
Identifying Capacity for Local Community Participation in Wildlife Management Planning

Case 2: White-tailed Deer Issues at Valley Forge National Historical Park



March 2007

HDRU Series No. 07-3

Prepared by:

Kirsten M. Leong and Daniel J. Decker
Human Dimensions Research Unit
Department of Natural Resources
Cornell University

HUMAN DIMENSIONS RESEARCH UNIT PUBLICATIONS SERIES

This publication is part of a series of reports resulting from investigations dealing with public issues in the management of wildlife, fish, and other natural resources. The Human Dimensions Research Unit (HDRU) in the Department of Natural Resources at Cornell University studies the social values of wildlife, fish, and other natural resources and the application of such information in management planning and policy. A list of HDRU publications may be obtained by writing to the Human Dimensions Research Unit, Department of Natural Resources, Fernow Hall, Cornell University, Ithaca, NY 14853, or by accessing our World Wide Web site at:

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



This report is available electronically at: <http://www.dnr.cornell.edu/hdru/PUBS>

EXECUTIVE SUMMARY

This project, supported by a cooperative agreement between Cornell University and the National Park Service (NPS), studies human dimensions of issues related to white-tailed deer and their management in the Northeast and National Capital Regions of the NPS. The research project consists of three phases. During Phase I, interviews were conducted with NPS natural resource managers and staff to describe the deer situation in northeastern parks and develop an approach for subsequent inquiry. In Phase II, interviews with public participation practitioners were completed to determine how public participation and civic engagement methods fit within NPS wildlife management. Phase III involves two types of studies with specific parks: Phase IIIA, interviews with local community residents, and Phase IIIB, a mail survey of local community residents. This report details Phase IIIA research conducted at Valley Forge National Historical Park (VFNHP), in southeastern Pennsylvania.

Interviews with local community residents 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. Two types of interviews were conducted. Type A interviews were in-depth, semi-structured, open-ended interviews with known stakeholders and influential community residents. Type B were brief interviews with residents intercepted in local gathering places. Type A interviewees included: township board members, park neighbors who regularly contacted VFNHP, archery club representatives, representatives of groups against lethal deer management, and individuals representing other organizations in the area (both private and public) who had experience with deer management on their property. Type B interviewees included: additional township board members, adjacent park neighbors, park visitors who lived in the surrounding area, and local business owners.

Interviewees identified multiple contributing factors to controversy about deer management at VFNHP, including: concerns about primary impacts from deer, concerns about deer themselves, and concerns about potential management actions. Important primary impacts from deer included deer-vehicle collisions, vegetation damage, and wildlife viewing opportunities. In addition, interviewees identified characteristics of deer that they believed resulted in these impacts: population size/density, home range and movements, and behavior. Finally, concerns about potential management actions included how long it would take to see effects and the geographic scale of management necessary to reduce primary, as well as collateral, impacts.

Most interviewees adopted the problem frame used throughout the greater Philadelphia area: “too many deer.” This simplification of the problem led to arguments for and against management alternatives to reduce the populations; however, the specific aspects of population reduction objectives (e.g., which negative impacts were of interest, how soon improvements should be experienced, etc.) were not articulated. Future discussions that reframe “deer management” beyond a one-dimensional focus on the appropriate number of deer may result in more constructive dialogue. Indeed, many interviewees identified anthropogenic factors, especially residential and commercial development and resulting loss of natural habitat, habitat fragmentation, and creation of artificial habitat as more important to address than deer *per se*.

Attention to clearly articulating and reaching agreement with stakeholders on the dimensions of both problem frame and solution frame (not specific solutions, but acceptable scope of solutions) may help avoid disagreement over appropriate means to achieve management goals. Input from stakeholders may assist managers in refining the problem and solution frames to reflect more accurately local conditions.

Deer issues were described as one of the more prominent local community concerns in the Valley Forge area, and many interviewees believed that deer populations could only be effectively managed on a landscape scale. These observations indicate the importance of including local stakeholder input and coordinating with communities when planning for shared effects from management of natural resources, such as deer. However, interviewees indicated a number of communication needs for effective public input: improved understanding about NPS management policies and VFNHP's specific purpose; improved credibility of park staff; and improved awareness and knowledge of NPS planning processes and facts related to deer issues. Including efforts to address such needs likely will require a more long-term, proactive approach to public participation, of the type described in recent NPS policies. While certain episodic, issue-specific public participation efforts are needed to fulfill legal mandates, an approach that views ongoing dialogue with local communities as an integral part of park management may help improve the substance of decisions, as well as build relationships, identify potential partners, and fulfill NPS mandates for civic engagement. For long-term, regional management issues (such as deer management) this broader, relationship-based approach to public participation may improve the ability of NPS to successfully implement actions.

ACKNOWLEDGMENTS

We are grateful to the local community members who made this study possible by sharing their insights and experiences, as well as commenting on drafts of this report. We also thank Natural Resource Management staff at Valley Forge National Historical Park for assistance in study design, facilitating entry into local communities by providing initial contacts, and manuscript review. In addition, we thank NPS Regional Chief Scientists of the Northeast Region for their roles as advisors to the project and for manuscript review. Staff of the National Park Service Biological Resource Management Division and Cornell University Department of Natural Resources also provided ongoing guidance on the project and input on drafts of this report.

Funding for this study was provided by the National Park Service Biological Resource Management Division, NPSDOI ID CA 4560C0047, OSP# 43138/A001 and by the Cornell University Agricultural Experiment Station federal formula funds, Project Number NYC-47433, received from Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture. The opinions, findings, conclusions or recommendations expressed in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government.

This study was approved by: Cornell University UCHS Protocol ID# 04-04-043, approved 6/23/2005; OMB Approval #1024-0224 (NPS #05-047), Expiration Date: 06/30/2006, and; Valley Forge National Historical Park, research permit number VAFO-2005-SCI-0003, Expiration Date 12/31/06.

TABLE OF CONTENTS

Executive Summary	i
Acknowledgments.....	iii
Table of Contents.....	iv
List of Figures.....	v
Introduction.....	1
Valley Forge and deer.....	3
Methods.....	5
Findings.....	6
Deer-related impacts to VFNHP and to local communities.....	7
Impacts to deer.....	8
Problem framing.....	11
Collateral impacts from stakeholder-identified potential management actions.....	14
Other local community concerns.....	16
Community affiliation with and image of VFNHP.....	16
Perceptions of public participation.....	20
Discussion.....	22
Literature Cited.....	26
Appendix A. Resources for Additional Information.....	28
Appendix B. Interview Guiding Questions.....	29

LIST OF FIGURES

Figure 1. Map showing the location of Valley Forge National Historical Park	4
Figure 2. Components of deer-related issues, as collectively described by interviewees	23

INTRODUCTION

This research project examines 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 consists of three phases:¹

Phase I: A web-based survey and semi-structured in-depth discussions with NPS natural resource managers and staff were used to 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 will be the focus of future inquiry (for full report, see Leong and Decker 2005).

Phase II: In-depth semi-structured interviews with 20 public participation practitioners were completed 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. A manuscript based on these interviews currently is in progress.

Phase III: Conduct studies with specific parks. **Phase IIIA:** 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. **Phase IIIB:** Scheduled for implementation in 2007 (pending approval by the Office of Management and Budget), this phase employs a mail-back survey to NPS managers and residents of communities near parks. The survey is designed based on results from Phase IIIA to describe and understand the differences in values and assumptions of NPS managers and stakeholders with respect to deer issues, and suggest how NPS staff might utilize this understanding to enhance management practices. In addition, the survey will help determine whether the perspectives of Phase IIIA

¹ For more information and copies of project reports, please contact the Human Dimensions Research Unit or visit our project website: <http://www.dnr.cornell.edu/deerpeopleparks>.

respondents are representative of a random sample of local residents and whether responses differ for parks with longer histories of deer impacts.

This report focuses on results of Phase IIIA inquiry.

The goal of Phase IIIA in this research project is to gain an in-depth understanding of a variety of stakeholder beliefs and attitudes regarding deer-related impacts. Impacts are the socially-determined important effects (e.g., ecological, economic, psychological, health, and 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).

White-tailed deer have been a major concern in park units of 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 (for example: 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 neighboring 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.

While park management decisions ultimately are made by NPS, such decisions 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 2000:12). 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 2003a: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 2000:12). 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 2000, 2003a). Federal agencies also are required to engage stakeholders whenever any action is considered that may significantly impact the environment (National Environmental Policy Act 1969). In addition to these policy directives, a growing body of literature recognizes the role of deliberative stakeholder engagement in resolving conflicts, improving the quality of decisions, and building relationships (for example, 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.² This phase of research examined the values and attitudes of residents living in communities near parks, i.e. those who had potential to experience direct impacts from deer or deer management at parks.

