Deer, People, and Parks:

Perspectives of Residents in Communities Near Valley Forge National Historical Park

December 2007

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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 Valley Forge National Historical Park (VFNHP).

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 VFNHP 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 two strata. The first stratum consisted of residents, aged 18 and older, of owner-occupied homes living in communities adjacent to VFNHP. The second stratum consisted of residents of owner-occupied homes who live slightly further away, in surrounding communities within a few miles of VFNHP. We mailed questionnaires to 1,200 households (600 in each 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 and Recommendations

We received 528 completed questionnaires, for an adjusted response rate of 45.8% (response rates in the adjacent and surrounding communities strata were 51% and 40%, respectively). We compared respondents and nonrespondents on 12 variables measured in a telephone follow-up of nonrespondents. Nonrespondents were slightly older than respondents, were less likely to worry about deer-related impacts, and were less likely to think they could influence decisions within VFNHP. However, respondents did not differ from nonrespondents with regard to gender or years living near VFNHP. Moreover, overall patterns of response were similar for nonrespondents and respondents from the two study strata. Given those similarities, we decided not to weight the data based on nonrespondent information.

The following bullets summarize key findings and recommendations.

- Residents living near VFNHP use and appreciate the park for its amenity values (e.g., as open space, as a leisure resource, as natural habitats). They visit VFNHP frequently to spend time outdoors, enjoy nature, or spend time with family, friends, or pets.

- Most residents interact with deer regularly. They believe deer use both park lands and local communities as their habitat—they recognize that the park and local communities share a common deer herd. Many residents are very concerned about three categories of negative impacts associated with the presence of deer on park lands and in their communities; impacts associated with deer-vehicle collisions, disease transmission from deer to humans, and deer browsing damage to landscape and natural plants). Future discussions of potential deer management activities should address how these concerns relate to management objectives and the degree to which they may be affected, either directly or indirectly. Substantial minorities of residents agree deer are having negative impacts on park resources and present serious health and safety risks in the park; however, the majority does not agree that deer are a serious nuisance to park visitors.

- The majority of residents believe NPS should be managing deer-related impacts on VFNHP. A majority of residents believe NPS actions to manage deer-related impacts would affect local communities. A majority of adjacent residents and a plurality of surrounding community residents believe action by NPS to manage deer-related impacts would affect them positively. Future communication is needed to determine the reasons behind this positive evaluation.

- While not reflected in responses from all community residents, a base of general credibility and trust exists for VFNHP decision makers. However, a substantial proportion of residents in both community categories 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 the park, but few have participated in activities where they provided input to decisions about park management activities.

- Substantial numbers of residents are interested in providing input on managing deer-related impacts in VFNHP, although many residents also indicated that they did not believe they had enough information to provide meaningful input.

- A substantial proportion of residents in both community categories are skeptical about the degree to which NPS decision makers listen to community residents or consider their input in decisions.

- Public issues education and/or community training on NEPA are indicated as 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 NEPA and public involvement.

- 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.

- 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 2006a: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 2007a: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 2006a: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 2006a, 2007a). Federal agencies also are required to engage stakeholders whenever any action is considered that may significantly impact the environment (National Environmental Policy Act, NEPA, 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 Valley Forge National Historical Park.

Context for Deer Management in Valley Forge National Historic Park

Located approximately 20 miles northwest of Philadelphia, Valley Forge National Historic Park (hereafter referred to as Valley Forge NHP or VFNHP) was the site of the 1777-78 winter encampment of the Continental Army under General George Washington (Figure 1).

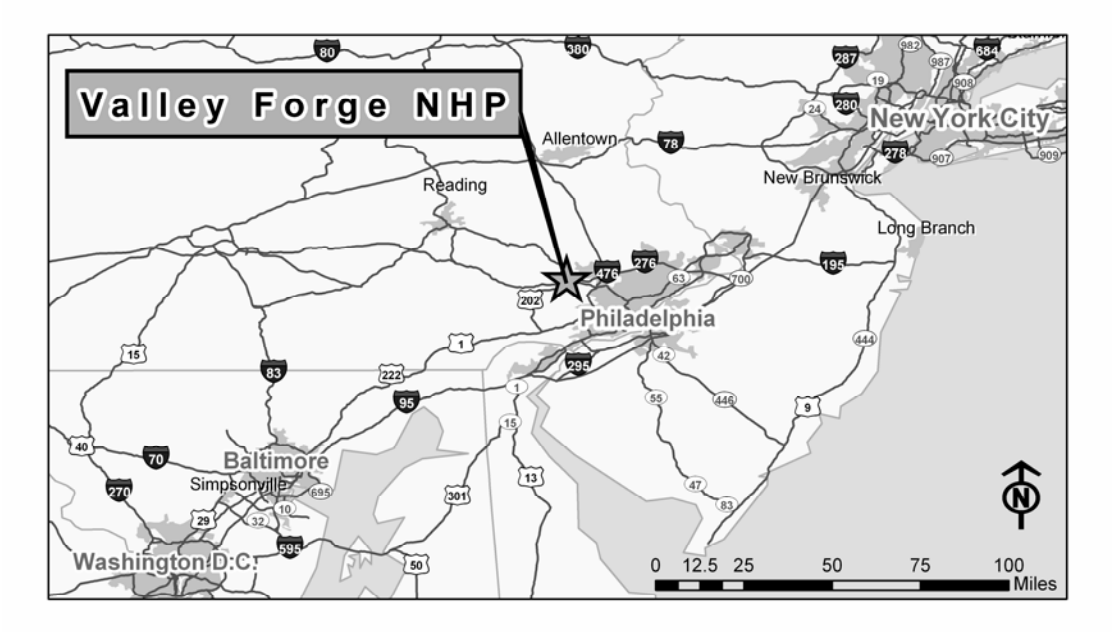

Figure 1. Geographic location of Valley Forge National Historic Park (VFNHP).

Although no battles were fought there, it commemorates the spirit of patriotism, perseverance and sacrifice of Washington and his troops during the Revolutionary War. In 1893, it became Pennsylvania's first state park. Administrative and operational responsibility was transferred to the federal government when it was designated a national historical park on July 4, 1976, as part of the nation's bicentennial celebration.

The population of white-tailed deer in and around Valley Forge National Historical Park has increased dramatically in the last two decades (Lovallo and Tzilkowski 2003). VFNHP's first study of deer in the park was conducted in the early 1980's and indicated a relatively small deer population and no impacts to vegetation. The habitat condition and herd health was described as excellent, no browse line was evident, and vegetation damage on adjacent lands was reported as insignificant (National Park Service 2006b).

Negative impacts from deer browse were not noted officially in VFNHP until the early 1990's, when additional studies were initiated (K. Heister, NPS VFNHP pers. comm.). Long-term monitoring of deer abundance and impacts to vegetation within VFNHP are on-going, as are the public's concerns about associated impacts and a desire for VFNHP to actively manage deer. Because deer move through political jurisdictions and across property boundaries, local community members experience a range of impacts from deer they associate with VFNHP, just as VFNHP experiences impacts from deer that use local communities. 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).

The degree to which impacts from deer warrant management action depends on a park's mission and management policies. VFNHP's 1982 General Management Plan (GMP), did not

address status of natural resource values (National Park Service 2003). Since that plan was adopted, both natural resource condition and NPS policy changed. In June 2000, Congress directed NPS to begin cultural and natural resource studies to address deer management at the park, in the context of the impacts on the cultural landscape. In 2002, a new GMP was initiated that eventually included natural resource objectives in all of the action alternatives. In 2006, VFNHP initiated a White-tailed Deer Management Plan/Environmental Impact Statement (EIS). A notice of intent was published in the Federal Register and public scoping meetings were held in 2006. The Record of Decision for the new GMP was signed in September 2007. One of the five main objectives identified in the GMP was to restore natural habitats and biodiversity. The preferred alternative was chosen, in part, because of its ability to meet this objective:

> "In cases where species populations occur in unnaturally high or low concentrations as a result of human influences or extirpation of predators, and these occurrences cause unacceptable impacts on natural resources and processes, the NPS will take action to accelerate natural recovery through biological and physical remedial actions. This includes…A future deer management plan/EIS [to] determine the best means to manage the size of the white-tailed deer herd" (National Park Service 2007b, p. A-3).

Articulation of a park's management objectives (based on NPS policy, park enabling legislation and planning documents such as GMPs) is necessary to assess the degree to which impacts from deer affect these objectives, either negatively or positively.

The VFNHP Deer Management Study

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., Fire Island National Seashore [Leong and Decker 2007a], VFNHP [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 five parks (phase IIIB).

Purpose of this report:

This report focuses on results of the final phase of research (phase IIIB), conducted in VFNHP. The goal of phase IIIB research was to gain an in-depth understanding of a variety of stakeholder beliefs and attitudes related to deer and deer-related impacts. This phase of research focused on comparisons of residents living in communities adjacent to a park with residents living in surrounding communities near parks (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 VFNHP, the role of VFNHP in deer and other wildlife management, and the influence of public input in wildlife management at VFNHP.

METHODS

Study area

Potential study sites 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, on Long Island, New York, was the only park identified with a long history of deer issues and experience with outreach activities with communities and visitors about deer. VFNHP, in southeastern Pennsylvania, and Morristown National Historical Park, in New Jersey, represent parks with a long history of deer issues and limited public outreach activities about deer. Chesapeake and Ohio Canal National Historical Park (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 IIIB 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 divided into two strata. The first stratum consisted of residents, aged 18 and older, of owner-occupied homes in communities adjacent to VFNHP. The second stratum consisted of residents of owner-occupied homes slightly further away, in surrounding communities within a few miles of VFNHP (Figure 2).

