

Antietam and Monocacy National Battlefields

Chronic Wasting Disease Detection and
Initial Response Plan / Environmental Assessment

National Park Service
U.S. Department of the Interior



Antietam and Monocacy National Battlefields

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Initial Response Plan / Environmental Assessment

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**UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE**

**CHRONIC WASTING DISEASE DETECTION AND INITIAL RESPONSE PLAN /
ENVIRONMENTAL ASSESSMENT**

ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS

Washington and Frederick Counties, Maryland

Both Antietam and Monocacy National Battlefields (the battlefields) fall within a 60-mile radius of confirmed West Virginia occurrences of chronic wasting disease (CWD) in white-tailed deer (*Odocoileus virginianus*). Staff at both battlefields currently undertake targeted and opportunistic surveillance for CWD. Both battlefields support relatively large populations of white-tailed deer, and as deer populations increase, the risk relating to the transmission of CWD becomes more of a concern. A CWD detection and initial response plan is needed at this time to address this potential threat to battlefield resources and to provide the means to cooperate and coordinate with state and federal agencies and other interested parties about the prevention, detection, research, and initial response for CWD.

This Chronic Wasting Disease Detection and Initial Response Plan / Environmental Assessment (plan/EA) analyzes the no-action alternative and two action alternatives for the detection of and initial response to CWD in white-tailed deer at Antietam and Monocacy National Battlefields. Under alternative A (no action), existing management practices would be followed and opportunistic and targeted CWD surveillance would continue, as well as education and public information activities, and state and federal coordination efforts. Other options for CWD detection and initial response would not be available. Alternative B (the National Park Service preferred alternative) would offer the battlefields a set of tools for CWD detection and initial response. Detection activities, which would begin immediately, would be aimed at determining whether CWD is present in the battlefields and assisting the state in its detection efforts. Initial response activities would follow a positive CWD detection in or very near the battlefields. A distinguishing feature of alternative B is that it would include the option of a one-time population reduction response to bring deer density inside the battlefields to a density similar to surrounding areas. The purpose of this reduction would be to lessen the likelihood of CWD becoming established in the deer population. Alternative C would offer the battlefields the same set of tools, except that the initial response would not include a one-time population reduction as a response action. Under alternative C, lethal removals would be more limited to provide for disease monitoring only.

The potential environmental consequences of the alternatives are addressed in detail for the white-tailed deer population, vegetation, other wildlife and wildlife habitat, cultural resources, socioeconomics, visitor use and experience, health and safety, and park management and operations. The analysis indicates that there would be no impairment of battlefield resources or values under any of the alternatives.

This plan/environmental assessment will be available for public review and comment for a 30-day minimum review period. Responses to public comments will be prepared and, depending on their nature, a revised EA or errata sheets will be prepared. If a revised EA is needed, a second 30-day public comment period will be announced. If any of the issues raised point to the potential for significant impacts, a notice of intent to prepare an environmental impact statement would be issued through the *Federal Register*. If this potential does not exist, the alternative or actions constituting the approved plan will be documented in a finding of no significant impact that will be signed by the Regional Director of the National Capital Region.

Comments can be submitted as follows:

- Electronically at <http://parkplanning.nps.gov/anti>
- By mail to:

National Park Service, Environmental Quality Division
RE: CWD Detection & Initial Response Plan/EA
P.O. Box 25287
Denver, CO 80225

Before including your address, phone number, e-mail address, or other personal identifying information in your comments, please be aware that your entire comment, including your personal identifying information, may be made publically available at any time.



Antietam and Monocacy National Battlefields

Chronic Wasting Disease Detection and Initial Response Plan /
Environmental Assessment

July 2009

SUMMARY

PURPOSE OF AND NEED FOR ACTION

The purpose of this action is to develop a range of strategies for the detection of and initial response to Chronic Wasting Disease (CWD) in white-tailed deer (*Odocoileus virginianus*) at Antietam and Monocacy National Battlefields (the battlefields). Both battlefields support relatively large populations of white-tailed deer. As deer populations increase, risks relating to the transmission of CWD and other contagious diseases within these higher density populations are a concern (NPS 2007a; Joly et al. 2006; Samuel et al. 2003).

Both battlefields fall within a 60-mile radius of confirmed CWD occurrences in West Virginia, which is the distance at which national park units are to implement CWD surveillance actions per the National Park Service (NPS) Director's CWD guidance memorandum (NPS 2002b). This memorandum also notes that environmental planning must be conducted prior to undertaking larger scale or multiple animal actions within a park. Therefore, a CWD detection and initial response plan is needed for Antietam and Monocacy National Battlefields at this time to address the following:

- The use of a range of CWD detection and initial response actions in light of recent detections in nearby geographic areas and their effect on the battlefields.
- Imminent or potential threats to park natural resources and components of the cultural landscapes, primarily white-tailed deer populations, from the establishment or spread of CWD.
- The desire to cooperate and coordinate with appropriate state and federal resource management agencies, as well as other interested parties, regarding prevention, detection, research, and initial response actions for CWD.

OBJECTIVES IN TAKING ACTION

Objectives define what must be achieved for an action to be considered a success. The following objectives, related to CWD detection and initial response at Antietam and Monocacy National Battlefields, were developed for this plan.

GENERAL

- Ensure actions are consistent with pertinent NPS management policies.

DEER POPULATIONS AT ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS

- Estimate ongoing risk of CWD infection in the white-tailed deer population of Antietam and Monocacy National Battlefields based on known disease risk factors.
- Appropriate to the level of risk, develop adaptive management protocols for the detection of CWD presence, prevalence, and distribution, as well as an initial response to the disease.

CULTURAL RESOURCES

- Minimize disruption to the natural resources and other components of the cultural landscapes from CWD or implementation of detection and initial response activities for the disease.

VISITOR USE AND EXPERIENCE

- Enhance the awareness and understanding of CWD and NPS resource management issues, policies, and mandates as they pertain to prevention, detection, and response to the disease for visitors and other interested parties.
- During implementation of CWD detection and initial response activities, minimize disruption to visitor use and experience.

HEALTH AND SAFETY

- Minimize the potential for health and safety issues for park staff and visitors associated with CWD surveillance and initial response activities.

PARK MANAGEMENT AND OPERATIONS

- Minimize impacts of CWD surveillance and response activities on current park operations, including budget and workload.
- Cooperate and coordinate with appropriate state and federal resource management agencies, as well as other interested parties, with respect to detection of CWD and initial responses to positive cases.

CWD AND WHITE-TAILED DEER AT ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS

CHRONIC WASTING DISEASE

CWD is in a family of diseases known as transmissible spongiform encephalopathy (TSE) and is an infectious, self-propagating, neurological disease. Free-ranging and captive mule deer (*Odocoileus hemionus*), white-tailed deer, elk (*Cervus elaphus*), and moose (*Alces alces*) are all susceptible to CWD, which impacts the neurological system of the animal and is eventually fatal. Although originally detected in the western United States, as of January 2009, CWD has been found in 12 states and 2 Canadian provinces in captive and farmed populations. In free-ranging populations, CWD has been found in 11 states and 2 provinces. The transmission of CWD is increased by the high concentrations of these animals and their lack of natural predators, as is the case with white-tailed deer in eastern national parks. CWD has been found within only two national parks: Rocky Mountain National Park, Colorado, and Wind Cave National Park, South Dakota. However, as of March 30, 2009, 37 deer tested positive for CWD in Slainesville, West Virginia, within 60 miles of several national park units, including Antietam and Monocacy National Battlefields. Battlefield staff have begun targeted and opportunistic surveillance for CWD.

WHITE-TAILED DEER

Although relatively rare at the turn of the twentieth century, white-tailed deer populations have rebounded during recent years. Deer density surveys at Antietam National Battlefield have been conducted every April and November since 2001 to estimate the size of the herd within the battlefield. Based on these surveys, the average fall density in the battlefield from 2001 to 2008 was 114 deer per square mile, and the average spring density from 2001 to 2008 was 90 deer per square mile (Wenschhof 2009a). Monocacy National Battlefield has also conducted deer density studies since 2001. Based on these studies, the average fall deer density from 2001 to 2008 was 164 deer per square mile; the average spring density from 2001 to 2008 was 134 deer per square mile (spring density data was not collected in 2004, 2005 or

2007) (Banasik 2006, 2009a). Deer densities historically found in areas surrounding the battlefields are estimated at 25 to 45 deer per square mile (Bates 2009).

ALTERNATIVES CONSIDERED

The alternatives under consideration include a required “no action” alternative and two action alternatives that were developed by an interdisciplinary planning team and through feedback from the public and scientific community during the planning process. The two action alternatives would meet, to a large degree, the objectives for this plan and also the purpose of and need for action. The alternatives are described below. There are also a number of actions that would be common to both alternatives, which are described in detail in the “Alternatives” chapter of this Chronic Wasting Disease Detection and Initial Response Plan / Environmental Assessment (plan/EA).

Alternative A: No Action (Current Activities Continued): Opportunistic and targeted CWD surveillance would continue, as well as education and public information activities, and state and federal coordination efforts. Other options for CWD detection and initial response would not be available.

Alternative B: CWD Detection and Reduction Response (Preferred Alternative): Alternative B would offer the battlefields a set of options, or “tools,” for CWD detection and initial response. Detection activities, which would begin immediately, would be aimed at determining whether CWD is present in the battlefields and assisting the state in its detection efforts. Initial response activities would follow a positive CWD detection in or very near the battlefields. A distinguishing feature of alternative B is that it includes the option of a one-time population reduction response to bring deer density inside the battlefields to a density similar to surrounding areas. The purpose of this reduction would be to lessen the likelihood of CWD becoming established in the deer population. The implementation of detection and initial response tools would be based on the proximity of the nearest CWD detection to the battlefields. Alternative B would also include education and public information activities, and coordination with state and federal agencies.

Alternative C: CWD Detection and Monitoring Response: Alternative C, like alternative B, would offer the battlefields a set of tools for CWD detection and initial response. Detection activities, which would begin immediately, would be aimed at determining whether CWD is present in the battlefields and assisting the state in its detection efforts. Initial response activities would follow a positive CWD detection in or very near the battlefields. A distinguishing feature of alternative C is that the initial response does not include the option of a one-time population reduction as a response action. Under alternative C, lethal removals during initial response would be more limited in nature to provide for disease monitoring only. Like alternative B, the implementation of detection and initial response tools would be based on the proximity of the nearest CWD detection to the battlefields. Alternative C would also include education and public information activities, and coordination with state and federal agencies.

ENVIRONMENTAL CONSEQUENCES

The summary of environmental consequences considers the actions being proposed and the cumulative impacts to resources from occurrences inside and outside the parks. The potential environmental consequences of the actions are addressed for white-tailed deer, vegetation; other wildlife and wildlife habitat; cultural resources; socioeconomics; visitor use and experience; health and safety; and park management and operations. The table below summarizes the results of the impact analysis for these topics.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
White-tailed Deer	<p>Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on white-tailed deer and their habitat from temporary disturbances during implementation. There would be long-term, moderate, adverse impacts because alternative A would have minimal effects on CWD risk factors, and the potential for amplification, spread, and establishment, as well as exposure to possible population level effects, would remain high.</p> <p>Alternative A would have negligible contributions to cumulative impacts on white-tailed deer populations, which would be long-term, moderate, and adverse. No impairment to white-tailed deer would occur under this alternative.</p>	<p>Detection and initial response actions would have short-term, negligible to minor, adverse impacts on white-tailed deer and their habitat from temporary disturbances during implementation. After implementation, impacts on deer density, especially from the possibility of early detection and reduced CWD amplification risk associated with a one-time 60% to 89% reduction in deer densities at the battlefields, would have long-term, beneficial effects. Alternative B would have both adverse and beneficial contributions to cumulative impacts on white-tailed deer populations. However, overall cumulative impacts would be long-term, minor to moderate, and adverse. No impairment to deer would occur under this alternative.</p>	<p>Detection and initial response actions would have short-term, negligible to minor, adverse impacts on white-tailed deer and their habitat from temporary disturbances during implementation. Although not as extensive as alternative B, impacts on deer density after implementation would have long-term, beneficial effects on the population as a whole from the possibility of early detection and reduced CWD amplification risk associated with a 10% to 32% reduction in deer densities at the battlefields. Alternative C would have both adverse and beneficial contributions to cumulative impacts on white-tailed deer populations. However, overall cumulative impacts would be long-term, minor to moderate, and adverse. No impairment to deer would occur under this alternative.</p>
Vegetation	<p>Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on vegetation from temporary disturbances during implementation. Because these surveillance efforts would not measurably affect deer density, CWD surveillance actions that would occur under alternative A would not result in any indirect effects to the existing vegetation conditions. Cumulative impacts on vegetation would be long-term, moderate, and adverse. Surveillance actions under alternative A would contribute minimally to these effects. No impairment to vegetation would occur under this alternative.</p>	<p>Detection and initial response actions would have short-term, negligible to minor, adverse impacts on vegetation from temporary disturbances during implementation. After implementation, reductions in deer density, especially if a one-time population reduction would occur, would have long-term beneficial effects on vegetation from reduced browsing and grazing pressure. Cumulative impacts on vegetation would be long-term, minor to moderate, and adverse, and detection and initial response actions under alternative B would contribute minimally to these effects. No impairment to vegetation would occur under this alternative.</p>	<p>Detection and initial response actions would have short-term, negligible to minor, adverse impacts on vegetation from temporary disturbances during implementation. After implementation, reductions in deer density from lethal removal of deer for CWD detection and/or a monitoring surveillance response would have long-term beneficial effects, although not to the extent of alternative B. Cumulative impacts on vegetation would be long-term, moderate, and adverse, in light of the potential for some beneficial effects. Detection and initial response actions under alternative C would contribute minimally to cumulative impacts. No impairment to vegetation would occur under this alternative.</p>

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Other Wildlife and Wildlife Habitat	Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on wildlife and wildlife habitat mainly from temporary disturbances during implementation. Because these surveillance efforts would not measurably affect deer density, CWD surveillance actions that would occur under alternative A would not result in any indirect effects to the existing wildlife or habitat conditions. Cumulative impacts on wildlife and wildlife habitat would be long-term, minor, and adverse, and surveillance actions under alternative A would contribute minimally to these effects. No impairment to wildlife and wildlife habitat would occur under this alternative.	Detection and initial response actions would have short-term, negligible to minor, adverse impacts on wildlife and wildlife habitat from temporary disturbances during implementation. After implementation, reductions in deer density, especially if a one-time population reduction occurs, would have long-term beneficial effects by reducing browsing and grazing pressure on vegetation that provides food and cover for other wildlife. Cumulative impacts on wildlife and wildlife habitat would be long-term, minor, and adverse, and detection and initial response actions under alternative B would contribute minimally to these effects. No impairment to wildlife and wildlife habitat would occur under this alternative.	Detection and initial response actions would have short-term, negligible to minor, adverse impacts on wildlife and habitat from temporary disturbances during implementation. After implementation, reductions in deer density, although not as extensive as alternative B, would have long-term beneficial effects by reducing browsing and grazing pressure on vegetation that provides food and cover for other wildlife. Cumulative impacts on vegetation would be long-term, minor, and adverse, and the detection and initial response actions under alternative C would contribute minimally to cumulative impacts. No impairment to wildlife and wildlife habitat would occur under this alternative.
Cultural Resources: Cultural Landscapes	Actions associated with opportunistic and targeted surveillance would have short- and long-term, negligible, adverse impacts on cultural landscapes from temporary disturbances during implementation and negligible changes in deer density. Alternative A would have minimal contributions to cumulative impacts on cultural landscapes, which would be long-term, negligible and adverse. No impairment of cultural landscapes would occur under this alternative.	Actions associated with opportunistic and targeted surveillance, supplemented with live tests and lethal removal of healthy appearing deer would have short-term, minor, adverse impacts on cultural landscapes from temporary disturbances during implementation. There would be long-term, negligible beneficial effects as a result of benefits to the deer herd, which are a component of the cultural landscapes. Alternative B would have minimal contributions to cumulative impacts on cultural landscapes, which would be long-term, negligible and adverse. No impairment of cultural landscapes would occur under this alternative.	Under alternative C, detection and initial response actions would have short-term, negligible to minor, adverse impacts on cultural landscapes, with the more intense impacts related to the lethal removal action for monitoring response. There would be long-term, negligible beneficial effects as a result of benefits to the deer herd, which are a component of the cultural landscapes. Cumulative effects on cultural landscapes would be long-term, negligible, and adverse, and alternative C would contribute minimal impacts. No impairment of cultural landscapes would occur under this alternative.