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; three sites were ultimately 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, represents a park with a long history of deer issues and experience with outreach activities with communities and visitors about deer. Valley Forge National Historical Park (VFNHP), in southeastern Pennsylvania, represents a park with a long history of deer issues and limited public outreach activities about deer. Prince William Forest Park, in Virginia, represents a park 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.

This report details experiences at Valley Forge National Historical Park.

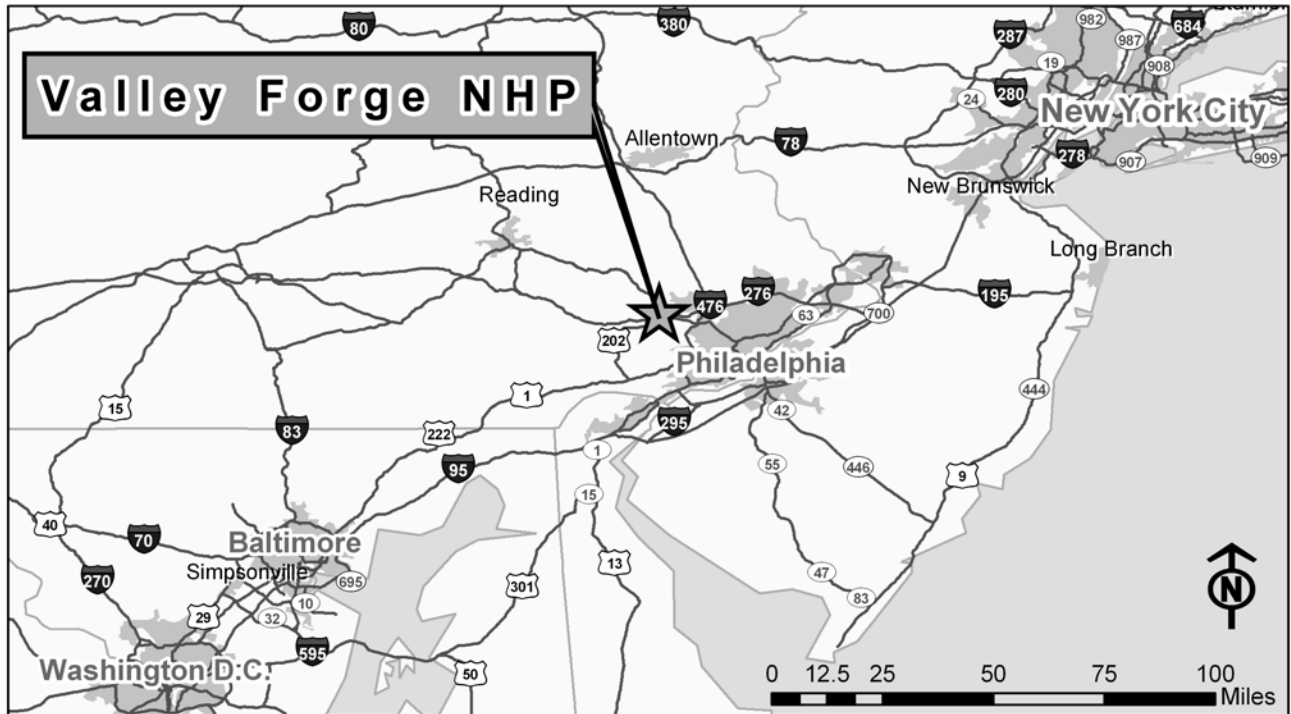
Valley Forge and deer

Located approximately 20 miles northwest of Philadelphia (Figure 1), VFNHP was the site of the 1777-78 winter encampment of the Continental Army under General George Washington. 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 1983 and indicated a relatively small deer population (165-185 animals) and no impacts to vegetation; the habitat condition was described as "excellent," no browse line was evident, and vegetation damage on adjacent lands was reported as insignificant (National Park Service 2006). Negative impacts from deer browse were not noted officially 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 impacts from deer they associate with VFNHP, just as VFNHP experiences impacts from deer that use local communities.

² The NPS currently administers many different types of units, one of which is National Park. However, for convenience, the term "national park" will be used throughout this paper to refer to any unit administered by the NPS, regardless of actual designation.

Figure 1. Map showing the location of Valley Forge National Historical Park (VFNHP), Pennsylvania.



The degree to which impacts from deer warrant management action depends on a park's mission and management policies. VFNHP's current General Management Plan (GMP), written in 1982, does not address status of natural resource values (National Park Service 2003b). Since that plan was adopted, both natural resource condition and NPS policy have 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. Recent NPS Management Policies (2000) also recognize that natural resources in parks are inherently important, regardless of park designation. In addition, each of the action alternatives in VFNHP's new draft General Management Plan/Environmental Impact Statement (GMP/EIS, currently in preparation) include a natural resources objective "...to preserve and restore the natural abundances, diversities, dynamics and distributions of native plants and animal populations within forested and other naturally occurring communities (such as wooded wetlands)" (National Park Service 2003b:2). If this natural resources objective is adopted in the final GMP/EIS, a follow-up implementation plan regarding biological resources will be developed. In 2006, VFNHP initiated a White-tailed Deer Management Plan/EIS. A notice of intent was published in the Federal Register and public scoping meetings are scheduled for early November 2006.³ Articulation of a park's management objectives (based on NPS policy, park enabling legislation and planning documents such as GMP's) is necessary to assess the degree to which impacts from deer affect these objectives, either negatively or positively.

³ For additional resources on VFNHP and deer, see Appendix A.

While biological studies can help assess physical impacts to the environment, sociological studies are necessary to determine impacts to stakeholders. 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

To become familiar with the physical setting and better understand the perspective of local community residents, the senior author resided in the Valley Forge area from October 6-23, and November 11-12, 2005. A qualitative, inductive, interview-based approach was used to discover more detailed, in-depth understanding about a few key classes of local community perspectives than would be expected from a quantitative survey instrument. These interviews provide insights into the deer situation at VFNHP and nearby areas, and inform development of the instrument to be used in the mail survey for the subsequent, quantitative, phase of inquiry (IIIB). Such interviews often are used to reveal the scope of an issue in a community and to provide richer understanding of various perspectives. The qualitative nature of these findings does not permit inferences about the proportions of members of the community who hold particular views. To achieve that ability requires random or systematic sampling, as will be used in Phase IIIB, the design of which will be informed by results of this phase (IIIA) and will provide statistics that describe the populations of concerns.

Two types of interviews were conducted in and around VFNHP. Type A were in-depth, semi-structured, open-ended interviews with known stakeholders and influential community residents (N=20). Type B were brief interviews with residents intercepted in local gathering places (N=42). Community leaders, local homeowners, and long-time residents were purposefully targeted (not randomly selected) as subjects because this study focuses on local community participation in management planning. Thus, subjects should not be considered a random sample representative of the general public. Interviewees were asked about their experiences related to deer and deer management in and around VFNHP, the role of VFNHP in deer and other wildlife management, and the influence of public input in wildlife management at VFNHP (Appendix B).

For Type A interviews, subjects were identified through snowball sampling (Babbie 2003). This method ensured that community leaders and individuals with known stakes in deer issues were included in the study. First, NPS natural resource managers identified individuals with whom the park had regular contact related to deer or other natural resource issues. Interviews were conducted with these individuals, who were then asked to identify other influential local residents as potential subjects, whether or not those individuals typically interacted with the NPS. The sample reached saturation when the same individuals were named repeatedly. Subjects were interviewed either individually or in groups at a day/time/location that was most convenient and comfortable for the subject(s). Face-to-face interviews were preferred, but telephone interviews were used when necessary based on interviewee schedule and

preference. Interviews lasted from 30 to 120 minutes; the majority (65%) were audio recorded and later transcribed by one of three transcriptionists. All transcriptions were checked for accuracy by the senior author. Some interviewees preferred not to be audio recorded while others could not be recorded effectively due to environmental conditions (e.g., wind, background noise, etc.). For interviews that were not audio-recorded, hand-written notes were taken during the interview and detailed notes were written up as soon as possible following the interview (usually within one day).

For Type B interviews, participant-observation (i.e., observation in which the researcher both observes and participates in the setting, Emerson 2001) and information from Type A interviews were used to identify informal gathering places in the area (e.g., recreation sites, community events, cafes and quick-service restaurants, retail sites). Local residents encountered at these locations were approached randomly to participate in face-to-face interviews, which typically lasted 15-20 minutes. Only three of these interviews were audio recorded due to environmental conditions. Hand-written notes were taken during the interviews and detailed descriptions were written up as soon as possible following the interview (again, usually within one day).