Adjacent communities were defined as the residential neighborhoods that share a boundary with the park, bounded by major geographic features (rivers, highways, other major roads). Boundaries include the Schuylkill River and Perkiomen Creek on the north, Egypt Rd. and Audubon Rd. on the east, 202 on the south, and Country Club Rd. on the west.

The surrounding communities were defined as the five townships that border the park (excluding adjacent communities): Schuylkill Township, Tredyffrin Township, Upper Merion Township, West Norriton Township, and Lower Providence Township.

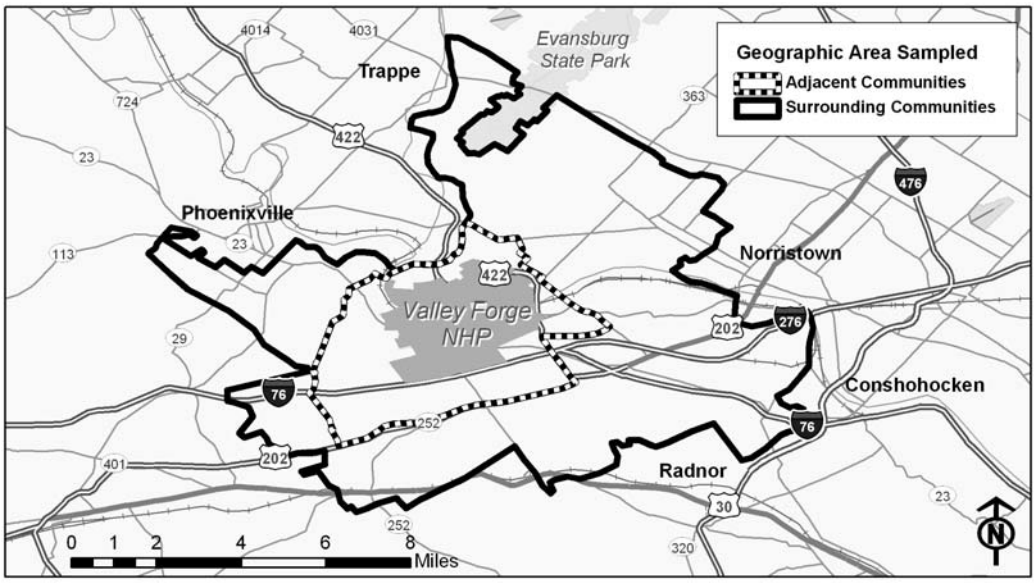

Figure 2. Geographic Area Sampled.

We mailed questionnaires to 1,200 households (600 in each stratum). 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 and questionnaire 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 completed 51 interviews in the adjacent communties stratum and 50 interviews in the surrounding communities stratum (Box 1). Data collection began on June 18, 2007 and was completed on July 8, 2007.

Box 1. Valley Forge National Historical Park: Outcome of Nonrespondent Follow-up Study	**N**		
	Overall	**Strata 1**	**Strata 2**
Completed survey	101	51	50
Bad phone number	27	17	10
Too Ill; Deceased; Incapable of responding	0	0	0
Language problem	2	0	2
Did not call	239	115	124
Refused	12	8	4
Pending (called, but not able to conduct interview)	246	92	154
Total	**627**	**283**	**344**

Analysis

In this report we provide descriptive study highlights using a set of tables with frequencies of response from residents in two geographic strata: (1) adjacent communities and (2) surrounding communities. We used chi square tests to identify statistically different results between the strata and between respondents and non-respondents. 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 VFNHP; (2) perceptions of deer behavior; (3) concerns about deer; and (4) public image of VFNHP management. All data analysis was conducted using SPSS version 15.0.0 (SPSS Inc., Chicago IL).

Community importance of VFNHP:

We developed 12 items to assess community residents' held values for VFNHP as a community asset. We used those 12 items to create a multi-item index of community importance placed on VFNHP. Dropping three items yielded a 9-item scale with high reliability (alpha = 0.808). Principal axis factoring identified two factors with an eigen value above 1. These factors accounted for 53% of the variance between items. Factor loadings ranged from 0.558 to 0.806. We labeled the factors "amenity values" and "economic values" (Appendix B, Table B1).

Perceptions of deer behavior:

We developed 12 items to assess community residents' perceptions of deer within VFNHP and in neighboring communities. Dropping three items yielded a 9-item scale with high reliability (alpha = 0.842 for perceptions of deer within VFNHP; alpha = 0.841 for perceptions of deer in local communities). Principal axis factoring identified two factors with an eigen value above 1. Those factors accounted for 60% of the variance between items in the park scale (59% of variance on the community scale). Factor loadings ranged from 0.555 to 0.821 in the park scale and from 0.484 to 0.811 in the community scale. We labeled the factors "natural" behavior and "harmless" (Appendix B, Table B2).

Concerns about deer:

We developed 12 items to assess community residents' concerns about deer within VFNHP and in neighboring communities. Dropping two items yielded a 10-item scale with high reliability (alpha = 0.882 for park scale; alpha = 0.876 for communities scale). Principal axis factoring identified two factors with an eigen value above 1. The factors accounted for 62% of the variance between items in the park scale (and 63% of variance in the community scale). Factor loadings ranged from 0.470 to 0.893 in the park scale and 0.480 to 0.908 in the community scale. We labeled the factors "damage concerns" and "other concerns" (Appendix B, Table B3).

Public image of VFNHP management:

We developed 8 items to assess community residents' image of VFNHP management. Dropping three items yielded a 5-item scale with high reliability (alpha = 0.858). Principal axis factoring identified one factor with an eigen value above 1. That factor accounted for 64.76% of the variance between items. Factor loadings ranged from 0.757 to 0.849. We labeled the factor "credibility" (Appendix B, Table B4).

RESULTS

We received 528 completed questionnaires, for an adjusted response rate of 45.8% (Table 1). Response rate was higher for the adjacent communities stratum (response rates in the adjacent and surrounding communities strata were 51% and 40%, respectively). We compared respondents and nonrespondents on 12 variables measured in our telephone follow-up study of nonrespondents (Appendix C). Nonrespondents were slightly older than respondents, were less likely to worry about deer-related impacts, and were less likely to think they could influence decisions within VFNHP. However, respondents did not differ from nonrespondents with regard to gender or years living near VFNHP. Moreover, overall patterns of response were similar for nonrespondents and respondents from the two study strata. Given those similarities, we decided not to weight the data based on nonrespondent information.

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 VFNHP.

Respondent characteristics

The majority of respondents in both strata were female (53% of adjacent community respondents; 56% of local community respondents). Mean age was 58 years old. On average, respondents had lived near VFNHP 25 years. The majority of respondents in adjacent and surrounding communities participated in walking/hiking and viewing wildlife. Participation in traditional wildlife-related and outdoor activities (i.e., fishing, hunting, camping) was relatively low in both types of communities. There were no significant differences between strata with respect to outdoor activity involvement (Table 2).

Use of Valley Forge NHP

Nearly everyone in the study sample (99.6% of respondents and 94.0% of nonrespondents) had visited VFNHP. VFNHP is bisected by major roads, and 23% of respondents reported only passing through the park on their way to another destination over the previous 12 months. The majority of those who visited VFNHP as their primary destination stayed less than 4 hours per visit. Residents of adjacent communities were more likely than residents of surrounding communities to have visited the park more than 10 times (Appendix C, Table C2).

Table 1. Response rates by stratum for the 2007 Valley Forge National Historic (NHP) Park Deer, People and Parks survey.

Community	n	Returns	Not deliverable	Not usable	Adjusted Response rate (%)
Adjacent communities	600	293	27	4	51.13
Surrounding communities	600	233	21	3	40.24
Total (*includes 2 returns with ID no. removed)	**1,200**	**528***	**48**	**7**	**45.83**

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

Activity	Strata: Adjacent communities (n=293)	Strata: Surrounding communities (n=232)	Chi-square	P-value
Hiked/Walked	93.2	90.5	1.24	NS[1]
Viewing wildlife	59.0	62.1	0.49	NS
Picnicking	47.1	49.6	0.31	NS
Biked	47.8	44.0	0.75	NS
Photo/sketch	27.0	25.4	0.15	NS
Boating	22.9	24.1	0.11	NS
Fishing	15.0	19.0	1.44	NS
Camping	13.3	9.9	1.43	NS
Horse riding	5.5	6.5	0.23	NS
Hunting	3.1	5.2	1.48	NS

[1] Not significant

The most common reasons for visiting VFNHP were to view the scenery, get exercise, and spend time outside. In addition to visiting VFNHP more frequently, residents of adjacent communities were more likely than residents of surrounding communities to utilize the park as a place for exercise (Table 3). On the other hand, residents of surrounding communities were more likely to use the park as a venue to spend time with family and friends (Table 3).

Table 3. Reasons for visiting Valley Forge NHP lands offered by the 73% of residents who visited Valley Forge NHP for a purpose other than passing through on the way to another destination. Numbers represent percent of respondents who indicated each reason.