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Cultural Resources: Archeological Resources	Actions associated with opportunistic and targeted surveillance, including removal and the potential for on-site burial of carcasses, could have long-term, negligible to minor, adverse impacts on archeological resources from ground disturbances during implementation. Alternative A would have minimal contributions to long-term negligible adverse cumulative impacts on archeological resources. No impairment of archeological resources would occur under this alternative.	Actions associated with opportunistic and targeted surveillance, supplemented with live tests and lethal removal of healthy appearing deer would have long-term minor, adverse impacts on archeological resources from ground disturbances during implementation. Alternative B would have minimal contributions to long-term negligible to minor adverse cumulative impacts on archeological resources. No impairment of archeological resources would occur under this alternative.	Detection and initial response actions would have long-term, negligible to minor, adverse impacts on archeological resources, with the more intense impacts related to the lethal removal action for monitoring response. Cumulative effects on archeological resources would be long-term, negligible, and adverse. Alternative C would have minimal contributions to cumulative impacts on archeological resources. No impairment of archeological resources would occur under this alternative.
National Historic Preservation Act Section 106 Summary	<p>In accordance with Section 106 of the <i>National Historic Preservation Act</i>, potential adverse impacts (as defined in 36 CFR 800) on cultural landscapes and archeological resources listed on or eligible for listing on the National Register of Historic Places would be coordinated between the National Park Service and the State Historic Preservation Officer to determine the level of effect on the property and to determine any necessary mitigation measures. Continuing implementation of the <i>Cultural Resource Management Guideline</i> (NPS 1998) and adherence to <i>NPS Management Policies 2006</i> (NPS 2006b) and the 2008 Servicewide programmatic agreement with the Advisory Council on Historic Preservation and National Conference of State Historic Preservation Officers would all aid in reducing the potential to adversely impact historic properties.</p> <p>Copies of this Chronic Wasting Disease Detection and Initial Response Plan / Environmental Assessment have been distributed to the Maryland State Historic Preservation Officer for review and comment related to compliance with Section 106 of the <i>National Historic Preservation Act</i>.</p>		

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Socioeconomics	<p>Actions associated with opportunistic and targeted surveillance would have long-term, negligible to minor adverse impacts on socioeconomics. CWD surveillance actions that would occur under alternative A would not result in any changes to the existing vegetation conditions, and adverse impacts resulting from deer-related crop and landscape damage would continue. Because alternative A would have minimal effects on CWD risk factors allowing the potential for amplification, spread, and establishment, as well as exposure to possible population level effects to remain high, there could be negligible to minor adverse impacts to hunting and tourism due to changes in deer numbers and/or the presence of the disease. However, the exact nature and level of impact would depend on what actions the state has taken in the communities surrounding the battlefields in response to the presence of CWD. Overall cumulative impacts on the local socioeconomic resources would be long-term and beneficial.</p>	<p>Actions taken under alternative B would result in short-term, negligible to minor adverse impacts to the socioeconomic resource, with the level of adverse impacts dependent upon the perceptions of visitors and hunters, the number of deer potentially affected by CWD, and the actions the state has taken in the communities surrounding the battlefields in response to CWD. Long-term beneficial effects could occur, primarily if initial response activities help preclude CWD from becoming established, offsetting potential losses in hunting related tourism, and as a result of reduced deer damage to crops and landscapes in the areas surrounding the battlefields due to lower deer densities.</p>	<p>Actions taken under alternative C would result in short-term, negligible to minor adverse impacts to the socioeconomic resource, with the level of adverse impacts dependent upon the perceptions of visitors and hunters, the number of deer potentially affected by CWD, and the actions the state has taken in the communities surrounding the battlefields in response to CWD. Although not as extensive as the one-time population reduction discussed under alternative B, long-term beneficial effects could occur, primarily if initial response activities help preclude CWD from becoming established, offsetting potential losses in hunting related tourism; and as a result of reduced deer damage to crops and landscapes in the areas surrounding the battlefields due to lower deer densities.</p>

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Visitor Use and Experience	<p>Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on visitor use and experience. If CWD were to occur in or near the battlefields, those impacts would increase to minor due to the likely increase in seeing sick or dead deer. The overall cumulative impacts of all past, present and future actions at the battlefields would be long-term and beneficial.</p>	<p>Similar to alternative A, actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on visitor use and experience, while lethal removal of healthy-appearing deer for detection and/or monitoring surveillance would have short-term, minor, adverse impacts. Due to the need for more frequent temporary trail or area closures and the likely increase in visitors impacted by the closures, implementing a one-time population reduction would result in is short-term, minor to moderate, adverse impacts to visitor use and experience (minor or moderate depending on the number and frequency of trail area closures). Long-term beneficial effects would occur from reduced deer densities that would create a more natural, healthy environment for the deer population at the battlefields; from decreased potential for CWD to become established; and from knowing that the NPS is taking actions to protect the deer herds in the battlefields. Cumulative effects on visitor use and experience would be long-term and beneficial.</p>	<p>Similar to alternative B, actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on visitor use and experience, while lethal removal of healthy-appearing deer for detection and/or monitoring surveillance would have short-term, minor, adverse impacts. Live testing would have no impacts on visitor use and experience. Long-term beneficial effects would occur from reduced deer densities that would create a more natural, healthy environment for the deer population at the battlefields; from decreased potential for CWD to become established; and from knowing that the NPS is taking actions to protect the deer herds in the battlefields. Cumulative effects on visitor use and experience would be long-term and beneficial.</p>

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Health and Safety	Opportunistic and targeted surveillance activities employed under alternative A would result in long-term, negligible, adverse impacts on health and safety. Cumulative impacts on health and safety would be long-term, minor to potentially moderate and adverse; however, alternative A would contribute very little to any overall adverse impacts.	Opportunistic and targeted surveillance activities employed under alternative B would result in long-term, negligible, adverse impacts on health and safety as would live testing; lethal removal of healthy-appearing deer for both detection and monitoring surveillance, and lethal removal of healthy-appearing deer for a one-time population removal would have negligible to minor adverse effects. Alternative B would have negligible contributions to cumulative impacts on health and safety, which would be long-term, minor to potentially moderate, and adverse.	Opportunistic and targeted surveillance activities employed under alternative C would result in long-term, negligible, adverse impacts on health and safety as would live testing, and lethal removal of healthy appearing deer (detection) would have negligible to minor adverse effects. Alternative C would have negligible contributions to cumulative impacts on health and safety, which would be long-term, minor to potentially moderate and adverse.
Park Management and Operations	Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on park management and operations. Alternative A would have negligible contributions to cumulative impacts on park management and operations, which would be long-term, moderate, and adverse.	Detection and initial response actions would have short-term, negligible to moderate, adverse impacts on park management and operations, with the more intense impacts related to the removal actions included in this alternative and the need for additional public education and outreach, particularly if the one-time removal response is implemented. Cumulative effects on park management and operations would be long-term, moderate, and adverse.	Detection and initial response actions would have short-term, negligible to minor, adverse impacts on park management and operations, with the more intense impacts related to the lethal removal action for monitoring response. Cumulative effects on park management and operations would be long-term, minor to moderate, and adverse.

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APPENDICES

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Purpose of and Need for Action

PURPOSE OF AND NEED FOR ACTION

INTRODUCTION

The National Park Service (NPS) is taking action at this time to evaluate a range of alternatives to address the potential threat of chronic wasting disease (CWD) at Antietam and Monocacy National Battlefields (the battlefields). This Chronic Wasting Disease Detection and Initial Response Plan / Environmental Assessment (plan/EA) presents three alternatives—two action alternatives and the no-action alternative—for detecting and initially responding to positive cases of CWD found in or near battlefield boundaries. Upon conclusion of this plan/EA and decision-making process, one of the three alternatives will become the selected plan and guide future actions for detection and initial response to CWD for the battlefields.

PURPOSE OF THE DETECTION AND INITIAL RESPONSE PLAN / ENVIRONMENTAL ASSESSMENT

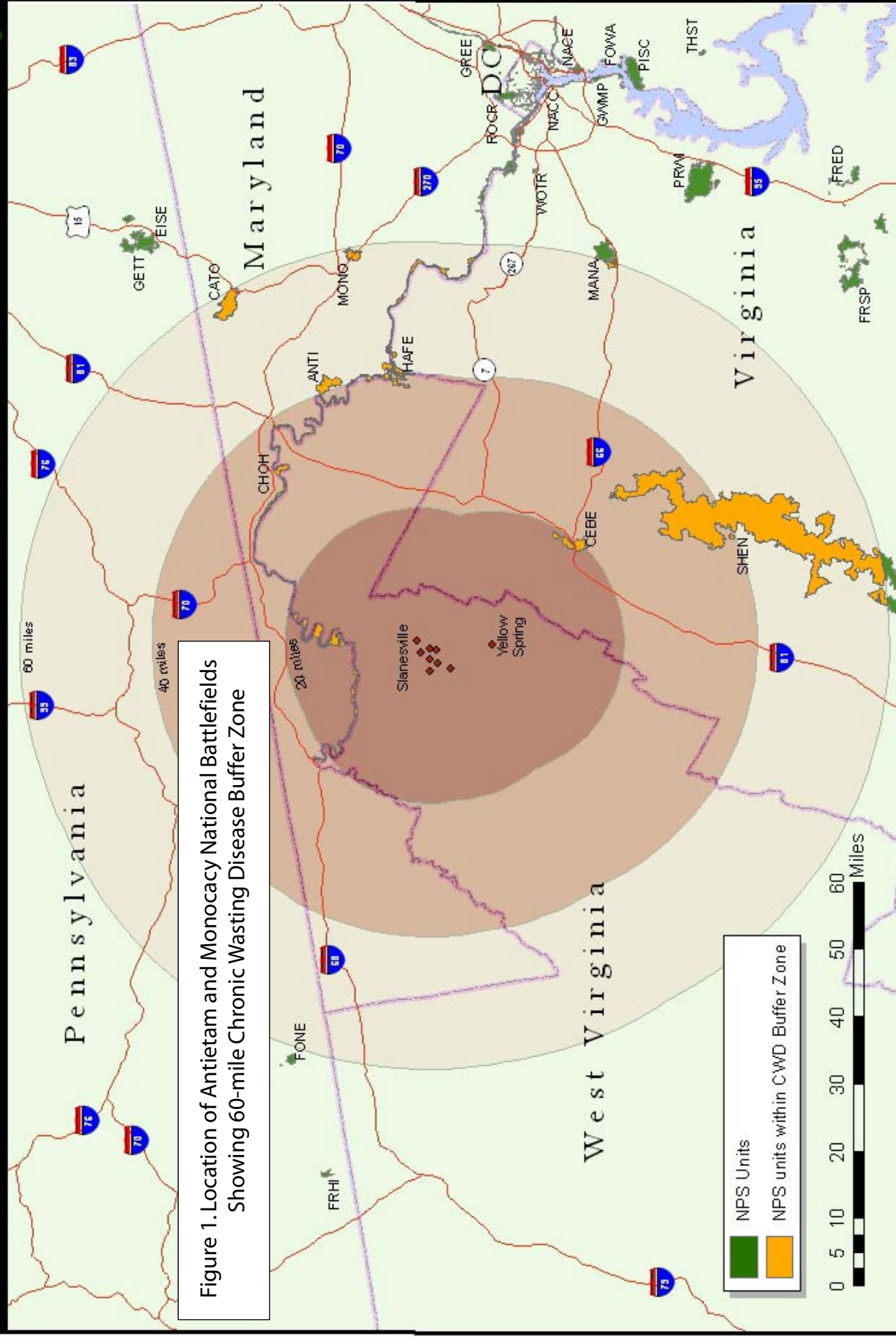
The purpose of this plan/EA is to develop a range of strategies for the detection of and initial response to CWD in white-tailed deer at Antietam and Monocacy National Battlefields, since the disease has been detected near the park units and may threaten park resources.

NEED FOR ACTION

Both Antietam and Monocacy National Battlefields support relatively large populations of white-tailed deer (*Odocoileus virginianus*). Although deer population numbers declined dramatically in the eastern United States after European settlement, deer populations have rebounded. As deer populations increase, risks relating to the transmission of contagious diseases, including CWD, within these higher density populations are a concern (NPS 2007a; Joly et al. 2006; Samuel et al. 2003). Much is still unknown about how CWD spreads among its hosts and affects them, including the potential for long-term population-level effects. Also, there is much concern among both the public and scientific communities regarding CWD.

Until 2005, CWD was apparently isolated to the West and Midwest regions of the United States. However, in March 2005, the disease was identified in captive and free-ranging white-tailed deer in New York, and in September 2005, CWD was first identified in a road-killed deer in West Virginia. Subsequently, 37 deer tested positive for CWD in West Virginia as of March 30, 2009. Both Antietam and Monocacy National Battlefields fall within a 60-mile radius of the confirmed West Virginia occurrences (figure 1), which is the distance at which park units are to implement CWD surveillance actions per the NPS Director's CWD guidance memorandum (NPS 2002b; appendix A of this plan/EA). This memorandum, which is further described in the "Related Laws, Policies, Plans, and Constraints" section of this chapter, also notes that environmental planning must be conducted prior to undertaking larger scale or multiple animal actions within a park. Therefore, a CWD detection and initial response plan is needed for Antietam and Monocacy National Battlefields at this time to address the following:

- The use of a range of CWD detection and initial response actions in light of recent detections in nearby geographic areas and their effect on the battlefields.
- Imminent or potential threats to park natural resources and components of the cultural landscapes, primarily white-tailed deer populations, from the establishment or spread of CWD.
- The desire to cooperate and coordinate with appropriate state and federal resource management agencies, as well as other interested parties, regarding prevention, detection, research, and initial response actions for CWD.



OBJECTIVES IN TAKING ACTION

Alternatives selected for detailed analysis in this plan/EA must meet all objectives to a large degree, and resolve the purpose and need for action. Objectives for detecting and responding to CWD must be grounded in the park's enabling legislation, purpose, and significance, and must be compatible with direction and guidance provided by each park unit's general management plan, resource management plan, and other management guidance. Any plan the park develops must be consistent with the laws, and regulations that guide the NPS. Objectives are "what must be achieved to a large degree for the action to be considered a success" (Director's Order 12, NPS 2001). Antietam and Monocacy National Battlefields are separate park units with their own enabling legislation, purpose, and significance, which were considered in developing objectives. The following objectives, related to CWD detection and initial response at Antietam and Monocacy national battlefields, were developed for this plan.

GENERAL

- Ensure actions are consistent with pertinent NPS management policies.

DEER POPULATIONS AT ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS

- Estimate ongoing risk of CWD infection in the white-tailed deer population of Antietam and Monocacy National Battlefields based on known disease risk factors.
- Appropriate to the level of risk, develop adaptive management protocols for the detection of CWD presence, prevalence, and distribution, as well as an initial response to the disease.

CULTURAL RESOURCES

- Minimize disruption to the natural resources and other components of the cultural landscapes from CWD or implementation of detection and initial response activities for the disease.

VISITOR USE AND EXPERIENCE

- Enhance the awareness and understanding of CWD and NPS resource management issues, policies, and mandates as they pertain to prevention, detection, and response to the disease for visitors and other interested parties.
- During implementation of CWD detection and initial response activities, minimize disruption to visitor use and experience.

HEALTH AND SAFETY

- Minimize the potential for health and safety issues for park staff and visitors associated with CWD surveillance and initial response activities.

PARK MANAGEMENT AND OPERATIONS

- Minimize impacts of CWD surveillance and response activities on current park operations, including budget and workload.
- Cooperate and coordinate with appropriate state and federal resource management agencies, as well as other interested parties, with respect to detection of CWD and initial responses to positive cases.

PROJECT SITE LOCATIONS

Antietam National Battlefield is in the southern part of Washington County, Maryland (figure 2). The Battle of Antietam (September 17, 1862) is considered by many historians as a turning point in the Civil War (NPS 1995). Antietam today is considered one of the best-preserved Civil War battlefields in the national park system (NPS 1995). The predominant land use is agriculture, and the farms and farmlands in and near the national battlefield appear much as they did in the mid-1860s. Of the approximately 3,263 acres within the legislative boundary, 1,937 acres are owned in fee by the federal government and managed by the NPS to maintain the historic setting and provide for visitor use; 820 acres are less-than-fee or in scenic easements; and 506 acres are private and state lands. Of the total land area, approximately 1,270 acres are managed for agricultural activities (57% crop, 27% pasture, and 16% hay).

Monocacy National Battlefield is in Frederick County, Maryland, approximately 3 miles from the city of Frederick (figure 3). The Battle of Monocacy (July 9, 1864) was considered a success in delaying Confederate troops from advancing on Washington, D.C., before General Ulysses S. Grant could mount a defense of the city. The park unit consists of 1,647 acres, of which 1,355 acres are owned in fee by the federal government and 182 acres are in scenic easement. Of the federally owned land, 765 acres are managed for agricultural activities (46% crop, 28% hay, and 25% pasture).

ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS: BACKGROUND

PURPOSE AND SIGNIFICANCE OF ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS

The purpose and significance are key elements that help shape the management of the battlefields. The purpose describes why the park was set aside as a NPS unit. Significance addresses why the park is unique—cultural heritage and natural features. Park significance statements capture the essence of the park's importance to the nation's natural and cultural heritage. Understanding park significance helps managers make decisions that preserve the resources and values necessary to the park's purpose.

Antietam National Battlefield

On August 30, 1890, Congress established Antietam National Battlefield, declaring:

All lands acquired by the United States...for the purpose of sites for tablets for marking of the lines of battle of the Army of the Potomac and of the Army of Northern Virginia at Antietam, and of the position of each of the forty-three different commands of the Regular Army engaged in the battle of Antietam, shall be under the care and supervision of the Secretary of the Interior (16 USC 446, August 30, 1890; and Executive Orders).

