THE HUMANE SOCIETY
OF THE UNITED STATES

Via electronic submission

February 17, 2009

Michael A. Caldwell, Superintendent
Valley Forge National Historical Park
1400 North Outer Line Drive
King of Prussia, Pennsylvania 19406

Website: http://parkplanning.nps.gov

Re: Comments on the *Draft* White-tailed Deer Management Plan/Environmental Impact Statement

On behalf of The Humane Society of the United States (HSUS), the nation's largest animal protection organization with more than 11 million members and supporters nationwide, including over 602,000 in Pennsylvania, we appreciate the opportunity to provide comments on the *Draft* White-tailed Deer Management Plan/Environmental Impact Statement (EIS) for Valley Forge National Historical Park (VFNHP).

While we understand the park's concerns over the perceived negative impacts caused by white – tailed deer (*Odocoileus virginianus*), the HSUS does not believe that lethal control is either a socially acceptable practice nor, in the long-term, the most ecologically sound approach to resolving conflicts with deer. Instead, we endorse *Alternative B: Combined Non – Lethal Actions* that would include strategic exclusion of deer, the use of repellents and possibly long term population stabilization through reproductive controls. The HSUS asserts that this alternative will better serve the park in its mission to protect and restore native plant communities.

Our specific comments are contained herein:

I. The *Draft* EIS does not clearly define native plant restoration goals and objectives, and as such, fails to demonstrate the need for lethal deer control at VFNHP

The Executive Summary of the EIS states that "An increasing number of deer in the park over the past two decades has resulted in unacceptable changes in the species composition, structure, abundance, and distribution of native plant communities and associated wildlife." While it may be true that the deer population has increased over the last twenty years, and as such, changes within the natural communities have occurred, this in and of itself cannot be taken as an indication that these vegetative changes are deleterious, and therefore "unacceptable", nor that deer are directly impeding the mandate and historic mission of the park.

Deer are a part of the ecosystem in which they reside and they play a role in the structure

and function of the said system and its associated food webs. In fact, many researchers consider deer to be a keystone species or an ecosystem engineer; a species that shapes the very communities of which it is a part. [i]

While it is true that white – tailed deer consume plants and that this activity may affect some species more than others and result in community – wide changes, any value judgment placed on these changes is by definition, purely subjective. The effects of herbivory are better interpreted in terms of vegetation state transition rather than on biased notions of perceived negative impacts.[ii] The reality of the supposed deleterious impacts of deer herbivory has not panned out in the long term.

A review of the literature concerning deer and their impacts on individual plants, their populations and communities found that there are virtually no studies that examine the plant population and ecosystem level effects of white – tailed deer herbivory. In fact, many studies have detected no overall effects on plant survival and reproduction and so – called negative effects have only been observed on small temporal and spatial scales. [iii] It is also ironic that as recently as 1988, researchers were claiming that "[a]lthough the white – tailed deer population within the park is not regulated and predation pressure is minimal, the herd has not adversely affected park vegetation."[iv] Proving that deer do, in fact, eat is a far cry from definitively proving that they are endangering the continued survival of a forested ecosystem.

The EIS also repeatedly states that deer are hampering forest regeneration at VFNHP. Generally, the term "regeneration" implies a re-growth or reestablishment after a disturbance or loss, hence the prefix "re-" which means "back" or "again". Throughout the EIS, it appears that the Park simply desires a carpet of seedlings and saplings in the absence of any disturbance. This requirement does not truly amount to regeneration in that the canopy is still intact. In the event that a tree were to fall and the canopy were to open, studies have shown that the mounds and pits formed by such events provide long - term refugia for seedling regeneration, even in the presence of intense deer herbivory.[v]

However, the HSUS is aware that the park considers the deer populations at VFNHP to be "overabundant" and that such population levels may be viewed as "unnatural". This idea of native wildlife damaging its environment and necessitating lethal removal is held by some to be a logical consequence of that perception and by others to be illogical. This lethal removal scheme may be viewed as a contradiction to the central mission of NPS, which is to not intervene in natural processes unless a compelling case can be made that they have been suspended or prevented through human action. As the forest appears to regenerate itself after disturbance, it is difficult to understand how a lack of seedling under intact canopy constitutes a suspension of natural processes.