	Strata			
Reason for visiting VFNHP	**Adjacent communities** (n=213)	**Surrounding communities** (n=170)	**Chi-square**	**P-value**
View the scenery	80.3	78.8	0.12	NS[1]
Exercise	82.2	72.4	5.26	0.022
Be outside	74.6	75.3	0.02	NS
View wildlife	46.5	44.1	0.21	NS
Spend time with family, friends	48.4	59.4	4.64	0.031
Enjoy sounds and smells of nature	47.9	51.8	0.56	NS
Learn about history	43.7	49.4	1.25	NS
Get away from demands	40.8	42.4	0.08	NS
Volunteer in park	4.7	2.4	1.47	NS
Other	13.1	14.7	0.19	NS

Deer-related experiences, attitudes, perceptions, and concerns

Visitors to VFNHP saw deer frequently. Sixty-six percent reportedly saw deer every visit and another 26% said they saw deer on half or more of their visits. Deer encounters in the park were not significantly different by strata. However, reported likelihood of encountering deer in one's community was different between strata ($\chi^2 = 34.282$; df = 4; $p < 0.000$). Fifty-nine

[1] Not significant.

percent of respondents from adjacent communities encountered deer daily or a few times a week compared to 34% of respondents from surrounding communities (Appendix C, Table C3).

The majority of respondents in both strata reportedly enjoy deer, but worry about deer-related impacts in VFNHP (Table 4). Attitudes toward deer in communities were less positive. Respondents from adjacent communities were more likely to report that they do not enjoy deer in their community (Table 4). Nonrespondents from both strata were more likely than respondents to hold positive attitudes toward deer (Appendix C, Table C5).

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

		(Percent)					
	n	**No particular feelings**	**Enjoy and do not worry**	**Enjoy BUT worry**	**Do not enjoy**	**Chi-square**	**P-value**
Attitude toward Deer in VFNHP							
Community Strata:							
Adjacent	269	4.1	19.7	70.6	5.6	0.988	NS[1]
Surrounding	215	4.2	19.1	73.0	3.7		
Attitude toward Deer in your Community							
Community Strata:							
Adjacent	274	4.7	14.2	52.2	28.8	8.750	0.033
Surrounding	219	6.8	17.8	57.2	17.8		

Residents of different community types held slightly different perceptions of deer behavior in the park and in local communities (Tables 5-6). Both groups of respondents generally regarded deer behavior as normal, natural, unthreatening, and harmless. However, residents of adjacent communities had a lower mean score for the "natural" factor of the perceptions of deer scale we created, both in the park and in their communities (Table 7). Analysis of individual items in the naturalness scale reveals that adjacent community residents were less likely to regard deer behavior as natural or normal, in the park or in their community (Table 5-6).

[1] Not significant.

Table 5. Perceptions of deer in Valley Forge NHP expressed by respondents to the 2007 Valley Forge NHP Deer, People and Parks survey, by stratum.

In VFNHP deer, in general are…	Strata	n	(Percent) Rarely	Some times	Almost Always	Chi-square	P-value
wild	Adjacent	258	41.5	26.4	32.2	5.257	NS[1]
	Surrounding	199	31.7	27.6	40.7		
peaceful	Adjacent	261	2.7	18.0	79.3	0.347	NS
	Surrounding	211	1.9	17.5	80.6		
behaving strangely	Adjacent	258	79.5	16.3	4.3	5.211	NS
	Surrounding	207	87.4	10.1	2.4		
dangerous	Adjacent	262	56.1	28.2	15.6	0.219	NS
	Surrounding	212	57.5	28.3	14.2		
tame	Adjacent	254	24.8	32.3	42.9	1.194	NS
	Surrounding	205	25.9	36.1	38.0		
behaving normally	Adjacent	263	7.6	19.0	73.4	11.44	0.003
	Surrounding	210	2.4	12.4	85.2		
aggressive	Adjacent	261	82.4	14.2	3.4	2.125	NS
	Surrounding	209	85.6	12.9	1.4		
timid	Adjacent	258	17.4	40.7	41.9	0.910	NS
	Surrounding	210	16.7	37.1	46.2		
acting naturally	Adjacent	262	8.4	17.6	74.0	5.670	NS
	Surrounding	211	3.8	14.2	82.0		
harmless	Adjacent	257	16.3	28.8	54.9	3.763	NS
	Surrounding	208	11.1	35.1	53.8		
threatening	Adjacent	260	72.3	20.0	7.7	1.693	NS
	Surrounding	209	73.7	21.5	4.8		
acting unnaturally	Adjacent	257	77.8	16.0	6.2	0.688	NS
	Surrounding	209	80.9	13.4	5.7		

[1] Not significant.

Table 6. Perceptions of deer in communities near Valley Forge NHP, expressed by respondents to the 2007 Valley Forge NHP Deer, People and Parks survey, by stratum.

In communities near VFNHP deer, in general are…	Strata	n	(Percent) Rarely	Some times	Almost Always	Chi-square	P-value
wild	Adjacent	252	44.4	23.0	32.5	8.93	0.011
	Surrounding	194	31.4	24.2	44.3		
peaceful	Adjacent	256	4.3	23.4	72.3	2.19	NS[1]
	Surrounding	202	5.9	18.3	75.7		
behaving strangely	Adjacent	259	77.6	18.1	4.2	5.32	NS
	Surrounding	195	84.1	14.9	1.0		
dangerous	Adjacent	258	48.4	33.7	17.8	2.26	NS
	Surrounding	202	55.0	27.7	17.3		
tame	Adjacent	250	28.8	31.6	39.6	2.90	NS
	Surrounding	197	35.0	32.5	32.5		
behaving normally	Adjacent	258	6.6	21.3	72.1	7.67	0.022
	Surrounding	205	3.9	13.2	82.9		
aggressive	Adjacent	256	81.3	14.5	4.3	1.99	NS
	Surrounding	202	84.2	13.9	2.0		
timid	Adjacent	255	16.1	40.0	43.9	2.76	NS
	Surrounding	203	13.8	34.5	51.7		
acting naturally	Adjacent	258	8.5	19.0	72.5	4.88	NS
	Surrounding	205	3.9	16.6	79.5		
harmless	Adjacent	258	19.0	31.8	49.2	1.30	NS
	Surrounding	201	15.9	35.3	48.8		
threatening	Adjacent	259	71.8	19.3	8.9	2.47	NS
	Surrounding	201	71.6	22.9	5.5		
acting unnaturally	Adjacent	255	74.1	18.8	7.1	2.711	NS
	Surrounding	200	80.5	13.5	6.0		

[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 Valley Forge NHP Deer, People and Parks survey.

Factor Label	Community Strata	"In VFNHP" n	"In VFNHP" mean [1]	"In VFNHP" t	"In VFNHP" P-value	"In your community" n	"In your community" mean	"In your community" t	"In your community" P-value
Natural	Adjacent	266	2.69	-2.789	0.005	264	2.67	-2.644	0.008
	Surrounding	211	2.80			205	2.78		
Harmless	Adjacent	270	2.60	-0.571	NS	267	2.53	-1.026	NS[2]
	Surrounding	216	2.62			208	2.57		

We assessed resident's concerns about a range of deer-related impacts. We found that substantial proportions of residents were very concerned about deer-car collisions, diseases and/or parasites carried by deer, and deer browsing on landscape plants, vegetable gardens, and naturally growing flowers, trees, and shrubs (Table 8-9). Levels of concern on several topics were significantly different between strata. Adjacent community residents reported relatively higher concern about fawn survival and their level of concern about deer browsing on naturally growing plants or garden plants in the park approached the criterion for significant difference from surrounding community residents (Table 8). Adjacent community residents reported relatively higher concern about presence of deer feces and deer browsing on landscape plants in their communities (Table 9). The finding that residents of both community types placed highest importance on concerns about deer-vehicle collisions, disease transmission, and browsing damage is expressed in aggregate by the high mean for the factor "damage concerns" in Table 10.

[1] 1=rarely, 2=sometimes, 3=almost always

[2] Not significant.

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

Concern	Strata	n	Level of concern (%) Not at all	Some what	Very	Chi-square	P-value
Car accidents involving deer	Adjacent	259	5.4	18.9	75.7	0.36	NS[1]
	Surrounding	210	4.3	20.0	75.7		
Diseases and/or parasites carried by deer	Adjacent	260	10.0	26.9	63.1	1.32	NS
	Surrounding	209	11.0	31.1	57.9		
Deer browsing on land-scaped flowers/trees/shrubs	Adjacent	260	31.5	23.5	45.0	4.70	NS
	Surrounding	207	33.8	30.4	35.7		
Deer browsing on vegetable gardens	Adjacent	250	40.4	19.6	40.0	5.83	NS
	Surrounding	202	39.1	28.7	32.2		
Deer browsing on naturally growing plants	Adjacent	263	39.2	23.2	37.6	5.92	NS
	Surrounding	208	49.0	23.1	27.9		
Deer accessing unsecured trash	Adjacent	249	49.8	21.3	28.9	1.50	NS
	Surrounding	200	44.0	23.5	32.5		
Presence of deer feces	Adjacent	254	48.4	26.8	24.8	5.17	NS
	Surrounding	202	46.0	35.6	18.3		
People's behavior around deer	Adjacent	254	36.2	37.8	26.0	<0.01	NS
	Surrounding	206	36.4	37.9	25.7		
Deer interacting with pets	Adjacent	247	50.2	24.7	25.1	0.22	NS
	Surrounding	202	51.5	22.8	25.7		
Having seen unhealthy deer	Adjacent	247	40.1	34.0	25.9	1.81	NS
	Surrounding	197	45.7	33.0	21.3		
Fawns that are born too late to survive winter	Adjacent	245	44.1	30.2	25.7	7.45	0.024
	Surrounding	198	54.0	30.3	15.7		
Deer behavior around people	Adjacent	254	51.2	29.1	19.7	0.54	NS
	Surrounding	206	52.9	30.1	17.0		
Other (e.g., "too many deer")	Adjacent	23	4.3	4.3	91.3	0.74	NS
	Surrounding	15	0.0	6.7	93.3		

[1] Not significant.