Unlike quantitative research that emphasizes numerical data, qualitative research examines "...things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them" (Denzin and Lincoln 2000:3). Thus, interview transcripts and notes are the "data" (Miles and Huberman 1994). Interview transcripts and notes were coded for themes using ATLAS.ti (version 5.0, Scientific Software Development GmbH, Berlin). An iterative process was used to generate codes based on themes that emerged in the interviews. That is, segments of text in the first interview were assigned thematic codes as they emerged. Each of these codes was then applied to text from the second interview. If the second interview introduced new themes, they were then added to the coding scheme. When new themes were added, previous interviews were re-scored to assure that codes were applied uniformly. Themes and topic areas were linked and quotes were sorted to reveal key concepts and to capture emergent relationships between themes.

FINDINGS

A total of 76 subjects were interviewed individually or in groups (N=62 interviews). No subjects refused interviews, although a few requested alternative times, not all of which were able to be accommodated. Interviewees' average age was early 40's, with the average tenure of residency approximately 20 years. Type A interviewees included: township board members, park neighbors who regularly contacted VFNHP, archery club representatives, representatives of groups against lethal deer management, and individuals representing other organizations in the area (both private and public) who had experience with deer management on their property. Type B interviewees included: additional township board members, adjacent park neighbors, park visitors who lived in the surrounding area, and local business owners. Interviewees believed that most people who care about and visit the park regularly come from within a 20-30 minute driving radius, which was reflected in the residence of many Type A interviewees as well as Type B interviewees encountered in the park.

Deer-related impacts to VFNHP and to local communities

When asked about deer and deer management at Valley Forge National Historical Park, interviewees identified common deer-related impacts. For interactions involving deer and humans, deer-vehicle collisions was the pervasive concern. Many interviewees also reported positive impacts provided by wildlife viewing opportunities. Almost all Type A interviewees mentioned negative effects of deer browse on native vegetation, ecosystem health, and/or biodiversity, which typically are concerns to NPS managers (Leong and Decker 2005). In addition, many Type A interviewees identified negative impacts from deer on landscaping and gardens. Other less commonly identified impacts included concerns about Lyme disease and ticks, economic concerns, and negative reactions to prevalence of deer feces.

Interviewees identified many more types of negative impacts than positive impacts associated with deer. However, not everyone used the same standards of frequency or magnitude of interactions to determine negative impact. For example, many people experienced deer browse but did not consider it a negative impact: "...the deer don't bother me. If the deer eat my plants down, I replace them. It's part of nature" (VA6).⁴ The numerous types of negative impacts often were weighed almost equally against the one positive impact, wildlife viewing:

"It's a mixture of both: positive, it's nice to look at and see wild animals; negative, there are problems in yards, a lot of deer claims with car accidents" (VB33).

Most believed that other types of stakeholders had uniform attitudes about deer that depended on their personal values and previous experiences with deer:

"Hunters want deer, people with property and flowers don't" (VB19, R2).

"I would think there would be polarized people. The 'tree huggers,' for lack of any better term, who only care about the impact for the deer, and the people with no aesthetic concerns, more mundane, who want to keep car accidents down" (VB30).

Yet, many were internally conflicted about deer:

"There are too many. And I love them. They're all over" (VB3).

"I really value their presence to some extent. I think you would really be missing a lot without them. But the numbers out here are way too high...I think that they have a valuable contribution to the ecology. The fact that they're animals, that there *are* animals is important. That there *are* deer. There are a lot of cities that don't have deer" (VA19, R2)

⁴ Numbers and letters in parentheses denote interview identification codes. The first letter indicates the study site (V=VFNHP), the second letter indicates Type A or Type B interview, and the number indicates interview number. For group interviews, individual respondent is indicated following the id code (R1=respondent 1, R2=respondent 2, etc.).

Only one type of positive impact was identified by interviewees: positive emotional responses to viewing deer. Yet, these emotions enhanced their entire experience with VFNHP:

“...they add a certain beauty to the surrounding scene. I can’t help but as I’m driving down the road and seeing the deer graze off, it’s a pretty sight” (VA5).

“It makes you feel like you’re out in the middle of wilderness, more so than geese, squirrels or fox. Deer makes it a more friendly environment” (VB4).

“I like the deer, that’s another reason why I come here...They’re nice to be around. All they want to do is eat, they don’t seem to bother anybody. It adds to the enjoyable experience” (VB5)

“...they make it look more like nature, I enjoy the park more, it’s more tranquil and peaceful” (VB29).

Interviewees also spoke of positive associations with viewing deer as a norm; i.e., a standard that everyone could agree on:

“...the only positive thing about it is the fact that...deer are a beautiful animal and everybody loves to view wildlife like that” (VA12).

“...I kind of look at them as a positive impact on the park. Most visitors don’t want to go to a sterile environment; they’d rather see the wildlife there” (VA8)

Impacts to deer

In addition to impacts on people or resources of VFNHP, interviewees described (and were concerned about) impacts to deer. Many were concerned about deer in poor body condition or with injuries from deer-vehicle collisions:

“...I feel sorry because they look underfed and I worry about them during the winter...so I’m really probably more worried about their well-being than their nuisance quality, although I have to live with it too” (VA5).

“...quite frankly we find deer running around the area in bad condition all the time...their broken legs and festering wounds from serious accidents with vehicles, that fortunately for them they survived, but they’re going to die from it sooner or later” (VA7).

Negative responses to seeing unhealthy or injured animals also were described normatively:

“...seeing that many deer and seeing unhealthy deer, or crippled or wounded deer... nobody wants to see that” (VA12).

Anthropogenic factors such as human population growth and land development often were described as the ultimate source of deer issues. Many interviewees perceived human-deer

interactions as a symptom of broader ecological disruption (e.g. habitat loss, fragmentation) that concentrated deer in undesirable locations:

“Development has created the problem, we, mankind has developed the problem. The deer are doing their best to survive, they’re coming back at us and eating our shrubbery. What are they supposed to do, lay down and die?” (VB10).

“We’re choking out the whole landscape by building up developments. There’s nowhere for them to go” (VB39).

“I usually see herds. It wasn’t like that when I was a kid. A couple of new developments were built, that’s when I noticed the difference. I attribute it to human encroachment. The zoning around here is out of control. There’s too much development bordering the park” (VB19, R1)

Some local groups have organized around development issues, either to prevent new development such as stores and luxury apartments, or to restore abandoned buildings or railroad right-of-ways for wildlife habitat. Interviewees were members of organizations such as the Sierra Club and Pennsylvania Wildlands Recovery Project or have their own foundations and are interested in restoration projects.

A few interviewees also recognized that suburban landscaping creates habitat for deer, again in undesirable locations:

“Around here they’re all habituated to humans and we’ve created more habitat, more browse...we created a niche for them, it’s a manmade niche, more than loss of open space, in my view” (VA19, R1).

Essentially, interviewees identified human population growth, migration, and changes in land-use practices on a regional scale as creating a local situation where deer and humans come into contact more frequently because the most suitable habitat for deer is in locations where deer are not “supposed to be” (VB6).

Another prominent theme was habituation of deer. In wildlife management, habituation is defined as a reduction of response to a repeated, inconsequential stimulus, usually resulting in loss of fear response to people (McCullough 1982, McNay 1998). Interviewees noted not only decreased fear response:

“...I think in the four and a half years that I’ve been here they have become more immune to cars, and traffic, and people and so forth” (VA5).

“They’re not afraid of people at all. They’re not afraid of cars at all. They stand right there” (VB24).

but also other behavioral changes:

“The deer here...the people who walk the trails, those deer will stop 80-90 yards away and watch those people clear and then continue on their beeline. That doesn't happen in the real wild. These deer are used to seeing people” (VA2).

“They know they're protected, they stay in the boundaries” (VB24).

“Deer in the park see a car stop and they look at you. They wait for you to wave them on” (VB33).

In addition, interviewees used language to describe deer that typically would be reserved for domesticated, not wild, animals:

“My husband was out back hitting golf balls and the deer didn't run away, they would go up and sniff the golf balls. They're tame. My dog doesn't chase them anymore” (VB37).

“I often see them at the side of the road feeding. They're very friendly, they almost wag their tails like dogs” (VB28).

Most interviewees did not associate positive or negative values with habituation, although the language used sometimes implied habituated deer were beginning to be viewed as pest species:

“The animals themselves get a little brazen where they're not very spooked by people” (VA7)

“...this area [of VFNHP] here is just terribly infested. And that's where they come from when they come into our community at night” (VA4)

“...they come right up next to you, next to your car. They're not afraid. I call 'em rats. When you drive into the wilderness, up in the mountains, you know there are deer there...but [you] see more signs of them. You don't see numbers like you see in the park” (VB27).

