



## **RECORD OF DECISION**

### **Rock Creek Park White-Tailed Deer Management Plan and Final Environmental Impact Statement**

#### **INTRODUCTION**

The Department of the Interior, National Park Service (NPS) has prepared this Record of Decision (ROD) for the Rock Creek Park White-tailed Deer Management Plan and Final Environmental Impact Statement (final plan/EIS). This ROD states what the decision is, identifies the other alternatives considered and the environmentally preferable alternative, discusses the basis for the decision, lists measures to minimize environmental harm, and briefly describes public and agency involvement in the decision-making process. The impairment determination for the selected action is attached to this ROD.

#### **PURPOSE AND NEED FOR THE PLAN/EIS**

There are no historic records of a white-tailed deer population in Rock Creek Park before 1960. In the 1960s, staff observation records show four sightings of deer in the park. By the early 1990s, deer sightings were so prevalent that park staff no longer completed observation cards. In 2007, sampling indicated 82 deer per square mile in the park. Deer population densities remained at high levels in 2008 (66 deer per square mile) and 2009 (67 deer per square mile).

Results of continual vegetation monitoring have documented the detrimental effects of the large deer herd size on forest regeneration in Rock Creek Park.

The purpose of the plan/EIS is to develop a white-tailed deer management strategy that supports long-term protection, preservation, and restoration of native vegetation and other natural and cultural resources in Rock Creek Park. Because the deer population in Rock Creek Park has grown, continues to exist at relatively high densities, and continues to have adverse effects on the park's vegetation, action is needed to address the following issues:

- The potential of deer becoming the dominant force in the park's ecosystem and adversely impacting native vegetation and other wildlife.
- A decline in tree seedlings caused by excessive deer browsing and the ability of the forest to regenerate in Rock Creek Park.
- Excessive deer browsing impacts on the existing shrubs and herbaceous species.
- Deer impacts on the character of the park's cultural landscapes.
- Opportunities to coordinate with other jurisdictional entities currently implementing deer management actions beneficial to the protection of park resource and values.

The objectives of the final plan/EIS are to:

- Develop and implement informed, science-based vegetation impact levels and corresponding measures of deer population density that would serve as a threshold for taking prescribed management actions within the park.
- Protect the natural abundance, distribution, and diversity of native plant species within the applicable park units by reducing excessive deer browsing, trampling, and nonnative seed dispersal.
- Maintain, restore, and promote a mix of native plant species and reduce the spread of nonnative plant species through effective deer management.
- Allow for a white-tailed deer population within the park while protecting other park resources.
- Protect the natural abundance, distribution, and diversity of native animal species within the park by reducing excessive deer browsing, trampling, and nonnative seed dispersal.
- Protect lower canopy, shrub, and ground nesting bird habitat from adverse effects of deer browsing.
- Protect habitat of rare plant and animal species from adverse effects of deer, such as excessive deer browsing, trampling, and nonnative seed dispersal.
- Protect the integrity, variety, and character of the cultural landscapes by reducing excessive deer browsing, trampling, and nonnative seed dispersal.
- Share information with the public regarding the deer population and the forest regeneration process and diversity, including the role of deer as part of a functioning park ecosystem, not the primary driving force within it.
- Initiate cooperative efforts to address deer effects on the park and surrounding communities.
- Share information with park staff and other regional parks regarding the deer population and management strategies.

## **BACKGROUND**

White-tailed deer have flourished in Rock Creek Park due to favorable habitat, an absence of natural predators, and a prohibition against hunting (Code of Federal Regulations (CFR), Title 36, Section 2.2.). To better understand deer-related impacts, park staff have monitored deer population levels and conducted studies of plant growth in the park's forest understory. In general, the data indicate that deer are having adverse effects on shrub cover, tree seedling regeneration, and understory plant densities.

Park staff has estimated deer population trends and density at Rock Creek Park through roadkill reporting; limited Forward Looking Infrared Surveys (FLIR); roadside spotlight surveys; and Distance Sampling, which provides the most accurate estimate of animal population density. First conducted in November 2000, Distance Sampling has been repeated annually by park staff. The deer density measured by Distance Sampling yielded these densities in following years: 62 deer per square mile in 2000; 63 deer per square mile in 2001; 60 deer per square mile in 2002; 98 deer per square mile in 2003; 75 deer per

square mile in 2004; 52 deer per square mile in 2005; 58 deer per square mile in 2006; 82 deer per square mile in 2007; 66 deer per square mile in 2008; and 67 deer per square mile in 2009.

Park staff also have conducted long-term monitoring of unfenced vegetation plots and studies of paired plots (fenced and unfenced) to assess the effects of deer browsing on forest vegetation. In 1990, 27 long-term vegetation monitoring plots were placed randomly in all three geographic regions in the park—north, central, and south—to capture general changes in vegetation over time. Data from these long-term unfenced plots, read every four years, indicate that  $3.1 \pm 0.9\%$  of the stems were browsed in 1991, compared to  $31.1 \pm 2.9\%$  in 2003. During this time, the shrub cover decreased from  $54.63 \pm 5.9\%$  in 1991 to  $14.92 \pm 2.2\%$  in 2003 (Hatfield 2005). A cumulative data analysis of all years through 2007 (Hatfield 2008) shows that all tree seedling counts generally declined since 1991, and that counts for all height classes were near zero in 2007. The data collected from these monitoring plots indicate that the mean seedling stocking rates declined significantly from 1991 to 2007, with a stocking rate of  $2.26 \pm 0.32\%$  in 2007. This is significantly below the 67% stocking rate recommended for forest regeneration (Hatfield 2008; Stout 1998).

In 2000, 20 paired plots (one plot fenced, one plot unfenced, located next to each other in similar vegetation conditions) were established in Rock Creek Park proper and Glover-Archbold Park. From 2001 to 2004, the paired plots showed that plant cover outside the fenced plots was substantially less when compared to plant cover inside the fenced plots over the study period. A report summarizing the results of the paired plot data from 2001 to 2009 (Krafft and Hatfield 2011) found that vegetation in plots protected from deer herbivory for nine years showed significantly greater vegetative cover compared to plots not protected from deer herbivory. This effect was most pronounced for woody and shrub cover. Cover by the dominant species was not significantly greater in the fenced plots compared to the paired unfenced control plots, indicating that the significant differences observed for groups were not driven by single species within those groups. Data about vegetation thickness indicate that protection from deer herbivory produced significantly higher levels of vegetation in the paired fenced plots compared to the paired unfenced control plots for both the low (0 to 30 centimeters) and middle (30 to 110 centimeters) height classes. These impacts can be directly attributed to deer browsing and indicate deer are affecting the integrity of the understory structure and species composition, diminishing the value of habitat for other wildlife. While there is some understory vegetation and the browse line is not prominent at Rock Creek Park, trends indicate that an unmanaged deer population could lead to these problems, which are currently being faced by similar eastern national parks.

## **DECISION (SELECTED ACTION)**

The NPS will implement alternative D, the selected action. This action was described as the NPS preferred alternative and the environmentally preferred alternative in both the draft and final plan/EIS, released to the public for the required 30-day no-action period beginning January 13, 2012 and ending February 13, 2012.

Under the selected action, the NPS will continue current park deer management actions. These include deer population monitoring (including Distance Sampling); caging of small areas and using small amounts of repellents to protect native plants and ornamental landscaping; monitoring to record deer browsing impacts and deer population numbers within the park (although specific monitoring actions may be modified or discontinued over time, depending on the results and need for monitoring); opportunistic and targeted surveillance for Chronic Wasting Disease (CWD); educational and interpretive activities to inform the public about deer ecology and park resource issues; and cooperation with regional entities and inter-jurisdictional agencies. In addition, the selected alternative will use a combination of certain additional lethal and non-lethal actions to reduce deer herd numbers. The lethal actions will include both sharpshooting and capture/euthanasia, and these actions will be taken initially to quickly reduce the deer

herd numbers. Reproductive control of does will be implemented to maintain the reduced herd numbers through sterilization or acceptable reproductive control agents, if the reproductive control agents meet criteria set forth in the plan (see the “Methods” section, below).