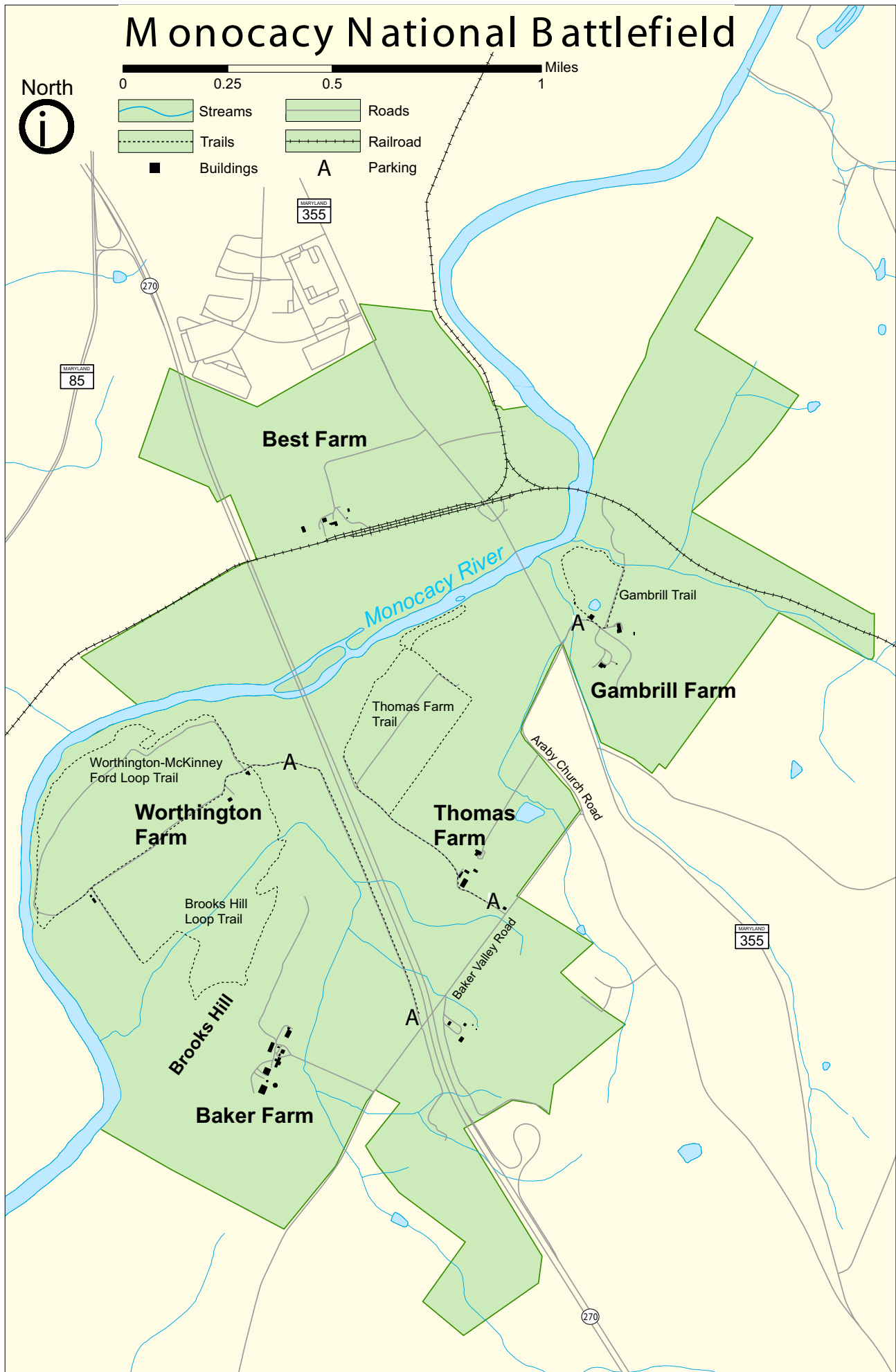
And in 1960, Congress enacted additional legislation stating:

...the Secretary finds necessary to preserve, protect and improve the Antietam Battlefield comprising approximately 1,800 acres in the State of Maryland...to assure the public a full and unimpeded view thereof, and to provide for the maintenance of the site in, or its restoration to, substantially the condition in which it was at the time of the battle of Antietam (*Act of April 22, 1960* (74 Stat. 79); 16 USC 430oo).

Figure 2: Antietam National Battlefield



Figure 3: Monocacy National Battlefield



The purposes for Antietam National Battlefield are as follows:

- To preserve, protect and improve the Antietam National Battlefield to assure the public a full and unimpeded view thereof.
- To provide for the maintenance of the site in, or its restoration to, substantially the condition in which it was at the time of the battle of Antietam.
- To inspire and educate future generations through the sacrifice made by soldiers and citizens upon these hallowed grounds.
- To preserve in perpetuity Antietam National Cemetery, as the final resting place of the remains of soldiers who fell at the battle of Antietam and other conflicts (NPS 1992).

Antietam is significant for the following reasons:

- Robert E. Lee's first invasion of the North during the Civil War. Without a victory at Antietam, Great Britain's recognition of the Confederacy was postponed.
- Antietam was the bloodiest single day battle in U.S. history.
- A result of the battle was President Abraham Lincoln issuing the preliminary Emancipation Proclamation. The Civil War now had a dual purpose – the reuniting of the United States (preserve the Union) and the freeing of slaves (NPS 1992).



Antietam Cemetery

Monocacy National Battlefield

Monocacy National Battlefield was established by Congress in 1934 with enabling legislation declaring:

That in order to commemorate the Battle of Monocacy, Maryland, and to preserve for historical purposes the breastworks, earthworks, walls, or other defenses or shelters used by the armies therein, the battlefield at Monocacy in the State of Maryland is hereby established as the Monocacy National Battlefield (16 USC 430j).

Subsequently, in 1976, Congress enacted legislation establishing the park unit boundary and authorizing funds for the acquisition of land.

The purposes of Monocacy National Battlefield are as follows:

- To preserve and protect the landscape, historic structures, archeological sites and monuments that contribute to the national significance of the Battle of Monocacy.
- To commemorate the Battle of Monocacy.
- To provide opportunities for visitors to understand and appreciate the significance of the Battle of Monocacy within the full context of the Civil War and American history (NPS 2006a).

Monocacy is significant for the following reasons:

- The July 9, 1864, battle where a small Union army successfully delayed a larger Confederate army's advance on Washington, D.C., thereby providing sufficient time for Gen. Ulysses S. Grant to send federal reinforcements to the U.S. capital and prevent its capture. This Confederate campaign, its third and final attempt to bring the war to the North, also was designed to divert

pressure from Gen. Robert E. Lee's besieged army at Petersburg, Virginia, and to lessen President Abraham Lincoln's chances for reelection.

- Other important events associated with the Civil War, including the 1862 Maryland Campaign and finding of Gen. Robert E. Lee's Special Order 191 outlining his plan of attack, the 1863 Gettysburg Campaign, and the August 1864 meeting of Generals Grant and Sheridan at the Thomas House to plan the Shenandoah Valley Campaign.
- A national battlefield where visitors can experience a historic landscape, structures, and transportation corridors that have changed little since the Battle of Monocacy. As a result, it offers many opportunities for understanding the evolution of settlement in the region and the Civil War within the broader context of American history (NPS 2006a).

CHRONIC WASTING DISEASE BACKGROUND

When the NPS started to prepare this plan/EA, a team of technical experts called the "science team" was formed to engage in the discussion of CWD and potential detection and initial response options available to the NPS. Participation was limited to people with scientific background in CWD, deer management and research, and NPS staff. Team participants are listed in the "Consultation and Coordination" chapter. The purpose of science team discussions was to provide a technical framework for the development of action thresholds and alternatives for the CWD detection and initial response plan.

The team convened via conference calls, meeting six times over a 5-month period in 2007, as well as contributing to the alternatives discussions in 2008. The topics of discussion included the following:

- existing conditions surrounding each park unit;
- existing data and CWD monitoring;
- CWD detection and initial response goals;
- approach to establishing action thresholds for detection and initial response; and
- issues related to implementation of various actions.

CHRONIC WASTING DISEASE RESEARCH SUMMARY

CWD Description and Distribution

CWD is in a family of diseases known as transmissible spongiform encephalopathy (TSE) and is an infectious, self-propagating, neurological disease. TSEs are characterized by accumulations of abnormal prion proteins primarily found in the lymph nodes and neural tissue. Free-ranging and captive mule deer

Prion: Proteinaceous infectious particle; a microscopic particle similar to a virus but lacking nucleic acid, thought to be the infectious agent for certain degenerative diseases of the nervous system such as CWD.

(*Odocoileus hemionus*), white-tailed deer, elk (*Cervus elaphus*), and moose (*Alces alces*) are all susceptible to CWD, which impacts the neurological system of the animal and is eventually fatal. There is no treatment or vaccine available to address CWD. CWD is in the same family as other TSEs such as bovine spongiform encephalopathy (BSE), also known as "mad cow" (NPS 2007a); however, there is no evidence to suggest that CWD is naturally transmitted to either humans or domestic animals. Research suggests there is a molecular barrier that likely limits the susceptibility of humans, cattle, and sheep to CWD (Raymond et al. 2000). Additionally, a recent epidemiological study of Colorado residents from CWD affected counties demonstrated that the relative risk of developing human prion disease was not elevated when

compared to residents from non-affected counties, indicating that human prion disease resulting from CWD exposure is rare or nonexistent (MaWhinney et al. 2006).

The exact origin of CWD is unknown and the time and place of emergence cannot be determined with certainty (Spraker et al. 1997; Williams et al. 2002). However, there are several hypotheses regarding the origin of the disease. One theory is that CWD resulted from a change in the way the normal prion was folded, resulting in an infectious prion that was subsequently transmitted to susceptible cervids (Williams et al. 2002). The sporadic form of Creutzfeldt-Jakob Disease (CJD), a TSE found in humans, is thought to arise in this manner. However, there are some questions about this potential origin for CWD because sporadic CJD in humans does not appear infectious, and sporadic TSEs have never been reported in animals (Williams et al. 2002).

Alternatively, CWD could be a mutated form of domestic sheep scrapie that has adapted to cervids (Raymond et al. 2000; Race et al. 2002). Both CWD and scrapie are infectious, contagious TSEs, and scrapie has been implicated in the BSE outbreak in Great Britain (Wilesmith et al. 1988; Collinge et al. 1996; Bruce et al. 1997). While the circumstances surrounding the BSE epidemic in cattle in the U.K. are vastly different from those involved with CWD in the United States, it does raise suspicion that TSEs from sheep can cross species barriers when the appropriate conditions exist. Then again, CWD may have originated from infection with another novel prion strain with adaptation and subsequent transmission among cervids (Williams and Miller 2003).

The precise origin of CWD will probably never be determined (Williams and Miller 2003), but it has likely been present in the historic area (northeastern Colorado, southeastern Wyoming, and the southwest corner of the panhandle of Nebraska) since the early 1960s or earlier (Miller et al. 2000). CWD was first observed clinically in 1967 in captive mule deer in a wildlife research facility in Colorado (it was recognized in 1978 in a similar facility in Wyoming). More than 80% of mule deer over the age of 2 years held in the Colorado facility from 1974–1979 died or were euthanized following signs consistent with CWD. By 1979, vacuolar brain lesions had been identified and the disease had been described as a spongiform encephalopathy (Williams and Young 1980, 1992). Although originally detected in the western United States, as of January 2009, CWD has been found in 12 states and 2 Canadian provinces in captive and farmed populations. In free-ranging populations, CWD has been found in 11 states and 2 provinces (figure 4).

While there are many unknowns surrounding CWD, what is known is that human associated movement of these animals has aided in the spread of CWD in captive, and likely free-ranging, deer and elk (Miller and Williams 2003; Salman 2003; Williams and Miller 2003). The transmission of CWD is increased by the high concentrations of these animals and their lack of natural predators (Spraker et al. 1997; Samuel et al. 2003; Farnsworth et al. 2005), as is the case with white-tailed deer in eastern national parks. There is also evidence that anthropogenic, or human caused, factors such as changes in land use patterns, also influence the spread of CWD (Farnsworth et al. 2005).

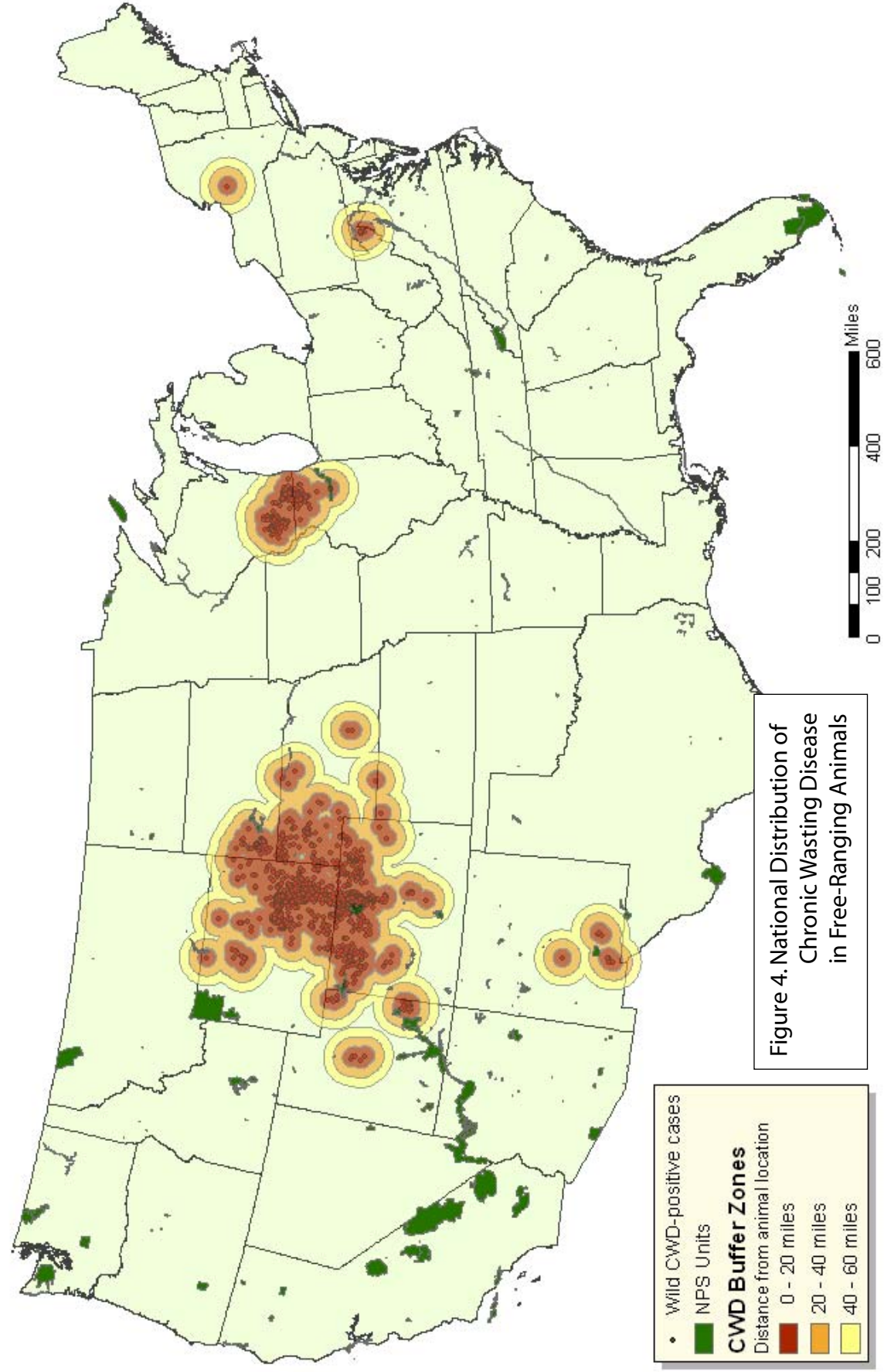


Figure 4. National Distribution of Chronic Wasting Disease in Free-Ranging Animals

Clinical Signs

Animals infected with CWD exhibit the disease through changes in behavior and body condition. Some signs of CWD include animals losing their fear of humans, showing repetitive movements, and/or appearing depressed but becoming quickly alert if startled. In addition to these behavioral signs, physical signs include losing weight, or poor body condition, despite having an appetite. In the beginning, these signs may be very subtle, and then over several weeks to several months the signs increase and become more pronounced. Other signs of CWD include lowered head/ears, increased urination, stumbling, “star-gazing,” increased salivation, wide-based stance, increased drinking, loss of coordination, and regurgitation. These behavioral changes could result in physical changes such as pneumonia, staying by water for long periods of time, etc. While any of these may give an observer an indication that an animal might have CWD, the disease can only be diagnosed through laboratory testing (NPS 2007a).



Deer showing signs of CWD

Diagnosis and Testing

Laboratory tests that are available for early CWD detection use tissue samples from the brain, lymph nodes, and tonsils. Although this process typically takes a few days, rapid tests are also available that provide quicker results; however, they are slightly less sensitive at diagnosing the disease in some species. In addition, advanced cases of CWD can be diagnosed by observing changes and degeneration of certain parts of the brain. None of these tests are 100% accurate, which means that a negative test does not guarantee a CWD-free animal (NPS 2007a).

Transmission

The natural path of transmission of CWD in deer and other affected animals is not fully understood, but studies have been conducted that suggest various direct and indirect paths of transmission. Numerous studies have suggested that environmental contamination contributes to the spread of CWD, such as being in the vicinity of dead or live animals with CWD, or being in the areas that the infected animal previously inhabited (Miller et al. 1998; Miller et al. 2000; Williams and Miller 2003; Miller et al. 2004; Johnson et al. 2006; Johnson et al. 2007; Schramm et al. 2006). In addition, bodily secretions such as feces, urine, and saliva have been suggested as means of transmission (Mathiason et al. 2006).

Based on current research, transmission of CWD in white-tailed deer populations is not uniform across the landscape. Preliminary sampling in Wisconsin shows there is a clustered distribution of diseased animals in the CWD-affected area of the state, indicating that deer in proximity to positive cases are more likely to have the disease (Joly et al. 2006). Although direct evidence of a density-dependent transmission relationship is weak (Joly et al. 2006), studies have shown that CWD can be very efficiently transmitted between animals in captive herds (Williams and Young 1980; Miller et al. 1998; Miller and Wild 2004). This finding may be similar in free-ranging herds in urban environments that are confined by land use patterns, where, like with other contagious diseases, CWD transmission increases when animals are

concentrated. Increased mortality in these populations, such as through management actions, may slow transmission by limiting the number of infectious contacts with a diseased animal.

Based on differences in prevalence rates between age and sex classes, recent research also indicates that CWD transmission in white-tailed deer is affected by social behavior. The Wisconsin study found that CWD prevalence was 3% to 4% in yearling males and females, but this increased to 13% for 3-year old males and 7% for 3-year old females (Gear et al. 2006). These differences may be attributed to direct transmission in male groups from late winter through early summer; transmission during the breeding season when males come into contact with many potentially-infected females or when they visit rubs and scrapes used by infected males; and the fact that males have larger home ranges and broader movements during the breeding season, which increases the chances of infectious contacts (Gear et al. 2006).