Other interviewees made this association more directly, and again attributed the change in wildlife behavior (and concomitant change in human values towards them) to anthropogenic activities:

“We make deer, geese, bear, turkey into rats. We've made them into species that follow human development and then come into human conflict. We're turning deer into pests. When people first get deer, they value them: aesthetics, sign of healthy environment. Then they become a deer-hater” (VA20).

“I'd like to see deer tied to the Canada goose issue. They are exactly the same. Exactly the same...the resident non-migratory Canada goose problem...Canada geese are not nature. They're a manmade subspecies and we have created a habitat just like the deer, so it's an identical issue” (VA19, R1).

“I was someone who grew up in a city, I grew up in New York City so I am one of those people who used to see the deer as beautiful and wonderful and special, but I’ve now come to see them as vermin. The wolves are gone, so they’ve been released, they’re out of control” (VA19, R3).

Many interviewees believed that humans were responsible for both habitat change and habituation of wildlife, which resulted in interactions between humans and wildlife. They then concluded that humans were responsible for mitigating the conflicts that arose from these interactions:

“...the problem is that our intervention into these systems is unbalancing the systems and we’re kind of stuck with the responsibility for what we’re doing” (VA1).

“We created the problems and we need to take more responsibility to deal with them...productive long-term solutions” (VA18).

Problem framing

In framing deer issues at VFNHP, interviewees often referred to the history of hunting or culling to reduce deer in parks, townships, and neighborhoods throughout the region. A number of neighborhoods that abut VFNHP and other types of nearby private landowners have been working with archery clubs to reduce deer; township parks, state parks and city parks in the Philadelphia region have utilized public hunting as a management tool, and; other city parks have worked with private contractors to cull deer. Most interviewees were well aware of these events through media coverage and word of mouth, and individuals and groups have organized to oppose lethal forms of management. As a result, many assumed the question was whether or not VFNHP would allow a public archery season. This assumption resulted in many interviewees listing arguments to support positions for or against various forms of population control. Very few interviewees realized that public hunting is not allowed under VFNHP enabling legislation and that it would require an act of Congress to change this policy. When this fact was explained, a number of interviewees who had been advocating public hunting changed their arguments to support direct reduction using qualified agency personnel.

Even though interviewees were concerned about impacts from deer, most discussions centered on attributes of deer. Interviewees described three dimensions of deer biology that contribute to perceptions of a “deer problem” in and around VFNHP: high numbers of deer, in undesirable locations, acting differently than wild deer. Probably due to regional history, when problems were framed in terms of deer, they were almost always described with respect to the first dimension (deer numbers). The other two dimensions (deer location and behavior) were observed and described but were rarely articulated as factors that could be affected through deliberate management action. In addition, many interviewees indicated a belief that action did not need to be taken related to deer or deer-related impacts. Consequently, most of the dialogue about VFNHP responsiveness to deer concerns centered on whether or not the population of deer needed to be reduced and appropriate means to do so.

Likewise, discussions about management alternatives were almost exclusively about different forms of population control: hunting (unspecified or non-archery hunting methods, mentioned in a majority of the interviews), direct reduction by agency personnel or contractors, reproductive control, and bow hunting. Management alternatives that also directly influence impacts of concern were mentioned less frequently and included: speed control, fencing, planting alternative species, repellents, and wearing appropriate clothing to protect against ticks. One interviewee suggested building wildlife overpasses that would allow deer to move across the landscape without presenting safety risks to motorists.⁵

Interviewees perceived that numbers of deer were too high because of impacts they experienced. Yet, for the most part, beliefs about the success of different management alternatives were based on whether deer numbers were affected, not whether adverse deer impacts were affected. Framing the problem around numbers of deer resulted in interviewees taking positions about (1) the appropriate numbers of deer in the area and (2) preferred management solutions that often pitted one group of stakeholders against another (i.e., hunters who desired opportunities to assist in population management vs. people who desired lethal control but were concerned about safety from unknown hunters vs. people who did not support any form of lethal control). Different interviewees desired different outcomes from management action, resulting in arguments over whether or not different management alternatives “worked.”

Many interviewees had different ideas about the expected time frame or scale of population reduction that was desired and wrongly assumed that others were using the same metrics of success. Sometimes the same argument was used both for and against different management alternatives:

“The Game Commission has a vested interest in hunting. It creates business for them. I don’t think it effectively reduces the herd. It’s like cutting grass, it keeps growing back, you have to keep cutting it” (VA14, anti-hunting activist).

“People think that you do it only once and it’s done. You got to get your hair cut every couple months, it’s the same thing. You have to have a sustained pressure and you have to keep at it” (VA12, urban archery club member).

“When we first started, it was on the news every night, there were protestors. Now we can’t get the media to cover it, and we want media coverage...It’s become routine, non-eventful, a non-story. It’s as routine as maintaining the grass and trimming the trees” (VA17, public land manager of a park reducing deer).

“In Fairmount they’re doing hunting. They were a good candidate for [reproductive control]. You should go with a non-violent solution if you have one. They decided to go with a more violent option. Hunting has to be every year. If you have to do it every year, you might as well do something safer” (VB34, proponent of reproductive control).

⁵ Wildlife overpasses and underpasses have been used successfully in many other urbanizing areas. For more information, see the U.S. Department of Transportation Federal Highway Administration webpage “Criticter Crossings” (<http://www.fhwa.dot.gov/ENVIRonment/wildlifecrossings/main.htm>).

In addition, some interviewees viewed deer as a source of impacts:

“[If the] mission is to improve the biological health of the park...then certain things are going to be necessary. I mean hey, if you’ve got a cold you’d want to kill those cold germs too” (VA3).

while others saw increased deer populations as a symptom of broader ecological disruption:

“I mean it’s kind of like stopping a dripping faucet. By catching a few drops and thinking it will be over...well no, it’s going to continue to drip” (VA5)

Sometimes, different beliefs about metrics of success led proponents of one form of population control to dismiss other alternatives outright. For example, among interviewees who desired an immediate dramatic reduction in population, reproductive control was not a logical option:

“It’s never been shown to work in a free-ranging population, with population level effects, in a situation that was not experimental. Will it result in abatement of issues you originally got involved within a reasonable time frame?...Who wouldn’t support solving the problem without hurting deer?...I’m critical of surveys that ask ‘would you rather have lethal control or reproductive control?’ It’s like asking ‘would you rather go to grandma and grandpa’s or take a rocket trip to the moon?’” (VA20).

On the other hand, interviewees who were less concerned about the time frame of reduction argued against hunting:

“To me, hunting is the problem, not the solution. With all the hunting going on, why is the herd increasing?...why do it if it’s not working? I don’t think it has produced better results than PZP.⁶ No one will convince me it’s morally or scientifically right. And don’t try to use the excuse that it’s an American tradition. Witch burning was a tradition once too” (VA14).

Thus, the way the problem is framed (e.g., whether the focus is on impacts or on deer, the dimensions of deer biology that are considered, and the time frame and geographic scale used to determine success) has implications for determining reasonable solutions. In some instances, problem framing led interviewees to believe there was only one reasonable alternative:

“The only effective way to significantly reduce the number, and those words are important, to SIGNIFICANTLY REDUCE THE NUMBER of deer is through sharpshooters” (VA17).

In this case, time frame, level of desired population reduction, and safety concerns were implied but not explicitly stated.

⁶ Porcine zona pellucida, used experimentally for immuno-contraception.

Collateral impacts from stakeholder-identified potential management actions

Interviewees were not asked specifically about potential management actions⁷ because VFNHP had not yet defined the specific parameters of their deer concerns at the time of these interviews. Problem definition is necessary to determine which potential actions might be considered. Interviewees often were unaware of federal management policies or assumed that, despite the unique purpose of VFNHP, the problem frame applied there would be the same as that used in city, state, and township parks in the Philadelphia region. Consequently, their responses often described opinions of management actions used throughout the region. Many positions about management alternatives appeared to be adopted because of concerns about collateral impacts; that is, impacts that result not from deer but from the management actions that are taken in response to deer impacts. For example:

“...no, I’m not against thinning the population out. I’m not so sure that those people that come in to do that in the areas that they can are doing it in the right manner” (VB6).

The management alternatives mentioned most frequently (hunting, direct reduction by agency personnel, and reproductive control) were associated with a variety of negative collateral impacts, including: public safety (often associated with distrust of hunters), fairness to both people and deer, and the amount of time it would take to reduce impacts from deer. Again, these collateral impacts often were used to support positions against potential management alternatives.

While some interviewees were morally opposed to lethal control, lethal alternatives generated concerns about a number of other collateral impacts that were more widely shared. A universal concern for any form of lethal control was public safety. Members of archery clubs working with neighborhoods defended their ability to hunt safely and ethically, while providing a service to communities that sought their assistance. Proponents of direct reduction by agency personnel used safety as an argument against allowing hunters to participate in population control. Opponents to any form of lethal control expressed safety concerns to bolster their position. In each of these cases, interviewees offered similar stereotypes about hunters to support their arguments:

“When I picture idiots running around with guns, it gives me the willies” (VB21, R2, resident of surrounding community).