Applying the concept of "natural" to an area that has undergone such widespread landscape manipulation over the past 250 years is not viable. In fact, knowledge of the vegetative community composition of this park is so jumbled that research papers published within 8 years of each other on work done in the park have conflicting information about the dominant vegetation. While Cypher et al. (1988) claim that the park is 57% field, 38% woodland, and about 5% developed and wetland areas, Pomerantz and Welch (1996) claim that mature woodlands are the prevalent habitat in the park with field composing a lesser portion of the park area.[vi]

Additionally, there are no data available on the deer populations in the park before 1983, so there is no way to know what populations were like in the area even 50 years ago, never mind 300 years ago. There

are no reliable data on deer populations before the European colonization of North America, so it is totally impossible to gauge how present day deer populations compare to those found under supposedly "natural" pre – colonization conditions.[vii]

Moreover, the population of *O. virginianus* in the United States was virtually extirpated by 1900. This species' recovery in Pennsylvania actually began with the reintroduction of imported animals from Canada in concert with the regeneration of clear – cut forest land.[viii] The oft- conjured image of a natural system thrown into disarray by the "overabundance" of one species is completely shattered when one considers the demonstrable levels of human manipulation on both the habitat and the deer populations of the state of Pennsylvania.

Finally, the urbanization of the area around this park is well – known as the park is often referred to as an "island" of deer habitat. The rapid expansion of suburban areas around the park has undoubtedly impacted not only deer population dynamics but also forest dynamics as the edge effects in the park have undoubtedly increased (section II).

Nonetheless, NPS chooses to regulate its activities under an assumption of allowing natural process to prevail and hence is caught between two sets of standards. The NPS stands, by these and other proposed deer management actions, to intervene, interfere, and in perpetuity manipulate a natural, native biotic component of an ecologically interacting system which it is mandated to conserve. This is a radical departure from its historic management philosophy and approach and must be carefully considered and weighed for the precedent it sets.

In summary, The HSUS believes that the EIS does not provide a substantial purpose and need for lethal deer removal under current NPS management philosophy and guidelines. With little evidence to suggest that deer have truly altered this ecosystem and prevented its perpetuation, it is incumbent upon the NPS to justify the killing of native wildlife in the absence of sustained threats to the VFNHP ecosystem.

II. The EIS fails to demonstrate what, if any, affect deer herbivory will have on forest health or any other feature of the VFNHP ecosystem.

Edge effects are well – known and their effects on plant species composition and diversity are well – documented.[ix] In fact, research in Pennsylvania and Delaware shows that the species composition of plants along forest edges is different than that found in interior forests.[x] These effects may be observed well over 40 meters from the edge of the forest and after 50 years of succession on the edge. There has been no detailed analysis on the edge effects at VFNHP nor the influence of human land use practices on the existing forest habitat. Considering the high human population density in the areas near the Park and the presence of surrounding farmlands, it is safe to assume that edge effects are having a major impact on the vegetative communities in the park.

In addition, deer are an edge species that attain their highest population densities in forest edge habitats that contain more suitable types of forage.[xi] Therefore, the increased edge habitat made available by agriculture, suburban sprawl and encroachment onto the borders of the park only serves to increase suitable deer habitat and increases the number of deer that can be supported by said habitat.

Another factor which is seldom considered when assessing the plant species composition in forests with deer herbivory is the successional status of that particular forest. Research has shown that plant species diversity is higher in primary forests than in secondary forests regardless of the herbivory regime. [xii] As the forest of VFNHP has been cleared in the past, it is secondary forest and, therefore, will not attain the levels of species diversity found in primary forests regardless of the herbivory regime.

Simulation models based upon field data have also shown that even at the most intense levels of deer herbivory, forest succession may slow down, but final forest composition is the same as would be found in unbrowsed areas. [xiii] In other words, while deer herbivory may influence plant species composition, especially in mid – successional stages, a browsed forest will attain the same climax community as a completely unbrowsed forest over the long term.

Based upon these findings, the Final EIS must explain how deer herbivory will affect the health and continued survival of the forest into the future. If the Park cannot do so, it will seriously call into question the purpose of this lethal control in the absence of eminent threats to any aspect of the VFNHP ecosystem.

III. Lethal Control and Compensatory Reproduction versus Immunocontraception and/or Sterilization

The HSUS asserts that the deer population at VFNHP does not require controls to ensure forest viability and survival. However, we are aware that the Park perceives an "overabundance" of deer, and therefore, if some form of population control is deemed necessary and appropriate, reproductive control methods, such as surgical sterilization and immunocontraception, are viable options and should be implemented by VFNHP.

