing deer-related impacts is stronger among adjacent community residents than among surrounding community residents. These findings indicate that adjacent and surrounding communities represent two different publics, with the adjacent community more likely to be actively seeking information about management of deer-related impacts.

These results corroborate the situational theory of publics (Grunig 1977), which posits that individuals are more likely to actively seek information and take action if they believe a situation involves them. This hypothesis is supported by our findings that year-round residents and adjacent community members were: more concerned about impacts from deer; more likely to think that the park should start now to address deer-related impacts; more likely to think that communities would be affected by any actions taken by the park; and more interested in providing input. The situational theory of publics suggests that to encourage involvement from a public who is less likely to become involved on their own (e.g., surrounding communities at FINS), the type of information to be provided should focus on: understanding the problem itself (to encourage the public to think about the problem and possibly to become involved), the solutions to the problem (to provide referent criteria for the specific problem), and information to eliminate constraints to action (in this case, increased awareness of opportunities to provide input). These suggestions assume that the park (as communicator) has adequately framed the problem and potential solutions. More recent communications research emphasizes the importance of two-way communication that incorporates dialogue with the public to improve mutual learning about the variety of ways the problem and potential solutions are understood (Pearce and Littlejohn 1997). This dialogic approach will be most important for topics where FINS and public perspectives diverge.

Over the past century, the types of units administered by the NPS have broadened from parks created to preserve America's scenic treasures to include parks that are embedded in human-dominated landscapes (Runte 1997), such as FINS. NPS public participation policies likewise have evolved to acknowledge communities of place (related to the physical context of resource management issues) in addition to communities of interest (e.g., regional or national publics with different sets of concerns, [Patterson et al. 2003]). The NPS Director's Order 12 Handbook for Conservation Planning, Environmental Impact Analysis, and Decision Making (National Park Service 2001) requires NPS to seek input on management decisions from all interested parties during development of an EIS. This requirement assures that input is received from communities of interest during specific planning episodes. NPS Director's Order #75A: Civic Engagement and Public Involvement (National Park Service 2007a), on the other hand,

views civic engagement as “...a continuous, dynamic conversation with the public...” (p. 2). This perspective better reflects the process for engaging communities of place (e.g., adjacent community residents). At FINS, deer issues have involved decades of dialogue and coordination between FINS and year-round residents and adjacent community members (some of which was initiated by NPS, some by community residents). Recent NPS policies recognize the importance of this type of dialogue and encourage ongoing two-way communication with communities of place as a way of doing business.

Overall, this study provides NPS decision makers with information that will help them better understand community interests related to deer impacts and management of NPS lands. Insights from this study can be used to guide ongoing communication about deer management between NPS personnel and residents of neighboring communities. Findings should be especially useful to park managers as they think about tailoring communication toward communities of place and communities of interest.

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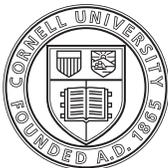
APPENDIX A: Survey instrument

Deer, People and Parks

*A Survey of Residents Living Near
Fire Island National Seashore*



Research conducted by



Cornell University
Department of Natural Resources
Human Dimensions Research Unit



National Park Service
Biological Resource Management Division

About this Questionnaire

The National Park Service seeks your help to improve public involvement in management decisions. The purpose of this survey is to learn about your experiences, opinions and suggestions related to natural resource management in Fire Island National Seashore, particularly with respect to deer and related issues in the park and surrounding community. This survey is part of a larger study about deer and the National Park System.