If an acceptable reproductive control agent becomes available sooner than expected, the park could select to use that first (before the initial sharpshooting), so that deer are not as hard to capture and more can be treated. However, it is assumed that sharpshooting will be conducted first and that population maintenance will be conducted using the most practical method. This could include a combination of lethal and non-lethal methods, although sharpshooting could be used solely to maintain the deer herd, if necessary.

Details on the costs of the selected action are summarized in the final plan/EIS in table 9. Details regarding methods used to implement the plan follow the “Adaptive Management” section, below.

### **Threshold for Taking Action**

Forest regeneration is the primary measure of the plan’s success. Therefore, tree seedlings must be monitored to determine at what point the browsing impacts would warrant implementation of the selected alternative. The point at which action would be needed is called the “threshold for taking action.”

As further explained in chapter 2 of the final plan/EIS, the vegetation monitoring method measures the number of tree seedlings and their heights in circular sampling plots under different levels of deer herbivory. At low deer density (between 13 to 21 deer per square mile, which is in the range of the desired deer density proposed for this plan), successful forest regeneration will be indicated when there are 51 seedlings or more within the subplots in 67 percent or more of the unfenced long-term plots monitored by the park. The park will determine the level of regeneration every four years from data collected from the plots.

### **Initial Deer Density Goal**

The selected alternative establishes a range of 15 to 20 deer per square mile as the initial deer density goal – the appropriate density of deer that will allow for natural forest regeneration. This deer density is consistent with the density range reported in the scientific literature as necessary for adequate tree regeneration. It is based on information provided by the science team that was formed to provide technical information and input into the planning process (see the “Scientific Background” section in chapter 1 of the final plan/EIS). This initial goal may be adjusted based on the results of vegetation and deer population monitoring, as described in the “Adaptive Management” section, below.

### **Adaptive Management**

According to the U.S. Department of the Interior Technical Guide (Williams et al. 2007), “Adaptive management is a systematic approach for improving resource management by learning from management outcomes” (Sexton et al. 1999). An adaptive management approach will be implemented as part of the selected action.

The number of deer to be removed annually will be adjusted based on the results of the previous year’s removal effort, monitoring of forest regeneration and deer population size, and estimated population growth. Because the goal of the action is to manage for successful forest regeneration within the park, the results of removal will be documented through monitoring of forest regeneration. This will allow the park staff to adjust the number of deer to be removed based on the response of the vegetation to a lower deer density. If monitoring indicates that vegetation is not regenerating, then management actions can be adjusted.

## **Methods**

### *Sharpshooting*

Qualified federal employees or contractors will be used to implement this alternative. All employees or contractors used will be experienced with sharpshooting methods and have the necessary sharpshooting qualifications. These employees or contractors will coordinate with park staff all details related to sharpshooting actions with park staff, including setting up bait stations; locating deer; sharpshooting; and disposition of the deer, including donation of meat and/or disposal of waste or carcasses.

In most locations, high-power, small-caliber rifles will be used from close range. Non-lead ammunition will be used for lethal removal of deer to preserve the opportunity to donate the meat or, in limited circumstances, for the deer to be left in the field for scavenging wildlife.

Every effort will be made to conduct the shootings as humanely as possible. Deer injured during the operation will be euthanized as quickly as possible to minimize suffering.

Noise suppression devices and night vision equipment will be used to reduce disturbance to the public. Activities will be in compliance with all federal firearm laws administered by the Bureau of Alcohol, Tobacco, and Firearms.

In very limited locations, deer removal may be done using archery (bow and arrow). Possible locations would include areas of the park that are too narrow or close to occupied buildings or residences. Any shooting with bow and arrow will be done from close range by federal employees or contractors specifically experienced with this type of deer removal.

Sharpshooting with firearms will occur primarily at night (between dusk and dawn), during the late fall and winter months when deer are more visible and fewer visitors are in the park. In some restricted areas, sharpshooting may be done during the day if needed, which could maximize effectiveness and minimize the overall time of restrictions. If this is done, the areas will be closed to park visitors. The public will be notified of any park closures in advance, exhibits regarding deer management will be displayed at visitor centers, and information will be posted on the park's website and bulletin boards to inform the public of deer management actions. Visitor access would be limited as necessary while reductions were taking place, and NPS personnel and U.S. Park Police officers will patrol public areas to ensure compliance with park closures and public safety measures. If more than one shooting location is used, the areas will be adequately separated to ensure safety.

Bait stations will likely be used to attract deer to safe removal locations, concentrate deer, improve removal success, and allow the maximum use of ground as a backstop (i.e., shooting will be directed downward toward the ground). The stations will be placed in park-approved locations away from public use areas to maximize the efficiency and safety of the reduction program.

During the first two to three years of removal, both does and antlered deer (bucks) will be removed based on opportunity, although there will be a preference for removing does. Deer populations are largely dependent on the number of does with potential for reproduction. Harvest of does is necessary to stabilize or reduce populations, and for a rapid decrease in deer population, at least two or three does should be culled for every buck that is culled (West Virginia University 1985). Records will be kept on the age and gender of all deer removed from the park to aid in defining the local population composition. This information will be compared with composition data collected during park population surveys.

To the maximum extent possible, the park intends to donate all deer meat to local charitable organizations.



### *Capture and Euthanasia*

Due to the potential for stress to animals, capture and euthanasia will be used only in limited circumstances where sharpshooting may not be appropriate. Activities will occur from dusk to dawn and in the fall or winter months when fewer visitors are in the park, but may occur at any time of day depending on deer activities. Deer will be captured with nets, traps, or chemical immobilization by dart gun and euthanized as humanely as possible. If trapped or netted, deer will be immobilized prior to any type of euthanasia being administered. Euthanasia methods would include those approved by the American Veterinary Medical Association and could include use of a penetrating captive bolt gun, chemical injection, or exsanguination. Several methods of wildlife trapping could be used, including but not limited to drop nets and box traps. Most trapping methods involve using bait to attract deer to a specific area or trap.

Several actions will be taken to ensure safety of the operation. NPS employees and/or their authorized agents trained in the use of penetrating captive bolt guns or tranquilizer guns will perform these actions. Training would include safety measures to protect both visitors and NPS employees. NPS employees or authorized agents will also be qualified to handle live deer in order to prevent disease transmission and prevent any harm to an animal or an employee/agent. Appropriate safety measures will be followed when setting drop nets or box traps. Visitor access would be limited as necessary while capture and euthanasia activities were taking place, and U.S. Park Police officers, supplemented by NPS park rangers, would patrol public areas to ensure compliance with park closures and public safety measures.

All actions will be conducted in accordance with American Veterinary Medical Association recommendations for the humane treatment of animals to the greatest extent possible (American Veterinary Medical Association 2001).

### *Reproductive Control of Does*

The results of current research on chemical reproductive control are highly variable in regard to key elements such as contraceptive efficacy and duration of effect. There also are logistical issues related to the administration of these drugs. Therefore, NPS will implement reproductive control agents to maintain the deer population when the following criteria are met. (Currently, an agent that fully meets these criteria is not available.)

<b>Reproductive Control Agent Criteria</b>	<b>Rationale for Criterion</b>
There is a federally approved fertility control agent for application to free-ranging populations.	It is critical that all aspects of a fertility control program be consistent with federal laws and regulations and NPS policies.
The agent provides multiple year (three to five years) efficacy.	Modeling efforts have clearly demonstrated that (1) "the efficacy of fertility control as a management technique depends strongly on the [multi-year] persistence of...the fertility control agent;" and (2) the only scenarios in which fertility control is more efficient than culling at maintaining population size is when a multi-year efficacy is achieved (Hobbs et al. 2000).
The agent can be administered through remote injection.	Remote delivery reduces the frequency of stressful capture and/or drug delivery operations.
The agent would leave no residual in the meat (i.e., meat derived from treated animals should be safe for human consumption according to applicable regulatory agencies).	Any fertility control agent applied in free-ranging wildlife populations that are contiguous with areas or with the same species that are hunted must be safe for human consumption.

## Reproductive Control Agent Criteria

## Rationale for Criterion

Overall there is substantial proof of success with limited behavioral impacts in a free-ranging population, based on science team review and NPS policy.