The spread and transmission of CWD in white-tailed deer populations can be attributed to a range of risk factors. With CWD spreading to new areas, it is thought that by identifying these risk factors, wildlife managers can better predict which populations are most likely to be exposed to or amplify CWD. Risk factors fall into two categories: exposure related and amplification related (Samuel et al. 2003). The first category addresses the likelihood that CWD will be introduced to a given population and includes areas:

- adjacent to CWD-positive wildlife;
- with CWD-positive farmed or captive animals;
- with concentrations of farmed or captive animals;
- that have received translocated deer or elk from CWD-affected regions;
- permitting transport of hunter-killed deer or elk carcasses from CWD identified areas; and
- adjacent to land on which TSE-positive animals, farmed or wild, have lived (Samuel et al. 2003).

The second set of risk factors addresses how CWD can spread once it is in a population and includes areas:

- with a history of CWD animals or CWD contaminated environments;
- with high deer or elk population density;
- with low abundance of large predators; and
- where free-ranging deer or elk are artificially concentrated (baiting, feeding, water development, and other human related habitat modifications) (Samuel et al. 2003).

Disposal of CWD Infected Material

There is currently no national standard for disposal of known or suspect CWD contaminated organic material such as whole or partial carcasses. Each state, Environmental Protection Agency Region, and refuse disposal area is likely to have different regulations and restrictions for disposal of potentially infected tissues. Because infected carcasses serve as a source of environmental contamination (Miller et al. 2004) and soils may act as a reservoir for prion infectivity (Johnson et al. 2007) it is recommended that known and suspect CWD positive animals be removed from the environment. Alkaline digestion and incineration are two of the most effective ways of destroying contaminated organic material. These are usually only available at veterinary diagnostic laboratories or universities. Arrangements can often be made with laboratories to test and then dispose of animals. Another option, depending on the region, is landfill disposal.

Chronic Wasting Disease in National Park Units and NPS CWD Policies

CWD has been found within only two national parks: Rocky Mountain National Park, Colorado, and Wind Cave National Park, South Dakota. Recently, CWD was detected near Slanesville, West Virginia, within 60 miles of several national park units, including Antietam and Monocacy National Battlefields.

Many aspects of CWD are still unknown and research on the subject is ongoing. While these research studies are being conducted, wildlife managers, including those in national park units, are developing plans to detect and address CWD. In 2002, a memo from the NPS Director (NPS 2002b; appendix A of this plan/EA) required park units within 60 miles of positive CWD detections to respond to the disease and cooperate with state agencies in CWD surveillance. In a February 2006 memorandum, the National Capital Region of the NPS directed parks within 60 miles of a known CWD case to use opportunistic sampling to track any emergence of CWD in deer populations and to work with state resource agencies to be cooperative and proactive on issues related to CWD. In addition, both battlefields have prepared specific standard operating procedures to comply with these memorandums. To further assist NPS managers in responding to CWD, the NPS developed *A National Park Service Manager's Reference Notebook to Understanding Chronic Wasting Disease*; the fourth edition was released in July 2007 (CWD handbook, NPS 2007a). This handbook is an informational reference that summarizes some of the most pertinent CWD literature, management options, and policies as they pertain to NPS units. All of these policies are described later in this chapter, in the "Related Laws, Policies, Plans, and Constraints" section.

Chronic Wasting Disease Management Options

The NPS CWD Handbook (NPS 2007a) has identified numerous management options that can be implemented if CWD is found in or near a park unit, considering the site-specific CWD goals and objectives of the park unit. Those discussed in the handbook are listed below:

- do nothing;
- opportunistic surveillance (taking samples for CWD testing from animals found dead or harvested within the unit);
- targeted surveillance (performing lethal removal of deer that exhibit clinical signs consistent with CWD);
- test and cull (test and remove any animals found to be diseased);
- "hot-spot" culling (removal in high incidence areas);
- population reduction (involves culling animals randomly within a population in an attempt to reduce animal density, and thus decrease CWD transmission rates);
- wolf predation as a stewardship tool; and
- depopulation (elimination of a population).

CWD management options from the NPS CWD Handbook include:

- *do nothing*
- *opportunistic surveillance*
- *targeted surveillance*
- *test and cull*
- *"hot-spot" culling*
- *population reduction*
- *wolf predation as a stewardship tool*
- *depopulation*

Alternative management options that were considered for use at the battlefields are discussed in detail in the "Alternatives" chapter of this plan/EA.

CURRENT CONDITIONS IN THE BATTLEFIELDS

Antietam National Battlefield and Monocacy National Battlefield have been conducting opportunistic sampling of deer for detection of CWD since 2007. As of April 2009, Antietam National Battlefield has

sampled 42 deer and Monocacy has sampled 12 deer, with no positive results for CWD (three test results are still pending for Antietam). Both battlefields also have seasonal summer staff who look for deer with clinical signs of CWD once per week. To date, no deer exhibiting clinical signs of CWD have been observed in or near either Antietam or Monocacy National Battlefield.

Additional background information on the deer populations in the battlefields can be found in the “White-tailed Deer” section of the “Affected Environment” chapter.

CWD Plans in States near the Battlefields

In the area of Antietam and Monocacy National Battlefields, the states of Maryland, Virginia, West Virginia, and Pennsylvania have developed response plans to address CWD in white-tailed deer populations. These four jurisdictions have been testing for CWD and implementing surveillance programs in recent years. The NPS would attempt to coordinate any CWD activities at Antietam and Monocacy National Battlefields with the states. The following details the response and surveillance plans of these states.

Maryland

In 2005, the Maryland Department of Natural Resources (MDNR) developed a CWD response plan that outlines management activities intended to address the presence of CWD, help determine the magnitude and geographic extent of infection, and attempt to eliminate or control transmission of CWD. This plan is updated annually to reflect the current knowledge concerning CWD. The current plan is dated February 2009 (Eyler 2009). Included in this plan are general responses about CWD such as how to address the media and public relations, how to respond to positive CWD cases in free-ranging and captive deer in Maryland, and how to respond to discovery of CWD within 20 miles and 5 miles of the Maryland border (MDNR 2009).

The Maryland CWD response plan details a systematic approach to detecting and determining the extent of CWD. If a positive CWD case is found, a selected surveillance area (SSA) would be established using a 5-mile radius (about 79 square miles) around the positive case. Within 21 days, the state would begin sampling deer in the SSA in order to reach an adequate level of confidence that the prevalence of CWD in the population has been determined. The total number of deer to be sampled would be based on the estimated population size within the SSA and the relationship between a given sample size and the corresponding degree of confidence that any additional infected deer have been identified. If additional positive cases are found within the SSA, the area would be extended around each new positive case by a 5-mile radius and sampling would continue. As sampling progresses, a CWD infection zone (CIZ) would be identified and targeted surveillance for CWD would be intensified within all of the counties immediately adjacent to the CIZ. This surveillance would focus on road-killed deer and deer taken under a Deer Management Permit, managed hunts and during the regular hunting season (MDNR 2009).

If after five consecutive years there are no new detections of CWD in the counties immediately adjacent to, and containing the CIZ, the area would be considered CWD free. If CWD is found in the infection zone within five consecutive years, the CIZ would be extended as necessary and an adaptive management approach would be used to determine how long to continue surveillance in the CIZ. If additional positive cases are identified, then the state would initiate a program to educate the public on how to adapt to having CWD in the environment (MDNR 2009).

The state response plan has provisions for CWD in captive populations, although animals testing positive for CWD have not been found to date in Maryland captive cervids. This plan has specific actions for captive facilities with CWD positive animals, and also calls for the CWD response plan around the captive facility (MDNR 2009). The primary objectives of the plan once a positive CWD is confirmed is to eradicate the disease from the captive herd and determine if it is also present in the surrounding free-ranging deer.

The state of Maryland is also looking beyond its borders and has developed responses for the potential discovery of CWD within both 20 miles and 5 miles of the state border. For a positive CWD occurrence within 20 miles of the state border the response plan includes enhanced surveillance along the border near areas known to have CWD infections, with a plan to collect a minimum of 60 samples in an approximately 50- to 100-square mile area to establish with 95% confidence that CWD does not exist at over 5% prevalence in the area. CWD sampling would include deer taken under deer damage permits, road-killed deer, and hunter-harvested deer (MDNR 2009).

For a positive CWD occurrence within 5 miles of the state border, the response plan includes enhanced sampling in Maryland areas adjacent to the positive CWD case. In addition to road-killed deer, hunter-harvested deer, and deer taken under deer damage permits, targeted sampling by sharpshooting would also be employed. If a positive case of CWD is detected in Maryland during this enhanced sampling, the measures described above for responding to CWD in free-ranging deer would be enacted.

MDNR began sampling sick or injured deer for CWD in 1999 and expanded the sampling to random hunter-harvested deer statewide in 2002. Currently, the state deer population is separated into “high-risk” and “low-risk” populations with the high risk population found in the eight counties that border Pennsylvania. These are considered high-risk populations because of the substantial presence of captive deer facilities both in Maryland and Pennsylvania and the relatively high density of free-ranging deer. The deer population in the remaining 15 counties of the state is considered low-risk because there are fewer captive deer facilities and the densities of free-ranging deer are lower (MDNR 2009).

Currently, MDNR collects 50 random samples from hunter-harvested deer in each of the 8 high-risk counties and 30 samples from each of the 15 low-risk counties. Since 2005 when West Virginia discovered CWD approximately 11 miles from the Maryland border, sampling in Allegany County has been intensified. Since 2002, a total of 4,682 deer have been tested in the state with no positive results (MDNR 2009).

Virginia

The state of Virginia is focused on preventing CWD introduction. If CWD is identified in Virginia or within 5 miles of the Virginia border the Virginia Department of Game and Inland Fisheries (VDGIF) is responsible for implementing a CWD response plan in the state. This plan outlines management activities to determine the prevalence and geographic extent of CWD infection and to control transmission of the disease (VDGIF 2008). Acknowledging the fact that other states have not been able to eradicate CWD from free-ranging deer populations, the goal of the Virginia CWD response plan is to contain or slow the spread of the disease in free-ranging deer (VDGIF 2008).

For free-ranging populations, a surveillance area of a 5-mile radius (approximately 79 square miles) would be established around a positive CWD case. Within 60 days of a confirmed CWD diagnosis in Virginia or within 5 miles of the Virginia border, VDGIF staff would determine and collect the number of samples necessary in this approximately 79 square miles to determine prevalence and geographic distribution. The goal is to estimate CWD prevalence with an error of +/- 5% at 90% confidence. During the first hunting season following the confirmed diagnosis of CWD in Virginia, or within 5 miles of the Virginia border, mandatory testing of all hunter-harvested free-ranging deer greater than 6 months of age within the 79 square mile surveillance area would be implemented. The goal is to estimate the CWD prevalence with an error of +/- 2% at 90% confidence. If needed, the sample size may be supplemented by other methods. During this time, counties within and adjacent to the surveillance area may intensify targeted surveillance of their deer populations for CWD and collect road-killed deer as necessary. Additional sampling of hunter-killed deer would also occur as necessary.

If the one-year mandatory testing in the CWD surveillance area yields no new positive CWD cases, the state would conduct annual CWD testing for hunter-killed deer greater than 6 months of age within the CWD surveillance area for the next 4 years and would place a heightened emphasis on targeted

surveillance and hunter-killed deer in all counties within and adjacent to the surveillance area. Areas would be considered CWD free after 5 consecutive years of no new detections (VDGIF 2008).

If additional positive cases are detected within the CWD surveillance area or within 5 miles of the surveillance area, the Virginia response plan calls for establishment of a CWD containment area that would encompass a 5-mile radius around all positive CWD cases within or near the initial surveillance area. The objectives for the containment area will be to monitor the prevalence and geographic extent of the CWD and contain or slow the spread of the disease. To achieve CWD containment, multiple management tools would be employed including, but not limited to, population reduction, extended deer season and increased bag limits, mandatory CWD testing surveillance areas, special designated CWD check station, prohibition of deer rehabilitation and deer feeding, prohibition of carcass transportation, and implementation of necessary depopulation and indemnification of captive cervids, fence security, and quarantine of cervid facilities. Containment areas would be considered CWD free after 5 consecutive years of no new detections (VDGIF 2008).

The state CWD response plan also includes provisions for captive populations. Captive cervid facilities in Virginia are primarily for exhibition/educational purposes (e.g., zoos), although there is a commercial deer farm in Shenandoah County. Four fenced hunting enclosures with native Virginia deer are also available for hunting, in the state. Combined, these facilities support approximately 450 captive cervids. The response plan has specific actions for captive facilities with CWD positive animals, and also calls for the implementation of the CWD response plan for free-ranging deer around a captive facility (VDGIF 2008).

The Virginia plan includes response actions for discovery of CWD within 50 miles of the state border as well. This plan includes identifying all Virginia counties that are partially or wholly included in the 50-mile radius of the first positive CWD case as high-risk areas and surveillance would be initiated per the VDGIF surveillance plan.

As required by the state CWD response plan, a CWD surveillance plan is developed in response to the discovery of CWD in another state, within 50 miles of Virginia. As a result of the discovery of CWD in deer near Slanesville, West Virginia, VDGIF developed and implemented a CWD surveillance plan in 2006. The plan was updated August 2007 and is designed to detect CWD in separate designated geographic surveillance areas that have been stratified based on the level of risk (VDGIF 2007). It defines high-, medium-, and low-risk areas, as follows:

- **High-Risk Surveillance Area:** Geographic areas that are within a 10-mile radius of a high-risk captive cervid facility without adequate surveillance, a captive cervid facility of unknown status, or an illegal cervid facility with known or suspected releases or escapes, or within 20-mile radius of a confirmed CWD positive captive or free-ranging cervid in a neighboring state. The sample sizes would be large enough to result in at least 99% confidence that CWD would be detected if the prevalence of the disease is greater than 1%. The sample sizes for each high-risk area are estimated to be 300 to 500 animals.
- **Medium-Risk Surveillance Area:** The remainder of the counties that contain a high-risk surveillance area, counties that are within 50-mile radius of a positive case of CWD within a neighboring state, counties that are within a 10-mile radius of high or medium risk, or unknown status, captive cervid facilities that lack adequate CWD surveillance in neighboring states and are not included in the high-risk surveillance area, and counties that contain a high-risk facility within the state.
- **Low-Risk Surveillance Area:** All other counties that are not considered high- or medium-risk areas (VDGIF 2007).

The specific surveillance strategies that would be used in these areas are defined in the plan as well, and include

- Random Active Surveillance: CWD testing of clinically normal road and hunter-harvested deer as well as deer killed under kill-permits (high-risk surveillance areas only).
- Enhanced Targeted Surveillance: Testing of CWD clinical suspect deer (6 months or older that are emaciated or have neurological signs consistent with CWD) as they become available (high- and medium-risk surveillance areas).
- Targeted Surveillance: Testing of CWD clinical suspect deer (16 months or older that are emaciated and have neurological signs consistent with CWD) as they become available (high-, medium, and low-risk surveillance areas) (VDGIF 2007).

As part of this plan, the state has also implemented regulations for captive facilities to help prevent introduction of CWD. They include prohibitions on interstate and intrastate movements, and mandatory CWD testing for any natural mortalities in captive herds. There is also a ban on importing cervid carcasses from CWD infected areas, as well as seasonal (September through January) bans on feeding deer. In addition, the southwestern part of Virginia borders states (Tennessee and Kentucky) that have reintroduced elk. Some animals move into Virginia and can be hunted in open deer season. All hunter- and road-killed elk are tested for CWD.

Due to the 2005 positive CWD case in West Virginia that was within 50 miles of the Virginia border, the state of Virginia partially activated its CWD response plan. As a result, approximately 1,000 square miles of the western and northern portions of the Shenandoah, Frederick, Clarke, and Loudoun counties were designated as an active surveillance area. Surveillance of road-killed and hunter-harvested deer in this area resulted in the collection of 559 samples. In addition, enhanced targeted surveillance was conducted in the high-risk and medium-risk areas, and targeted surveillance was conducted in the low-risk areas. Furthermore, CWD testing of elk and captive cervids was continued. This resulted in the collection of 749 samples during 2005. In 2006 the same surveillance strategies were conducted; however, limited statewide active surveillance of road-killed white-tailed deer was performed. As a result, 919 samples were collected during 2006. In 2007, statewide active surveillance of road-killed and hunter-harvested deer was conducted with an emphasis on sampling deer from western Frederick County as well as statewide targeted surveillance. This resulted in the collection of 1,215 samples. In summary, a total of 4,151 samples have been collected across Virginia since 2002 with no positive detections (VDGIF 2009).

West Virginia

In September 2005, CWD was detected in a road-killed deer in Hampshire County, West Virginia, near Slanesville. The West Virginia Division of Natural Resources (WVDNR) immediately implemented its CWD response plan designed to accomplish the following objectives:

- determine the distribution and prevalence of CWD through enhanced surveillance efforts;
- communicate and coordinate with the public and other appropriate agencies on issues relating to CWD and the steps being taken to respond to this disease; and
- initiate appropriate management actions necessary to control the spread of this disease, prevent further introduction of the disease, and possibly eliminate the disease from the state (WVDNR 2006).

The state's goal is to estimate the CWD prevalence with 98% confidence that CWD occurs at less than 1% prevalence in the area where the disease is found. In addition the state will sample deer state-wide to be 98% confident that if the disease is present at or above 1% prevalence it will be detected. Samples can be taken from road-killed deer, special deer collected by Wildlife Resources Section personnel, sick deer as reported by the public, deer harvested under crop damage permits, and hunter-harvested deer. This plan also outlines communication and coordination procedures, disease management actions, and immediate logistical needs (WVDNR 2006).