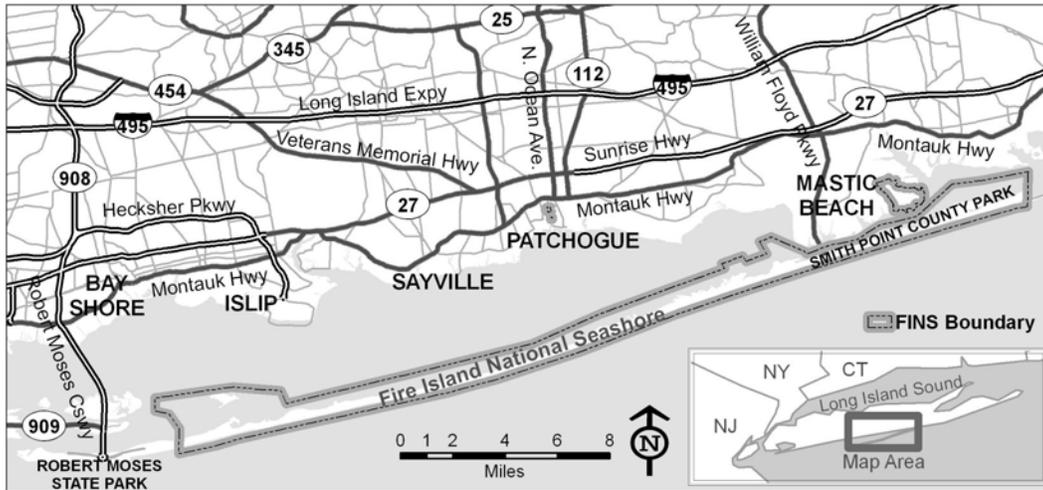
Even if you have not visited Fire Island National Seashore, your feedback will assist the National Park Service when considering community involvement there and at other parks in the future.

Please complete this questionnaire at your earliest convenience, seal it, and drop it in any mailbox (no envelope is needed); return postage has been provided. The questionnaire has an identification number so you can be removed from our mailing list when you return it; your name and address will not be saved with your responses. We appreciate your prompt response.

Thank you for your help with this important study!

Throughout this survey, we may refer to the National Park Service as “NPS” and Fire Island National Seashore as “Fire Island NS,” “FINS,” or “the Park.”

We are specifically interested in your experiences on Fire Island, not in FINS administered areas on Long Island.



YOUR EXPERIENCES WITH FIRE ISLAND NATIONAL SEASHORE, DEER, AND YOUR COMMUNITY

1. Have you ever visited Fire Island National Seashore?

- Yes
 No *(If no, please skip to Question 6)*

2. When you visit Fire Island National Seashore, how much time do you usually spend there? Please check one.

- Passing through on my way to somewhere else
 Less than 4 hours
 Four hours or more, but less than one day
 One day or more

3. Why do you visit Fire Island National Seashore?

Please check all that apply.

- To view the scenery
 To enjoy the smells and sounds of nature
 To view wildlife
 To learn about history
 To spend time with family and friends
 To exercise
 To be outside
 To get away from the usual demands of life
 To volunteer in park activities
 Other, please specify: _____

4. How many visits have you made to Fire Island National Seashore in the past 12 months?

- None *(If none, please skip to Question 6)*
 1
 2-4
 5-10
 More than 10
 Don't know/Can't remember

5. In the past 12 months, how often have you seen deer in Fire Island National Seashore?

Please check one.

<input type="checkbox"/> Every visit	<input type="checkbox"/> Half or more but not all visits	<input type="checkbox"/> Less than half of visits	<input type="checkbox"/> Never
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6. In the past 12 months, how often have you seen deer in your community near Fire Island NS? Please check one.

<input type="checkbox"/> Daily	<input type="checkbox"/> A few times a week	<input type="checkbox"/> Weekly	<input type="checkbox"/> Less often than once a week	<input type="checkbox"/> Never
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7. Please indicate to what extent you agree or disagree with the following statements about Fire Island National Seashore and your community.

Fire Island National Seashore ...

Please circle one number for each item.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Sure
makes my community a special place to live	1	2	3	4	5	9
is not an important place for recreation for my community	1	2	3	4	5	9
provides habitat for plants and animals	1	2	3	4	5	9
does not help the local economy	1	2	3	4	5	9
does not protect the landscape from development	1	2	3	4	5	9
provides open space for my community	1	2	3	4	5	9
plays a significant role in my community	1	2	3	4	5	9
attracts tourism dollars to my community	1	2	3	4	5	9
is not a good neighbor	1	2	3	4	5	9
increases the job opportunities in my community	1	2	3	4	5	9
preserves natural resources	1	2	3	4	5	9
is a place where people in my community spend leisure time	1	2	3	4	5	9

YOUR OPINIONS ABOUT DEER IN THE PARK & COMMUNITY

8. In areas administered by Fire Island National Seashore (e.g., the Lighthouse, Sailors Haven, Talisman/Barrett Beach, Watch Hill, Otis Pike Wilderness Area) or in communities on Fire Island, to what extent do you think that deer, in general, are:

Please circle one number for each item.