“Their problem is they’re afraid some idiot will shoot a shotgun and a shell will go in a neighborhood and kill somebody’s kid and I can understand that. That’s a real fear” (VA4, near neighbor who allows archers on property).

“...the other thing is the professionalism of the sharpshooters themselves. They’re out there to do a job. They’re not out to go hog wild in killing” (VA3, public land manager of a park reducing deer).

⁷ In some instances, when interviewees chose to discuss management actions, follow-up questions about potential management actions were asked to clarify their responses.

“...most of the clubs that hunt here are pretty good clubs. They’re not a bunch of just rooty-gazooty guys who come up and hunt. They’re serious” (VA2, archery club member).

In addition to general safety concerns, there were other concerns about utilizing hunters for population reduction. Interviewees often did not distinguish between recreational hunters and members of urban archery clubs, who have specific standards of conduct unique to the urban setting. Many interviewees also were distrustful of hunters and hunter motivations:

“I guess my preference would be non-lethal, then sharpshooters, then local guys. That’s mostly a safety issue. And I feel that sharpshooters would be more focused on keeping it in balance than keeping it on a fireplace on the mantle, they would be more likely to kill the does than the bucks” (VB36).

“There’s not enough communication to know what kind of people are sitting on the sheds. And they’re up in the stands all day, they see you come and go on your own property, you don’t know what kind of people they are” (VB37).

A few interviewees were concerned that children might see wounded or dead deer. Some believed that allowing hunting increased poaching activity, although others believed that the presence of legitimate hunters discouraged poachers. Some also believed it would be unfair to other park users and taxpayers to close the park for hunters.

Additional collateral impacts of direct reduction by agency personnel also included concerns about fairness of closing the park to other users for safety reasons. In addition, hunters believed that using agency personnel would be unfair to hunters:

“...hunting for deer [is] part of our rights. Hunting as conservation is a part of our right also. When they [use agency personnel], what are they doing? They’re taking animals out just to take animals out” (VA2).

as well as unfair to deer, from the perspective of fair chase:

“Sharpshooters are the easy way out. It’s a slaughter” (VA15).

Hunters also believed that they could provide a free service while agency personnel would be more costly to taxpayers.

Few collateral impacts of reproductive control were identified, probably because it has not been tried near VFNHP and interviewees had limited knowledge about it. One interviewee was concerned about potential long-term environmental effects. Some were unsure that reproductive control would be effective at reducing primary impacts:

“What are you going to do? Go out and castrate the deer and how many times can you do that? And in the meantime, if they’re still out there then we’re still hitting them and

they're still on people's property and they're still crapping on the property and bringing Lyme disease onto your property...All these things still exist" (VA7).

Others were concerned about the amount of time it would take to reduce primary impacts using only reproductive control. Whether this longer time frame is perceived as a collateral impact or as a reason to dismiss reproductive control as a reasonable management alternative depends on the criteria used to define the management problem.

Other local community concerns

To situate the relative importance of deer issues, interviewees were asked to identify other local community concerns involving VFNHP. Few local community concerns were identified. For those who identified concerns, traffic congestion, recreational and open space needs, and management of deer issues were most prominent. Concerns about development and ecological issues related to the park also were mentioned to a lesser degree.

Community affiliation with and image of VFNHP

In general, interviewees spoke of VFNHP as a valuable resource to the community that provided a variety of recreational opportunities, aesthetic and meditative qualities of open space, historical resources, and economic benefits to surrounding communities. Interviewees summarized:

"I think that the park has a dense number of people who come there for all kinds of celebrations. It's the birthplace of the Republic. There's all kinds of people who come there purely to walk and run and slide down the hills in the wintertime and have picnics and it's just, it's a great treasure for the area" (VA1).

"All of these parks are so important to people anymore...People need escape, connection with nature. They're working constantly, [they can] get out, walk, it's good for the mind and body" (VB41).

"I would love to say that the park gives us a lot. I'm not thinking they do, you know? But...the people in this area look at Valley Forge National Park as the jewel of this area and we want it to survive. It's hallowed ground, as far as we're concerned. We want it to do well. We want it to prosper. It's an attraction to this area. If it provides nothing more than historical preservation, or historical significance...We love Valley Forge Park and we like it being here. Seriously. So it doesn't really have to give us much back because that's probably enough" (VA7).

Most interviewees had very little interaction with park staff, except at the Visitor Center, and similarly scant knowledge of VFNHP mission and mandate with respect to resource management. While they believed VFNHP was an important part of the community, this sentiment was less due to a close relationship with the park and mostly because "It's here. I mean if you're here you're part of it" (VA9). In fact, when asked, "Do you believe the park

makes good decisions about resource management?,” many believed they did not know enough about the park (or resource management) to comment:

“I hope so, but that’s another area where we don’t really know” (VA9).

“I can’t really answer that. I have no basis on which to answer. The last time I visited the park I was very impressed with what they’ve done with the facility, but as to resource management, I don’t know what they have to manage” (VB27).

“I don’t really know, I guess I’m neutral. I don’t know what they’re doing in terms of resource management” (VB35).

Others responded in terms of park maintenance:

“I believe so. I’ve been coming here for many, many years. The park is clean, nice enough to feel the park is maintained as well as historic, a sense of a historical place” (VB18).

“I don’t even know what they do. I don’t know what their resource management consists of...Like I said the park seems to be in always great shape. It is always clean” (VB20).

“I don’t know enough to say. They do an A-1 job of keeping it clean. I never see it being landscaped, but they must do it because it looks like it’s effectively landscaped” (VB30).

“I don’t think I’d be one to comment, I don’t know much about their inner workings. It seems to be well-maintained. Scouts use it for camping and things. It’s well utilized for public grounds. I think it’s a very nice area with green space” (VB40).

Some believed the park was not as well-maintained as it had been in the past and that the park was not as welcoming as it used to be:

“...over the years the park has become less and less friendly to the visitors. Maybe that’s just my opinion but I see the picnic areas aren’t in as good a shape as they used to be. It’s more like they want to herd everybody to the visitor’s center, do a quick tour through the visitor’s center and then get them out. The park isn’t as family friendly and fun as it used to be” (VA8).

“They let the field grow up to weeds. A lot could be done, but they don’t want to be bothered” (VA16).

In the absence of specific knowledge about VFNHP, most interviewees appeared to rely on their general values about city parks and open space to form their opinions about VFNHP.

In contrast, community and stakeholder group leaders had more intimate knowledge of VFNHP. These interviewees described changing relationships with VFNHP, primarily

dependent on the personality of the latest Superintendent, who arrived at VFNHP only a few months before data collection for this study:

“[The new Superintendent is] very proactive. He’s got ideas. We share our common problems together and there’s an entirely different feeling...He is listening to our problems and then either making suggestions for solving them or looking into how he could help in terms of solving them from his office and that has been a real blessing” (VA5).

Prior to the new Superintendent, interviewees described the park as unresponsive. This was reflected in the qualities they emphasized as affecting the credibility of VFNHP staff: responsiveness, professionalism, inclusiveness, communication, trust, and accessibility. For the most part, interviewees spoke positively about their relationship with the current Superintendent and were optimistic about future partnerships.

Interviewees recognized the interdependence of VFNHP and local communities, especially with respect to deer. Many believed that deer populations could only be effectively managed on a landscape scale, with all affected parties contributing to population reduction efforts:

“The park isn’t going to deal with this alone. It’s like a lot of things. It’s an issue that is in the park and also that’s outside because the deer move back and forth across boundaries” (VA1).

“...we’re all sort of a little put off by the fact that Valley Forge has consistently refused to deal with the problem and therefore we have to deal with the problem, but we can only deal with our part of their problem, you know?...[There] are all the residual issues that we all have to deal with because the park has up until now refused to deal with it all, and I think the people are tired of it” (VA7).

“I think a lot of the sentiment of southeastern Pennsylvania has been, ‘Well these are Valley Forge’s deer and until they commit to doing something we are not even going to bother talking to the Game Commission about it because if Valley Forge isn’t going to manage their deer there is nothing I can do that is going to help the problem.’ So just the notion that Valley Forge [might] take on this issue I think is a huge step in the right direction...to say, ‘Hey wait a minute. They are doing something about it. We’ve got to do something about this too’” (VA6).