The plan was updated in 2006 and includes increasing CWD surveillance in a 5-mile radius around the initial positive CWD detection, and a 1-mile radius around subsequent positive detections. Sampling primarily occurs through sharpshooting and testing of hunter-harvested deer in these close proximity areas. Samples from the remainder of Hampshire County are obtained primarily from hunter-harvested deer. In surrounding counties, samples come primarily from road-killed deer and deer taken due to crop damage. In these counties, approximately 300 animals would be tested to establish with 95% confidence that if CWD occurs at 1% prevalence or greater, it will be detected through sampling efforts. In Jefferson, Berkley, and Morgan Counties, all of which are close to Antietam National Battlefield, the state goal is to sample approximately 259 road-killed deer to determine with 95% confidence that if CWD is present in the population at or above 1% prevalence, it will be detected (WVDNR 2007).

Implementation of this plan has resulted in identification of 37 additional positive CWD cases, all located within Hampshire County. The 37 total positive test results came from two road-killed deer, one in 2005 and one in 2008; 12 hunter-killed deer, one during the 2006 season, six during the 2007 season and five during the 2008 season; and 23 deer collected by WVDNR staff, four in 2005, five in 2006, three in 2007, and 11 in 2008. Since 2002 a total of 8,485 deer have been tested (Crum 2009).

Based on this surveillance, WVDNR has identified a 4% to 5% prevalence rate within a 1-mile radius of any known CWD positive deer. The state expects to sample for 3 years to determine prevalence with greater confidence; their current confidence level is unknown. The aggressive sampling/surveillance strategy has reduced deer density from 44 deer per square mile to 28–34 deer per square mile in Hampshire County. The reduction in deer density could help reduce CWD transmission.

There are approximately 40 to 50 captive facilities in the state, and they are regulated by the WVDNR and West Virginia Department of Agriculture. These facilities contain anywhere between 2 and 200 animals, and are considered a serious concern for CWD. Strictly enforced rules require mandatory inventories of captive cervids and mandatory testing for CWD.

Pennsylvania

The state of Pennsylvania updates its CWD response plan annually. The most current revision was completed in August 2008. This plan calls for targeted and active surveillance for CWD in free-ranging cervids, which are defined, respectively, as (1) identifying and testing free-ranging cervids statewide that show signs consistent with CWD; and (2) collecting and testing representative samples of outwardly healthy cervids harvested by hunters during normal hunting seasons, harvested under crop damage permits, or killed by vehicle collisions (PAGC 2008a). The Pennsylvania Department of Agriculture is responsible for surveillance of captive cervids. The Pennsylvania Department of Agriculture has two programs available for farmed cervids relative to CWD (more information is available from the Pennsylvania Department of Agriculture on these programs):

1. The CWD Herd Certification Program is a five-year plan intended to achieve CWD certified status for a herd. Requirements include annual herd inventories, mandatory official identification, and postmortem (after death) testing of all deer that are 12 months or older.
2. The CWD Herd Monitoring Program is a surveillance program for farmed cervid herds that cannot meet the requirements of the program.

In the event of a positive detection in either captive or free-ranging cervids (deer or elk), the state would establish a 5-mile radius around the positive CWD case to establish a surveillance zone. Within one month, approximately 300 cervids would be tested in this 79-square-mile area to determine with 99% confidence that if CWD occurs at or above 1% prevalence, it will be detected. The exact sample size would be based on the population of cervids within the surveillance zone. Samples would come from

hunter-harvested cervids, as well as those removed by the state or by landowners with state assistance. If no further detections occur, CWD testing would continue in the surveillance zone for no less than 5 years, with samples coming from hunter-harvested deer and elk, as well as road-killed cervids (PAGC 2008a).

If another CWD positive animal were found in the surveillance zone, a new 79-square-mile zone—the containment zone—would be established around this case. At this phase in CWD response, containment of the disease and reduction of the prevalence rate are the priorities. The majority of samples for determining prevalence would be obtained from hunter-harvested animals during regular hunting seasons, with non-hunter harvested animals tested opportunistically as they become available. Population reduction would be implemented, and all deer greater than 6 months of age would be tested. If there are no additional detections in the containment zone, CWD testing would continue for five years with samples from hunter-harvested animals. If additional detections occur in the containment zone, it would be expanded and CWD surveillance and population reduction would continue. Ultimately, as effective environmental decontamination methods are identified by research, or based on the experience of other states, efforts may be made to apply different decontamination methods to the containment zone (PAGC 2008a).

The whole state is considered high risk for CWD, with the biggest focus on the border with West Virginia. This border area is popular with hunters who may take their kill to other nearby states, which can impede testing. In 2007 4,251 hunter-killed deer were sampled with no CWD positive cases. In total, as of June 2007 the state has tested 18,069 hunter-harvested deer and 260 hunter-harvested elk with no results positive for CWD, not including 39 samples taken by the NPS at Gettysburg National Military Park, which were also negative for CWD. As of June 2007 the state has also tested more than 750 deer and elk dying for unknown reasons with no positive results for CWD, and as of May 2008 no CWD was found in the more than 7,200 farmed cervids that were tested (PAGC 2008b).

SCOPING PROCESS AND PUBLIC PARTICIPATION

National Environmental Policy Act (NEPA) regulations require “an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.” The scope of issues to be addressed was discussed at an internal scoping meeting, held with the NPS Interdisciplinary Planning Team convened for this plan, as well as many battlefield staff, on November 15 and 16, 2006. Public meetings were held on February 12 and 20, 2007, at both battlefields to solicit public input on issues related to CWD and possible management actions. Additional public meetings were held on December 3 to 4, 2008, to present more detailed alternatives to the public and solicit input on various options for disease detection and response, including lethal removal (see the “Consultation and Coordination” chapter for more information on public scoping and meetings). As a result of the initial scoping effort and subsequent discussions, several issues were identified that required further analysis in this plan. These issues represent existing concerns, as well as concerns that may arise during consideration and analysis of alternatives.

The issues included for analysis are presented below. These issues form the basis for the impact topics discussed in the “Affected Environment” and “Environmental Consequences” chapters of this plan/EA.

WHITE-TAILED DEER

CWD detection and initial response actions would result in temporary disturbances to deer during implementation. Options for CWD detection and initial response that would involve removing presumably healthy animals would affect the white-tailed deer populations at Antietam and Monocacy National Battlefields. While initial response activities may be implemented to try to keep the disease from becoming established (i.e., reduce the potential for transmission), the disease could have effects on localized populations of deer by causing large-scale declines or CWD could eventually come to an equilibrium state and stabilize at an endemic level. Regardless, this would have an effect on native deer

populations and their management in NPS units; therefore, this impact topic was retained for further analysis.

VEGETATION

According to the *NPS Management Policies 2006*, the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants. Implementation of CWD detection and initial response actions would result in limited trampling of vegetation that occurs during routine field work. The potential also exists for seeds of non-native species to be introduced from the use of vehicles and as people walk through the Antietam and Monocacy National Battlefields during CWD detection and initial response activities. Although the battlefields conduct exotic plant management, there is the potential for such activities to affect the composition of plant communities at the park units. In addition, options for CWD detection and initial response that would involve removing presumably healthy deer could reduce the number of deer that browse in the park units. Because these actions may have measurable effects, this impact topic was retained for further analysis.

OTHER WILDLIFE AND WILDLIFE HABITAT

According to the *NPS Management Policies 2006*, the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of animals. Studies have linked high deer densities to undesirable effects on other wildlife species, such as migratory birds (deCalesta 1994; McShea 2000; McShea and Rappole 2000). As deer populations increase, increased browsing has adverse effects on vegetation that provides cover, forage, and nesting habitat for such birds, as well as other wildlife (e.g., small mammals, reptiles, etc.). However, CWD detection and initial response activities could reduce browsing effects (as a result of removing deer for CWD testing), which could benefit other wildlife and wildlife habitat. In addition, some deer carcasses could be left on the ground at the battlefields after lethal CWD testing activities, increasing the availability of carrion that could benefit other wildlife (e.g., coyotes). These actions may have measurable effects; therefore, this impact topic was retained for further analysis.

CULTURAL RESOURCES

Section 106 of the *National Historic Preservation Act*, as amended in 1992 (16 USC 470 et seq.); NPS Director's Order 28: Cultural Resources Management Guideline; and *NPS Management Policies 2006* require the consideration of impacts on cultural resources. The potential for burying carcasses from CWD testing efforts on site at Antietam and Monocacy National Battlefields would cause ground disturbances that could have the potential to affect archeological resources. In addition, cultural landscapes, which reflect the relationship between what is natural and what is man-made, are managed in these park units, to the extent possible, to reflect the conditions at the time of the battles of Antietam and Monocacy. Because white-tailed deer were a component of that landscape, options for CWD detection and initial response that would involve removing presumably healthy deer could also affect the cultural landscape at the battlefields; therefore, this impact topic was retained for further analysis.

SOCIOECONOMICS

Although not allowed within the battlefields, white-tailed deer hunting contributes to the local economy as a result of hunting-related expenditures (e.g., provisions, lodging, etc.). Options for CWD detection and initial response that would affect deer (e.g., those that would involve removing presumable healthy animals) could affect the local economy by reducing animals available for hunting. Antietam and Monocacy National Battlefields also attract visitors to the local area, contributing to tourism. Should there be any changes in visitation to the battlefields as a result of CWD detection and initial response activities, it could have effects on local socioeconomics. Agricultural activities, both within and adjacent to

Antietam and Monocacy National Battlefields, also contribute to the economy, and crop damage from deer could have an economic impact. As a result, the strategies that involve the potential removal of white-tailed deer for CWD testing, could reduce the amount of deer damage on agricultural lands. These actions may have measurable effects; therefore, this impact topic was retained for further analysis.

VISITOR USE AND EXPERIENCE

The implementation of CWD detection and initial response activities may require certain areas of the battlefields to be closed to general public use during such activities, affecting visitor use and experience. Recreational resources in the battlefields that could be affected include the use of trails (Antietam and Monocacy National Battlefields) and boat put-ins (Antietam National Battlefield only). CWD detection and initial response activities that result in fewer deer at Antietam and Monocacy could alter the cultural landscape, and possibly reduce the opportunity to view deer, which may affect visitor use and experience. The use of firearms could influence the soundscape at the battlefields which could impact visitor experience and adjacent landowners. These actions may have measurable effects; therefore, this impact topic was retained for further analysis.

HEALTH AND SAFETY

CWD detection and initial response activities that involve capturing and immobilizing live animals for marking/collaring and performing tonsillar biopsies have the potential to affect the health and safety of the individuals involved. Options that involve the use of firearms also have the potential to affect the safety of park staff, visitors, and adjacent landowners. These actions may have measurable effects; therefore, this impact topic was retained for further analysis.

PARK MANAGEMENT AND OPERATIONS

In response to the detection of CWD in white-tailed deer near Slanesville, West Virginia, less than 60 miles from Antietam and Monocacy National Battlefields, both park units have implemented targeted and opportunistic surveillance. In addition, both battlefields currently conduct deer monitoring activities that require park staff and funds. CWD detection and initial response activities proposed in this plan would require additional staff time and expenditures that could affect park management and operations. Increased communication and coordination with the state, as well as educating the public and other interested parties about CWD, its detection, and initial response, would also require additional staff time. These actions may have measurable effects; therefore, this impact topic was retained for further analysis.

ISSUES CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

Based on the review of the NPS Environmental Screening Form at internal scoping and subsequent discussion of issues by the Interdisciplinary Planning Team and with the public, it was determined that the following issues could be dismissed from detailed consideration in the plan/EA:

- **Geohazards:** A geohazard is an event related to geological features and processes that cause loss of life and severe damage to property and the natural and built environment, such as an earthquake or rock slide. There are no known geohazards within the battlefield that would be affected by CWD detection and initial response activities.
- **Air Quality:** The *Clean Air Act of 1963* (42 USC 7401 et seq.) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The primary source of air quality emissions from the implementation of CWD detection and initial response activities would be from the few vehicles used to carry out the prescribed actions, which would have short-term, negligible adverse impacts on air quality. To be consistent with the state, the NPS proposes to landfill carcasses from CWD testing, therefore, there is limited potential for the

use of incinerators. However, should carcasses require incineration, it would be conducted at a controlled facility and would not be expected to alter the facility's emissions. As a result, this impact topic was dismissed from further analysis.

- **Greenhouse gas emissions and climate change:** There is strong evidence linking global climate change to human activities, especially greenhouse gas emissions associated with the burning of fossil fuels (IPCC 2007). Some of the activities associated with CWD detection and initial response may result in fossil fuel consumption, such as vehicular trips by battlefield personnel conducting surveillance. Some specialized activities, such as sharpshooting and live testing, may require vehicular travel by non-battlefield personnel to assist in carrying out detection and initial response activities. However, greenhouse gas emissions associated with the plan would be negligible in comparison to park-related, local, and, regional greenhouse gas emissions. Therefore, the issue of the contribution of CWD detection and initial response activities to climate change through greenhouse gas emissions was dismissed from further analysis.
- **Prime Farmlands:** While designated prime farmland does occur in the vicinity of Antietam and Monocacy National Battlefields, implementation of CWD detection and initial response activities would not result in the conversion of such lands to other uses.
- **Water Resources (Quality/Quantity/Streamflow Characteristics):** NPS policies require protection of water quality consistent with the *Clean Water Act*. The potential exists for CWD prions to enter and be transported by surface and ground waters should it be detected in or near the battlefields, but this does not affect water quality in the traditional sense. Water as a potential pathway for exposure to prions is discussed under the white-tailed deer topic. CWD detection and initial response would not occur in any area or involve actions that would potentially impact water quantity or streamflow. Therefore, this impact topic was dismissed from further analysis.
- **Soils:** According to the *NPS Management Policies 2006*, the NPS will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources. Soil disturbance during detection and initial response activities would be minimal as a result of people walking through the battlefields. In addition, carcass burial (if needed) would occur in previously disturbed areas, and would not affect native soils.

There is the potential for soils to act as reservoirs for prions, which could contribute to transmission of the disease. Infected carcasses serve as a source of prions that persist in the environment and may serve as a source of the disease following removal of CWD-positive deer (Miller et al. 2004). Results of recent studies suggest that these prions bind to soil particles and continue to be infectious, and can remain in soil environments for at least three years (Johnson et al. 2006; Schramm et al. 2006). It is unknown to what extent such contamination contributes to CWD transmission, or how long CWD remains infective in the environment, but it is likely an important factor (Williams and Young 1992; Miller et al. 1998; Miller et al. 2000; Williams and Miller 2003; Miller et al. 2004). Similar to water quality, prions in soils do not cause soil contamination in the traditional sense, but could serve as a reservoir or pathway for spread of the disease to exposed deer, so this aspect is covered under the white-tailed deer topic. Therefore, this impact topic was not retained for separate analysis.

- **Marine or Estuarine Resources:** There are no marine or estuarine resources in Antietam or Monocacy National Battlefields.
- **Floodplains or Wetlands:** The implementation of CWD detection and initial response activities would not have any effects on floodplains or wetlands at Antietam and Monocacy National Battlefields.

- **Unique Ecosystems, Biosphere Reserves, World Heritage Sites:** There are no known Biosphere Reserves, World Heritage Sites, or unique ecosystems listed in the battlefields.
- **Unique or Important Wildlife or Wildlife Habitat:** The implementation of CWD detection and initial response activities would not have any effects on unique or important wildlife or wildlife habitat.
- **Unique, Essential, or Important Fish or Fish Habitat:** The implementation of CWD detection and initial response activities would not have any effects on unique, essential, or important fish or fish habitat or any other fish or fish habitat within the battlefields.
- **Species Listed or Proposed to be Listed on the List of Endangered or Threatened Species or Critical Habitat:** The implementation of CWD detection and initial response activities is not expected to have impacts on species listed or proposed to be listed under the *Endangered Species Act*, or their designated critical habitat, because none has been identified in the battlefields.
- **Rare or Unusual Vegetation/Species of Special Concern: Rare Species:** In addition to federally-listed species, the NPS *Management Policies 2006* and Director's Order 77: Natural Resources Protection require the NPS to examine the impacts on state-listed threatened, endangered, candidate, rare, declining, and sensitive wildlife and vegetation species. There are no known rare or unusual vegetation communities or wildlife species of concern that occur in the park units. Some state-listed plant species of special concern do occur and could be impacted by trampling during CWD detection and initial response activities. However, the locations of these plants are known and would be avoided during implementation of this plan/EA. Additionally, alternatives that involve removal of deer could benefit these plants by temporarily reducing deer browse. As a result, this impact topic was dismissed from further consideration.
- **Museum Collections:** The implementation of CWD detection and initial response would not have any effects on the museum collections of Antietam or Monocacy National Battlefields.
- **Historic Structures:** Although historic structures at the battlefields are listed or eligible for listing on the National Register of Historic Places, there would be no impacts on these structures from implementing, or not implementing, CWD detection and initial response activities.
- **Ethnographic Resources:** Ethnographic resources have not been identified in the battlefields. The implementation of CWD detection and initial response activities, including the no-action alternative, would not limit access to or use of Indian sacred sites or affect the physical integrity of such sites.
- **Energy Resources and Resource Sustainability:** The implementation of CWD detection and initial response activities would not be expected to affect energy resources or resource sustainability within the battlefield.
- **Minority and Low-Income Population:** Minority and low-income populations would not be disproportionately affected by CWD detection and initial response activities at Antietam and Monocacy National Battlefields.
- **Long-term Management of Resources or Land/Resource Productivity:** The implementation of CWD detection and initial response activities at the battlefields would not alter the productivity of lands or resources (i.e., agricultural lands, forest products) within or outside the park units. In addition, these activities would not affect the long-term management of such resources. Therefore, this impact topic was dismissed from further consideration.
- **Other Important Environmental Resources:** other important environmental resources that would be affected were not identified.