	IN FINS ADMINISTERED AREAS			IN YOUR COMMUNITIES ON FIRE ISLAND		
	Rarely	Sometimes	Almost always	Rarely	Sometimes	Almost always
wild	1	2	3	1	2	3
peaceful	1	2	3	1	2	3
behaving strangely	1	2	3	1	2	3
dangerous	1	2	3	1	2	3
tame	1	2	3	1	2	3
behaving normally	1	2	3	1	2	3
aggressive	1	2	3	1	2	3
timid	1	2	3	1	2	3
acting naturally	1	2	3	1	2	3
harmless	1	2	3	1	2	3
threatening	1	2	3	1	2	3
acting unnaturally	1	2	3	1	2	3

9. Generally, how do you feel about deer IN FIRE ISLAND NATIONAL SEASHORE ADMINISTERED AREAS? *Please check one.*

- I have no particular feelings about deer in Valley Forge NHP
- I enjoy deer AND I do not worry about deer-related impacts
- I enjoy deer BUT I worry about deer-related impacts
- I do not enjoy deer in Fire Island National Seashore

10. Generally, how do you feel about deer IN COMMUNITIES ON FIRE ISLAND? *Please check one.*

- I have no particular feelings about deer in my community
- I enjoy deer AND I do not worry about deer-related impacts
- I enjoy deer BUT I worry about deer-related impacts
- I do not enjoy deer in my community

11. Please indicate whether you are concerned about any of these deer-related impacts, either In Fire Island National Seashore administered areas or in communities on Fire Island:

Please circle one number for each item.

	IN FINS ADMINIS- TERED AREAS			IN COMMUNI- TIES ON FIRE ISLAND		
	Not at all concerned	Somewhat concerned	Very concerned	Not at all concerned	Somewhat concerned	Very concerned
Having seen unhealthy deer	1	2	3	1	2	3
Fawns that are born too late to survive winter	1	2	3	1	2	3
Presence of deer feces	1	2	3	1	2	3
Deer browsing on naturally growing flowers, trees and shrubs	1	2	3	1	2	3
Deer browsing on landscaped flowers, trees and shrubs	1	2	3	1	2	3
Deer browsing on vegetable gardens	1	2	3	1	2	3
Deer accessing unsecured trash	1	2	3	1	2	3
Deer interacting with pets	1	2	3	1	2	3
Deer behavior around people	1	2	3	1	2	3
People's behavior around deer	1	2	3	1	2	3
Diseases and/or parasites carried by deer	1	2	3	1	2	3
Car accidents involving deer	1	2	3	1	2	3
Other (Please specify): _____	1	2	3	1	2	3

12. Please indicate to what extent you agree or disagree with the following statements.

Please circle one number for each item.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Sure
It is reasonable to have deer in the park	1	2	3	4	5	9
The habitat for deer is better in FINS administered areas than in communities on Fire Island	1	2	3	4	5	9
The local deer herd uses habitat both in FINS administered areas and in communities on Fire Island	1	2	3	4	5	9
Deer seriously damage plants and other resources in the park	1	2	3	4	5	9
Deer create a serious nuisance for people visiting the park	1	2	3	4	5	9
Deer present a serious health risk in the park	1	2	3	4	5	9
Deer present a serious safety risk in the park	1	2	3	4	5	9
The park should start now to address deer-related impacts in the park	1	2	3	4	5	9
Addressing deer-related impacts in FINS administered areas would affect communities on Fire Island	1	2	3	4	5	9
Addressing deer-related impacts in FINS would affect me positively	1	2	3	4	5	9
Addressing deer-related impacts in FINS administered areas would affect me negatively	1	2	3	4	5	9
It is important to understand other people's views about deer-related impacts	1	2	3	4	5	9
The park is part of the local community	1	2	3	4	5	9