While the EIS briefly discusses the option of surgical sterilization, it quickly dismisses it as infeasible. And yet, from 2002-2005, the city of Highland Park, Illinois conducted a trap – sterilize – release program on the city's deer.[xiv] In that study, does were sterilized through tubal ligation so they were not susceptible to the behavioral alterations typical of methodologies that halt hormone production. This methodology was both safe and humane and resulted in very low mortality rates due to surgery. Computer models of surgical sterilization from this and other research revealed that areas can maintain their deer populations at target densities by sterilizing 32% of the does per year. [xv] Based upon these results, VFNHP may do well to reconsider surgical sterilization as a viable option for deer management.

The EIS also claims that "the current status of chemical reproductive control agents makes them difficult to implement and potentially ineffective in large, free-ranging deer populations, costly and logistically infeasible" and then provides a list of criteria that would have to be met in order for VFNHP to consider using a chemical agent to manage deer populations at VFNHP (EIS 2-28).

It is our understanding that VFNHP personnel have solicited and received comments on this particular section of the EIS from Dr. Jay Kirkpatrick, the Director of Science and Conservation Biology at ZooMontana, and Dr. Allen Rutberg, Research Assistant Professor Center for Animals and Public Policy Cummings School of Veterinary Medicine at Tufts University. We would appreciate receiving copies of Dr. Kirkpatrick and/or Dr. Rutberg's comments at your earliest convenience.

In the interim, with all due respect, we disagree with the blanket claim about the "status of chemical reproductive agents" since the chemical agent known as Porcine Zona Pellucida (or PZP) meets all but one of the listed criteria, has been shown to effectively reduce fertility in white-tailed deer, and has been associated with population reductions of 7.9% on average over the course of an 8 year study at the National Institute of Standards and Technology, Maryland, with similar results from Fire Island National Seashore, New York. [xvi] This technique was originally developed for use on wild horses at Assateague Island National Seashore, Maryland, and is also currently in use for wild horse management at Cape Lookout National Seashore, North Carolina.[xvii]

The PZP vaccines used at these other NPS sites require annual boosters to be effective, but significant progress has been made since 2002 on long-acting single shot PZP vaccines.[xviii] The effects of the vaccine are reversible after three years of treatment, and no adverse health effects have been apparent among treated deer or among fawns they carried at the time of treatment.[xix]

Furthermore, on October 22, 2002, the HSUS submitted a proposal to Valley Forge National Historical Park to conduct research on the efficacy of PZP on deer in the park. The proposal was rejected on the grounds that the park did not have any plans to manage its deer populations. Now that the park has decided to implement a deer management program, we hope that you will reconsider our offer to conduct immunocontraception research at Valley Forge. The site is an ideal area for the use of immunocontraception due to its high density of deer, the documented site fidelity of females, and the approachability of individual animals for treatment. Please consider these comments a reaffirmation of The HSUS' willingness to work with the Park to establish an immunocontraception research site at the Park. A copy of the original 2002 proposal has been included with these comments for your reference; any new proposal would be submitted only after extensive consultation with VFNHP.

While chemical and physical sterilization has been shown to effectively reduce deer fertility, lethal control may sometimes have the opposite effect. It has been shown that the reproductive rate of *O. virginianus* is greatly reduced at high population densities while deer in areas subjected to periodic harvest have enhanced fertility rates resulting in increased population growth to compensate for harvested animals.[xx] Further research also indicates that harvest of both sexes does nothing to stop fluctuations in deer populations due to forage competition and natural mortality as a result of severe winter weather. [xxi]

Sterilization is superior to lethal control in that it leaves animals in a population as "placeholders" that are reproductively "dead ends" yet continue to occupy consistent home ranges and exhibit natural herding behaviors. The presence of these adult "placeholders" ensures continuity in the social framework of the herd while limiting the number of young and more mobile animals that might pose increased risks of collisions with vehicles and dispersal to adjoining private properties.

Based upon our offer and available research, the EIS must seriously re-evaluate the usefulness of both chemical and surgical sterilization to stabilize deer population density at VFNHP. It behooves the Park to more closely examine these options especially in light of the social and political controversy that surrounds lethal deer management. **The EIS must also discuss how the park can justify the increased levels of reproduction that are known to occur in *O. virginianus* populations subjected to lethal harvest when alternatives are available.**

IV. Underestimation of the Preferred Alternative's Effects on Visitor Experience

In discussing the effects on visitors by the preferred lethal control option for deer management at VFNHP, the EIS states that the "overall impact of Alternative D on the visitor use and experience would be long-term, negligible and adverse." (EIS pg -76) We find this statement to be delusional. Very few visitors to VFNHP perceive any forest regeneration problems at the Park. Visitors come to VFNHP to see and explore historical, cultural and natural areas. We believe it is safe to assume that the average visitor would be upset if, upon arriving at the Park for a hike, they saw signs indicating it was closed for deer culling. Personal experience has revealed that hikers actively seek out areas that do not have hunting or deer culling so family members and pets can hike without the fear of stray bullets.