RELATED LAWS, POLICIES, PLANS, AND CONSTRAINTS

The laws, policies, and plans by the NPS, the state of Maryland government, or agencies with neighboring land or relevant management authority described in this section show the constraints this plan/EA will need to operate under and the goals and policies that it must meet. It should be noted that the state of Maryland does not have management authority on NPS lands.

NPS ORGANIC ACT 1916 AND NPS MANAGEMENT POLICIES 2006

Congress directed the U.S. Department of the Interior and the NPS to manage units “to conserve the scenery and the natural and historic objects and wild life therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations” (16 USC 1). The *Redwood National Park Expansion Act of 1978* reiterates this mandate by stating that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress” (16 USC 1a-1).

Despite these mandates, the *Organic Act* and its amendments afford the NPS latitude when making resource decisions. Because conservation remains predominant, the NPS seeks to avoid or to minimize adverse impacts on park resources and values. However, the NPS *Organic Act* gives the Secretary of the Interior discretion to provide “for the destruction of such animal and of such plant life as may be detrimental to the use of any of said parks, monuments, or reservations” (16 USC 3), and the NPS *Management Policies 2006* give the NPS discretion to allow negative impacts when necessary (sec. 1.4.3). This was upheld in *New Mexico State Game Commission v. Udall*, 410 F.2d 1197 (10th Cir 1969) when the 10th Circuit Court of Appeals determined that “(t)he obvious purpose of this language is to require the Secretary to determine when it is necessary to destroy animals which, for any reason, *may be detrimental* to the use of the park.”

While some actions and activities can cause impacts, the NPS cannot allow an adverse impact that constitutes resource impairment (NPS *Management Policies 2006*, sec. 1.4.3). The *Organic Act* prohibits actions that impair park resources unless a law directly and specifically allows for such actions (16 USC 1 a-1). An action constitutes an impairment when its effects “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 *Management Policies 2006*, sec. 1.4.4). 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 *Management Policies 2006*, sec. 1.4.4).

Because park units vary based on enabling legislation, natural resources, cultural resources, and missions, management activities appropriate for each unit and for areas within each unit vary as well. An action appropriate in one unit could impair resources in another unit. Thus, this EA will analyze the context, duration, and intensity of impacts related to CWD detection and response activities within Antietam and Monocacy National Battlefields, as well as the potential for resource impairment, as required by Director’s Order 12 (NPS 2001).

DIRECTOR’S ORDER 12: CONSERVATION PLANNING, ENVIRONMENTAL IMPACT ANALYSIS, AND DECISION MAKING AND HANDBOOK (2001 AND UPDATES)

Director’s Order 12 is the NPS guidance for Conservation Planning, Environmental Impact Analysis, and Decision Making. Director’s Order 12 outlines the guidelines for implementing NEPA and meets all Council on Environmental Quality (CEQ) regulations.

NATURAL RESOURCES REFERENCE MANUAL, NPS-77 (1991 AND UPDATES)

The *Natural Resource Reference Manual 77*, which supersedes the 1991 NPS 77: *Natural Resource Management Guideline*, provides guidance for NPS employees responsible for managing, conserving, and protecting the natural resources found in national park system units.

DIRECTOR'S ORDER 28: CULTURAL RESOURCES MANAGEMENT (2002)

This Director's Order sets forth the guidelines for management of cultural resources, including cultural landscapes, archeological resources, historic and prehistoric structures, museum objects, and ethnographic resources. This order calls for the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship in accordance with the policies and principles contained in the *NPS Management Policies 2006*.

A NATIONAL PARK SERVICE MANAGER'S REFERENCE NOTEBOOK TO UNDERSTANDING CWD, VERSION 4 (MAY 2007)

Although not a policy or directive, this document provides NPS managers with an informational reference that summarizes some of the most pertinent CWD literature, management options and policy as they pertain to NPS units (NPS 2007a). It includes discussions of CWD, its ecology, equipment decontamination and disposal, implications of CWD on cervid management, management options, cooperation/coordination with other agencies, data management, sample collection, handling, and storage, NPS CWD policy and recommendations, as well as several appendices.

DIRECTOR'S CWD GUIDANCE MEMORANDUM (2002)

This memo (NPS 2002b; appendix A of this plan/EA) provides guidance to regions and parks on the NPS response to CWD, including the following:

- Cooperate and coordinate with state wildlife and agriculture agencies regarding proposed prevention, surveillance, research, and control actions for CWD.
- Parks in close proximity (60 miles) to areas where CWD has been detected should initiate a targeted surveillance program to monitor for deer and elk with clinical signs of the disease and submit samples for diagnostic testing from all deer and elk found dead.
- Immediate action should be taken, on a limited scale, to address imminent threats such as a deer or elk exhibiting clinical signs of CWD. Euthanasia of CWD suspect deer or elk with samples submitted for diagnostic evaluation is a reasonable response.
- Prior to undertaking larger scale or multiple animal actions within a park (e.g., population reduction of deer and elk) environmental planning documents, including NEPA and, if applicable, Section 7 consultation with the U.S. Fish and Wildlife Service, will need to be prepared.
- Proposed translocations of live deer or elk into or out of NPS units must receive critical review and CWD risk assessment. Deer or elk will not be translocated from areas where CWD is known to occur or where there is inadequate documentation to confirm absence of the disease (i.e., prevalence less than 1% with a 99% confidence interval).
- Use of park or regional public affairs staff to assist in outreach to surrounding communities and communications to park visitors regarding CWD and CWD management is encouraged.
- Remain alert to potential threats from CWD and contact the NPS Biological Resource Management Division or state wildlife agencies if further information or animal testing is needed.

NATIONAL CAPITAL REGION MEMORANDUM: MONITORING FOR CHRONIC WASTING DISEASE

The National Capital Region of the NPS released a memorandum in February 2006 (updated January 2007) providing guidance to those parks in this region within a 60-mile radius of a known CWD case. Parks were informed that those with a moderate risk for CWD, where it has not yet been encountered, should use opportunistic sampling for the disease. This involves testing animals that are found dead (by disease, predators, vehicle collisions, or by an undetermined cause) on park property. Such sampling can be covered under NEPA using a categorical exclusion (Director's Order 12, sec. 3.3M). However, if CWD is found within 5 radial miles of a park, the park should coordinate with state natural resource agencies that may request testing animals that appear healthy for CWD. This memo directs parks that participate in such activities to conduct NEPA compliance in the form of an EA or EIS (NPS 2006c).

ANTIETAM NATIONAL BATTLEFIELD STANDARD OPERATING PROCEDURE: SURVEILLANCE FOR CWD

This standard operating procedure provides park level direction for implementing the guidance provided in the 2002 Director's CWD Guidance Memorandum (NPS 2002b; appendix A of this plan/EA) and the National Capital Region Deputy Regional Director's February 2006 memo Monitoring for Chronic Wasting Disease (NPS 2006c). It addresses opportunistic and targeted surveillance, including those authorized to take clinically suspect deer, and reporting procedures (NPS 2006d).

MONOCACY NATIONAL BATTLEFIELD STANDARD OPERATING PROCEDURE: SURVEILLANCE FOR CWD

This standard operating procedure provides park level direction for implementing the guidance provided in the Director's CWD Guidance Memorandum (NPS 2002b; appendix A of this plan/EA) and the National Capital Region Deputy Regional Director's February 2006 memo Monitoring for Chronic Wasting Disease (NPS 2006c). It addresses opportunistic and targeted surveillance, including those authorized to take clinically suspect deer, and reporting procedures (NPS 2007b).

NATIONAL CHRONIC WASTING DISEASE PLAN (CWD TASK FORCE 2002)

The Plan for Assisting States, Federal Agencies, and Tribes in Managing Chronic Wasting Disease in Wild and Captive Herds was released in June, 2002. This plan is a result of a task force made up of representatives from the U.S. Department of Agriculture, U.S. Department of Interior, and various state wildlife and agriculture management agencies, as well as universities, from Arizona, Colorado, Iowa, Louisiana, Michigan, Missouri, Nebraska, South Dakota, Georgia, Wisconsin, and Wyoming. To create this report, six working groups were created, each of which developed goals for addressing CWD and actions to meet those goals. These issues included communications, scientific and technical information dissemination, improving diagnostics, disease management, identifying research needs, and developing consensus standards for surveillance of both captive and free-ranging herds. This report also provided a summary of existing state regulations and activities as they relate to CWD surveillance and response (CWD Task Force 2002).

OTHER LEGISLATION, COMPLIANCE, AND NPS POLICY

The NPS is governed by laws, regulations, and other policies before, during, and following any management action related to the developed NEPA document.

REDWOOD AMENDMENT TO THE GENERAL AUTHORITIES ACT

Reasserting the systemwide standard of protection established by Congress in the original *Organic Act*, the Redwood Amendment stated:

The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress (P.L. 95-250; USC 1a-1).

Congress intended the language of the Redwood Amendment to the *General Authorities Act* to reiterate the provisions of the *Organic Act*, not to create a substantively different management standard. The House committee report described the Redwood amendment as a “declaration by Congress” that the promotion and regulation of the national park system is to be consistent with the *Organic Act*. The Senate committee report stated that under the Redwood amendment, “The Secretary has an absolute duty, which is not to be compromised, to fulfill the mandate of the 1916 Act to take whatever actions and seek whatever relief as will safeguard the units of the national park system.” Although the *Organic Act* and the *General Authorities Act*, as amended by the Redwood amendment, use different wording (“unimpaired” and “derogation”) to describe what the NPS must avoid, they define a single standard for the management of the national park system—not two different standards. For simplicity, the *NPS Management Policies 2006* uses “impairment,” not both statutory phrases, to refer to that single standard.

NATIONAL ENVIRONMENTAL POLICY ACT, 1969, AS AMENDED

The purpose of NEPA is to encourage productive and enjoyable harmony between humans and the environment; to promote efforts that will prevent or eliminate damage to the environment and stimulate the health and welfare of mankind; and to enrich the understanding of the ecological system and natural resources important to the nation.

ENDANGERED SPECIES ACT OF 1973, AS AMENDED

The *Endangered Species Act* requires all federal agencies to consult with the Secretary of the Interior on all projects and proposals having potential effects on federally endangered or threatened plants and animals, or their designated critical habitat.

THE NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED

Section 106 of the *National Historic Preservation Act* requires federal agencies to consider the effects of their undertakings on properties listed, or potentially eligible for listing, on the National Register of Historic Places. All actions affecting cultural resources at the battlefields must comply with this legislation. This plan/EA has been developed to meet the consultation and coordination requirements of section 106 of the *National Historic Preservation Act* (see the “National Historic Preservation Act Section 106 Summary” in the “Environmental Consequences” chapter).

HISTORIC SITES, BUILDINGS, AND ANTIQUITIES ACT, 1935

The *Historic Sites, Buildings, and Antiquities Act* establishes “national policy to preserve for public use historic sites, buildings and objects of national significance.” It gives the Secretary of the Interior broad powers to protect these properties, including the authority to establish and acquire nationally significant historic sites.

FEDERAL NOXIOUS WEED ACT, 1975

The *Federal Noxious Weed Act* (7 USC 2801-2814, January 3, 1975, as amended 1988 and 1994) provides for the control and management of nonindigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. Because the potential exists for seeds of non-native and potentially invasive or noxious plants to be introduced during vehicle use associated with CWD detection and initial response activities, this Act was considered in developing potential actions.

CODE OF FEDERAL REGULATIONS, TITLE 43

Title 43 of the *Code of Federal Regulations* (CFR) part 24 describes the four major systems of Federal lands administered by the Department of the Interior. Section 24.4(f) states that “Units of the National Park System contain natural, recreation, historic, and cultural values of national significance as designated by Executive and Congressional action.” In describing appropriate activities, it states that “[a]s a general rule, consumptive resource utilization is prohibited.” In addition, section 24.4 (i) instructs all Federal agencies of the Department of the Interior, among other things, to “[p]repare fish and wildlife management plans in cooperation with State fish and wildlife agencies and other Federal (non-Interior) agencies where appropriate.” It also directs agencies to “[c]onsult with the States and comply with State permit requirements ... except in instances where the Secretary of the Interior determines that such compliance would prevent him from carrying out his statutory responsibilities.”

CODE OF FEDERAL REGULATIONS, TITLE 36

Title 36 provides the regulations “for the proper use, management, government, and protection of persons, property, and natural and cultural resources within areas under the jurisdiction of the National Park Service” (36 CFR 1.1(a)). Specifically, 36 CFR 1.1 (a, b) states that the regulations are intended for the proper use, management, and protection of property and natural resources within the jurisdiction of the NPS. These regulations will be utilized to fulfill statutory purposes of the NPS, including conservation of wildlife and providing for the enjoyment of resources in a manner that will enable future generations to receive the same benefits.

EXECUTIVE ORDER 13112, INVASIVE SPECIES

The use of vehicles and the presence of people associated with CWD detection and initial response activities have the potential to introduce seeds of non-native plants. This executive order requires the NPS to prevent the introduction of invasive species, provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause.

ANIMAL WELFARE ACT (7 USC 2131-2159), AS AMENDED

The *Animal Welfare Act* requires that minimum standards of care and treatment be provided for certain animals bred for commercial sale, used in research, transported commercially, or exhibited to the public. Individuals who operate facilities in these categories must provide their animals with adequate care and treatment in the areas of housing, handling, sanitation, nutrition, water, veterinary care, and protection from extreme weather and temperatures. Although federal requirements establish acceptable standards, they are not ideal. Regulated businesses are encouraged to exceed the specified minimum standards. CWD detection and initial response activities with a research component would be regulated by this Act.

RELATIONSHIP TO OTHER PLANNING DOCUMENTS FOR THE BATTLEFIELDS

ANTIETAM NATIONAL BATTLEFIELD GENERAL MANAGEMENT PLAN/FINAL ENVIRONMENTAL IMPACT STATEMENT (1992)

The NPS approved the General Management Plan/Final Environmental Impact Statement (GMP/FEIS) (NPS 1992) for Antietam National Battlefield in August 1992, and implementation continues on most elements of the plan. The purpose of this plan is to provide for future management, use, and interpretation of the area in ways that will best serve visitors while preserving the historic character and appearance of the battlefield.

The GMP/FEIS identifies a number of issues and concerns identified by the public, other agencies, and the NPS. Of these issues and concerns, those related to natural resources, expressed as follows, would be considered when developing potential CWD detection and initial response actions: the woods, creek, and other natural features within the battlefield contribute to its pastoral setting, and preservation of these natural features is an important goal of planning.

To this extent the NPS preferred alternative called for reestablishing vegetation patterns on the battlefield (farm fields, woods, and orchards) to resemble conditions just before the battle, and also provided specific natural resource management actions to increase habitat for sensitive species. Ultimately, the restoration of Antietam National Battlefield to 1862 conditions would increase the diversity of wildlife habitat at the park unit. The GMP/FEIS did note that orchards might attract deer, which could require that young trees be fenced.

Although disease management is not specifically addressed in the document under Natural Resources, all alternatives considered for this CWD detection and initial response plan were developed within the overall framework of the battlefield's GMP/FEIS.

ANTIETAM NATIONAL BATTLEFIELD RESOURCES MANAGEMENT PLAN (1995)

The Resources Management Plan (NPS 1995) is a strategic planning document and a key element in good management and resource preservation. These management objectives are addressed in a series of project statements that consider natural, cultural, and integrated resource problems, activities, or issues. The Resources Management Plan for Antietam National Battlefield provides a specific management objective for the landscape and resources at the battlefield:

The Antietam National Battlefield will be managed to provide for the restoration and preservation of the battlefield landscape to substantially the condition in which it was on the eve of the Battle of Antietam. The preserved battlefield will include within a natural setting those essential features of the rural agricultural landscape (cultural landscape) which existed at the time (e.g., orchards, fences, field patterns, woods), remaining historic structures and resources, and those post-battle elements necessary for the administration, commemoration and visitor understanding of the battlefield (e.g., monuments, visitor and administrative structures and facilities, roads).

The plan also contains a project statement titled "Integrated Pest Management" that addresses impacts on vegetation from white-tailed deer and suggests a monitoring program early while deer impacts are still low. A separate project statement recommends an annual monitoring program for population numbers and construction of exclosures to monitor changes in natural vegetation and crop fields resulting from deer browsing. The plan does not address CWD, but it was considered when developing alternatives.

ANTIETAM NATIONAL BATTLEFIELD LAND PROTECTION PLAN (1983)

The guiding principle of the Antietam National Battlefield Land Protection Plan (NPS 1983a) is to ensure the protection of the park unit consistent with the stated purposes for which it was created and administered. The plan is meant to determine what lands or interests in land need to be in public ownership and what means of protection are available to achieve unit purposes. Although the plan does not directly address deer or CWD detection and initial response, it does state that protection of the woodlands along Antietam Creek is essential for preservation of the historic scene (NPS 1983a).

MONOCACY NATIONAL BATTLEFIELD DRAFT GENERAL MANAGEMENT PLAN/EIS (2006)

The NPS is currently revising the 1979 GMP and preparing a draft GMP/EIS for Monocacy National Battlefield (NPS 2006a). The purpose of this management plan, which is in its final stages of completion for public review, is to guide the decision making and problem solving related to resource protection and the visitor experience at Monocacy National Battlefield. The approved plan will provide a framework for proactive decision-making, including decisions about visitor use and the management of natural and cultural resources and development.