No study has demonstrated that fertility control works to reduce deer numbers in free-ranging populations to the extent needed at Rock Creek Park to allow for tree regeneration. Therefore it is important that proof of success be demonstrated to a review panel. Also, it is important that any agent used would meet NPS policies including those regarding altered behavior (NPS *Management Policies 2006*, (NPS 2006, sec. 4.4.1)).

The success of using a reproductive control agent on a population that has been subject to several years of sharpshooting efforts will depend on advances in reproductive control technology, sensitivity of the deer herd to humans, methods used by the sharpshooters, changes in immigration with reduced deer density, and general deer movement behavior (Porter et al. 2004; Naugle et al. 2002). After sharpshooting is conducted, it may become increasingly difficult to approach the deer closely enough to administer remote injections, due to deer behavior changes in response to previous human interaction. NPS also will consider sterilization as a reproductive control maintenance option. This will reduce the number of does requiring treatment over the long term, although the initial cost per doe is about the same as reproductive control.

Assuming a park deer population of 70 deer (density of about 15 per square mile) following sharpshooting, with 65 percent (45) of the deer being does (K. Ferebee, pers. comm. 2008b), 41 does (45 × 90 percent) would need to be treated annually in order to halt population growth and maintain the deer at the desired density. If an agent like GonaCon® is available and meets the criteria established for use of reproductive control agents, the frequency of treatment and costs would be reduced (current formulations of GonaCon® last up to four years). However, GonaCon® does not meet the criteria for remote injection, and there is no substantial proof of its success in a free-ranging population. Until a reproductive control agent meets all of the use criteria described above, sharpshooting would be used for long-term maintenance of the reduced deer population size as needed (i.e., approximately 14 deer would be removed annually).

Depending on the reproductive control agent to be used, treated does will need to be marked for non-consumption. This will likely be accomplished using ear tags with a unique identifier bearing the statement "Not for Human Consumption." The ear tag will also identify which does have been treated. With the ear tag technique, each doe must be captured and handled at least once initially, and each may require additional annual treatment. Telemetry darting likely will be the primary capture method used. Some handling-related mortality could occur under this method due to tranquilizer use and stress on the doe (DeNicola and Swihart 1997; Kilpatrick et al. 1997); generally a two to five percent mortality rate may be expected. An alternative capture method is the use of traps or nets.

Bait piles will likely be used to concentrate does in certain locations so that the darting could be done as efficiently as possible. Visitor access will be restricted in certain areas of the park during the treatment period. The areas targeted for treatment will be chosen based on maximizing deer presence and accessibility, while minimizing disruption to the visitor experience. The treatment of does will be conducted during the off-peak visitor hours (early morning and evening) and weekdays to the extent possible, but will likely need to occur in the period immediately preceding the deer rut (September and October).

## **Deer and Vegetation Monitoring**

Monitoring under the selected alternative will include opportunistic and targeted surveillance for CWD, spotlight surveys to assess the effectiveness of reproductive controls, and vegetation monitoring to document changes in forest regeneration that would result from reduced deer numbers. The numbers of deer to be removed or treated in subsequent years will be adjusted based on the success of previous removal or reproductive control efforts, projected growth in the population, and vegetation and deer monitoring results.

## **Mitigation**

A number of mitigation measures will be implemented as part of the selected alternative. These actions include the following:

- Non-lead ammunition will be used for any lethal removal of deer to preserve the opportunity to donate the meat or, in limited circumstances, for the carcass to be left in the field for scavenging wildlife.
- Sharpshooting with firearms will occur primarily at night (between dusk and dawn), during late fall and winter months when deer are more visible and fewer visitors are in the park. Similarly, any capture and euthanasia actions or treatment of does will occur during the off-peak visitor hours (early morning and evening) and weekdays to the extent possible.
- Visitor access would be limited as necessary to provide for public safety during reduction or treatment operations, and NPS personnel and U.S. Park Police will patrol public areas to ensure compliance with park closures and public safety measures. The public will be notified of any park closures in advance, and will be provided with information about the deer management actions taking place through the park's Web site, through press releases, and by notices placed on park bulletin boards.
- Noise suppression devices and night vision equipment will be used during sharpshooting to reduce disturbance to the public. Activities will be in compliance with all federal firearm laws administered by the Bureau of Alcohol, Tobacco, and Firearms. Safety zones will be established around park boundaries during removal operations.
- Bait stations will be placed in park-approved locations away from public use areas to maximize the efficiency and safety of the reduction program.
- Capture and euthanasia will be used only in limited circumstances where sharpshooting may not be appropriate. There is the potential for stress to animals during this activity.
- Does treated with a reproductive control agent will be appropriately marked or tagged to facilitate identification of treated individuals and to prevent human consumption if necessary.

## **ENVIRONMENTALLY PREFERRED ALTERNATIVE**

The NPS is required to identify the environmentally preferred alternative in its NEPA documents for public review and comment. Guidance from the CEQ states that the environmentally preferred alternative is "the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources: (CEQ



1981). Alternative D (the selected action) was identified as the environmentally preferred alternative, because it is the alternative that would best protect the biological and physical environment by ensuring an immediate reduction in deer population numbers that could be sustained with proven methods over the life of the plan. Alternative D would also best protect, preserve, and enhance the cultural and natural processes that support the park's forests and cultural landscapes by providing multiple management options to maintain low deer numbers. Although alternatives C and D are very close in meeting the guidance for identification of the environmentally preferred alternative, alternative D was selected primarily because it provides the park with the ability to select the least environmentally damaging option as science and technology advance. Alternatives A and B were not considered environmentally preferred because of their lack of effect on the deer population numbers, which would result in potential or continued adverse impacts on the biological and cultural resources of the park over the life of the plan.

## **ALTERNATIVES CONSIDERED BUT NOT SELECTED**

### **Alternative A: No Action (Existing Management Continued)**

Under the “no action” alternative, Rock Creek Park would continue to implement current management actions and policies related to deer and their effects. This would include deer population monitoring (including Distance Sampling), as well as caging of small areas and using small amounts of repellents to protect native plants and ornamental landscaping. Current monitoring efforts would continue to record deer browsing impacts and deer population numbers within the park, although specific monitoring actions may be modified or discontinued over time, depending on the results and need for monitoring. Educational and interpretive activities would continue to be used to inform the public about deer ecology and park resource issues, and cooperation with regional entities and inter-jurisdictional agencies would continue. No additional deer management actions to reduce the deer population would occur under this alternative.

The actions that would continue under alternative A are described in detail on pages 46 to 50 of the final plan/EIS. These actions would also be common to all action alternatives as well.

### **Alternative B: Combined Non-Lethal Actions — Large Exclosures and Reproductive Control of Does**

In addition to the actions described under alternative A, a combination of non-lethal actions would be implemented under alternative B to protect forest seedlings, promote forest regeneration, and gradually reduce deer numbers in the park. The additional actions would include constructing large-scale fenced exclosures, and controlling doe reproduction through surgical sterilization and use of an approved reproductive control agent.

Up to 14 large exclosures (fenced areas of more than five acres each, constructed for the purpose of excluding deer from entering) would be constructed to fit the landscape, each covering from about seven to 25 acres or up to a total of approximately 167 acres, or about five percent of the entire park and approximately 10 percent of the main park reservation, which is largely forested. Areas containing valuable habitats (i.e., areas that are diverse, sensitive, free of invasive plants, and/or relatively pristine) would be targeted for protection. Deer would be driven out of the exclosures by park staff before completion. Visitors would not be able to use the areas included in the exclosures during or after construction for approximately 10 years. Maintenance on the exclosures would be performed on an as needed basis but a minimum of four times a year.

Sterilization of does would be the initial action taken to reduce deer numbers, unless another contraceptive method that meets NPS criteria would become available for use. Use of acceptable reproductive control agents with does would be phased in under alternative B when feasible, which is defined for this plan as having an agent that meets the same criteria as discussed for the selected action. At the time this plan was first prepared, leuprolide, an agent with single-year application, was selected as an example for the purposes of the analysis and cost estimate. The park would continue to monitor the status of ongoing reproductive control research. If advances in technology could benefit deer management in the park, then the future choice of a reproductive control agent could change.