13. Please indicate to what extent you agree or disagree with the following statements about NPS managers in general.

Please circle one number for each item.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Sure
NPS managers think it is reasonable to have deer in the park	1	2	3	4	5	9
NPS managers think the habitat for deer is better in FINS administered areas than in communities on FI	1	2	3	4	5	9
NPS managers think the local deer herd uses habitat both in FINS administered areas and communities	1	2	3	4	5	9
NPS managers think deer seriously damage plants and other resources in the park	1	2	3	4	5	9
NPS managers think deer create a serious nuisance for people visiting the park	1	2	3	4	5	9
NPS managers think deer present a serious health risk in the park	1	2	3	4	5	9
NPS managers think deer present a serious safety risk in the park	1	2	3	4	5	9
NPS managers think they should start now to address deer-related impacts in the park	1	2	3	4	5	9
NPS managers think that addressing deer-related impacts FINS administered areas would affect communities on Fire Island	1	2	3	4	5	9
NPS managers think that addressing deer-related impacts in the park would affect me positively	1	2	3	4	5	9
NPS managers think that addressing deer-related impacts in FINS areas would affect me negatively	1	2	3	4	5	9
NPS managers think it is important to understand other people's views about deer-related impacts	1	2	3	4	5	9
NPS managers think the park is part of the local community	1	2	3	4	5	9

YOUR EXPERIENCES WITH PARK MANAGEMENT

14. Have you done any of the following IN THE PAST 12 MONTHS?

Please circle one category for each item.

Read or listened to news about the park	Yes	No	Not Sure
Talked with local park staff	Yes	No	Not Sure
Talked with other public officials about the park	Yes	No	Not Sure
Provided written comments to a park management plan, impact statement, or survey (excluding this survey)	Yes	No	Not Sure
Written a letter to a newspaper about the park	Yes	No	Not Sure
Attended a public meeting about the park	Yes	No	Not Sure
Participated in a community group or community activity related to a park issue	Yes	No	Not Sure

15. If the park were to consider addressing deer-related impacts in the future, how likely is it that you would do any of the following ?

Please circle one number for each item.

	Very Unlikely	Unlikely	Likely	Very Likely	Not Sure
Read or listen to news about park actions to address deer-related impacts	1	2	3	4	9
Talk with local park staff about deer impacts	1	2	3	4	9
Talk with other public officials about deer impacts	1	2	3	4	9
Provide written comments to a park management plan, impact statement, or survey related to deer impacts (in addition to this survey)	1	2	3	4	9
Write a letter to a newspaper about deer impacts	1	2	3	4	9
Attend a public meeting about deer impacts	1	2	3	4	9
Participate in a community group or community activity related to deer impacts	1	2	3	4	9

16. Please indicate to what extent you agree or disagree with the following statements about management and planning at Fire Island National Seashore.

Please circle one number for each item.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Sure
	1	2	3	4	5	9
I usually have enough opportunities to provide input on park management decisions						
I do not believe my input typically is (or would be) taken seriously by park management						
I do not have enough information to give meaningful input on deer management						
The different ways the park asks for my opinion (e.g., via written comments, conversations with park staff, public meetings, etc.) encourage me to provide input						
I am not comfortable voicing my opinion about park management decisions						
Public input usually leads to better management decisions						
For the most part, interactions between myself, park managers, experts, and people with ideas different from my own help build future relationships						

17. How much influence do you think people like yourself can have on the management of Fire Island National Seashore? Please check one.

- A lot
 Some
 Very little
 None at all

18. How much influence do you think people like yourself can have in making the communities surrounding Fire Island National Seashore a better place to live? Please check one.

- A lot
 Some
 Very little
 None at all

19. Please indicate to what extent you agree or disagree with the following statements about management at Fire Island National Seashore.