The draft GMP/EIS identifies several planning issues related to preserving the battlefield landscape and protecting important natural resource areas. It also recognizes the contributions that natural resources make to the landscape of Monocacy National Battlefield, and identifies several external threats to these resources. At issue is finding ways to preserve the landscape and enhance the qualities that make it significant while at the same time minimizing effects on resources from surrounding development (NPS 2006a). In addition, the draft GMP/EIS identifies the effects of deer browsing as an issue because it can alter the historic appearance at the battlefield by forcing farmers to change agricultural practices to those less favorable to the deer. Browsing also can alter regrowth in forested areas, further changing the prominent historic patterns and suppressing the regeneration of native trees (NPS 2006a). The draft GMP/EIS also states that natural resources provide considerable resource value aside from their important role in the cultural landscape. Although the primary management direction for the national battlefield is to protect and preserve the historical values, the natural resource areas also require considerable attention because they are important to the region's ecology (NPS 2006a).

MONOCACY NATIONAL BATTLEFIELD RESOURCE MANAGEMENT PLAN (1993)

The Resource Management Plan for Monocacy National Battlefield (NPS 1993) provides specific management objectives for the landscape and resources at the battlefield:

- preserve and protect as a cultural resource the historic battlefield scene as well as the significant historic structures and archeological resources therein;
- provide visitor orientation to the park resources and interpretation of the battle at Monocacy in relation to the American Civil War; and
- preserve and protect the natural resources in the area and allow public use of these resources in such a manner that is compatible with the legislative intent of the battlefield.

The Resource Management Plan is a strategic planning document and a key element in good management and resource preservation. These management objectives are addressed in a series of natural and cultural resource project statement sheets that contribute to the battlefield's prioritization of park resources and issues. The plan addresses the damage by white-tailed deer to row crops that are planted to maintain the cultural landscape of the battlefield. The plan recommends protocols, monitoring, and aerial observations of deer populations and trends of impacts to vegetation. The plan does not address CWD infection.

MONOCACY NATIONAL BATTLEFIELD CULTURAL LANDSCAPES INVENTORY (2002)

Monocacy National Battlefield forms an overall cultural landscape that represents most of the area where, in July 1864, the “Battle that saved Washington” took place. The cultural landscape at Monocacy National Battlefield contains four component landscapes (the Hermitage, Araby, Clifton, and Baker Farm component landscapes) defined by individual histories, characteristics, and significance (NPS 2002a). While the analysis and evaluation of the cultural landscape in this inventory addresses natural systems and features, topography, and vegetation, it does not directly address deer or other wildlife. However, in discussing vegetation that grows between fields and in old fence lines at the battlefield, the inventory does note the distinctive deer browse lines that are visible long the edge of the fields on Clifton, Baker, and Hill farms. As CWD detection and initial response activities would occur in the cultural landscapes of the battlefield, this plan must take into consideration the potential effects on components of the landscape, and address any potential impacts.

MONOCACY NATIONAL BATTLEFIELD LAND PROTECTION PLAN (1983)

The guiding principle of the Monocacy National Battlefield Land Protection Plan (NPS 1983b) is to ensure the protection of the park unit consistent with the stated purposes for which it was created and administered. The plan is meant to determine what



Farm at Monocacy

lands or interests in land need to be in public ownership and what means of protection are available to achieve unit purposes. Although the plan does not directly address deer or CWD detection and initial response, it does reiterate the battlefield’s goal of preserving and protecting the natural resources in the area and allowing public use of these resources (NPS 1983b).

STATE AND LOCAL LAWS, REGULATIONS, AND POLICIES

MARYLAND GUIDE TO HUNTING AND TRAPPING AND DEER REGULATIONS

The MDNR Wildlife Division has the legal mandate and legislated authority to manage deer populations throughout the state of Maryland. As part of this function they set the goals and regulations for deer management in the state. The long-term goal of the state is to ensure the present and future well-being of deer and their habitat; to maintain deer populations at levels necessary to ensure compatibility with human land uses and natural communities; to encourage and promote the recreational use and enjoyment of the deer resource; and to inform and educate Maryland citizens about deer biology, management options, and the effects that deer have on landscapes and people. Deer regulations in the state of Maryland cover hunting hours, licensing and stamp requirements, daily limits, legal hunting devices, and the use of dogs in hunting. These regulations are explained in the yearly Guide to Hunting & Trapping in Maryland, along with any new regulations or updates to existing regulations.

While the state of Maryland has the legal mandate and authority over deer populations, it does not preclude the NPS from managing natural resources within park boundaries, including deer. As a general rule, the NPS has broad authority to manage wildlife and other natural resources within the boundaries of units of the National Park System. See, generally 16 USC 1 (NPS “shall promote and regulate the use of the Federal areas known as national parks...by such means and measures as conform to the fundamental purpose of the parks...to conserve the scenery and natural and historic objects and the wild life

therein...”). This ability to manage natural resources, specifically wildlife within park boundaries was upheld by *New Mexico State Game Commission v. Udall*, supra, whereby the 10th Circuit of Appeals reversed and remanded a lower court’s ruling, stating that the killing of deer within Carlsbad Caverns National Park is allowed pursuant to 16 USC 3, if it is for the purpose of protecting park resources from animals that have a negative impact on its lands. The NPS ability to manage wildlife resources has also been upheld in *Kleppe v. New Mexico* and *United States v. Moore*, even despite conflicting state laws.

MARYLAND DEPARTMENT OF NATURAL RESOURCES WILDLIFE AND HERITAGE SERVICE CWD RESPONSE PLAN

This response plan issued by the MDNR Wildlife and Heritage Service (WHS) outlines WHS management activities that address the disease’s presence, determine the magnitude and geographic extent of the infection, and attempt to eliminate or control transmission of the disease. The plan outlines surveillance strategies for monitoring efforts should CWD be reported within 20 miles or 5 miles of Maryland’s borders. Additionally, the plan lists response activities for both free-ranging and captive deer (MDNR 2009). Jurisdictional issues under the hunting and trapping regulations above also apply to the CWD response plan.

Alternatives

ALTERNATIVES

This “Alternatives” chapter describes the various actions that could be implemented for current and future detection of and initial response to CWD in Antietam and Monocacy National Battlefields (the battlefields). NEPA requires federal agencies to explore a range of reasonable alternatives and to analyze what impacts the alternatives could have on the human environment, which the act defines as the natural and physical environment and the relationship of people with that environment. The analysis of impacts is presented in the “Environmental Consequences” chapter and is summarized in table 7 at the end of this chapter.

The alternatives under consideration must include a “no-action” alternative, as prescribed by NEPA regulations at 40 CFR 1502.14. The no-action alternative in this document is the continuation of the current CWD detection at the battlefields, which is limited to opportunistic and targeted surveillance.

Two action alternatives that include both detection and initial response were developed by the interdisciplinary planning team, based on information provided by the science team, the NPS Biological Resources Management Division (BRMD) staff, and public input. These alternatives meet, to a large degree, the management objectives for the battlefields and also the purpose of and need for action as expressed in the “Purpose of and Need for Action” chapter. Because these action alternatives would meet the park’s objectives and would be technically and economically feasible, they are considered “reasonable.”

INTRODUCTION AND OVERVIEW OF ALTERNATIVES

This chapter describes the alternatives developed for this plan/EA, as well as the background information used in setting action thresholds for implementing the alternatives. The alternatives selected for detailed analysis are briefly described below. This is followed by a description of the action thresholds, which are based on the distance of the battlefields to positive CWD detections. Next, detailed descriptions of each alternative are presented. The remainder of the chapter addresses adaptive management, alternatives that were considered but eliminated from detailed analysis, and the identification of the NPS preferred and the environmentally preferred alternative. As noted in the “Purpose of and Need for Action” chapter, this plan addresses CWD only and not the overall management of deer. A long-term deer management plan is being considered, but is not part of the scope of this plan.

NO-ACTION ALTERNATIVE

Alternative A: No Action (Current Activities Continued)

Under alternative A, opportunistic and targeted CWD surveillance would continue, as well as education and public information activities, and state and federal coordination efforts, as described in the “Purpose of and Need for Action” chapter. Other options for CWD detection and initial response would not be available.

ACTION ALTERNATIVES

Alternative B: CWD Detection and Reduction Response

Alternative B would offer the battlefields a set of options, or “tools,” for CWD detection and initial response. Detection activities, which would begin immediately, would be aimed at determining whether CWD is present in the battlefields and assisting the state in its detection efforts. Initial response activities would follow a positive CWD detection in or very near the battlefields. A distinguishing feature of alternative B is that it includes the option of a one-time population reduction response to bring deer density inside the battlefields to a density similar to surrounding areas. The purpose of this reduction

What is the difference between detection and initial response?

Although the tools available for detection are similar to the tools available for initial response, their purpose is different. Detection efforts are aimed at determining with a high level of confidence whether CWD is present in the battlefields. Initial response efforts would follow a positive CWD detection in or very near the battlefields and are aimed at assessing and monitoring the disease. In the case of alternative B, the option to conduct a one-time population reduction to minimize the likelihood of CWD becoming established in the deer population is also included as a component of initial response.

would be to lessen the likelihood of CWD becoming established in the deer population. The implementation of detection and initial response tools would be based on the proximity of the nearest CWD detection to the battlefields. Alternative B would also include education and public information activities, and coordination with state and federal agencies.

Alternative C: CWD Detection and Monitoring Response

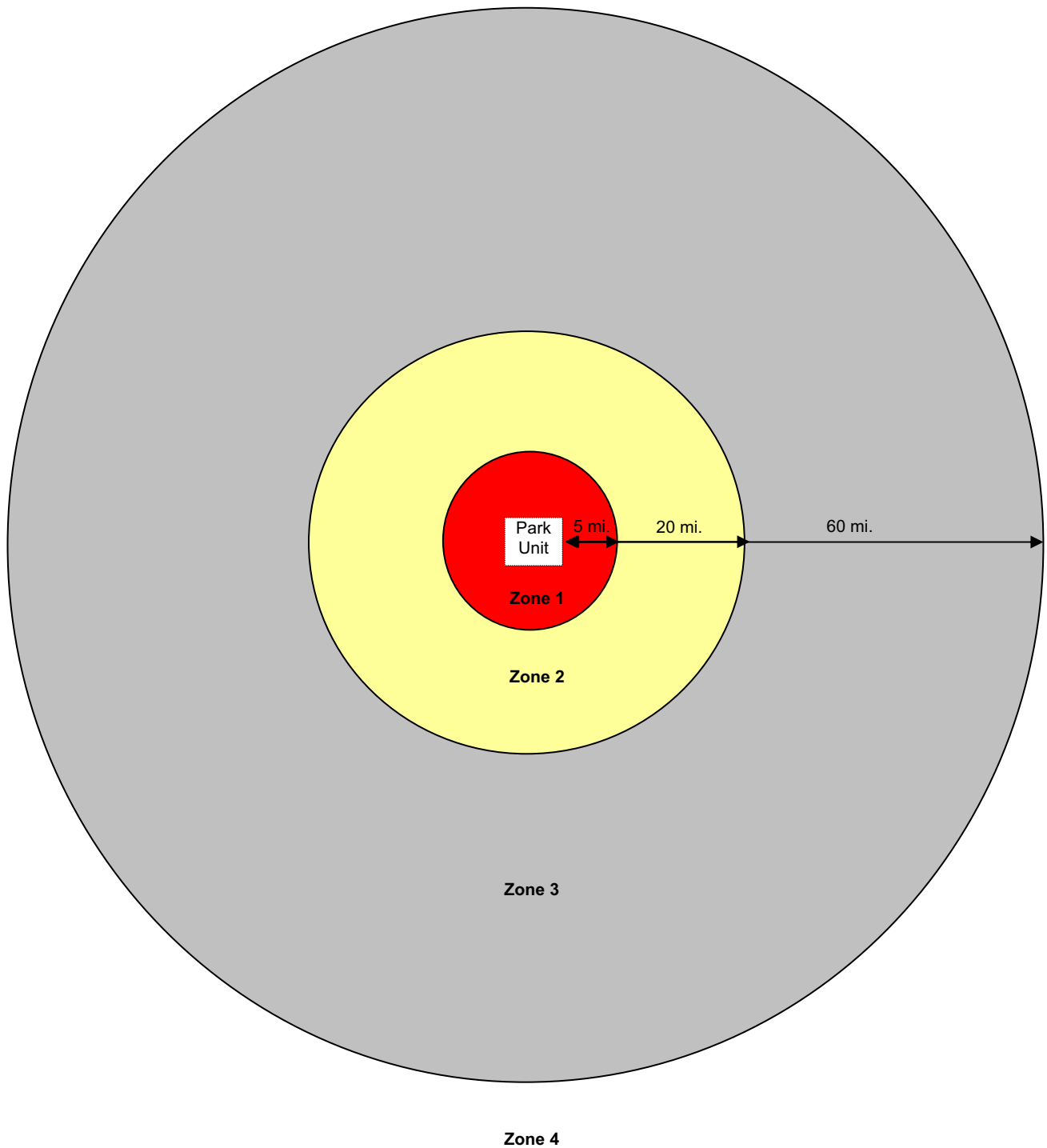
Alternative C, like alternative B, would offer the battlefields a set of tools for CWD detection and initial response. Detection activities, which would begin immediately, would be aimed at determining whether CWD is present in the battlefields and assisting the state in its detection efforts. Initial response activities would follow a positive CWD detection in or very near the battlefields. A distinguishing feature of alternative C is that the initial response does not include the option of a one-time population reduction as a response action. Under alternative C, lethal removals during initial response would be more limited in nature to provide for disease monitoring only. Like alternative B, the implementation of detection and initial response tools would be based on the proximity of the nearest CWD detection to the battlefields. Alternative C would also include education and public information activities, and coordination with state and federal agencies.

THRESHOLDS FOR TAKING ACTION UNDER THE ACTION ALTERNATIVES

The action threshold defines a point when a detection or response action would be taken or altered. For the purposes of this plan, the action thresholds that would trigger both detection and initial response actions were defined by the distance that CWD is detected from the battlefields, referred to as “implementation zones.” Four distinct zones were identified by drawing concentric circles out from the park unit boundaries at set distances (figure 5). Distance was used to define the implementation zones because proximity to known CWD cases is an important measure of CWD risk at the battlefields. The proximity of a positive CWD detection would trigger different actions in the battlefields with more intensive actions considered appropriate the closer the disease is found to the battlefields.

The innermost zone (Zone 1) was defined based on a number of factors, but primarily to be consistent with the 5-mile radius around a known infected animal applied by Maryland and nearby states when establishing their zones for taking action related to CWD (see the section “CWD Plans in States near the Battlefields” in the “Purpose of and Need for Action” chapter). For this plan, the 5-mile zone would extend from the battlefield boundary, so that certain actions would be taken in cooperation with the state if an infected animal would occur within 5 miles of the park unit. The middle zone (Zone 2) was more loosely defined as a distance that would be consistent with the maximum distance a deer must travel outside of the average home range, as documented by a movement study conducted at Antietam National Battlefield (NPS 2006e). The science team estimated this zone should extend no less than 20 miles from the park unit, creating the limits of Zone 2 between 5 and 20 miles from the park unit. The outermost zones (Zones 3 and 4) were defined to be consistent with current NPS policy (NPS 2002b). Zone 3 was designated as the area between 20 and 60 miles from a park unit (NPS requires certain detection actions if a park unit lies within 60 miles of a positive case), and Zone 4 would include everything outside of 60 miles from the park unit.

FIGURE 5: CWD IMPLEMENTATION ZONES



Note: figure not to scale.

The detection and response methods used would depend on the zone in which a positive CWD case is detected. Table 1 summarizes the actions that could be taken within the battlefield boundaries based on the implementation zones or action thresholds. These actions listed may vary by alternative and are described in more detail under the alternative descriptions. Again, it is important to note that although the actions are based on detections in zones located outside the battlefield boundaries, the actions themselves would be conducted only on federal lands within the legislated boundary of the battlefields, and would require coordination with the state for efforts on non-federal lands within the boundary.

TABLE 1: POTENTIAL CWD DETECTION AND INITIAL RESPONSE ACTIONS
(by action threshold/implementation zone)

Zone/Threshold	Detection Activities	Initial Response Activities
Zone 4 (Positive CWD detection greater than 60 miles from park unit)	1. Opportunistic surveillance 2. Targeted surveillance (these actions are encouraged per NPS guidance)	None – only detection would occur when CWD is found within this zone
Zone 3 (Positive CWD detection between approximately 20 and 60 miles from park unit)	1. Opportunistic surveillance 2. Targeted surveillance 3. Live test 4. Lethal removal – Potentially appropriate – used within the park unit only if certain criteria that indicate an increased risk or need for additional samples are met, for example: The state is increasing surveillance There are multiple detections in the zone The 5-mile state surveillance areas within the zone are expanding towards the battlefields A 5-mile state surveillance area includes a part of Zone 2.	None – only detection would occur when CWD is found within this zone
Zone 2 (Positive CWD detection between approximately 5 and 20 miles from park unit)	1. Opportunistic surveillance 2. Targeted surveillance 3. Live test 4. Lethal removal – removals for testing would be appropriate within the park unit to supplement samples needed from the park units to meet the detection goals	1. Opportunistic surveillance 2. Targeted surveillance 3. Live test 4. Lethal removal – would be appropriate within the park unit, in response to state actions, to coordinate with the state, or if conditions warrant more intense response in this zone; intensity of response would depend on alternative and location of positive CWD detection in relation to park
Zone 1 (Positive CWD detection within 5 miles of the park unit)	None – assume CWD is within park unit and NPS would move to initial response	1. Opportunistic surveillance 2. Targeted surveillance 3. Live test 4. Lethal removal – would be appropriate, using all available options

ALTERNATIVE A: NO ACTION (CURRENT ACTIVITIES CONTINUED)

Section 1502.14(d) of the CEQ regulations for implementing NEPA requires that the alternatives analysis in the EA “include the alternative of no action.” In the case of developing a plan for CWD detection and

initial response, the no-action alternative represents no change from current activities being conducted by staff of Antietam and Monocacy National Battlefields determined to be categorically excluded from NEPA requirements (NPS 2001).