### **Alternative C: Combined Lethal Actions — Sharpshooting and Capture and Euthanasia**

Alternative C would continue the actions described under alternative A, and two types of lethal action would be used by NPS or their authorized agents to reduce and control deer herd numbers: sharpshooting or capture and euthanasia. Sharpshooting would be used to initially reduce the deer population in areas of the park and as a maintenance treatment if needed. Sharpshooting would involve using trained sharpshooters to shoot deer in designated areas, generally using firearms, as described for the selected alternative. Sharpshooting with firearms would primarily occur at night (between dusk and dawn), during late fall and winter months when deer are more visible and fewer visitors are in the park, and other mitigation measures as listed for the selected alternative would be followed to minimize impacts to the public and surrounding landowners. This action would continue for a minimum of three years, at which time it is estimated that the population would be reduced to the initial density goal of 15 to 20 deer per square mile. Assuming a 20 percent growth rate in the deer herd, about 14 deer would need to be removed annually in subsequent years to maintain the population at about 70 deer or 15 deer per square mile. This number may vary annually depending on success of previous removal efforts, deer adaptations to removal efforts, regeneration response, and other factors.

Also as described for the selected alternative, capture and euthanasia would be used in limited circumstances where sharpshooting may not be appropriate. The preferred technique for this method would be for NPS employees or their authorized agents to trap deer, immobilize them using chemical injection, and euthanize them. Activities would occur at dawn or dusk and in the fall or winter months when fewer visitors are in the park, but may occur at any time of day depending on deer activities.

### **BASIS FOR DECISION**

To identify the preferred alternative, the planning team evaluated each alternative based on its ability to meet the plan objectives (see table 11 of the final plan/EIS) and the potential impacts on the environment ("Chapter 4: Environmental Consequences" of the final plan/EIS). Alternative D was identified as the NPS preferred alternative.

Both alternatives C and D fully meet the plan objectives and are very close in their meeting of all objectives and their relative impacts. However, alternative D provides for the opportunity to use a wider variety of management methods, including reproductive control, which would be an option when the criteria established by the planning team are met. Alternative D provides for an efficient initial removal of deer, and the flexibility to address future removals in different ways. If reproductive control is used, there could be reduced impacts relating to visitors, safety, and the environment by eliminating the need to close the park for extended periods of time and limiting the time that shooting would occur in the park.

Alternative B partially meets some of the objectives. However, it would not result in the immediate reduction in deer numbers, nor is it certain that the deer density goal would be achieved under this alternative, even over an extended period of time. Alternative A (no action) fails to meet or fully meet the objectives of the plan, since no action would be taken to reduce deer numbers or effect a change in conditions that are the basis for the purpose of and need for action.

## **PUBLIC SCOPING**

Public scoping for the plan/EIS began with the publishing of the Notice of Intent in the Federal Register on September 20, 2006, and concluded on December 8, 2006. During this time, two public scoping meetings were held (November 1 and November 2, 2006) that included an open house, presentations by the NPS, and an opportunity for formal public comment. The purpose of these meetings was to solicit public input, especially on issues and ideas for alternatives. The meetings were held at the Rock Creek Nature Center in Washington, D.C. Notices of the meetings were posted on the NPS Planning, Environment, and Public Comment (PEPC) website. Additionally, a newsletter was mailed in October 2006 to the project's preliminary mailing list of government agencies, organizations, businesses, and individuals. The newsletter announced the public scoping meetings and summarized the purpose of and need for a deer management plan, the plan objectives, and the history of Rock Creek Park's deer research and management.

During the comment period, 34 pieces of correspondence were received that contained 140 comments. The majority of the public comment received focused on various alternatives and alternative elements. Other comments expressed concern about the impacts to vegetation from the deer herd, while others encouraged the NPS to ensure that the proper methodologies and assumptions were made with regard to the deer population as well as other components of the Rock Creek Park ecosystem.

## **Public Review of the Draft Plan/EIS**

The draft plan/EIS was made available for review through a Notice of Availability on July 10, 2009. Following the release of the draft plan/EIS, the public comment period was open between July 13, 2009 and October 13, 2009. This public comment period was announced on the park's website ([www.nps.gov/rocr](http://www.nps.gov/rocr)); on flyers posted on the park's bulletin boards; and by postcards that were sent to interested parties, elected officials, and appropriate local and state agencies. Due to the high level of public interest, the comment period was later extended until November 2, 2009. The public was notified of this extension by a park press release and subsequent Federal Register notice. The draft plan/EIS was made available through several outlets, including the NPS PEPC website at <http://parkplanning.nps.gov/rocr>, as well as on CD or hard copy obtainable upon request from the park. Thirty hard copies and 51 CDs of the draft plan/EIS, as well as 38 letters announcing the availability of the document on PEPC, were mailed to interested parties, elected officials, and appropriate local and state agencies. A limited number of hard copies were made available at the Cleveland Park Public Library, the Chevy Chase Public Library, the Tenley-Friendship Public Library, the Georgetown Public Library, the Martin Luther King Junior Memorial Library, the Mount Pleasant Public Library, the Petworth Public Library, and the Palisades Public Library. The public was encouraged to submit comments regarding the draft plan/EIS through the NPS PEPC website, at the public meeting, or by mailing a letter to the park.

In addition to the public review and comment period, one public meeting was held on September 2, 2009, from 6:30 p.m. to 9:00 p.m. at the Rock Creek Park Nature Center in Washington, D.C. This public meeting was held to obtain community feedback on the draft plan/EIS for deer management at Rock Creek Park. Release and availability of the draft plan/EIS, as well as the public meeting, were advertised as described above.

A total of 127 attendees signed in during the meeting. The meeting began with a brief open-house format where attendees had the opportunity to ask questions and observe displays illustrating the study area; the purpose, need, and objectives of the plan; and summaries of the four proposed alternatives, as well as deer population monitoring, vegetation monitoring, and impacts. Following the open-house format, park staff made a formal presentation explaining the specifics of the plan and the proposed alternatives. The presentation was followed by a formal public comment period/hearing that allowed attendees to provide their comments on the draft plan/EIS. Attendees had the opportunity to fill out comment forms and

submit them at the meeting or mail them to the park at any time during the public comment period, which ended November 2, 2009. Those attending the meeting also received a public meeting informational handout, which provided additional information about the National Environmental Policy Act (NEPA) process, a comparison of actions under each proposed alternative, and additional opportunities for commenting on the project, including directing comments to the NPS PEPC website.

During the comment period, 414 pieces of correspondence were received, one of which was a form letter containing 339 signatures, and one of which was a petition with 540 signatures, for a total of 1,293 signatures on all correspondence. Correspondence was received by the following methods: email, hard copy letter via U.S. mail, comment sheet submitted at the public meetings, transcript recorded during the public meeting, or entered directly into the Internet-based PEPC system. Once all the correspondence was entered into PEPC, each was read, and specific comments within each piece of correspondence were identified. A total of 2,118 comments were derived from the correspondence received, and these comments were further identified as substantive or non-substantive. Comments simply in favor of or against the proposed action or alternatives, or comments that only agree or disagree with NPS policy, are not considered substantive. All substantive comments were analyzed to identify common concerns or issues for response from the NPS. Members of the NPS planning team responded to the identified concern statements, and the responses are included in appendix G of the final plan/EIS.

Approximately 63 percent of the comments were non-substantive and were related to four codes: general lethal reduction, the combined non-lethal alternative, the combined lethal alternative, and the preferred combined lethal and nonlethal alternative. The majority of the comments were categorized under code *Oppose Lethal Reduction (Non-Substantive)*, which accounted for 18.76 percent of the total comments received. Comments under the code *Support of Alternative B: Non-Lethal Actions (Non-Substantive)* were the second most common comment, representing 16.73 percent of the total comments made. Comments under the code *Oppose Alternative D: Combined Lethal and Non-Lethal Actions (NPS Preferred) (Non-Substantive)* were the third most common comment, representing 14.03 percent of the total comments made. The fourth most comments fell under the code *Oppose Alternative C: Combined Lethal Actions (Non-Substantive)*, with 13.83 percent of the total comments. Of the 1,293 signatures, 386 (29.85 percent) came from commenters in the state of Maryland, 171 (13.23 percent) came from within the District of Columbia, and 562 (43.46 percent) came from the Commonwealth of Virginia. The remaining pieces of correspondence came from eight other states, except for commenters who stated they resided in "UN." The majority of comments (97.76 percent) came from unaffiliated individuals, with 0.31 percent of the comments coming from conservation/preservation organizations.