“More attention needs to be paid by the Department of the Interior to the area surrounding the park. They need to create a chain surrounding the park and protect that chain if they really want to protect that park” (VB19, R1)

Others were skeptical of the conclusions drawn from scientific studies at VFNHP. They believed that the park’s objectives were not clear enough to determine whether deer prevented the park from meeting them:

“At the last meeting, I was told there is no undergrowth. It’s different from what they said before. I don’t know what’s right. The park has to rethink what its policies are. If its mission is historical, they have to decide how historical” (VA13, R2).

“I don’t understand what we’re trying to accomplish in the long run. So we decrease the numbers, so what?...Is it natural to have paved trails, and roads in the park? There are lots of things that weren’t there in 1776. Why do deer have to be the only thing to go back to 1776? There’s something wrong with that philosophy...Given that all these things are going on in the park, this is acceptable, but there can’t be deer there? I think it’s because it’s an easy component to see and control. It doesn’t impact us, but it makes us feel good that we’re restoring something...I’m baffled by the idea of going back to a frozen point in time and letting human activity continue. It’s bizarre logic” (VA18)

They desired a logical and clear explanation of the criteria that were used to determine whether VFNHP natural resources should be managed as a forest vs. farmland vs. denuded encampment. Some interviewees believed the use of the term “natural” was misleading for an urban park embedded in a highly developed landscape. They believed that many who argue that deer populations must be reduced for ecosystem reasons fail to recognize that the desired end result is not an inherently “natural” state, but only one concept of nature:

“The park is something that appears to be a natural environment in the midst of an unnatural environment. It’s surrounded by asphalt, bricks, chemical products. Since that’s what we’ve left to stand, it must conform to our concept of what it should look like” (VA18).

“They pretend to be scientific studies but only consider one thing so they find ways to support [their position]” (VA13, R2).

Overall, interviewees did not have a uniform concept of acceptable deer impacts to vegetation or the natural state of VFNHP. Many believed there deer browse has no negative impacts to vegetation:

“...I don’t think the [deer] numbers are enough to cause damage to the flora, trees, bushes. I don’t see them causing a big impact on what the park looks like. It’s clean and natural enough. I don’t think deer are causing harm. It’s good to see deer, its part of the experience” (VB18).

“There are a lot of deer, but I don’t see it as a problem. It’s green, there’s foliage, it’s clean...The deer look healthy, there’s good undergrowth, the forest looks healthy. I have to go by what I see. Things look healthy” (VB34).

Others believed that objectives for vegetation were not clear enough to determine whether deer were responsible for damaging the ecosystem:

“I would like a more intelligent discussion of what the damage is from deer. The vegetation study says damage is to natives. Why red oaks? What are you calling

damage? ...Why not plant saplings, plant and protect them [until they get above the browse line]?...The notion of damage is not explored sufficiently...If you assume 'yes it is damage,' assess what is really causing the damage" (VA13, R2).

Still others described a direct link between deer and negative impacts on the ecosystem:

"They have completely changed the habitat to where there is no understory anywhere. You look through the forest and you've got a clear shot for almost a mile through the woods and that's not natural" (VA11).

"I've watched the deer browse line go up at Valley Forge. Valley Forge used to be known for having great wild flowers, lupines, trailing arbutus and all kinds of great things and I can just imagine that there's absolutely none of that left by now. The plant surveys would probably tell it all. I'm not telling you anything new. There's no regeneration of the forest" (VA19, R1).

In addition to the resulting condition of resources, some interviewees associated the means for achieving that condition as having implications for "naturalness":

"...one of the things that is attractive is that parks be kept in a natural state so you don't want to be involved in killing and control measures unless there's absolutely no other alternative" (VA1).

Perceptions of public participation

Most Type B interviewees had little experience with public input and VFNHP, although some had attended public meetings for the GMP/EIS. Type A interviewees were in more regular contact with VFNHP because of their standing as community and stakeholder group leaders. Many were personally invited to public meetings or regularly interacted with staff members.

Many Type A interviewees were frustrated by the past Superintendent's unwillingness to address deer issues and searched for alternative ways to be heard. This perceived unresponsiveness led some interviewees to lobby Congress, resulting in the Congressional directive to address deer management in the park.

A number of interviewees had attended meetings for the GMP/EIS between fall 2002 and spring 2003, although not all of these attendees were clear on the purpose of those meetings. They spoke positively about the opportunities and varied formats to provide input, but some questioned whether their comments influenced decisions:

"There were more than an adequate number of opportunities for people to speak their mind and become involved. I'm not sure how the input is used, how it's analyzed, what they do with it, how it influences the process. That I'm not comfortable with. It's two different sides of the coin of the process...I've never seen a summary of the comments. If it was really taken seriously, they would summarize it, have it available somewhere...People can write comments, what did they do with them? Did they throw

them away? Without seeing [the analysis], it's hard to believe it was taken seriously. It would seem like a more reliable basis for decision-making" (VA18).

"I don't feel like I had much input. I didn't feel like we were given enough information to give good input. It felt like it was forced. A lot of us were opposed to development in the area. Because of politics, money, developments went through even though no one at the meeting was in favor of it. [It felt like they were getting] input to make us feel like we're having input... We need to know our opinion sticks, it's not just listened to and set aside. It didn't seem like they were taking notes, keeping a record, not even taking our opinions with them" (VB34).

"...there has to be some significant follow up on it [after] 30 days, 90 days, so that people know that maybe their ideas aren't all incorporated, but that they were all heard" (VA8).

"We never heard any feedback as a result of this. As a matter of fact after that it seemed like, from my standpoint, and I'm on the mailing list, that the whole GMP process just disappeared. It just sort of went on hold or...I'm not sure what happened" (VA10).

Most believed that key stakeholders were represented at GMP meetings, but some expressed concern that attendance was low in comparison to the number of people who lived in the region or that attendees were not representative of the general public:

"I would like to see some attempt of all sides being weighed equally, in terms of what they considered in the process. You've heard the quote 'The world is run by the people who show up.' If the wrong people show up, there can be problems of non-representation" (VB30).

"However you design public meetings, the most likely participants will be those with the strongest feelings and agenda. Don't ignore them, but don't mistake them for the public in general. A large portion of the public is not motivated to come" (VA20).

Many interviewees who had not attended believed that they did not have enough information or a strong enough opinion to contribute to the process:

"I'm not in tune with the pulse on a day-to-day basis, I'm just a casual user. I don't know what I could contribute" (VB27).

"I don't know anything about it, I wouldn't be much help" (VB25).

"I can't figure out what decision I have on the right way to do it, so I don't go" (VB37).

Others were not aware of meetings or only heard about them after the fact. Still others felt no need to provide feedback to the park:

"I just think they are doing a fine job and I think when something is not broke you shouldn't try to fix it. You know 'not broke don't fix it'" (VB8).

“There’s no point of contention strong enough to voice my mind” (VB5).

Interviewees displayed a wide range of individual preferences for providing input to the park: telephone, mail surveys, one-to-one conversations, web sites, e-mail, and various formats for public meetings. However, they did not necessarily believe that providing input would influence management decisions, an opinion that often was colored by experiences with other agencies or local governments:

“Most EIS’s, by the time they get to public hearings, they know what they want to do. With most agencies, they’re going to do what they want to do. If you want to change their mind, either you need to have a lot of money or be someone’s cousin” (VA18).

“I get the feeling that studies are done after the fact, when the decision is already made, to make it look like the decisions are based on science” (VA13, R2).

“No matter what my opinion was...They’re not going to listen to anybody. They’re going to do it their way and that’s the way the government works” (VA2).

“I’ve gone to several meetings, but they’re anything but productive. Nothing ever gets resolved. It pits neighbors against each other” (VB26).

Others believed their opportunities to contribute to park decisions was adequate:

“...I feel like letter writing is always effective. Even if it’s sappy responses, I know it goes on the record” (VB19, R1).

“I filled out their questionnaires. It’s like voting. If you don’t do anything, you can’t complain” (VB17, R1).