Table 9. Concerns about deer-related impacts "in your community, outside the park," expressed by respondents to the 2007 VFNHP Deer, People and Parks survey, by stratum.

Concern	Strata	n	Level of concern (%) Not at all	Some what	Very	Chi-square	P-value
Car accidents involving deer	Adjacent	261	4.2	12.3	83.5	3.50	NS[1]
	Surrounding	206	5.3	18.0	76.7		
Diseases and/or parasites carried by deer	Adjacent	261	8.4	21.8	69.7	2.71	NS
	Surrounding	205	6.8	28.3	64.9		
Deer browsing on land-scaped flowers/trees/shrubs	Adjacent	259	15.8	19.7	64.5	6.22	0.045
	Surrounding	202	16.3	29.2	54.5		
Deer browsing on vegetable gardens	Adjacent	255	17.3	22.7	60.0	1.24	NS
	Surrounding	201	17.9	26.9	55.2		
Deer browsing on naturally Growing plants	Adjacent	261	25.7	19.9	54.4	5.63	NS
	Surrounding	201	32.3	24.4	43.3		
Presence of deer feces	Adjacent	253	40.3	24.5	35.2	6.35*	0.042
	Surrounding	194	41.8	33.0	25.3		
Deer accessing unsecured trash	Adjacent	253	42.3	25.3	32.4	1.77	NS
	Surrounding	195	38.5	23.1	38.5		
Deer interacting with pets	Adjacent	251	43.4	24.7	31.9	0.64	NS
	Surrounding	198	42.9	27.8	29.3		
Having seen unhealthy deer	Adjacent	244	38.5	32.8	28.7	2.84	NS
	Surrounding	189	46.6	28.0	25.4		
People's behavior around deer	Adjacent	256	34.4	38.3	27.3	0.85	NS
	Surrounding	201	38.3	34.8	26.9		
Fawns that are born too late to survive winter	Adjacent	242	46.3	29.3	24.4	4.24	NS
	Surrounding	189	54.5	28.6	16.9		
Deer behavior around People	Adjacent	256	45.3	33.2	21.5	1.61	NS
	Surrounding	200	50.5	28.0	21.5		
Other (e.g., "too many deer")	Adjacent	25	0.0	4.0	96.0	3.32	NS
	Surrounding	14	7.1	14.3	78.6		

[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 Valley Forge NHP Deer, People and Parks survey.

Factor Label	Community Strata	"In VFNHP" n	"In VFNHP" mean[1]	"In VFNHP" t	"In VFNHP" P-value	"In your community" n	"In your community" Mean	"In your community" t	"In your community" P-value
Damage concerns	Adjacent	264	2.28	1.504	NS	262	2.52	1.600	NS[2]
	Surrounding	210	2.19			206	2.43		
Other concerns	Adjacent	260	1.77	0.467	NS	260	1.88	0.922	NS
	Surrounding	208	1.75			202	1.83		

Perceptions of VFNHP staff and land management

Most community residents valued VFNHP as a community asset. Nearly all respondents agreed that VFNHP provides open space and wildlife habitat. Most agreed that having the park nearby makes their community a special place to live (Table 11). Residents were more likely to agree that the park provided amenity values than they were to agree it provided positive economic impact to their communities (Table 12). Few differences between strata emerged, suggesting that the park is valued at much the same level in both types of communities.

The majority of residents seem to believe that deer and deer-related impacts cross jurisdictional boundaries. Although 85% in both strata believe the habitat inside the park is better than outside, the same proportion of residents also believe that local deer use habitat inside and outside the park (Table 13). Substantial minorities in both strata believed that deer in the park are having a negative impact on park plants and/or threatening public health or safety (Table 13).

Three out of four respondents agreed with the statement, "The park should start now to address deer-related impacts." Most of those respondents anticipated that actions by the park to manage deer-related impacts would have a positive effect on local communities (Table 13).

[1] 1=not at all concerned, 2=somewhat concerned, 3=very concerned

[2] Not significant.

Table 11. Attitudes about benefits that Valley Forge NHP provides to people living near the park ("adjacent communities") and in surrounding communities, reported in the 2007 Valley Forge NHP Deer, People and Parks survey.

Valley Forge NHP…	Strata	n	(Percent) Disagree, Strongly disagree	Neutral	Agree, Strongly agree	Not sure	Chi-square	P-value
provides open space for my community.	Adjacent	286	1.7	1.0	97.2	0.0	3.582	NS[1]
	Surrounding	228	0.4	1.8	97.4	0.4		
makes my community a special place to live.	Adjacent	285	2.8	1.1	95.8	0.4	8.028	0.045
	Surrounding	228	0.9	4.4	94.3	0.4		
provides habitat for plants and animals.	Adjacent	284	4.6	4.9	89.4	1.1	6.220	NS
	Surrounding	229	.9	4.8	93.4	0.9		
is a place where people in my community spend leisure time.	Adjacent	285	2.5	4.2	91.9	1.4	2.731	NS
	Surrounding	230	.9	6.1	91.7	1.3		
preserves natural resources.	Adjacent	283	3.5	6.7	86.6	3.2	1.796	NS
	Surrounding	229	2.6	4.8	90.4	2.2		
plays a significant role in my community.	Adjacent	285	3.2	10.2	85.6	1.1	5.578	NS
	Surrounding	230	1.3	11.3	83.9	3.5		
attracts tourism dollars to my community.	Adjacent	284	5.6	13.0	76.4	4.9	6.278	NS
	Surrounding	229	2.2	10.5	79.5	7.9		

[1] Not significant.

Table 11. continued.

Valley Forge NHP…	Strata	n	(Percent) Disagree, Strongly disagree	Neutral	Agree, Strongly agree	Not sure	Chi-square	P-value
increases the job opportunities in my community.	Adjacent	282	18.4	34.4	29.1	18.1	8.861	0.031
	Surrounding	230	9.6	37.8	29.6	23.0		
does not protect the landscape from development.	Adjacent	284	76.1	3.9	14.4	5.6	2.171	NS[1]
	Surrounding	226	79.2	4.4	13.3	3.1		
is not an important place for recreation for my community.	Adjacent	283	83.0	2.8	13.1	1.1	0.725	NS
	Surrounding	229	83.0	2.6	14.0	0.4		
does not help the local economy.	Adjacent	282	65.6	13.8	12.8	7.8	6.018	NS
	Surrounding	227	65.2	17.2	7.0	10.6		
is not a good neighbor.	Adjacent	285	82.8	6.0	10.9	0.4	4.303	NS
	Surrounding	229	88.2	4.4	6.6	0.9		

[1] Not significant.

Table 12. A comparison of mean scores on factors within a VFNHP community importance scale, expressed by respondents to the 2007 Valley Forge NHP Deer, People and Parks survey in two community strata.

Factor label	Community Strata	n	mean[1]	t	P-value
Amenity values	Adjacent	287	4.513	-1.792	NS[2]
	Surrounding	230	4.590		
Economic values	Adjacent	287	3.933	-1.956	NS
	Surrounding	229	4.054		

[1] 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.

[2] Not significant.

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

			(Percent)					
	Strata	**n**	**Disagree, Strongly Disagree**	**Neutral**	**Agree, Strongly Agree**	**Unsure**	**Chi-square**	**P–value**
It is reasonable to have deer in the park	Adjacent Surrounding	288 226	5.6 3.5	8.0 5.8	84.7 89.8	1.7 0.9	3.057	NS[1]
The habitat for deer is better in the park than in communities outside the park	Adjacent Surrounding	284 225	6.0 6.2	6.0 6.2	85.2 86.2	2.8 1.3	1.317	NS
The local deer herd uses habitat both in the park and in communities outside	Adjacent Surrounding	284 224	3.5 2.7	4.2 6.7	86.3 84.4	6.0 6.3	1.788	NS
Deer seriously damage plants and other resources in the park	Adjacent Surrounding	282 224	19.5 25.9	17.7 20.1	54.3 39.7	8.5 14.3	11.920	0.008
Deer present a serious safety risk in the park	Adjacent Surrounding	287 228	34.8 39.5	13.9 18.4	46.3 36.8	4.9 5.3	5.101	NS
Deer create a serious health risk in the park	Adjacent Surrounding	286 227	36.0 37.4	16.8 18.5	40.2 32.6	7.0 11.5	5.082	NS
Deer create a serious nuisance for people visiting the park	Adjacent Surrounding	286 223	54.2 59.2	20.3 18.8	20.3 17.0	5.2 4.9	1.409	NS

[1] Not significant.

Table 13. continued.