All comments received were carefully considered and incorporated into the final plan/EIS. Changes made in the final plan/EIS as a result of public comment are factual in nature and did not result in changes to the NPS preferred alternative or the outcome of the impact analysis for any of the management alternatives considered.

The final plan/EIS was available for public inspection for a 30-day no-action period, which began with the publication of the Notice of Availability of the final plan/EIS on January 13, 2012, and ended on February 13, 2012.

## **Agency Coordination**

### *U.S. Environmental Protection Agency*

The NPS received a letter from the U.S. Environmental Protection Agency providing its comments on the draft plan/EIS, and rating the draft plan/EIS as LO, Lack of Objections. EPA's letter is in appendix G of the final plan/EIS.

### *U.S. Fish and Wildlife Service*

The U.S. Fish and Wildlife Service (USFWS) was contacted as part of public scoping for the plan on June 17, 2008. No reply was received. A copy of the draft and final plan/EIS was sent to the USFWS to complete Section 7 consultation. A letter (Attachment B) was received from the USFWS on January 23, 2012 stating that they concurred with the conclusion of the NPS that the preferred alternative will have negligible impacts and is "not likely to adversely affect" the federally endangered Hay's Spring amphipod (*Stygobromus hayi*), which is located in the area to be affected by the proposed action.

### *District of Columbia Historic Preservation Office*

The District of Columbia Historic Preservation Office was contacted as part of public scoping for the plan on June 18, 2008, and a response was received on July 18, 2008. It is included at the end of appendix H of the final plan/EIS. A copy of the draft plan/EIS was sent to the District Historic Preservation Office to complete Section 106 compliance and a letter was received on August 3, 2009 (included in Appendix G of the final plan/EIS) stating concurrence with the NPS determination that implementation of the preferred alternative will have "no adverse effect" on historic properties conditioned upon the sites for the enclosure fences being carefully located to avoid or completely contain identified archaeological sites. Installation of the fencing will be monitored by an archaeologist meeting the *Secretary of Interior's Standards*.

### *State of Maryland Wildlife and Heritage Service*

The Maryland Department of Natural Resources Wildlife and Heritage Service was contacted as part of public scoping for the plan on October 27, 2008. No response was received. A copy of the draft plan/EIS was sent to this office.

### *National Capital Planning Commission and Commission of Fine Arts*

Both of these agencies were contacted as part of public scoping for the plan on June 18, 2008. No responses were received. A copy of the draft plan/EIS was sent to each office.



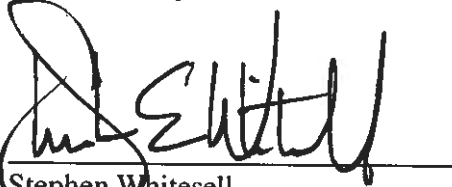
## CONCLUSION

Overall, among the four alternatives considered, the selected action best meets the purpose, need, and objectives of the plan/EIS and is expected to support the long-term protection, preservation, and restoration of native vegetation and other natural and cultural resources at Rock Creek Park. It incorporates all practical means to avoid or minimize environmental harm and will not result in the impairment of park resources and values or violate the NPS Organic Act.

The required "no-action period" before approval of the ROD was initiated on January 13, 2012 with the U.S. Environmental Protection Agency's *Federal Register* notification of the filing of the final plan/EIS (77 FR 1720)

The official responsible for implementing the selected action is the Superintendent of Rock Creek Park, Washington, D.C.

Approved by:

A handwritten signature in black ink, appearing to read "Stephen Whitesell", written over a horizontal line.

Stephen Whitesell  
Regional Director,  
National Capital Region, National Park Service

5.1.12

Date

## REFERENCES

American Veterinary Medical Association

- 2001 "2000 Report of AVMA Panel of Euthanasia." *Journal of Animal Veterinary Medical Association* 218 (5):669–96.

Council on Environmental Quality

- 1981 "Forty Most Asked questions Concerning CEQ's National Environmental Policy Act Regulations." *Federal Register* 46(55):18026–38. Available at: <http://ceq.eh.doe.gov/nepa/regs/40/40p.3.htm>.

DeNicola, A.J. and R.K. Swihart

- 1997 "Capture-induced Stress in White-tailed Deer." *Wildlife Society Bulletin* 25(2):500–503.

Ferebee, Ken, Natural Resource Management Specialist Rock Creek Park

- 2007 Personal communication with Beth Kunkel, URS Corporation, regarding deer density data. January 29, 2007.
- 2008a Personal communication with Nancy Van Dyke, the Louis Berger Group, Inc., regarding latest deer density and other monitoring information, visitation trends, turbidity/water/tributaries, browse impacts, deer health observations, golf course noise levels. March 11, 2008.
- 2008b Personal communication with Nancy Van Dyke, the Louis Berger Group, Inc., regarding deer herd composition, cost of fencing, 2007 staffing levels, consultation letters, October 17, 2008.
- 2010 Personal communication with Nancy Van Dyke, the Louis Berger Group, Inc., regarding distance sampling results for 2008 and 2009. November 1, 2010.

Hatfield, J. S.

- 2005 "Analysis of long-term vegetation data collected at Rock Creek Park during 1991–2003." Unpublished report. U.S. Department of Interior, National Park Service.
- 2008 "Analysis of Vegetation Changes in Rock Creek Park, 1991–2007." U.S. Department of Interior, National Park Service. Natural Resource Technical Report NPS/NCR/NCRO/NRTR–2009/001. Washington, D.C.

Hobbs, N.T., D.C. Bowden, and D.L. Baker, et al.

- 2000 "Effects of Fertility Control on Populations of Ungulates: General, Stage-Structured Models." *Journal of Wildlife Management* 64(2):473–491.

Kilpatrick, H.J., S.M. Spohr, and A.J. DeNicola

- 1997 "Darting Urban Deer: Techniques and Technology." *Wildlife Society Bulletin* 25(2):542–46.

Krafft, C.C. and J.S. Hatfield

- 2011 Impacts of deer herbivory on vegetation in Rock Creek Park, 2001–2009. Natural Resource Technical Report, NPS/NCR/NCRO/NRTR—2011. United States Department of the Interior, National Park Service, Washington, D.C.

McWilliams, W.H., S.L. Stout, T.W. Bowersox, and L.H. McCormick

- 1995 "Adequacy of Advance Tree-Seedling Regeneration in Pennsylvania's Forests." *Journal of Applied Forestry* 12:187–91.

National Park Service

- 2005 "Deer Management Plan and Environmental Impact Statement, Final Internal Scoping Report, Rock Creek Park," Washington DC: National Park Service. November 28, 2005.
- 2006 *NPS Management Policies 2006*. U.S. Department of the Interior, National Park Service, Washington, D.C.

Naugle, R.E., A.T. Rutberg, H.B. Underwood, J.W. Turner, Jr., and I.K.M. Liu

- 2002 "Field Testing Immunocontraception on White-tailed Deer (*Odocoileus virginianus*) on Fire Island National Seashore, New York, USA." *Reproduction Supplement* 60:145–53.

Porter, W.F., H.B. Underwood, and J.L. Woodard

- 2004 "Movement Behavior, Dispersal, and the Potential for Localized Management of Deer in Suburban Environments." *Journal of Wildlife Management* 68(2):223–34.

Rossell, C. Reed, Jr., S. Patch and S. Salmons

- 2007 "Effects of Deer Browsing on Native and Non-native Vegetation in a Mixed Oak-Beech Forest on the Atlantic Coastal Plain. *Northeastern Naturalist* 14(1):61–72.

Sexton, W.T., A. Malk, R.C. Szaro, and N. Johnson (editors)

- 1999 *Ecological Stewardship: A Common Reference for Ecosystem Management, Volume 3: Values, Social Dimensions, Economic Dimensions, Information Tools*. Oxford, UK: Elsevier Science. Cited in: Williams et al. 2007. *Adaptive Management: The U.S. Department of the Interior Technical Guide*. Washington, DC: Adaptive Management Working Group, U.S. Department of Interior.