Please circle one number for each item.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Sure
On the whole, National Park Service employees are dedicated to preserving and protecting Fire Island National Seashore	1	2	3	4	5	9
Fire Island National Seashore is an educational resource for my community	1	2	3	4	5	9
I do not feel welcome at Fire Island National Seashore	1	2	3	4	5	9
Fire Island National Seashore typically works with local communities for shared purposes	1	2	3	4	5	9
On the whole, the rules and regulations at Fire Island National Seashore do not help preserve and protect it for the future.	1	2	3	4	5	9
My community typically does not help care for Fire Island National Seashore	1	2	3	4	5	9
Managers at Fire Island National Seashore typically listen to opinions from people like me	1	2	3	4	5	9
I usually do not support the resource management decisions made at Fire Island National Seashore	1	2	3	4	5	9
I usually trust management at Fire Island National Seashore to make good decisions about resource management	1	2	3	4	5	9

20. Please indicate to what extent you agree or disagree that management at Fire Island National Seashore typically is...

Please circle one number for each item.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Sure
trustworthy	1	2	3	4	5	9
not knowledgeable	1	2	3	4	5	9
not fair	1	2	3	4	5	9
telling the whole story	1	2	3	4	5	9
unbiased	1	2	3	4	5	9
concerned about my community's well-being	1	2	3	4	5	9
unconcerned about the public interest	1	2	3	4	5	9
watching out for my community's interests	1	2	3	4	5	9

BACKGROUND INFORMATION

All information you provide is never associated with your name.

21. In what year were you born? 19_____

22. Are you male or female? Male Female

23. How long have you lived in a community near Fire Island?
_____ years

24. Please tell us which activities you have participated in, at any location (not just in the park or your community), in the last 12 months: *Please check all that apply.*

- Hiking/Walking outdoors
- Biking
- Picnicking
- Camping
- Boating/Canoeing/Kayaking
- Wildlife viewing
- Nature photography/Painting/Sketching
- Horseback riding
- Hunting
- Fishing

25. What is the highest level of formal education you have completed? *Please check one.*

- Some high school
- High school diploma/G.E.D.
- Some college or technical school
- Associate's Degree (e.g., A.A.)
- College undergraduate degree (e.g., B.A., B.S.)
- Graduate degree (e.g., M.S., Ph.D., M.D.)

26. Please use the space below for any additional comments:

THANK YOU FOR YOUR PARTICIPATION!

**To return this questionnaire, simply seal it and drop it into the nearest mailbox.
Postage has already been provided.**

For more information about this project, please visit:

<http://www.dnr.cornell.edu/deerpeopleparks>

or call: 607-255-4136.

To learn more about the National Park System, please visit:

<http://www.nps.gov>

To learn more about Fire Island National Seashore, please visit:

<http://www.nps.gov/fils/>

OMB Control # 1024-0251

Expiration Date: 3/31/2010

APPENDIX B: Factor loadings for data reduction scales

Table B1. Factor loadings for 11-item scale on values of FINS to local communities, obtained from the 2006 FINS deer management survey.

“FINS...”	Factor 1 (Amenity and economic values)	Factor 2 (Ecological values)
attracts tourism dollars to my community	.848	.114
increases the job opportunities in my community	.799	-.034
makes my community a special place to live	.639	.402
plays a significant role in my community	.624	.348
is a place where people in my community spend leisure time	.617	.334
provides open space for community	.607	.492
is a good neighbor	.600	.247
helps the local economy	.562	.399
provides habitat for plants and animals	.197	.678
preserves natural resources	.195	.727
protects the landscape from development	.123	.695
% variance explained by factor	44.62	10.05
factor alpha	.868	.545

Table B2. Factor loadings for 9-item scale on perceptions of deer in or near FINS, obtained from the 2006 FINS deer management survey.

“...deer in general are...”	Park scale Factor 1 (Natural)	Community scale Factor 1 (Natural)
acting naturally	.744	.749
behaving normally	.735	.659
not behaving strangely	.695	.768
not aggressive	.681	.657
not acting unnaturally	.680	.683
harmless	.672	.660
not threatening	.648	.626
not dangerous	.619	.698
peaceful	.584	.659
% variance explained by factor	45.55	48.37
factor alpha	.846	.862

Table B3. Factor loadings for 8-item scale on concerns about deer in or near FINS, obtained from the 2006 FINS deer management survey.