	Strata	n	(Percent) Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Unsure	Chi-square	P-value
The park is part of the local community	Adjacent	289	2.4	3.1	93.1	1.4	1.453	NS[1]
	Surrounding	228	2.2	1.8	93.9	2.2		
It is important to understand other people's views about deer-related impacts	Adjacent	286	7.7	18.5	71.0	2.8	0.087	NS
	Surrounding	224	7.1	19.2	71.0	2.7		
The park should start now to address deer-related impacts in the park	Adjacent	285	10.2	9.8	77.2	2.8	4.266	NS
	Surrounding	225	7.6	15.1	73.8	3.6		
Addressing deer-related impacts in the park would affect communities outside	Adjacent	289	7.6	9.3	75.8	7.3	4.917	NS
	Surrounding	226	7.1	11.5	69.0	12.4		
Addressing deer-related impacts in the park would affect me positively	Adjacent	288	14.2	13.9	63.5	8.3	14.076	0.003
	Surrounding	224	15.6	21.9	48.2	14.3		
Addressing deer-related impacts in the park would affect me negatively	Adjacent	285	63.9	18.2	9.1	8.8	12.826	0.005
	Surrounding	225	55.1	25.3	4.4	15.1		

[1] Not significant.

We repeated the questions asked in Table 13 and asked residents how they thought VFNHP staff would respond. Depending on the item and stratum, 25-42% of residents responded "not sure" (Table 14). In aggregate, this pattern suggests unfamiliarity with park staff and their views on deer and deer management.

Findings suggest that VFNHP and park staff have a positive public image in neighboring communities. Most residents believed NPS employees were dedicated to preserving and protecting the park and the majority reported having trust in VFNHP staff to make good decisions about natural resource management (Table 15). However, many were also unsure whether park staff listen to public opinion or work with local communities for shared purposes (Table 15). The majority of respondents in both strata believed that the park is trustworthy, knowledgeable and fair. The majority of surrounding community residents and a plurality of adjacent community residents responded that the VFNHP management is concerned about the public interest (Table 16). Fewer respondents agreed that the VFNHP is unbiased and tells the whole story (Table 16). On average, the park was rated higher on professionalism by surrounding community residents than adjacent community residents; average scores for community affiliation were lower than scores for professionalism for both strata (Table 17).

Interest in opportunities to provide input to VFNHP on deer management

The majority of residents agreed that public input usually leads to better management decisions (Table 18). Less than 15% of respondents agreed with the statement "I usually have enough opportunities to provide input on park management decisions" (Table 18). Nearly half believed they did not have enough information to provide meaningful input on deer management in the park. Adjacent community residents were comparatively more skeptical about whether their input would be taken seriously (Table 18).

The majority of residents had learned about park news from mass media sources during the previous 12 months. Few had had taken personal actions to learn about park activities. However, adjacent community residents were more likely to have talked with local staff, provided some form of written comments to the park, or attended a public meeting offered by the park (Table 19).

Though few had provided input previously, substantial numbers of residents expressed an interest in providing input 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, residents of adjacent communities were more likely than residents of surrounding communities to believe they could have little influence on management decisions in the park (Table 21).

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

			(Percent)					
"NPS managers think…"	**Strata**	**n**	**Disagree, Strongly Disagree**	**Neutral**	**Agree, Strongly Agree**	**Unsure**	**Chi-square**	**P–value**
it is reasonable to have deer in the park	Adjacent	280	2.1	5.4	67.5	25.0	1.988	NS[1]
	Surrounding	221	1.8	8.1	63.3	26.7		
the habitat for deer is better in the park than in communities outside the park	Adjacent	277	2.2	8.7	58.5	30.7	1.092	NS
	Surrounding	220	1.8	6.4	59.1	32.7		
the local deer herd uses habitat both in the park and in communities outside the park	Adjacent	280	2.9	5.4	64.6	27.1	3.094	NS
	Surrounding	217	4.6	7.8	58.5	29.0		
deer seriously damage plants and other resources in the park	Adjacent	278	14.0	11.2	43.9	30.9	17.160	0.001
	Surrounding	218	10.1	18.3	29.4	42.2		
deer create a serious health risk in the park	Adjacent	277	28.9	12.3	26.7	32.1	10.124	0.018
	Surrounding	219	24.7	15.1	17.4	42.9		
deer create a serious nuisance for people visiting the park	Adjacent	275	34.2	17.1	14.9	33.8	2.059	NS
	Surrounding	218	32.6	13.8	14.2	39.4		
deer present a serious safety risk in the park	Adjacent	278	25.2	12.6	30.9	31.3	3.186	NS
	Surrounding	218	23.9	14.7	24.8	36.7		

[1] Not significant.

Table 14. continued.

"NPS managers think…"	Strata	n	(Percent) Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Unsure	Chi-square	P-value
the park is part of the local community	Adjacent	280	4.6	8.6	60.4	26.4	3.867	NS[1]
	Surrounding	221	1.8	7.7	59.7	30.8		
it is important to understand other people's views about deer impacts	Adjacent	274	6.6	9.9	54.0	29.6	0.829	NS
	Surrounding	217	6.0	12.0	51.2	30.9		
the park should start now to address deer impacts in the park	Adjacent	279	10.8	9.7	47.0	32.6	3.378	NS
	Surrounding	220	6.4	9.1	47.7	36.8		
addressing deer impacts in the park would affect communities outside the park	Adjacent	276	9.1	8.0	50.4	32.6	8.885	0.031
	Surrounding	219	2.7	10.5	53.4	33.3		
addressing deer impacts in the park would affect me positively	Adjacent	275	10.9	16.4	36.7	36.0	3.127	NS
	Surrounding	218	7.8	17.4	32.6	42.2		
addressing deer impacts in the park would affect me negatively	Adjacent	273	34.8	20.9	5.9	38.5	2.606	NS
	Surrounding	217	36.4	18.4	3.2	41.9		

[1] Not significant.

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

Valley Forge NHP…	Strata	n	(Percent) Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not sure	Chi-square	P-value
VFNHP is an educational resource for my community.	Adjacent	254	2.0	2.8	95.3	0.0	7.467	NS
	Surrounding	206	0.0	1.5	97.6	1.0		
NPS employees are dedicated to preserving, protecting park.	Adjacent	251	3.2	4.4	85.7	6.8	6.948	NS
	Surrounding	206	0.0	4.4	89.8	5.8		
I usually trust management at VFNHP to make good decisions about resource management.	Adjacent	254	11.4	20.5	55.5	12.6	7.351	NS
	Surrounding	206	5.8	17.0	66.5	10.7		
VFNHP works with local communities for shared purposes.	Adjacent	252	8.7	22.2	37.3	31.7	8.739	0.033
	Surrounding	205	2.4	20.5	42.0	35.1		
Managers at VFNHP listen to opinions from people like me.	Adjacent	252	12.7	23.4	23.8	40.1	4.841	NS
	Surrounding	206	7.3	21.8	23.3	47.6		
My community typically does not help care for VFNHP.	Adjacent	252	36.9	18.7	19.0	25.4	3.027	NS
	Surrounding	206	32.0	16.0	19.9	32.0		
I usually do not support the resource management decisions made at VFNHP.	Adjacent	252	28.6	38.5	13.1	19.8	10.306	0.016
	Surrounding	205	35.6	34.6	5.4	24.4		
The rules and reg's at VFNHP do not help preserve and protect it for the future.	Adjacent	249	54.6	13.7	11.2	20.5	4.575	NS
	Surrounding	206	60.7	15.5	6.3	17.5		
I do not feel welcome at VFNHP.	Adjacent	253	91.3	4.7	3.6	0.4	2.421	NS
	Surrounding	206	92.2	2.4	4.4	1.0		

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

Management at VFNHP typically is…	Strata	n	(Percent) Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not Sure	Chi-square	P-value
trustworthy	Adjacent	249	3.6	15.7	54.6	26.1	5.125	NS[1]
	Surrounding	200	1.0	13.0	62.5	23.5		
not knowledgeable	Adjacent	249	59.0	11.6	6.4	22.9	5.023	NS
	Surrounding	200	60.5	15.5	2.5	21.5		
not fair	Adjacent	247	53.0	16.2	4.5	26.3	5.194	NS
	Surrounding	200	56.0	18.5	1.0	24.5		
telling the whole story	Adjacent	247	14.6	21.9	29.1	34.4	3.157	NS
	Surrounding	199	13.6	26.6	22.6	37.2		
unbiased	Adjacent	245	16.3	28.6	22.4	32.7	3.350	NS
	Surrounding	201	10.4	30.3	22.9	36.3		
concerned about my community's well-being	Adjacent	247	15.4	14.6	40.5	29.6	6.828	NS
	Surrounding	200	8.0	17.5	47.0	27.5		
unconcerned about the public interest	Adjacent	249	47.8	13.3	13.7	25.3	0.681	NS
	Surrounding	200	50.0	14.5	11.0	24.5		
watching out for my community's interests	Adjacent	249	13.3	20.9	34.1	31.7	5.735	NS
	Surrounding	200	7.0	25.0	38.5	29.5		

[1] Not significant.

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

Factor label	Community Strata	n	mean[1]	t	P-value
Professionalism	Adjacent	205	3.71	-2.222	0.027
	Surrounding	164	3.87		
Community Affiliation	Adjacent	188	3.29	-1.760	NS[2]
	Surrounding	157	3.45		

[1] 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.
[2] Not significant.

Table 18. Perceptions about Valley Forge NHP use of public input for land management decisions, expressed by respondents to the 2007 Valley Forge NHP Deer, People and Parks survey in two community strata.