Stout, S.L.

- 1998 "Assessing the Adequacy of Tree Regeneration on the Cuyahoga Valley National Recreation Area: A Literature Review and Recommendations. Unpublished report on file at Cuyahoga Valley National Recreation Area, U.S. Department of Interior, National Park Service. 33 pp

West Virginia University

- 1985 "Deer and Agriculture in West Virginia." Publication 806. Center for Extension and Continuing Education, Cooperative Extension Service. Available at <http://www.wvu.edu/agexten/wildlife/deer806.pdf>

Williams, B.K, R. C. Szaro, and C.D. Shapiro

- 2007 *Adaptive Management: The U.S. Department of the Interior Technical Guide*. Washington, DC: Adaptive Management Working Group, U.S. Department of Interior.

# ATTACHMENTS

## Attachment A – Impairment Determination for the Selected Action

Pursuant to the NPS Guidance for Non-Impairment Determinations and the NPS NEPA Process (NPS 2011), a non-impairment determination for the selected alternative is included here as an appendix to the Record of Decision.

Chapter 1 of the final plan/EIS describes the federal acts and policies regarding the prohibition against impairing park resources and values in units of the national park system. The prohibition against impairment originates in the National Park Service (NPS) Organic Act, which directs that the NPS shall:

“promote and regulate the use of the...national parks...which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

According to *NPS Management Policies 2006*, an action constitutes an impairment when its impact “would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values” (NPS 2006, sec. 1.4.5). To determine impairment, the NPS must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (NPS 2006, sec. 1.4.5).

National park system units vary based on their enabling legislation, natural and cultural resources present, and park missions. Likewise, the activities appropriate for each unit and for areas in each unit also vary. For example, an action appropriate in one unit could impair resources in another unit.

As stated in the *NPS Management Policies 2006* (NPS 2006, sec. 1.4.5), an impact on any park resource or value may constitute an impairment, but an impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; or
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified in the park’s general management plan or other relevant NPS planning documents as being of significance.

The resource impact topics carried forward and analyzed for the NPS preferred alternative in the final plan/EIS, and for which an impairment determination is contained in this ROD, are: vegetation; soils and water quality; wetlands and floodplains; wildlife (including deer) and wildlife habitat; rare, unique, threatened or endangered species; cultural landscapes; and soundscapes.

### Vegetation

Rock Creek Park contains the largest unbroken forest in the Washington metropolitan area, providing habitat for much of the city’s wildlife and acting as an important contributor to the region’s biodiversity. Approximately 80 percent (2,471 acres) of the park is covered with mature second growth forest that is approximately 125 years old. Woodlands in the park are primarily a mixture of deciduous species typical

of the eastern deciduous forest in the later stages of succession (NPS 2005a). Primary overstory species include tulip poplar (*Liriodendron tulipifera*), hickory (*Carya*) species, green ash (*Fraxinus pennsylvanica*), American beech (*Fagus grandifolia*), white oak (*Quercus alba*), northern red oak (*Quercus rubra*), southern red oak (*Quercus falcata*), and black locust (*Robinia pseudoacacia*). Dominant understory species in the forest include saplings, American holly (*Ilex opaca*), spicebush (*Lindera benzoin*), greenbrier (*Smilax* spp.), Japanese honeysuckle (*Lonicera japonica*), English ivy (*Hedera helix*), and poison ivy (*Toxicodendron radicans*). There are also remnant Virginia pines (*Pinus virginia*) that occur mostly as scattered individuals or small clusters, as well as pine-oak mixed woodlands. Other vegetative types in the park include maintained lawns with landscaped trees and shrubs, including American holly, pin oak (*Quercus palustris*), willow oak (*Quercus phellos*), and tulip poplar saplings; and shrubs including witch hazel (*Hamamelis* spp.) and smooth serviceberry (*Amelanchier arborea*).

Healthy, native terrestrial vegetation is necessary to fulfill the purposes for which the park was established and is key to the natural integrity and enjoyment of the park. Implementation of the preferred alternative would not impair vegetation because of the low magnitude of adverse effects from management actions and the benefits that would result from reduced deer browsing pressure. The preferred alternative would enhance natural forest regeneration by quickly reducing deer browsing pressure and by maintaining a smaller deer population. This would result in long-term beneficial impacts, as both woody and herbaceous vegetation could thrive and recover throughout the park. Over time as natural forest regeneration occurred, adverse long-term impacts that currently exist due to deer browse would be reduced to impacts that would be small, localized, and of little consequence. Observed seedling density would be expected to show that fair to good regeneration was occurring. Under the preferred alternative, less than one percent of the park's woody or herbaceous vegetation would be affected by trampling at bait stations, shooting sites, trapping locations, or disposal sites. Adverse impacts of these actions would be short term and the change would be so small that it would not be measurable or perceptible. Because there would be only slight adverse impacts and primarily long-term beneficial impacts, the preferred alternative would not result in impairment to vegetation.

### **Soils and Water Quality**

The primary concern related to soils and water quality in this plan/EIS is the potential for greater erosion as a result of increased deer browsing, which can reduce vegetative ground cover and result in sedimentation in the waters associated with the Rock Creek watershed. There are 25 major soil types within Rock Creek Park. Nearly all of these soils are moderately erodible, and two are highly erodible (USDA 1976). Currently, the park's soil resources are being affected adversely by accelerated erosion, compaction, and deposition. Some areas that receive heavy visitor use are subject to soil compaction, removal of vegetation cover, and erosion. This is particularly evident along stream banks, at popular recreation areas, and along heavily used or infrequently maintained trails. Accelerated stream bank erosion is occurring as a result of increased runoff from the upstream watershed, and associated deposition of some of the eroded soils is occurring in park floodplains (NPS 2005b).

The Rock Creek watershed is approximately 76.5 square miles with 15.9 square miles contained within the District of Columbia (DCDOH 2004). Two major and 16 smaller tributaries drain into Rock Creek within the park. The high level of development and increase of impervious surfaces within the watershed has led to increased stormwater runoff, which has damaged Rock Creek and its tributaries by increasing the amount of sedimentation as well as carrying other pollutants into creek waters (NPS 2005b). Within the park, erosion is primarily the result of bank destabilization along drainage ways and tributaries of Rock Creek, and sedimentation and excess turbidity are most apparent in the smaller tributaries that are spring-fed and have less upstream flow (K. Ferebee, pers. comm. 2008). Areas denuded of vegetation by deer browse, visitor use, or other disturbances also contribute to stormwater runoff. Rock Creek and its



tributaries have been designated for restoration to meet all five beneficial use classes under current water quality regulations. They have also been designated “Special Waters of the District of Columbia” for their scenic and aesthetic importance (NPS 2005b).

Maintenance of the park’s water quality and conservation of soils is necessary to fulfill the purposes for which the park was established and is key to the natural integrity of the park. Implementation of the preferred alternative would not impair soils or water quality because adverse effects from management actions would not have a measurable effect on these resources, and benefits would result from reduced deer browsing pressure. The preferred alternative would immediately reduce the number of deer in the park and maintain a population of 15 to 20 deer per square mile after the third year of implementation. Vegetative ground cover would be able to reestablish itself, helping mitigate any soil erosion and sediment loading into the park’s creeks, a long-term beneficial impact. Actions taken to reduce deer damage, which include some trampling at bait stations, shooting sites, trapping locations or disposal sites, as well as the continued use of small cages and repellents, likely would have little impact on soil erosion. These actions also may cause deer to concentrate browsing elsewhere, which would result in increased loss of vegetation in those newly browsed areas, a slight adverse effect that would not be of any measurable or perceptible consequence. Water quality would remain within historical conditions. Because there would be only slight adverse impacts on soils and water quality, and primarily long-term benefits, the preferred alternative would not result in impairment.