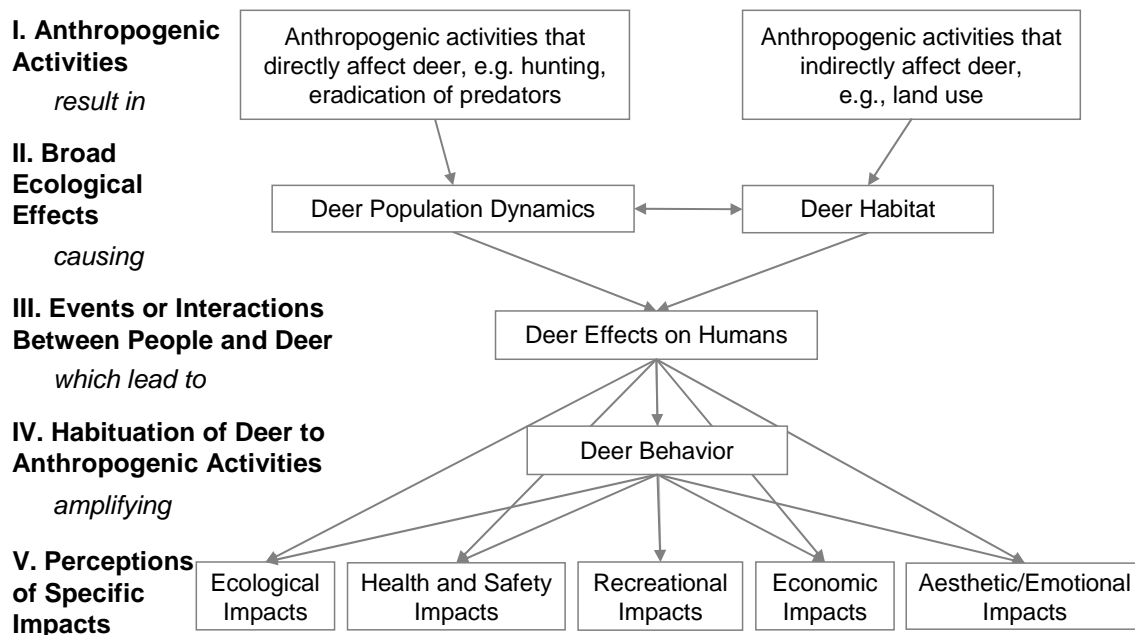
“It’s always good to get your opinion out there. I did what I thought I *could* do, let people know. I know what I did was valuable” (VB35).

DISCUSSION

Local community residents collectively described deer issues in and around VFNHP as a complex web of interrelated components. Very few interviewees mentioned natural processes that might affect the system. Rather, anthropogenic factors, both inside and outside the park, were seen to result in broad ecological effects that cause events or interactions between humans and deer. The perception of these interactions or events results in the specific impacts experienced by stakeholders, which can be amplified when deer become habituated to humans (Figure 2). Each component of the system can be influenced by activities aimed specifically at that component, or indirectly by activities aimed toward components at higher levels. Individual interviewees recognized or placed weight on different components of the system, which signaled potential for disagreement on how to resolve “the deer problem.” The way the problem is

framed, i.e. the components of the system that are included or excluded as part of the problem, has implications for the types of management actions that are or are not considered. Clarification of the problem frame, including responsibilities and jurisdiction for various system components and assumptions about system response, will be essential to engaging in constructive dialogues to develop solutions.

Figure 2. Components of deer-related issues, as collectively described by interviewees. Individuals recognized and placed importance on different aspects of the collective “system,” and therefore saw different potential solutions depending on the level and pathway that was emphasized.



Known stakeholders (Type A interviewees) had a much richer understanding of the complexity of deer issues than others (Type B interviewees). In fact, many Type B interviewees did not believe there were any impacts from deer that warranted management action. Some Type A interviewees who were against lethal control also shared this belief. They desired a clearly defined, logical explanation for why action would need to be taken, and why now.

Interviewees described multiple dimensions contributing to their different opinions about deer, including concerns about specific impacts, concerns about deer, and concerns about potential management actions. Most interviewees adopted the problem frame used throughout the greater Philadelphia area: “too many deer.” This simplification of the problem led to arguments for and against management alternatives to reduce the populations (actions acting at level II); however, the specific objectives of population reduction (e.g., reduction of negative impacts, desired time frame, etc.) were not articulated. While it seems obvious to assume that reduction of deer will result in reduced deer-related impacts, the question of how quickly and to

what degree the population must be reduced to result in an acceptable reduction of impacts remains to be answered. Re-framing “the deer problem” to recognize other dimensions may identify additional management actions to reduce impacts, independent of absolute numbers of deer. For example, interviewees suggested that deer-vehicle collisions may be reduced by decreasing the number of cars on the road or the speed at which they travel; vegetation damage may be avoided by fencing areas of concern, planting trees and fencing them until they grow above the browse line, or by creating habitat corridors to connect VFNHP to other natural areas, thereby dispersing deer (actions acting at level V).

Indeed, many interviewees identified anthropogenic factors, especially development and resulting loss of natural habitat, habitat fragmentation, and creation of artificial habitat as more important to address than deer *per se*. Local groups who address development issues currently exist. Even if these groups are successful in creating additional wildlife habitat, deer still may prefer suburban environments. Homeowners who replant when deer damage their landscaping create a continuous preferred food source. A significant reduction in deer numbers would not reduce the attractiveness of the landscaping to deer, although it could reduce the probability of deer finding the property. Most interviewees recognized the interdependence of the park and surrounding communities and that the success of deer management within the park would likely depend on processes and actions taken outside the park, and *vice versa*.

Another anthropogenic factor was habituation. While most interviewees did not associate positive or negative values with habituation, other case studies indicate that stakeholders can have different opinions about the value of and appropriate management alternatives for deer that are perceived to be tame vs. deer that are perceived to be wild, especially with food-conditioned animals (Leong and Decker 2007). Food conditioning (i.e., when an animal learns to associate food with the presence of people, due to positive experiences of acquiring food easily, McCullough 1982, McNay 1998) was not prevalent at VFNHP, or in the surrounding communities, according to interviewees, and only a few interviewees reported negative associations with tame deer. Food conditioning appears to contribute to perceptions of deer as a pest species vs. valued wildlife (Leong and Decker 2007). Continuing to discourage wildlife feeding at VFNHP may help reduce the likelihood of deer becoming viewed primarily as a nuisance by most stakeholders.

Interviews included questions about public participation because any formal deer management plan at VFNHP would require public input. Many, especially Type A interviewees, had already made up their minds about preferred forms of population management and had amassed arguments to support their positions. Yet these arguments often were based on differing assumptions about goals of management. Future discussions that reframe “deer management” beyond a one-dimensional focus on numbers of deer may result in more constructive dialogue. The dimensions of both problem frame and solution frame (not specific solutions, but acceptable scope of solutions) must be clearly articulated by VFNHP managers and agreed on by stakeholders or there may be disagreement over appropriate means to achieve management goals. Input from stakeholders may assist managers in refining the problem and solution frames to more accurately reflect local conditions.

It is important to recognize that there will always be trade-offs in deciding which dimensions of a management issue are addressed or not addressed. As noted by one interviewee, “All alternatives have particular and significant downfalls” (VA17). While this interviewee was referring to methods of population reduction, the same can be said for other potential management actions as well. Clearly defining the dimensions of the problem that will be addressed by management action can help identify which downfalls and/or collateral impacts are acceptable or unacceptable from the standpoint of achieving objectives.

Deer issues were described as one of the more prominent local community concerns, and many interviewees believed that deer populations could only be effectively managed on a landscape scale. These observations indicate the importance of including local stakeholder input and coordinating with communities when planning for shared resources, such as deer. However, interviewees indicated a number of challenges to effective communication. First, although VFNHP was believed to be an important asset to the community, many interviewees did not have a clear understanding of park mandates or desired condition for resources. Communication efforts to improve understanding about NPS policies and VFNHP’s specific purpose will be necessary to ensure that stakeholders’ opinions are informed by specific knowledge about VFNHP rather than general values about city parks and open space. In addition, while stakeholders described positive experiences with current VFNHP administration, they were somewhat cautious because past experiences were not always as positive. They indicated that responsiveness, professionalism, inclusiveness, communication, trust, and accessibility demonstrated by park staff might improve credibility, and therefore relationships and dialogue.

It is clear that there are many local community members who are motivated to be involved in planning efforts at VFNHP. Interviewees who had participated in past efforts indicated that follow-up that described how their input was considered would give them greater confidence in the planning process. Interviewees who were not motivated to become involved believed they did not have enough information or a strong enough opinion to contribute to the process, or did not hear about it in time. Communication efforts to improve awareness and knowledge of NPS planning processes and facts about deer issues may broaden the scope of interested parties beyond polar extremes.

Much of the controversy surrounding deer issues in and around VFNHP resulted from differences in opinion about: (1) problem frame, and therefore appropriateness of related solutions, (2) goals of natural resource management at VFNHP, and (3) scale of responsibility for addressing the problem. Clear communication efforts in all of these areas to improve understanding between stakeholders and park management will be key in reducing controversy associated with any deer management planning. Meeting these additional communication needs likely will require a more long-term, proactive approach to public participation, similar to that described in recent NPS policies (National Park Service 2001, 2003a). While certain episodic, issue-specific public participation efforts are needed to fulfill legal mandates, an approach that views park management as an ongoing dialogue with local communities may help improve the substance of decisions, as well as build relationships, identify potential partners, and fulfill NPS mandates for civic engagement. For long-term, regional management issues (such as deer management) this broader, relationship-based approach to public participation may improve the ability of NPS to successfully implement actions.