Valley Forge NHP…	Strata	n	(Percent) Disagree, Strongly Disagree	Neutral	Agree, Strongly Agree	Not sure	Chi-square	P-value
For the most part, interactions between myself, park managers, and people with different ideas helps build future relationships.	Adjacent	276	4.0	20.3	63.8	12.0	0.658	NS[1]
	Surrounding	218	4.1	17.9	67.0	11.0		
Public input usually leads to better management decisions.	Adjacent	281	11.4	18.1	59.8	10.7	1.203	NS
	Surrounding	222	9.5	15.8	64.0	10.8		
I do not have enough information to provide meaningful input on deer mgmt.	Adjacent	279	30.8	16.1	48.4	4.7	6.651	NS
	Surrounding	217	21.7	18.9	51.6	7.8		
I do not believe my input typically (or would be) taken seriously by park mgmt.	Adjacent	280	26.4	20.7	39.3	13.6	14.477	0.002
	Surrounding	219	24.2	27.4	26.0	22.4		
The different ways the park asks for my opinion encourages me to provide input.	Adjacent	275	28.4	26.2	30.2	15.3	8.113	0.044
	Surrounding	218	21.6	35.8	24.3	18.3		
I am not comfortable voicing my opinion about park mgmt. decisions.	Adjacent	280	55.7	23.6	15.0	5.7	7.089	NS
	Surrounding	221	45.7	28.5	15.4	10.4		
I usually have enough opportunities to provide input on park mgmt. decisions.	Adjacent	274	41.6	25.2	14.6	18.6	13.061	0.005
	Surrounding	217	31.3	34.6	8.8	25.3		

[1] Not significant.

Table 19. Actions taken in the previous 12 months to obtain information about Valley Forge NHP, reported by respondents to the 2007 Valley Forge NHP Deer, People and Parks survey in two community strata.

Actions in past 12 months	Strata	n	(Percent) No	Yes	Not sure	Chi- square	P-value
Read or listened to news about park.	Adjacent	282	19.5	78.0	2.5	6.132	0.047
	Surrounding	222	28.8	68.5	2.7		
Talked with local park staff.	Adjacent	282	73.4	25.5	1.1	6.763	0.034
	Surrounding	224	83.0	16.1	0.9		
Attended a public meeting about the park.	Adjacent	284	85.2	13.7	1.1	17.648	0.000
	Surrounding	222	96.4	3.2	0.5		
Participated in a community group or activity related to a park issue.	Adjacent	283	86.2	13.1	0.7	5.552	NS[1]
	Surrounding	224	92.4	6.7	0.9		
Talked with other public officials about the park.	Adjacent	281	89.0	10.0	1.1	0.615	NS
	Surrounding	223	87.0	12.1	0.9		
Provided written comments to a park plan, impact statement, survey.	Adjacent	282	88.7	9.6	1.8	15.733	<0.001
	Surrounding	224	97.8	2.2	0.0		
Written a letter to a newspaper about the park.	Adjacent	283	97.9	1.4	0.7	4.806	NS
	Surrounding	224	100.0	0.0	0.0		

[1] Not significant.

Table 20. Likelihood of participating in involvement opportunities if those opportunities were provided at Valley Forge NHP, reported by respondents to the 2007 Valley Forge NHP Deer, People and Parks survey in two community strata.

Actions	Strata	n	(Percent) Very unlikely, Unlikely	Very likely, Likely	Not sure	Chi-square	P–value
Read or listen to news about park actions to address deer impacts.	Adjacent Surrounding	285 224	7.0 8.0	92.3 89.3	0.7 2.7	3.416	NS[1]
Attend a public meeting About deer impacts.	Adjacent Surrounding	282 225	30.5 55.1	64.9 39.1	4.6 5.8	34.203	<0.001
Talk with local park staff About deer-related impacts	Adjacent Surrounding	280 224	45.7 61.2	45.0 30.4	9.3 8.5	12.669	0.002
Provide written comments to a park plan, impact statement, survey related to deer impacts.	Adjacent Surrounding	281 223	48.4 63.2	44.5 30.0	7.1 6.7	11.807	0.003
Participate in a community group or activity related to deer impacts.	Adjacent Surrounding	281 223	42.7 65.0	43.8 25.1	13.5 9.9	25.365	<0.001
Talk with other public officials About deer-related impacts.	Adjacent Surrounding	279 225	53.0 63.1	38.0 29.8	9.0 7.1	5.165	NS
Write a letter to a newspaper About deer impacts.	Adjacent Surrounding	279 223	75.6 82.5	16.8 11.2	7.5 6.3	3.768	NS

[1] Not significant.

Table 21. Level of influence respondents perceive they have to influence management of VFNHP or communities surrounding the park, expressed by respondents to the 2007 Valley Forge NHP Deer, People and Parks survey in two community strata.

How much influence do you think people like yourself can have …	n	(Percent) a lot	Some	Very little	None at all	Chi-square	P-value
on the management of Valley Forge NHP?							
Adjacent	285	6.7	46.7	39.3	7.4	9.094	0.028
Surrounding	225	6.2	58.7	27.1	8.0		
in making communities surrounding the park a better place to live?							
Adjacent	285	20.7	56.1	19.3	3.9	0.869	NS[1]
Surrounding	225	19.6	60.0	17.3	3.1		

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. Almost all respondents agreed or strongly agreed that VFNHP is part of the local community. They regularly use and appreciate the park for its amenity values (e.g., as open space, as a leisure resource, as natural habitats) and visit VFNHP frequently to spend time outdoors, enjoy nature, or spend time with family, friends, or pets. Respondents indicated these quality-of-life factors to be as important, if not more so, than the historical and cultural aspects that led to the park's creation, a phenomenon typical in many gateway communities (Howe et al. 1997).

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. Many residents are very concerned about three categories of negative impacts associated with the presence of deer on park lands and in their communities (category of highest concern is listed first): impacts associated with deer-vehicle collisions, disease transmission from deer to humans, and deer browsing damage to landscape and natural plants. In addition, substantial minorities of residents agree that deer are having negative impacts on park resources and present serious health and safety risks in the park (although most do not agree that deer are a serious nuisance to park visitors). The majority of

[1] Not significant.

residents believe NPS should be managing deer-related impacts on VFNHP, and a majority of adjacent residents and a substantial minority of surrounding community residents believe action by NPS would benefit their community.

The objectives of the VFNHP White-tailed Deer Management EIS (currently in development) explicitly address damage from deer browsing on natural and cultural resources (National Park Service 2006c). Public health and safety were identified by the internal scoping team as issues associated with white-tailed deer management, although objectives do not address these issues directly. We did not ask respondents how they believed action by NPS would benefit their community; however, given that highest concerns were related to deer-vehicle collisions and diseases/parasites carried by deer, and not the direct objectives of the VFNHP White-tailed Deer Management EIS (hereafter referred to as, Deer Management EIS), we recommend that future communication with communities address expectations for subsequent effects of deer management on public health and safety. Previous research revealed that different problem frames exist for deer issues in VFNHP. That is, the topics that individuals perceive as salient affect the way they think about the dimensions of the problem and the appropriate means, time frame and geographic scope of potential solutions (Leong and Decker 2007b). Concerns about deer-vehicle collisions and reduction of disease/parasites were as 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 those chosen by NPS managers.

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 VFNHP. The Deer Management EIS considers a variety of means to affect deer densities. Future communication with the public also may include discussion of complementary actions which may address public concerns, but may be outside the scope of the EIS. The park already may engage in some of these activities, such as efforts to reduce vehicle speed or habitat management to reduce visitor exposure to ticks.

While not reflected in responses from all community residents, a base of general credibility and trust exists for VFNHP 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, but few have participated in activities where they provided input to decisions about park management activities. Substantial numbers of residents are interested in providing input on managing deer-related impacts in VFNHP, although many residents also indicated that they did not believe they had enough information to provide meaningful input. A substantial proportion of residents in both community types 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 VFNHP, adjacent communities have greater potential to experience direct impacts from deer associated with the park or deer management initiated by VFNHP than do surrounding communities. As expected, experience with deer and concern about deer damage to vegetation is stronger in adjacent communities than surrounding communities, indicating that the objectives of the VFNHP Deer Management EIS are more salient to adjacent communities. Interest in providing input to managing deer-related impacts also is stronger in adjacent communities than in surrounding communities. These findings indicate that adjacent and surrounding communities represent two different publics, with the adjacent community more likely to be actively seeking information about the situation of concern to VFNHP managers. Thus, adjacent communities may be more prepared to discuss the problem as perceived by VFNHP, while communication targeting surrounding communities would need more emphasis on problem definition and supporting logic.