Related to this, the EIS does not indicate how it plans to ensure that no visitors are in the park while the proposed sharp shooting would be taking place. While it is easy to close parking lots and post signs, it is not as simple to close off foot trails that traverse the park and enter onto adjacent land. Some hikers do prefer to begin their activities around dawn or plan to stop hiking right around dusk.

Additionally, the EIS makes no mention of how deer burial pits may negatively impact visitor experiences to the park. Considering that 2007 survey indicated that many visitors that come to VFNHP do so to watch deer, it seems highly unlikely that the possibility of seeing or smelling a burial pit or carcasses of deer spread around the park would be appreciated or serve to enhance their experience (EIS pg. 3-32).

The EIS also indicates that deer shooting activities would be conducted in the winter, when the smallest numbers of people visit VFNHP. However, even during the "slowest" months of December and January, according to a visitor survey in 2001, over 42% of respondents claimed to use the park in winter (EIS pg. 3-32). This could hardly be considered a "negligible number" if the park received an estimated 1.3 million visitors in 2007. (EIS pg. 3-31). The EIS severely downplays this potential impact to the natural experience of 10s of thousands of Park visitors.

Therefore, the HSUS emphasizes that the Final EIS must realistically depict the potential impact of intense lethal control of deer on visitor experience at VFNHP. The current draft severely downplays these impacts and does not even consider the possibility that visitor numbers may be significantly reduced during the winter months as a direct result of the proposed shootings.

V. Conclusions

The HSUS acknowledges VFNHP's efforts to address a perceived problem with white – tailed deer through a deer management plan. This is a highly contentious issue in which scientific uncertainty and human value systems meet head-on within a social framework that, frankly, views deer as a predominantly consumable and sustainable resource providing recreational opportunities. This is neither the mission nor the mandate of NPS, but the larger social context into which it must fit its own goals and plans. The HSUS regards the "standard" social model to be a vortex into which agencies like NPS might be easily pulled.

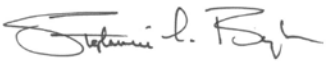
The NPS must decide if they want to be intervening, managing and manipulating deer for the foreseeable future in VFNHP and any other park units. Given the NPS mandate, is this justified and by what approaches and methodologies will NPS ever be able to determine what ecological end-point it seeks to achieve? Before the Final EIS is drafted, the park must have a clear picture of the end goals of deer management at the park, especially in light of the long history of human land use in and around the park and the lack of data to prove that deer will have a long – term effect on the continued existence of the forest ecosystem at VFNHP.

The Final EIS must also realistically depict the potential negative impacts that deer shooting would have on visitor experiences at VFNHP. Assuming that the average visitor is more concerned with forest regeneration than deer, dismissing tens of thousands of visitors as a negligible proportion, and downplaying the negative public perception of killing wildlife on protected lands is profoundly disingenuous.

However, The HSUS does recognize that there is a perceived conflict with deer in VFNHP. Regardless of the nature of this interaction, the fact that deer populations are viewed as in conflict with park goals necessitates some resolution. Hence, the HSUS supports Alternative B – Non-lethal combination, as presented in the Final EIS with the use of chemical contraception and/or surgical sterilization for reproductive control. We feel that this alternative will best serve to placate the critics of the deer's influence on the habitat while allowing for the continued enjoyment of these animals by visitors. This option is also the least controversial and the one that is most acceptable to the general public.

Thank you for the opportunity to comment on this Draft EIS. If you wish to discuss any of the information contained in these comments, do not hesitate to contact me directly.

Sincerely,



Stephanie L. Boyles, M.S., Wildlife Scientist
Wildlife and Habitat Protection
The Humane Society of the United States
2100 L Street NW
Washington DC 20037
Phone: 240-252-9790
Fax: 757-337-0023

Endnotes

[i] Rooney, T.P. and D.M. Waller. 2003. Direct and indirect effects of white – tailed deer in forest ecosystems. *Forest Ecology and Management* 181: 165 – 176.