Potential concerns:	Park scale		Community scale	
	Factor 1 (Primary)	Factor 2 (Other)	Factor 1 (Primary)	Factor 2 (Other)
Deer browsing on naturally growing flowers, trees and shrubs	.825	.197	.801	.195
Deer browsing on landscaped flowers, trees and shrubs	.902	.276	.920	.196
Deer browsing on vegetable gardens	.853	.320	.883	.231
Presence of deer feces	.282	.717	.309	.703
Deer accessing unsecured trash	.376	.586	.526	.454
Deer interacting with pets	.111	.853	.126	.843
Deer behavior around people	.257	.782	.206	.818
Diseases and/or parasites carried by deer	.449	.509	.508	.473
% variance explained by factor	34.4	28.0	52.8	14.5
factor alpha	.889	.812	.860	.778

Table B4. Factor loadings for 5-item scale on image of FINS management, obtained from the 2006 FINS deer management survey.

“Management at FINS typically is...”	Factor 1 (Professionalism)	Factor 2 (Community affiliation)
knowledgeable	.775	.030
fair	.738	.416
concerned about the public interest	.719	.123
trustworthy	.650	.481
watching out for my community’s interests	.503	.646
concerned about my community’s well-being	.501	.675
unbiased	.140	.793
telling the whole story	.047	.798
% variance explained by factor	51.58	13.01
factor alpha	.781	.804

APPENDIX C: Nonrespondent-respondent comparison tables

Table C1. Percent of respondents and nonrespondents who have visited FINS by stratum.

Ever visited FINS?	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
No	Respondents	3	1.3	7	5.0	0	0.0
	Nonrespondents	3	6.0	2	4.0	2	4.8
Yes	Respondents	221	98.7	132	95.0	76	100.0
	Nonrespondents	47	94.0	48	96.0	40	95.2
Total	Respondents	224	100.0	139	100.0	76	100.0
	Nonrespondents	50	100.0	50	100.0	42	100.0

Table C2. Percent of respondents and nonrespondents who visited FINS, by stratum and number of visits in past 12 months.

Visits in past 12 months	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
0, 1, don't know	Respondents	10	4.6	30	23.1	9	13.4
	Nonrespondents	2	4.3	19	39.6	5	12.5
2-4 times	Respondents	13	6.0	30	23.1	3	4.5
	Nonrespondents	2	4.3	9	18.8	4	10.0
5 or more visits	Respondents	194	89.4	70	53.8	55	82.1
	Nonrespondents	43	91.5	20	41.7	31	77.5
Total	Respondents	217	100.0	130	100.0	67	100.0
	Nonrespondents	47	100.0	48	100.0	40	100.0
Chi-square			0.234		4.798		1.250
P-value			NS ¹		NS		NS

¹ Not significant.

Table C3. Percent of FINS respondents and nonrespondents by stratum and by frequency with which they see deer in their community.

See deer in community	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
Daily	Respondents	137	60.6	16	11.9	65	82.3
	Nonrespondents	30	60.0	11	22.9	29	69.0
A few times a week	Respondents	53	23.5	18	13.4	13	16.5
	Nonrespondents	10	20.0	6	12.5	1	2.4
Weekly	Respondents	22	9.7	9	6.7	0	0.0
	Nonrespondents	5	10.0	6	12.5	2	4.8
Less than once a week	Respondents	13	5.8	45	33.6	0	0.0
	Nonrespondents	2	4.0	12	25.0	5	11.9
Never	Respondents	1	0.4	46	34.3	1	1.3
	Nonrespondents	3	6.0	13	27.1	5	11.9
Total	Respondents	226	100.0	134	100.0	79	100.0
	Nonrespondents	50	100.0	48	100.0	42	100.0
Chi-square			9.176		5.731		24.739
P-value			NS ¹		NS		<0.001

¹ Not significant.