These results also 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 theory also suggests that to encourage involvement from a public, 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 VFNHP 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 VFNHP. 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 VFNHP, decades of dialogue with adjacent community members (some of which was initiated by NPS, some by community residents) contributed to the development of a Deer Management EIS. 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 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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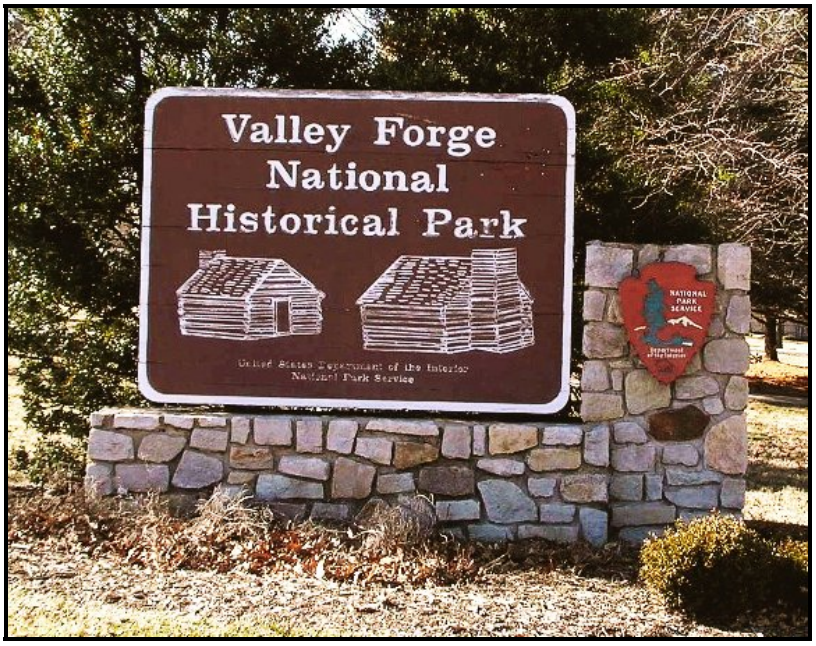
APPENDIX A: Survey instrument

Deer, People and Parks

A Survey of Residents Living Near
Valley Forge National Historical Park



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 Valley Forge National Historical Park, 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.

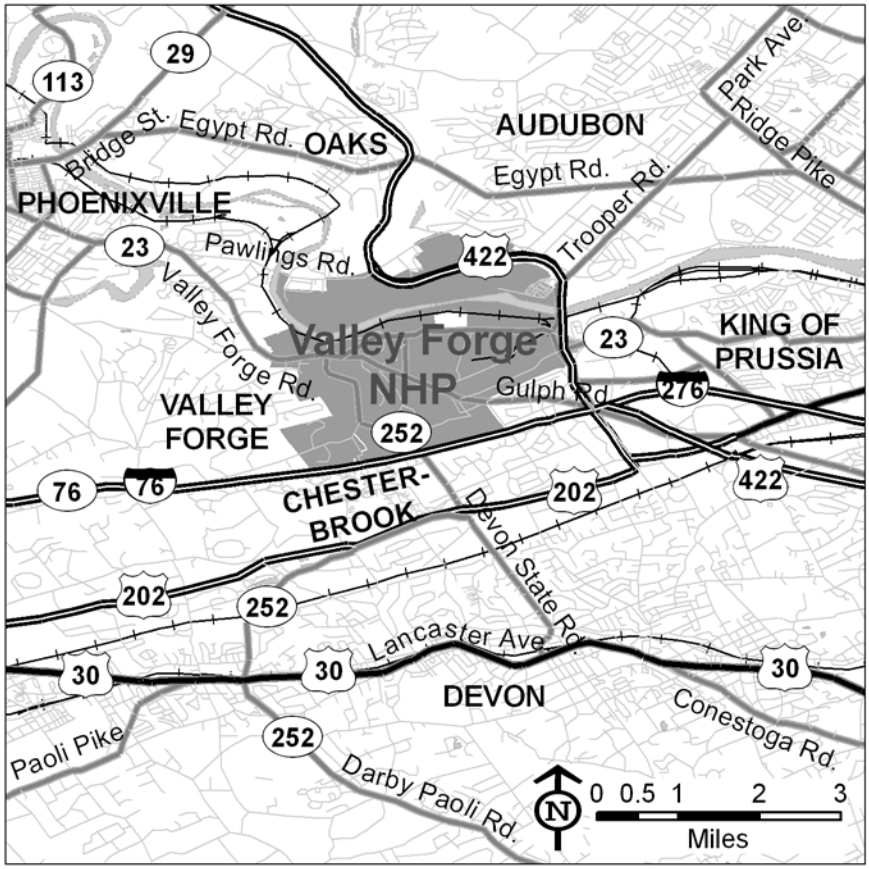
Even if you have not visited Valley Forge National Historical Park, your feedback will assist the National Park Service when considering community involvement there and at other parks in the future.

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 Valley Forge National Historical Park as “Valley Forge NHP,” or “the Park.”

By Valley Forge National Historical Park, we mean the area shaded in gray on the map.



YOUR EXPERIENCES WITH VALLEY FORGE NATIONAL HISTORICAL PARK, DEER, AND YOUR COMMUNITY

1. Have you ever visited Valley Forge National Historical Park?

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

2. When you visit Valley Forge National Historical Park, 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 Valley Forge National Historical Park?

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 Valley Forge National Historical Park 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 Valley Forge National Historical Park? *Please check one.*

☐ Every visit	☐ Half or more but not all visits	☐ Less than half of visits	☐ Never

6. In the past 12 months, how often have you seen deer in your community near Valley Forge NHP? *Please check one.*

☐ Daily	☐ A few times a week	☐ Weekly	☐ Less often than once a week	☐ Never

7. Please indicate to what extent you agree or disagree with the following statements about Valley Forge National Historical Park and your community.

Valley Forge National Historical Park …

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 Valley Forge National Historical Park or in your community (outside the park), to what extent do you think that deer, in general, are:

Please circle one number for each item.

	IN VALLEY FORGE NHP			IN YOUR COMMUNITY (OUTSIDE THE PARK)		
	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 VALLEY FORGE NATIONAL HISTORICAL PARK?
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 Valley Forge National Historical Park

10. Generally, how do you feel about deer IN YOUR COMMUNITY (outside Valley Forge NHP)? *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 within Valley Forge National Historical Park or in your community (outside the park):

Please circle one number for each item.

	IN VALLEY FORGE NHP			IN YOUR COMMUNITY (OUTSIDE THE PARK)		
	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 the park than in communities outside the park	1	2	3	4	5	9
The local deer herd uses habitat both in the park and in communities outside the park	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 the park would affect communities outside the park	1	2	3	4	5	9
Addressing deer-related impacts in the park would affect me positively	1	2	3	4	5	9
Addressing deer-related impacts in the park 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 the park than in communities outside the park	1	2	3	4	5	9
NPS managers think the local deer herd uses habitat both in the park and in communities outside the park	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 in the park would affect communities outside the park	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 the park 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 <u>IN THE PAST 12 MONTHS?</u>

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 Valley Forge National Historical Park.

Please circle one number for each item.

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

17. How much influence do you think people like yourself can have on the management of Valley Forge National Historical Park? *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 Valley Forge National Historical Park 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 Valley Forge National Historical Park.

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 Valley Forge National Historical Park	1	2	3	4	5	9
Valley Forge National Historical Park is an educational resource for my community	1	2	3	4	5	9
I do not feel welcome at Valley Forge National Historical Park	1	2	3	4	5	9
Valley Forge National Historical Park typically works with local communities for shared purposes	1	2	3	4	5	9
On the whole, the rules and regulations at Valley Forge National Historical Park do not help preserve and protect it for the future.	1	2	3	4	5	9
My community typically does not help care for Valley Forge National Historical Park	1	2	3	4	5	9
Managers at Valley Forge National Historical Park 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 Valley Forge National Historical Park	1	2	3	4	5	9
I usually trust management at Valley Forge National Historical Park 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 Valley Forge National Historical Park 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 Valley Forge NHP?
_____ 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 Valley Forge National Historical Park, please visit:
http://www.nps.gov/vafo/

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Expiration Date: 3/31/2010

APPENDIX B: Factor loadings for data reduction scales

Table B1. Factor loadings for 9-item values of VFNHP to communities scale.

"VFNHP…"	Factor 1 (Amenity values)	Factor 2 (Economic values)
makes my community a special place to live	**.716**	.125
provides open space for my community	**.712**	.120
preserves natural resources	**.632**	.224
provides habitat for plants and animals	**.630**	.125
is a place where people in my community spend leisure time	**.558**	.409
plays a significant role in my community	.430	**.590**
attracts tourism dollars to my community	.287	**.767**
helps the local economy	.211	**.720**
increases the job opportunities in my community	-.003	**.806**
% variance explained by factor	40.57	12.84
factor alpha	.732	.760

Table B2. Factor loadings for 9-item scale on perceptions of deer in VFNHP.

	Park scale		Community scale	
"…deer in general are…"	Factor 1 (Natural)	Factor 2 (Harmless)	Factor 1 (Natural)	Factor 2 (Harmless)
behaving normally	**.821**	.219	**.790**	.256
not behaving strangely	**.801**	.199	**.746**	.223
acting naturally	**.789**	.245	**.797**	.218
not acting unnaturally	**.784**	.192	**.805**	.148
not aggressive	.395	**.555**	.467	**.484**
not threatening	.241	**.710**	.321	**.653**
peaceful	.226	**.589**	.273	**.558**
not dangerous	.134	**.806**	.154	**.811**
harmless	.118	**.761**	.083	**.789**
% variance explained	45.81	14.46	45.78	13.40
factor alpha	.845	.785	.836	.735

Table B3. Factor loadings for 10-item scale on concerns about deer in VFNHP.