### **Wetlands and Floodplains**

The Rock Creek watershed includes only a few areas designated as wetlands, including six temporarily or seasonally flooded forested wetlands in the northern portion of the park and in the Pinehurst Branch area. Other smaller wetlands are found in the narrow alluvial deposits of the Pinehurst Branch, Fenwick Branch, and Joyce Branch drainages (NPS 2005b), and vernal pools are widely scattered wetland features in the park. Other important wetland-related features in the park include groundwater springs and seeps fed by relatively dependable flows of pollutant-free water. Within Rock Creek Park, floodplain development is fairly restrictive, limited primarily to Rock Creek itself. The 100-year floodplain of Rock Creek ranges from 50 to 500 feet wide, depending upon the topography (FEMA 1985).

Maintenance of the park’s wetlands/floodplains is necessary to fulfill the purposes for which the park was established and is key to the natural integrity of the park. Implementation of the preferred alternative would not impair wetlands or floodplains because adverse effects from management actions would not have a measurable effect on these resources, and benefits would result from reduced deer browsing pressure. Under the preferred alternative, the reduction and long-term maintenance of a small deer herd would allow vegetative ground cover to reestablish itself in the primary park wetland areas and would limit the damage from deer trampling in smaller wetland areas, resulting in beneficial, long-term impacts on wetlands. Also, no occupancy, modification, or development of floodplains is expected under the preferred alternative, other than the possibility of small caging around specific landscapes or rare plants if these were located within wetlands or floodplains. The structure and function of wetlands or floodplains would not be affected. Effects would either be non-detectable, or, if detected, would be considered slight and localized. No measurable or perceptible effects on size, integrity, or connectivity of wetlands would occur from management actions. The loss of ground vegetation through deer browsing would be greatly reduced, with long-term, beneficial effects on overall floodplain function. Because there would be only slight adverse impacts on wetlands and floodplains, and primarily long-term benefits, the preferred alternative would not result in impairment to these resources.

### **Wildlife (including deer) and Wildlife Habitat**

As noted in the discussion on vegetation, Rock Creek Park provides habitat for much of the city’s wildlife and acts as an important contributor to the region’s biodiversity. Common fauna likely to occur within

Rock Creek Park include species adapted to disturbed habitat associated with an urban environment and transient species associated with the adjacent forested habitat. According to the NPSpecies database, 36 species of mammals, 13 species of amphibians, six species of reptiles, and 181 species of birds are present or likely present within park boundaries (NPS 2008). The National Audubon Society and the American Bird Conservancy recognize Rock Creek Park as an important birding area due to its exceptional diversity of bird species during migration (Maryland/District of Columbia Audubon Society 2004). Deer are also an integral part of the wildlife in Rock Creek Park. Deer density has ranged between 52 and 98 deer per square mile over the past 10 years, and current (2009) density is estimated at 67 deer per square mile.

Viable wildlife populations and wildlife habitat are necessary to fulfill the purposes for which the park was established and are key to the natural integrity of the park. Implementation of the preferred alternative would not impair wildlife or wildlife habitat because of the low magnitude of adverse effects from management actions and the benefits that would result from reduced deer browsing pressure. The actions in the preferred alternative would have mainly beneficial impacts because quickly reducing deer browsing pressure and maintaining a smaller deer population would enhance forest regeneration and therefore enhance forest habitat by allowing vegetation to recover and improving foraging habitat. Impacts on other wildlife would be long term and beneficial because of rapidly reduced deer numbers in the park. This would result in decreased browsing pressure and natural forest regeneration, allowing increased abundance and diversity of other wildlife that depend on understory vegetation. Adverse, long-term impacts would be reduced over time.

A few predators and scavengers that use deer and their carcasses as a food source could be adversely affected by a lower deer density or denser understory conditions, but this alternative could also increase the availability of other prey. Other wildlife would be temporarily affected by trampling at bait stations, shooting sites, trapping locations, reproductive control techniques, or deer carcass disposal sites. Impacts of these actions on native species, their habitats, or the natural processes sustaining them may not be detectable, and changes to population numbers, population structure, or other demographic factors would not occur. Occasional responses to disturbance by some individuals could be expected, but without interference to factors affecting population levels. Sufficient habitat would remain functional to maintain viability of all species. Impacts would be outside critical reproduction periods for sensitive native species.

For deer, removal would adversely impact individuals, as would reproductive control/surgical sterilization, resulting in potential major adverse impacts to individual deer due to handling stress and the possible physiological or behavioral changes due to the use of sterilization/reproductive controls. However, it is expected that although impacts on deer, their habitats, or the natural processes sustaining them would be detectable, and changes to population numbers, population structure, or other demographic factors would occur, the species would remain stable and viable. Frequent responses to disturbance by some individuals could be expected, but sufficient habitat would remain functional to maintain the viability of the species. For these reasons, and because there would be long-term benefits to both wildlife habitat and the deer population, the preferred alternative would not result in impairment of deer or other wildlife.

### **Rare, Unique, Threatened or Endangered Species**

The Endangered Species Act requires federal agencies to ensure that their activities would not jeopardize existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. Only one federally listed species, the endangered Hay's Spring amphipod (*Stygobromus hayi*), is known to inhabit the park. Another rare species, Kenk's amphipod (*Stygobromus kenki*), also known as the Rock Creek groundwater amphipod, was identified in park springs (NPS 1997). Kenk's amphipod is not currently listed under the Endangered Species Act but it has been considered for

listing in the past by the U.S. Fish and Wildlife Service (USFWS 2007). Rare species are also identified by the District of Columbia, Maryland, and Virginia. Three other *Stygobromus* species of amphipods that are listed by the state of Maryland as rare or uncommon have been located in or near the park (Maryland Department of Natural Resources 2003). There are also several plant and animal species that have been or are currently listed as rare or uncommon by the Maryland Department of Natural Resources that have been documented (although rare) in Rock Creek Park. The District of Columbia accepts local state-designated plants and also identifies certain wildlife as species of concern. Because of the habitat value provided by Rock Creek Park, many of these species could be found in the park. Habitats preferred by these species generally include springs, seeps, wetlands, waterways, and/or associated moist forested areas.

Viable populations of special status species are necessary to fulfill the purposes for which the park was established and are key to the natural integrity of the park. Under the preferred alternative, the reduced deer density would minimize potential impacts on the habitat for the federally listed Hay's Spring amphipod, resulting in long-term, beneficial effects that would reduce adverse impacts such that there would be no observable or measurable impacts to federally listed species, their habitats, or the natural processes sustaining them in the proposed project area. Impacts on species listed or considered special status species by Maryland and the District of Columbia, as well as their habitat, would be beneficial and long term as a result of rapid reductions in deer numbers in the park. These reductions, which would diminish deer browsing pressure on woody and herbaceous vegetation and allow increased abundance and diversity of other species that depend on understory vegetation. There would be no long-term observable or measurable adverse impacts to these species, and impacts would not affect critical periods (e.g., breeding, nesting, denning, feeding, or resting) or habitat. A few predators and scavengers that use deer and their carcasses as a food source could be adversely affected by a lower deer density or denser understory conditions, but this alternative could also increase the availability of other prey. Adverse, long-term impacts would be reduced over time. Human disturbances from trampling during implementation of sharpshooting, capture and euthanasia, and reproductive control would be temporary and isolated within the park with no observable or measurable impacts to these species, their habitats, or the natural processes sustaining them in the proposed project area. Because adverse effects would be limited and there would be primarily long-term beneficial effects, the preferred alternative would not result in impairment to rare, unique, endangered, or threatened species.

## **Cultural Landscapes**

Rock Creek Park encompasses the last major natural landscape in the District of Columbia. The area composing the park was little modified by human interaction prior to its creation as a park. Since that time, the park has preserved and maintained the valley's natural and cultural resources while also addressing the recreational and transportation requirements of modern Washington and incorporating the highest cultural and aesthetic values. As such, the historic natural landscape contributes to the National Register of Historic Places-listed Rock Creek Park Historic District and has significance under Criteria A, B, and C (Bushong 1990). The nomination states, "Rock Creek Park possesses significance as a historic natural landscape, which was adapted and significantly enhanced as a public park by the U.S. Corps of Engineers and the National Park Service between 1890 and 1941." As a result of an analysis (1997) of the cultural landscape character-defining features of the Rock Creek Park Historic District, two individual cultural landscape inventories were completed in 1998. One of these inventories was for Linnaean Hill (including the Peirce-Klingbe Mansion) (NPS 2003a) and the other for Peirce Mill (NPS 2003b). In addition, cultural landscape reports have been published for Dumbarton Oaks Park and Montrose Park (NPS 2004).