Table C4. Percent of respondents and nonrespondents with particular attitudes toward deer in FINS, by stratum.

Collapsed response categories	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
No particular feelings/ Enjoy deer without worry	Respondents	62	30.8	70	53.4	34	47.2
	Nonrespondents	11	22.0	25	51.0	13	31.0
Enjoy deer but worry/ Do not enjoy deer	Respondents	139	69.2	61	46.6	38	52.8
	Nonrespondents	39	78.0	24	49.0	29	69.0
Total	Respondents	201	100.0	131	100.0	72	100.0
	Nonrespondents	50	100.0	49	100.0	42	100.0
Chi-square			1.519		0.083		2.898
P-value			NS ¹		NS		NS

Table C5. Percent of respondents and nonrespondents with particular attitudes toward deer in their community, by stratum.

Collapsed response categories	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
No particular feelings/ Enjoy deer without worry	Respondents	44	20.0	63	47.7	25	33.8
	Nonrespondents	17	34.7	26	53.1	14	34.1
Enjoy deer but worry/ Do not enjoy deer	Respondents	176	80.0	69	52.3	49	66.2
	Nonrespondents	32	65.3	23	46.9	27	65.9
Total	Respondents	220	100.0	132	100.0	74	100.0
	Nonrespondents	49	100.0	49	100.0	41	100.0
Chi-square			4.935		0.407		0.002
P-value			0.026		NS ¹		NS

¹ Not significant.

Table C6. Percent of FINS respondents and nonrespondents by stratum and beliefs about level of influence they can have on management of the park.

Level of influence you expect to have on park decisions	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
A lot	Respondents	23	10.3	12	9.2	9	12.0
	Nonrespondents	11	23.4	6	12.8	6	15.0
Some	Respondents	84	37.7	73	55.7	30	40.0
	Nonrespondents	12	25.5	10	21.3	3	7.5
Very little	Respondents	92	41.3	40	30.5	28	37.3
	Nonrespondents	19	40.4	17	36.2	16	40.0
None at all	Respondents	24	10.8	6	4.6	8	10.7
	Nonrespondents	5	10.6	14	29.8	15	37.5
Total	Respondents	223	100.0	131	100.0	75	100.0
	Nonrespondents	47	100.0	47	100.0	40	100.0
Chi-square			6.897		29.152		19.222
P-value			NS ¹		0.000		0.000

¹ Not significant.

Table C7. Percent of FINS respondents and nonrespondents by stratum and response to trustworthiness of FINS staff.

“Management at FINS is typically trustworthy”	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
Strongly disagree, Disagree	Respondents	25	12.1	4	3.2	7	10.3
	Nonrespondents	7	14.3	7	14.0	15	35.7
Neutral	Respondents	43	20.9	27	21.6	12	17.6
	Nonrespondents	13	26.5	15	30.0	15	35.7
Strongly agree, Agree	Respondents	101	49.0	59	47.2	42	61.8
	Nonrespondents	24	49.0	17	34.0	8	19.0
Not sure	Respondents	37	18.0	35	28.0	7	10.3
	Nonrespondents	5	10.2	11	22.0	4	9.5
Total	Respondents	206	100.0	125	100.0	68	100.0
	Nonrespondents	49	100.0	50	100.0	42	100.0
Chi-square			2.169		9.599		22.280
P-value			NS ¹		0.022		0.000

¹ Not significant.

Table C8. Percent of FINS respondents and nonrespondents by stratum and response to concern about local communities among FINS staff.

“Management at FINS is concerned about my community”	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
Strongly disagree, Disagree	Respondents	63	30.6	7	5.6	18	26.1
	Nonrespondents	16	32.7	17	34.0	18	42.9
Neutral	Respondents	41	19.9	33	26.6	20	29.0
	Nonrespondents	11	22.4	16	32.0	7	16.7
Strongly agree, Agree	Respondents	57	27.7	54	43.5	20	29.0
	Nonrespondents	18	36.7	11	22.0	12	28.6
Not sure	Respondents	45	21.8	30	24.2	11	15.9
	Nonrespondents	4	8.2	6	12.0	5	11.9
Total	Respondents	206	100.0	124	100.0	69	100.0
	Nonrespondents	49	100.0	50	100.0	42	100.0
Chi-square			5.142		28.127		4.190
P-value			NS ¹		0.000		NS

¹ Not significant.