	Park scale		Community scale	
Potential concerns:	Factor 1 (Damage)	Factor 2 (Other)	Factor 1 (Damage)	Factor 2 (Other)
Deer browsing on naturally growing flowers, trees and shrubs	**.854**	.086	**.839**	.083
Deer browsing on landscaped flowers, trees and shrubs	**.893**	.232	**.908**	.155
Deer browsing on vegetable gardens	**.799**	.272	**.843**	.257
Diseases and/or parasites carried by deer	**.578**	.439	**.623**	.405
Car accidents involving deer	**.577**	.337	**.633**	.291
Having seen unhealthy deer	.236	**.695**	.209	**.689**
Presence of deer feces	.417	**.470**	.480	**.431**
Deer accessing unsecured trash	.180	**.765**	.124	**.788**
Deer interacting with pets	.211	**.815**	.208	**.779**
Deer behavior around people	.225	**.801**	.270	**.775**
% variance explained by factor	49.06	13.17	48.54	14.43
factor alpha	.857	.823	.872	.810

Table B4. Factor loadings for 7-item scale on image of VFNHP management.

"Management at VFNHP typically is…"	Factor 1 (Professionalism)	Factor 2 (Community affiliation)
Knowledgeable	**.879**	.155
Fair	**.843**	.264
Trustworthy	**.693**	.399
Concerned about the public interest	**.668**	.134
Watching out for my community's interests	.409	**.727**
Concerned about my community's well being	.373	**.790**
Unbiased	.030	**.798**
% variance explained by factor	53.84	14.41
factor alpha	.852	.662

APPENDIX C: Nonrespondent-respondent comparison tables

Table C1. Percent of respondents and nonrespondents who have visited Valley Forge NHP by stratum.

Ever visited VFNHP?	Respondent classification	Adjacent Communities		Surrounding Communities	
		n	(%)	n	(%)
No	Respondents	1	0.4	1	0.4
	Nonrespondents	0	0.0	3	6.0
Yes	Respondents	284	99.6	230	99.6
	Nonrespondents	51	100.0	47	94.0
Total	Respondents	285	100.0	231	100.0
	Nonrespondents	51	100.0	50	100.0

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

Visits in past 12 months	Respondent classification	Adjacent Communities		Surrounding Communities	
		n	(%)	n	(%)
0, 1, don't know	Respondents	18	6.5	28	12.3
	Nonrespondents	5	9.8	16	34.0
2-4 times	Respondents	49	17.8	71	31.3
	Nonrespondents	2	3.9	5	10.6
5 or more visits	Respondents	209	75.6	128	56.4
	Nonrespondents	44	86.3	26	55.3
Total	Respondents	276	100.0	227	100.0
	Nonrespondents	51	100.0	50	100.0
Chi-square			6.559		17.414
P-value			0.038		<0.001

Table C3. Percent of Valley Forge NHP 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	
		n	(%)	n	(%)
Daily	Respondents	88	30.8	36	15.8
	Nonrespondents	1	2.0	11	22.0
A few times a week	Respondents	82	28.7	42	18.4
	Nonrespondents	11	21.6	14	28.0
Weekly	Respondents	30	10.5	32	14.0
	Nonrespondents	7	13.7	5	10.0
Less than once a week	Respondents	72	25.2	97	42.5
	Nonrespondents	12	23.5	7	14.0
Never	Respondents	14	4.9	21	9.2
	Nonrespondents	20	39.2	13	26.0
Total respond.		286	100.0	228	100.0
Total nonresp.		51	100.0	50	100.0
Chi-square			65.385		21.688
P-value			<0.001		<0.001

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

Collapsed response categories	Respondent classification	Adjacent Communities		Surrounding Communities	
		n	(%)	n	(%)
No particular feelings/ Enjoy deer without Worry	Respondents	64	23.8	50	23.3
	Nonrespondents	18	35.3	19	38.0
Enjoy deer but worry/ Do not enjoy deer	Respondents	205	76.2	165	76.7
	Nonrespondents	33	64.7	31	62.0
Total	Respondents	269	100.0	215	100.0
	Nonrespondents	51	100.0	50	100.0
Chi-square			2.976		4.579
P-value			NS[1]		0.032

[1] Not significant.

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

Collapsed response categories	Respondent classification	Adjacent Communities		Surrounding Communities	
		n	(%)	n	(%)
No particular feelings/ Enjoy deer without Worry	Respondents	52	19.0	54	24.7
	Nonrespondents	20	39.2	21	42.9
Enjoy deer but worry/ Do not enjoy deer	Respondents	222	81.0	165	75.3
	Nonrespondents	31	60.8	28	57.1
Total	Respondents	274	100.0	219	100.0
	Nonrespondents	51	100.0	49	100.0
Chi-square			10.211		6.581
P-value			0.001		0.010

Table C6. Percent of Valley Forge NHP 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	
		n	(%)	n	(%)
A lot	Respondents	19	6.7	14	6.2
	Nonrespondents	2	3.9	6	12.8
Some	Respondents	133	46.7	132	58.7
	Nonrespondents	11	21.6	8	17.0
Very little	Respondents	112	39.3	61	27.1
	Nonrespondents	23	45.1	17	36.2
None at all	Respondents	21	7.4	18	8.0
	Nonrespondents	15	29.4	16	34.0
Total	Respondents	285	100.0	225	100.0
	Nonrespondents	51	100.0	47	100.0
Chi-square			26.860		37.572
P-value			<0.001		<0.001

Table C7. Percent of Valley Forge NHP respondents and nonrespondents by stratum and response to trustworthiness of VFNHP staff.

Management at VFNHP is typically trustworthy	Respondent classification	Adjacent Communities		Surrounding Communities	
		n	(%)	n	(%)
Strongly disagree, Disagree	Respondents	9	3.6	2	1.0
	Nonrespondents	3	5.9	4	8.0
Neutral	Respondents	39	15.7	26	13.0
	Nonrespondents	25	49.0	24	48.0
Strongly agree, Agree	Respondents	136	54.8	125	62.5
	Nonrespondents	18	35.3	17	34.0
Not sure	Respondents	64	25.8	47	23.5
	Nonrespondents	5	9.8	5	10.0
Total	Respondents	248	100.0	200	100.0
	Nonrespondents	51	100.0	50	100.0
Chi-square			30.273		41.892
P-value			<0.001		<0.001

Table C8. Percent of Valley Forge NHP respondents and nonrespondents by stratum and response to concern about local communities among VFNHP staff.

Management at VFNHP is concerned about my community	Respondent classification	Adjacent Communities		Surrounding Communities	
		n	(%)	n	(%)
Strongly disagree, Disagree	Respondents	38	15.4	16	8.0
	Nonrespondents	11	21.6	6	12.0
Neutral	Respondents	36	14.6	35	17.5
	Nonrespondents	14	27.5	15	30.0
Strongly agree, Agree	Respondents	100	40.7	94	47.0
	Nonrespondents	23	45.1	21	42.0
Not sure	Respondents	72	29.3	55	27.5
	Nonrespondents	3	5.9	8	16.0
Total		246	100.0	200	100.0
		51	100.0	50	100.0
Chi-square			14.432		6.169
P-value			0.002		NS[1]

[1] Not significant.

Table C9. Percent of Valley Forge NHP 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	
		n	(%)	n	(%)
Very unlikely, unlikely	Respondents	128	45.7	137	61.2
	Nonrespondents	35	68.6	32	64.0
Very likely, likely	Respondents	126	45.0	68	30.4
	Nonrespondents	15	29.4	18	36.0
Not sure	Respondents	26	9.3	19	8.5
	Nonrespondents	1	2.0	0	0.0
Total	Respondents	280	100.0	224	100.0
	Nonrespondents	51	100.0	50	100.0
Chi-square			9.898		4.709
P-value			0.007		NS[1]

[1] Not significant.

Table C10. Percent of Valley Forge NHP 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	
		n	(%)	n	(%)
Very unlikely, unlikely	Respondents	136	48.4	141	63.2
	Nonrespondents	27	52.9	29	58.0
Very likely, likely	Respondents	125	44.5	67	30.0
	Nonrespondents	23	45.1	21	42.0
Not sure	Respondents	20	7.1	15	6.7
	Nonrespondents	1	2.0	0	0.0
Total	Respondents	281	100.0	223	100.0
	Nonrespondents	51	100.0	50	100.0
Chi-square			2.000		5.353
P-value			NS[1]		NS

[1] Not significant.

Table C11. Percent of Valley Forge NHP respondents and nonrespondents by stratum and likelihood ofattending 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	
		n	(%)	n	(%)
Very unlikely, unlikely	Respondents	86	30.5	124	55.1
	Nonrespondents	28	54.9	36	72.0
Very likely, likely	Respondents	183	64.9	88	39.1
	Nonrespondents	23	45.1	14	28.0
Not sure	Respondents	13	4.6	13	5.8
	Nonrespondents	0	0.0	0	0.0
Total	Respondents	282	100.0	225	100.0
	Nonrespondents	51	100.0	50	100.0
Chi-square			12.601		6.256
P-value			0.002		0.044

Table C12. Gender of Valley Forge NHP respondents and nonrespondents by stratum.

Gender	Respondent classification	Adjacent Communities		Surrounding Communities	
		n	(%)	n	(%)
Male	Respondents	136	46.9	101	43.9
	Nonrespondents	23	45.1	23	46.0
Female	Respondents	154	53.1	129	56.1
	Nonrespondents	28	54.9	27	54.0
Total	Respondents	290	100.0	230	100.0
	Nonrespondents	51	100.0	50	100.0
Chi-square			0.056		0.072
P-value			NS[1]		NS

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

		n	Mean	Median
Year born	Respondents	513	1949	1951
	Nonrespondents	101	1954	1955
Years lived in community near park	Respondents	527	24.7	21.5
	Nonrespondents	101	21.8	20

[1] Not significant.