[ii] Van der Wal, R. 2006. Do herbivores cause habitat degradation or vegetation state transition? Evidence from the tundra. *Oikos* 114(1): 177 – 186.

[iii] Russell, F.L. et al. 2001. Effects of white – tailed deer (Odocoileus virginianus) on plants, plant populations, and communities: a review. *American Midland Naturalist* 146(1): 1 – 26.

[iv] Cypher, B.L. et al. 1988. Seasonal food use by white – tailed deer at Valley Forge National Historical Park, Pennsylvania, USA. *Environmental Management* 12(2): 237 – 242.
[v] Krueger, L.M. and C.J. Peterson. 2006. Effects of white – tailed deer on *Tsuga canadensis* regeneration: evidence of microsites and refugia from browsing. *American Midland Naturalist* 156(2): 353 – 362.
[vi] Pomerantz, J.T. and J. M. Welch. 1996. Utilization of woody browse by white – tailed deer (Odocoileus virginianus) in Valley Forge National Historical Park. The *Pennsylvania Geographer* 34(2): 87 – 97.
[vii] Cote, S.D. et al. 2004. Ecological impacts of deer overabundance. *Annual Review of Ecology, Evolution, and Systematics* 35: 113 – 147.
[viii] Woolf, A. and J.L. Roseberry. 1998. Deer management: our profession's symbol of success or failure*? Wildlife Society Bulletin* 26(3): 515 - 521.
[ix] Murcia, C. 1995. Edge effects in a fragmented forest: implications for conservation. *Trends in Ecology and Evolution* 10(2): 58 – 62.
[x] Maltlack, G.R. 1994. Vegetation dynamics of the forest edge – trends in space and successional time. *Journal of Ecology* 82: 113 – 123.
[xi] Horsely, S.B.et al. 2003. White – tailed deer impact on the vegetation dynamics of a northern hardwood forest. *Ecological Applications* 13(1): 98 – 118.
[xii] Rooney, T.P. and W.J. Dress. 1997. Patterns of plant diversity in overbrowsed primary and mature secondary hemlock – northern hardwood forest stands. *Journal of the Torrey Botanical Society* 124(1): 43 – 51.
[xiii] Seagle, S.W. and S. Liang. 2001. Application of a forest gap model for prediction of browsing effects on riparian forest succession. *Ecological Modelling* 144: 213 – 229.
[xiv] Matthews, N.E. et al. 2005. *Evaluation of a Trap-Sterilize- Release Program for White-tailed Deer in Highland Park, Illinois, 2002 - 2005*. Report for the Highland Park City Council September 12, 2005. 52pp.
[xv] Porter, W.F. et al. 2004. Movement behavior, dispersal, and the potential for localized management of deer in a suburban environment. *Journal of Wildlife Management* 68(2): 247 -256.
[xvi] Rutberg, A.T. et al. 2004. Effects of immunocontraception on a suburban population of white – tailed deer *Odocoileus virginianus*. *Biological Conservation* 116: 243 – 250.
Naugle, R.E. et al. 2002. Field testing of immunocontraception on white-tailed deer (*Odocoileus virginianus*) on Fire Island National Seashore, New York, USA. *Reproduction Supplement* 60:143-153.
[xvii] Kirkpatrick J. F. et al. 1990. Remotely-delivered immunocontraception in feral horses. *Wildlife. Society Bulletin* 18:326-330.
[xviii] Fraker, M.A. et al. 2002. Long-lasting, single dose contraception of feral fallow deer in British Columbia. *Journal of Wildlife Management* 66:1141-1147.
Turner, J.W. et al., 2002. Porcine zona pellucida (PZP) immunocontraception of wild horses (*Equus caballus*) in Nevada: a ten-year study. *Reproduction Supplement* 60:177-186.
[xix] Miller, L. A. et al. 2000. Long-term effects of PZP immunization on reproduction in white-tailed deer. *Vaccine* 18:568-574.
[xx] Swihart, R.K. et al. 1998. Nutritional condition and fertility of white - tailed deer (*Odocoileus virginianus*) from areas with contrasting histories of hunting. *Canadian Journal of Zoology* 76: 1932 – 1941.
[xxi] Patterson, B.R. and V. A. Power. 2002. Contributions of forage competition, harvest, and climate fluctuation to changes in population growth of northern white – tailed deer. *Oecologia* 130: 62 – 71.