Table C9. Percent of FINS respondents and nonrespondents by stratum and likelihood of talking to park staff about deer impacts if park offers such opportunities.

Likelihood of talking with park staff about deer impacts	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
Very Unlikely, Unlikely	Respondents	68	30.9	71	54.6	9	12.2
	Nonrespondents	21	42.0	24	48.0	17	40.5
Very likely, likely	Respondents	130	59.1	42	32.3	59	79.7
	Nonrespondents	28	56.0	23	46.0	23	54.8
Not sure	Respondents	22	10.0	17	13.1	6	8.1
	Nonrespondents	1	2.0	3	6.0	2	4.8
Total	Respondents	220	100.0	130	100.0	74	100.0
	Nonrespondents	50	100.0	50	100.0	42	100.0
Chi-square			4.648		3.802		12.381
P-value			NS ¹		NS		0.002

¹ Not significant.

Table C10. Percent of FINS respondents and nonrespondents by stratum and likelihood of writing comments regarding an issue with deer in the park.

Likelihood of provide some form of written comments (to a park plan, impact statement, survey) related to deer impacts	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
		-----		-----		-----	
Very Unlikely, Unlikely	Respondents	84	38.2	75	57.7	16	21.6
	Nonrespondents	20	40.8	18	36.0	21	50.0
Very likely, likely	Respondents	108	49.1	41	31.5	48	64.9
	Nonrespondents	28	57.1	28	56.0	19	45.2
Not sure	Respondents	28	12.7	14	10.8	10	13.5
	Nonrespondents	1	2.0	4	8.0	2	4.8
Total	Respondents	220	100.0	130	100.0	74	100.0
	Nonrespondents	49	100.0	50	100.0	42	100.0
Chi-square			4.831		9.203		10.535
P-value			NS ¹		0.010		0.005

¹ Not significant.

Table C11. Percent of FINS respondents and nonrespondents by stratum and likelihood of attending a public meeting on the topic of deer-related impacts in the park.

Likelihood of attending a public meeting related to deer impacts	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
Very Unlikely, Unlikely	Respondents	62	28.2	74	56.9	10	13.3
	Nonrespondents	23	46.0	26	52.0	22	52.4
Very likely, likely	Respondents	135	61.4	45	34.6	60	80.0
	Nonrespondents	25	50.0	21	42.0	20	47.6
Not sure	Respondents	23	10.5	11	8.5	5	6.7
	Nonrespondents	2	4.0	3	6.0	0	0.0
Total	Respondents	220	100.0	130	100.0	75	100.0
	Nonrespondents	50	100.0	50	100.0	42	100.0
Chi-square			6.830		0.976		21.938
P-value			0.033		NS ¹		<0.001

¹ Not significant.

Table C12. Gender of FINS respondents and nonrespondents by stratum.

Gender	Respondent classification	Adjacent communities		Surrounding communities		Year-round residents	
		n	(%)	n	(%)	n	(%)
Male	Respondents	116	50.2	55	39.0	40	50.6
	Nonrespondents	23	46.0	25	50.0	21	50.0
Female	Respondents	115	49.8	86	61.0	39	49.4
	Nonrespondents	27	54.0	25	50.0	21	50.0
Total	Respondents	231	100.0	141	100.0	79	100.0
	Nonrespondents	50	100.0	50	100.0	42	100.0
Chi-square			0.292		1.832		0.004
P-value			NS ¹		NS		NS

Table C13. Year born and years lived in a community near FINS for FINS survey respondents and nonrespondents.

		n	Mean	Median
Year born	Respondents	442	1948	1948
	Nonrespondents	140	1951	1950
Years lived in community near park	Respondents	455	32.4	32.0
	Nonrespondents	141	32.8	30.0

¹ Not significant.