Preservation of cultural landscapes is necessary to fulfill the purposes for which the park was established and is key to the cultural integrity of the park. Implementation of the preferred alternative would not

impair cultural landscapes because adverse effects from management actions would not have a measurable effect on these resources, and benefits would result from reduced deer browsing pressure. Under the preferred alternative, enhancing natural forest regeneration by quickly reducing deer browsing pressure and maintaining a smaller deer population would result in beneficial, long-term impacts because vegetation, which is an important component of cultural landscapes, could thrive and recover throughout the park. Less than one percent of the park's vegetation would be affected by trampling at bait stations, shooting sites, trapping locations, or disposal sites. Therefore, adverse impacts of these actions on cultural landscapes would be at the lowest level of detection, with neither adverse nor beneficial consequences. The combined actions under the preferred alternative would result in no adverse effect under Section 106 of the NHPA. Because there would be few adverse impacts and primarily long-term beneficial impacts, the preferred alternative would not result in impairment to cultural landscapes.

## **Soundscapes**

One of the natural resources of Rock Creek Park is the natural soundscape, which includes all of the naturally occurring sounds of the park. Sources of noise within the park and surrounding areas are those typical of an urban area and include recreational activities, motor vehicle operations, and the noises associated with residential development in an urban setting (i.e., lawn mowers). Within the main section of Rock Creek Park and within the Rock Creek and Potomac Parkway, there is an extensive roadway network that is the primary source of noise.

Natural soundscapes in the park are necessary to fulfill the purposes for which the park was established, and are key to the natural integrity of the park. Implementation of the preferred alternative would not impair soundscapes because adverse effects from management actions would not have a measurable effect on these resources. Overall impacts to soundscapes under the preferred alternative would be limited to the short-term use of firearms for direct reduction (sharpshooting). Natural sounds would predominate for the majority of the year in areas where management objectives call for natural processes to predominate, and noise from deer management actions would be infrequent and would vary based on several factors, particularly timing, distance, and attenuation from the source. Long-term adverse impacts related to implementation of fencing, exclosures, reproductive control, and spraying would be expected to decrease as the overall deer herd population decreases, reducing the need for direct reduction. Because the more intense adverse impacts would be very short term during reduction efforts, and long-term adverse impacts would decrease with a reduction in herd density, the preferred alternative would not result in impairment to soundscapes.

## **SUMMARY**

As described above, adverse impacts on park resources or values anticipated as a result of implementing the preferred alternative would not rise to levels that would constitute impairment.

## **REFERENCES- ATTACHMENT A**

District of Columbia Department of Health (DCDOH)

- 2004     *District of Columbia Final Total Maximum Daily Loads for Metals in Rock Creek. Department of Health Environmental Health Administration Bureau of Environmental Quality Water Quality Division. Accessed at: [http://www.epa.gov/reg3wapd/tmdl/dc\\_tmdl/RockCreek/Metals/Final%20DC%20Rock%20Creek%20Metals%20TMDL.pdf](http://www.epa.gov/reg3wapd/tmdl/dc_tmdl/RockCreek/Metals/Final%20DC%20Rock%20Creek%20Metals%20TMDL.pdf)*

Federal Emergency Management Agency (FEMA)

- 1985      *FIRM maps for D.C.* November 15, 1985. Available at:  
<http://www.fema.gov/hazard/map/firm.shtm>.

Ferebee, Ken, Natural Resource Manager Rock Creek Park

- 2008      Personal communication with Nancy Van Dyke, the Louis Berger Group, Inc., regarding latest deer density and other monitoring information, visitation trends, turbidity/water/tributaries, browse impacts, deer health observations, and golf course noise levels. March 11, 2008.

Maryland/District of Columbia Audubon Society

- 2004      "Maryland-District of Columbia Important Bird Areas." In *Rock Creek Park and Rock Creek and Potomac Parkway. Final General Management Plan/ Environmental Impact Statement*.

Maryland Department of Natural Resources, Heritage and Biodiversity Conservation Program

- 2003      *Current and Historical Rare, Threatened, and Endangered Species of Montgomery County, Maryland.* Available on the Internet at <http://dnrweb.dnr.state.md.us/download/rteplants.pdf>

National Park Service (NPS)

- 1997      "An Aquatic Subterranean Macroinvertebrate Survey of Rock Creek and Associated National Parks, Washington, DC." Principal Investigator, Daniel J. Feller. Washington, DC.
- 2003a      "Cultural Landscape Inventory, Linnaean Hill, Rock Creek Park." 1998, rev. 2003. National Park Service, Washington, DC.
- 2003b      "Cultural Landscape Inventory, Peirce Mill, Rock Creek Park." 1998, rev. 2003. National Park Service, Washington, DC.
- 2004      "Montrose Park Cultural Landscape Report."
- 2005a      "Deer Management Plan and Environmental Impact Statement, Final Internal Scoping Report, Rock Creek Park," Washington DC: National Park Service. November 28, 2005.
- 2005b      *Rock Creek Park and Rock Creek and Potomac Parkway. Final General Management Plan/ Environmental Impact Statement.*
- 2006      *NPS Management Policies 2006.* Washington, DC.
- 2008      Unpublished Data- NPSpecies Data for Rock Creek Park. Available from NPS Center for Urban Ecology, Washington, DC.
- 2010      Interim Guidance for Impairment Determinations in NPS NEPA Documents. 4 pages.
- 2011      Guidance for Non-Impairment Determinations and the NPS NEPA Process. October 31, 2011. 4 pages.



U.S. Department of Agriculture (USDA)

- 1976      *Soil Survey of District of Columbia*. United States Department of Agriculture, Natural Resources Conservation Service.

U.S. Fish and Wildlife Service (USFWS), U.S. Department of the Interior

- 2007      “Endangered and Threatened Wildlife and Plants – 90 day finding on a petition to list Kenk’s amphipod, Virginia well amphipod, and the copepod *Acanthocyclops columbiensis* as Endangered.” 72 *Federal Register* 175: 51766–51769, September 11, 2007.

## Attachment B – Fish and Wildlife Service Section 7 Consultation Letter



### United States Department of the Interior

#### FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office  
177 Admiral Cochrane Drive  
Annapolis, Maryland 21401  
<http://www.fws.gov/chesapeakebay>



January 23, 2012

Mr. Kenneth B. Ferebee  
National Park Service, Rock Creek Park  
3545 Williamsburg Lane, N.W.  
Washington, DC 20008-1207

*RE: White-tailed Deer Management in Rock Creek Park/Section 7 ESA Review*

Dear Mr. Ferebee:

We have reviewed the information provided in your cover letter and final EIS for the referenced management action and are providing comments in accordance with Section 7 & of the Endangered Species Act, as requested.

As pointed out in the Environmental Impact Statement (EIS), there is only one Federally listed species, the Hay's spring amphipod (*Stygobromus hayi*) in the area to be affected by the proposed action. Please note that one other species in the area, Kenk's amphipod (*Stygobromus kenki*), is a candidate species and is being considered for future listing under the Endangered Species Act.

We concur with your conclusion that the preferred alternative (Alternative D) will have negligible impact on the Hay's spring amphipod and may provide some long-term benefits to the species. Because the proposed management program is not likely to adversely affect the Hay's spring amphipod, no further consultation under Section 7 of the Endangered Species Act is required.

The analysis you provided for the Hay's spring amphipod applies to the candidate Kenk's amphipod, as well, since both species are groundwater amphipods found in similar seep/spring habitats. Therefore, we conclude that there will be no adverse effect on Kenk's amphipod.

We appreciate your efforts to protect threatened and endangered species and look forward to working with Rock Creek Park in the future to further the conservation of these two rare groundwater amphipods. Should you have any questions regarding this letter, please contact Andy Moser of my Endangered Species staff at (410) 573-4537.

Sincerely,

Genevieve LaRouche  
Supervisor