LITERATURE CITED

- Babbie, E. 2003. *The Practice of Social Research*. 10th edition. Wadsworth, Belmont, CA.
- Beierle, T. C., and J. Cayford. 2002. *Democracy in Practice : Public Participation in Environmental Decisions*. Resources for the future, Washington, D.C.
- Decker, D. J., M. A. Wild, S. J. Riley, M. M. Miller, K. M. Leong, J. G. Powers, and J. C. Rhyan. 2006. Wildlife disease management: A manager's model. *Human Dimensions of Wildlife* 11: 151-158.
- Denzin, N. K., and Y. S. Lincoln. 2000. *Handbook of Qualitative Research*. 2nd edition. Sage Publications, Thousand Oaks, CA.
- Emerson, R. M. 2001. Fieldwork practice: Issues in participant observation. Pages 113-151 *in* Emerson, R. M., editor *Contemporary Field Research* Waveland Press, Prospect Heights, IL.
- Frost, H. C., G. L. Storm, M. J. Batcheller, and M. J. Lovallo. 1997. White-tailed deer management at Gettysburg National Military Park and Eisenhower National Historic site. *Wildlife Society Bulletin* 25: 462-469.
- Halvorsen, K. E. 2003. Assessing the effects of public participation. *Public Administration Review* 63: 535-543.
- Leong, K. M., and D. J. Decker. 2005. White-tailed Deer Issues in NPS Units: Insights from Natural Resource Managers in the Northeastern U.S. Human Dimensions Research Unit Publication Series Number 05-5. New York State College of Agriculture and Life Sciences, Department of Natural Resources, Cornell University, Ithaca, New York, USA.
- Leong, K. M., and D. J. Decker. 2007. Identifying Capacity for Local Community Participation in Wildlife Management Planning. Case 1: White-tailed Deer Issues at Fire Island National Seashore. Human Dimensions Research Unit Publication Series Number 07-1. New York State College of Agriculture and Life Sciences, Department of Natural Resources, Cornell University, Ithaca, New York, USA.
- Lovallo, M. J., and W. M. Tzilkowski. 2003. Abundance of White-tailed deer (*Odocoileus virginianus*) within Valley Forge National Historical Park and Movements Related to Surrounding Private Lands. Technical Report NPS/NERCHAL/NRTR-03/091. National Park Service, Philadelphia, P.A.
- McCullough, D. R. 1982. Behavior, bears, and humans. *Wildlife Society Bulletin* 10: 27-33.
- McNay, M. E. 1998. Wolf-human interactions in Alaska and Canada: a review of the case history. *Wildlife Society Bulletin* 30: 831-843.

- Miles, M. B., and A. M. Huberman. 1994. *Qualitative Data Analysis: An Expanded Sourcebook*. 2nd edition. Sage Publications, Thousand Oaks, CA.
- National Environmental Policy Act. 1969. 42 U.S.C. § 4321 *et seq.*
- National Park Service. 2000. *Management Policies 2001*. National Park Service, Washington, DC.
- National Park Service. 2001. *Director's Order #52A: Communicating the National Park Service Mission*. National Park Service, Washington, DC.
- National Park Service. 2003a. *Director's Order #75 A: Civic Engagement and Public Involvement*. National Park Service, Washington, DC.
- National Park Service. Valley Forge National Historical Park GMP/EIS Newsletter 2--Winter 2003 Alternatives. 2003b [cited August 20 2006]. Available from http://www.nps.gov/vafo/vafo_gmp/vafo_gmp_newsletter2_alts.pdf.
- National Park Service. Valley Forge National Historical Park White-tailed Deer Management Plan/EIS: Chronology of Major Events [webpage]. 2006 [cited October 12 2006]. Available from http://www.nps.gov/vafo/parkmgmt/upload/VAFO_DeerEIS_ChronologyOfEvents_parkv2.pdf.
- Porter, W. F., and H. B. Underwood. 1999. Of elephants and blind men: Deer management in the U. S. National Parks. *Ecological Applications* 9: 3-9.
- Riley, S. J., D. J. Decker, L. H. Carpenter, J. F. Organ, W. F. Siemer, G. F. Mattfeld, and G. Parsons. 2002. The essence of wildlife management. *Wildlife Society Bulletin* 30: 585-593.
- Shafer-Nolan, A. L. 1997. The science and politics of deer overabundance at Cuyahoga Valley National Recreation Area. *Wildlife Society Bulletin* 25: 457-461.
- Underwood, H. B. 2005. *White-tailed Deer Ecology and Management on Fire Island National Seashore (Fire Island National Seashore Science Synthesis Paper)*. Technical Report NPS/NER/NRTR--2005/022. National Park Service, Boston, M.A.
- Underwood, H. B., and W. F. Porter. 1991. Values and science: White-tailed deer management in eastern National Parks. *Transactions of the 56th North American Wildlife and Natural Resources Conference*: 67-73.
- Warren, R. J. 1991. Ecological justification for controlling deer populations in eastern National Parks. *Transactions of the 56th North American Wildlife and Natural Resources Conference*: 56-66.
- Wondolleck, J. M., and S. L. Yaffee. 2000. *Making Collaboration Work: Lessons from Innovation in Natural Resource Management*. Island Press, Washington, DC.

APPENDIX A. RESOURCES FOR ADDITIONAL INFORMATION

Websites

Deer, People and Parks: Human Dimensions of Deer Issues in National Parks:

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

Valley Forge National Historical Park General Management Plan/Environmental Impact Statement website: http://www.nps.gov/vafo/vafo_gmp/index.html

Valley Forge National Historical Park – White-tailed Deer Management:

<http://www.nps.gov/vafo/parkmgmt/white-tailed-deer.htm>

Valley Forge National Historical Park Management – Protect Fawns:

<http://www.nps.gov/vafo/parkmgmt/upload/Protect%20Fawns.pdf>

Articles and Reports

Lovallo, M. J., and W. M. Tzilkowski. 2003. Abundance of White-tailed deer (*Odocoileus virginianus*) within Valley Forge National Historical Park and Movements Related to Surrounding Private Lands. Technical Report NPS/NERCHAL/NRTR-03/091. National Park Service, Philadelphia, P.A. Available at:

http://www.nps.gov/nero/science/FINAL/vafo_deer/vafo_deer.html

Podniesinski, G., L. Sneddon, J. Lundgren, H. Devine, B. Slocumb, and F. Koch. 2005. Vegetation Classification and Mapping of Valley Forge National Historical Park. Technical Report NPS/NER/NRTR--2005/028. National Park Service, Philadelphia, P.A. Available at:

http://www.nps.gov/nero/science/FINAL/VAFO_vegmap/VAFO_vegmap.htm

APPENDIX B. INTERVIEW GUIDING QUESTIONS

1. How long have you lived near this park?
2. Are you a year-round or seasonal resident?
3. Which community do you live in?
4. Please describe and draw the boundaries to this community and other communities you interact with on the map.
5. Have you visited this park before?
If yes:
 - a. How often have you visited in the last two years?
 - b. What are the main reasons you visit the park? List all that apply.
6. Please describe your observations on deer and deer management at the park and in the surrounding community.
7. Have you learned about deer from park staff, exhibits or other materials, either within the park or in other contexts?
If yes:
 - a. What did you learn?
 - b. How did you learn it?
8. Do you believe deer impact the park, either positively or negatively? How?
9. Do you believe deer from the park impact the local community, either positively or negatively? How?
 - a. How responsive is the park to these local concerns about deer?
 - b. How do you feel about the park's responsiveness to these concerns?
10. In comparison to deer impact, how responsive is the park to other types of local concerns?
 - a. How do you feel about the park's responsiveness to these concerns?
11. Please describe the types of interactions you typically have with park staff.
12. Do you believe the park makes good decisions about resource management? Why or why not?

13. Have you acted to influence decision-making at this park? Why or why not?

If yes:

- a. Please describe your activities and the topics or issues.
- b. Which activities were most effective?

14. Have you ever given input or participated in public meetings or other scoping processes related to park decision-making?

If yes:

- a. Please describe your participation/input.
- b. Why did you participate?
- c. Do you believe that your input made a difference in park decisions? Why or why not?
- d. What was the best/most effective part of the process?
- e. What could be improved?

If no:

- a. Did you ever have the opportunity to participate/give input?
- b. Would you like to participate/give input?

If yes:

- i. How would you like to be notified?
- ii. How would you like to participate?
- c. What could be done to encourage you to participate?

15. Do you have any additional comments that you would like to add?

OMB Approval #1024-0224 (NPS #05-047), Expiration Date: 06/30/2006

Cornell University UCHS Protocol ID# 04-04-043, approved 6/23/2005