OPPORTUNISTIC SURVEILLANCE

Opportunistic surveillance includes taking diagnostic samples for CWD testing from deer that have died in the battlefields due to disease, predators, vehicle collisions, other trauma-related mortality; those lethally removed from the battlefields for other purposes (e.g., research); and those that die in park units as a result of injuries from hunting outside the battlefields. Per the standard operating procedure in place at both battlefields, if an employee sees a dead deer on the battlefield or along tour roads, it would be reported and a determination would be made as to whether or not the carcass should be sent for CWD testing as part of opportunistic surveillance.

TARGETED SURVEILLANCE

Targeted surveillance, as defined by the NPS, includes lethal removal of deer that exhibit clinical signs consistent with CWD for testing (NPS 2007a). Targeted surveillance has minimal effects on the current population, removes a potential source of CWD infection, and is an efficient means of detecting new infections (Miller et al. 2000). Both battlefields have seasonal summer staff who look for deer with clinical signs of CWD once per week. Support and staffing for targeted surveillance will vary, depending on funding and staff availability.

Antietam National Battlefield has also educated and solicited the assistance of neighboring landowners in looking for deer showing clinical signs of CWD. In addition, both battlefields have developed a standard operating procedure related to CWD that is based on the Director's CWD Guidance Memorandum (NPS 2002b; appendix A of this plan/EA) and the 2006 memorandum from the National Capital Regional Assistant Regional Director (NPS 2006d). According to these standard operating procedures, battlefield staff would contact the Chief Ranger or Natural Resources Manager to report clinically suspect deer (NPS 2007a). A determination would be made by either the Chief Ranger or Natural Resources Manager as to whether or not a clinically suspect deer would be lethally removed for CWD testing as part of targeted surveillance. Law enforcement rangers or natural resource management staff qualified to use firearms would be authorized to remove a clinically suspect deer. Procedures for shooting, collecting samples, handling, cleanup, and storage would be provided by the Chief Ranger or Natural Resources Manager and would be based on information provided in "A National Park Service Manager's Reference Notebook to Understanding Chronic Wasting Disease, Version 4" (NPS 2007a).

Deer removed as part of targeted surveillance would be shot, sampled, and taken to a designated holding area until test results were received. In accordance with the American Veterinary Medicine Association guidance (AVMA 2007), efforts would be made to ensure actions are conducted as humanely as possible to minimize deer suffering.

Opportunistic Surveillance –

Taking diagnostic samples for CWD testing from deer found dead or harvested through a management activity within a national park unit.

Targeted Surveillance – Lethal removal of deer that exhibit clinical signs of CWD, such as changes in behavior and body condition, and testing to determine if CWD is present.

SAMPLING REQUIREMENTS AND CARCASS HANDLING

Samples for CWD detection would be taken from any animals obtained from opportunistic or targeted surveillance. If at all possible, sampled carcasses would be removed and taken to a temporary storage area located in an existing maintenance/storage yard (which is far removed from any historic structures or visitor use areas). In particular, all attempts would be made to remove any carcasses of deer that displayed signs consistent with CWD from the environment, along with any blood or blood-soaked soils. However, if the entire carcass cannot be immediately moved, the head would be taken and the remainder of the carcass would be left in the field and marked by GPS, so that it could be readily retrieved at a later date if necessary. Once test results are received, carcass disposal and possible decontamination would be addressed. The NPS would adopt the state's preference to landfill any diseased carcasses. However, if for some reason the landfills would not accept the carcasses, other options would be considered, including burial within the battlefields (in previously disturbed sites in or near developed areas of the battlefields, avoiding areas of known cultural resources), incineration, or other method approved for disposal at the time this plan is implemented. Currently, there are no incinerators nearby that can handle large numbers of carcasses, although there are some in Maryland and the surrounding states that can handle a few carcasses. Carcasses that are CWD negative would be allowed to decompose in place or would be disposed of using traditional methods (i.e., on-site burial in previously disturbed areas in or near developed areas of the battlefields or in landfills).

Areas that may have been exposed to prion contamination would be decontaminated by disposing of any remaining tissue, blood, or obviously contaminated (blood-soaked) soils. Hard surfaces used for storage would be cleaned with a solution of 50% bleach or 10% Environ LpH ® disinfectant or similar agent.

EDUCATIONAL AND INTERPRETIVE MEASURES

The battlefields have provided information on CWD by posting information on the internet and in storefronts in the vicinity of the park units. If needed, the battlefields would also issue press releases and conduct outreach efforts to various groups.

CONTINUED AGENCY AND INTER-JURISDICTIONAL COOPERATION

The NPS BRMD follows a specific protocol for tracking samples, including maintaining an electronic database, and notifies park units of the results. All test results would be reported to the state once received. All positive detections are reported to the NPS regional staff and the Regional Director. Due to the proximity of the NPS National Capital Region and Northeast Region park units, a positive CWD test result would be reported to both regions. Both battlefields also maintain deer mortality documentation and records to track the results of CWD testing.

IMPLEMENTATION COSTS

Implementation costs of alternative A are summarized in table 2. The cost associated with CWD laboratory testing is estimated at about \$30 per animal, although it is possible that this service may be provided by the NPS BRMD at no cost to the battlefields. Costs for disposal of deer carcasses or contaminated materials are very speculative at this time. Disposal costs would vary depending on whether the waste would be considered hazardous and the disposal options that would be in effect at that time. Current costs for off-site disposal have been found from about \$20 per deer for landfill disposal, to \$58 per ton (\$0.029 per pound) for nonhazardous waste in general, to \$0.86 per pound for incineration of hazardous material (Wenschhof, pers. comm. 2009e). Assuming an average weight of 125 pounds per deer, the latter two costs would be about \$4 per deer and \$100 per deer, respectively. Since current costs vary so much and future costs for disposal of CWD-contaminated materials are very uncertain at this time, no cost estimates were included in table 2.

TABLE 2: COST ESTIMATE, ALTERNATIVE A, NO ACTION

Action	Assumptions	Annual Cost	Cost for the 10 Year Planning Period
Targeted Surveillance	Testing – for the purposes of these calculations, it is assumed that a total of 5 deer would be sampled annually at each battlefield using targeted surveillance, for a total of 10 deer, and testing would cost \$30 per deer Surveillance labor – it is assumed that the limited effort for targeted surveillance would be included as part of overall wildlife management duties.	\$300	\$3,000
Opportunistic Surveillance	Testing – for the purposes of these calculations, it is assumed that a total of 20 deer would be sampled annually at each battlefield using opportunistic surveillance; for a total of 40 deer; testing would cost \$30 per deer Labor – very minimal to none for surveillance – deer found during course of normal duties	\$1,200	\$12,000
Labor for carcass handling/transport, sampling, sending for disposal, any necessary decontamination	Approximately 3 hours per deer at \$25 per hour = \$75 per deer – assuming 50 deer per year for both battlefields (above); total of 100 deer, annual costs would be \$7,500.	\$7,500	\$75,000
Carcass Disposal	The cost of disposing of CWD-positive deer or contaminated materials is uncertain at this time, so any estimate would be too speculative (see text).		
Total for Planning Period without disposal			\$90,000

ACTION ALTERNATIVES

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES (ALTERNATIVE B OR C)

Sampling Requirements and Carcass Handling

Requirements for sampling and carcass handling would be the same as described for alternative A (no action), including the preference to dispose of carcasses in landfills. However, under the action alternatives there would be larger numbers of deer removals, including apparently healthy deer, so all action alternatives would include a preference to store and donate meat if this is possible and costs are not prohibitive. If feasible, the battlefields would attempt to secure refrigerated storage for carcasses from deer sampled for detection and initial response activities that remove a large number of deer, such as the one-time population reduction under alternative B, if this could be done at a reasonable cost or provided for by a meat processor. If this is possible and allowable, given applicable policy, guidance, and any regulatory requirements in place at the time the removals are done (including NPS public health guidelines for donation of meat from areas affected by CWD), meat from CWD-negative deer could be donated to local food banks. Meat would be held until results for CWD tests are completed.

Under all action alternatives, the battlefields would install a cement pad in or near the existing areas used for temporary storage of carcasses, which would also be covered during any holding period. Ultimately,

vehicles and equipment used in the sampling and transporting of carcasses, as well as the cement pad itself, would be decontaminated or cleaned, as appropriate, to help prevent disease transmission.

Enhanced Educational and Interpretive Measures

Under all action alternatives, educational measures currently being conducted would be enhanced and expanded, and could include the following:

- Posting information to message boards;
- Setting up hotlines for visitors to report sick deer;
- Providing education materials to visitors so they understand what they might see or hear; and/or
- Putting notices in local newspapers, battlefield newsletters, and/or battlefield websites.

In addition to public education/outreach, the following steps would be initiated.

- NPS staff in the battlefields and other parks would be educated so that people receive accurate information when a question is asked.
- The NPS would coordinate with the state education/outreach programs related to CWD (e.g., participate in meetings held by the state on the subject).
- Regional training would be provided for other staff working in park units (e.g., what to observe for targeted surveillance).
- Coordination would be initiated with landowners and agricultural permittees regarding the implementation of best agricultural practices.

Enhanced Agency and Inter-jurisdictional Cooperation

The NPS would continue the agency and inter-jurisdictional reporting and cooperation as described under alternative A. Under all action alternatives, there would be extensive information sharing and enhanced coordination with state and federal agencies for the purposes of communicating detections; assessing disease prevalence and distribution, and determining the extent of detection and initial response actions.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Alternative B would include both detection and initial response options or “tools” that could be selected for use based on the distance that CWD is detected from the battlefields (i.e., the location of a positive CWD detection in relation to the implementation zones and the battlefield boundary). In the event there are CWD detections in multiple zones, the detection and/or initial response actions taken would correspond with those proposed for the zone closest to the park (i.e., if there is a detection in Zone 3 and Zone 2, actions would be implemented based on the Zone 2 detection). A distinguishing feature of alternative B is that it includes the initial response option of a one-time population reduction to bring deer density inside the battlefields to a density similar to surrounding areas, if conditions are such that this is needed. The purpose of this reduction would be to lessen the likelihood of CWD becoming established in the deer population.

Tools for Detection

Opportunistic Surveillance. Opportunistic surveillance would be the same as described under alternative A. Opportunistic surveillance would take advantage of deer that die in the battlefields due to disease, predators, vehicle collisions, other trauma-related mortality, lethal removal for other purposes (e.g., research), and as a result of injuries from hunting outside the park. This tool would be available should CWD be detected in any of the implementation zones.

To increase the NPS samples for CWD testing, the battlefields would work with the state and/or county so that battlefield staff are notified of carcasses on state/county roads and are given the opportunity to sample them and remove the carcasses. Other park neighbors may also be encouraged to report road kills to the NPS.

Targeted Surveillance. As described under alternative A, this technique would involve battlefield staff looking for deer showing clinical signs of CWD. If observed, these deer would be reported and possibly lethally removed for testing. This tool would be available should CWD be detected in any of the implementation zones.

Currently, all staff at the battlefields are familiar with the clinical signs of CWD and are relied upon to report suspect deer. As part of alternative B, targeted surveillance could be enhanced, which would include dedicating a half-time employee (NPS or contractor) looking year-round for deer with clinical signs of CWD. Targeted surveillance would be limited to federal lands within the legislated boundaries. The individual would be qualified to lethally remove and sample the deer. In addition, the battlefields would encourage local users, volunteers, and other NPS staff or researchers working in the park units to look for deer with clinical signs of the disease. Although NPS inventory and monitoring efforts do not typically involve deer research, these individuals could be trained to look for clinical signs of the disease while they are in the field.

As described under alternative A, deer removed as part of targeted surveillance would be shot, sampled, and taken to a designated holding area (with appropriate containment) until test results were received. In accordance with the American Veterinary Medical Association guidance (AVMA 2007), efforts would be made to ensure actions are conducted as humanely as possible to minimize deer suffering. To protect visitor health and safety during targeted surveillance, any area where firearms would be used would be closed and visitors notified of the reasons for the closure.

Currently, the NPS does not have the ability to assist the state in the removal of a deer on non-federal property within or adjacent to the battlefields that shows clinical signs of CWD. The same is true for state staff who observe deer with clinical signs on park property. However, under alternative B, the battlefields would work with landowners and the state to develop agreements that would provide either entity with the ability to remove a deer that shows clinical signs of the disease, regardless of land ownership. This memorandum would outline procedures for removal under these circumstances, taking into consideration legal issues related to management of wildlife, liability, and the level of funding available to the NPS for expenditures on non-federal lands. However, the agreement described in alternative B could be important if targeted surveillance identifies a clinically suspect animal, and the agency with jurisdiction is not available to remove the animal. In the absence of such an agreement, if a deer with clinical signs of CWD were observed on non-federal lands, the NPS could only monitor the animal's movement until the state arrived, and vice versa.

Live Test for CWD for Detection Surveillance. A live test that is available for deer could be used as part of detection actions. The live test requires anesthetizing the animal, removing a small piece of tonsillar tissue, and telemetry-marking the animal so it can be tracked for removal should the deer be CWD positive. Live testing for CWD would only be used for detection efforts when deer are being collared in the park units (by either NPS or other researchers) as part of other projects. Qualified personnel would have to be trained, and could include researchers, state agency staff, battlefield staff, or BRMD staff. Training would not be required for researchers working in the park that do not participate in sampling. This tool would be available should CWD be detected in any of the implementation zones.

Lethal Removal of Healthy-Appearing Deer for Detection Surveillance. This option would involve lethally removing deer that appear healthy and testing to detect CWD. This is different from targeted surveillance, which, although lethal, focuses only on deer that show clinical signs of CWD. Lethal removal would be supplemented with samples from the state to be 95% confident that CWD would be detected if the disease is present in the population at 1% prevalence or greater (referred to as "95/1"). This

level of sampling would be consistent with the efforts that would be undertaken by the state of Maryland. Ultimately, the NPS could decide to test enough deer (with supplemental data from the state) to be 99% confident that CWD would be detected if it exists at 1% prevalence or greater (referred to as “99/1”). When considering lethal removal of apparently healthy deer as part of detection efforts, it is important to keep in mind that the purpose of the removal is for detection of the disease, not population reduction. Also, although the CWD detections that trigger action could occur outside the park units, lethal removal would only occur on federal lands within the legislated boundary of the battlefields. Table 1 summarizes the use of lethal removal for detection by implementation zone. Note that lethal removal for detection would be done if a positive case is found in Zone 3 only under certain circumstances that indicate an increased risk or need for additional samples.

Lethal removal for detection surveillance could be expected to result in the removal of approximately 32–110 deer per detection effort from Antietam and 36–83 deer per detection effort at Monocacy, based on plausible future and current deer densities. Appendix B explains the derivation of the number of deer needed for sampling in more detail. Based on current (2008) deer densities, about 50 deer per battlefield would be removed per detection effort; this figure is used for estimating costs shown in table 3. The exact number of removals per detection effort would depend on factors such as desired sampling confidence level (i.e., 95/1 or 99/1) and differences in deer density between the battlefields and surrounding areas. Annual removals at each battlefield would not exceed annual recruitment, which is the number of fawns that survive from birth to fall each year. However, only adult (greater than one year of age) deer would be targeted for removal.

Lethal removal activities would be conducted by qualified NPS employees or authorized agents. Authorized agents could include, but are not limited to, other agency personnel, contractors, and skilled volunteers. For the purposes of this plan, a contractor would be a fully insured business entity, nonprofit group, or other entity engaged in wildlife management activities that include the direct reduction with firearms. The contractor would possess all necessary permits. Skilled volunteers operating as part of a removal effort would be private citizens supervised by NPS staff. Skilled volunteers would not be permitted to remove meat or other portions of the deer from the battlefields. All authorized agents, whether they are contractor or skilled volunteers, must have adequate training (as determined or administered by park staff) and must demonstrate skills and understanding all of the program elements and the reasons that NPS is taking these actions. Training would also include actions related to disposal and decontamination, and, because prions are so difficult to decontaminate, part of the training would be related to minimizing contact with infectious materials. Requirements for all authorized agents would include a specific level of firearm proficiency and experience in the use of firearms for wildlife removal. In the event that authorized agents are used for a lethal removal effort, the type of agents used and their specific uses during the effort would be determined by battlefield management based on factors such as effectiveness, efficiency, and cost.

During lethal removals, if necessary, park staff would clear or close an area to all visitors to protect visitor health, safety, and experience. However, the NPS could also take lethal removal actions at night, when visitors are not allowed in the battlefields. If closures are needed, the park units would notify the public through newsletters, written letters to neighbors, press releases, etc.

Lethal removal would be conducted at any time of the year because the NPS needs the flexibility to take these actions whenever the thresholds are reached. Lethal removal with firearms would be conducted from stands and blinds, and could include the possibility of attracting deer with bait. In the past, work conducted at night has used spotlighting to find deer, which would also apply to lethal removal actions conducted at night. The NPS would coordinate the timing of lethal removal with the state to assist removing deer for CWD testing that flee the battlefield, which would help maximize the effort. Detection efforts could continue indefinitely if CWD is not found.

If a deer shot on NPS property does not die immediately, but rather dies on non-federal lands, the NPS would need permission from the landowner to collect the deer, and would notify the state and county.

Tools for Initial Response

As previously described, the NPS would only implement initial response actions if CWD is detected in implementation Zones 1 or 2. As a result, these tools are only available for use in initial response if CWD is detected in these zones. Under alternative B, the battlefields would use the most aggressive approach needed to address the current situation.

Opportunistic and Targeted Surveillance. Opportunistic and targeted surveillance for initial response would occur in the same manner described under detection; however, as an initial response action, the goals would be to provide samples from across the landscape for assessing the prevalence and distribution of the disease, and to remove a potential source of CWD prions from the environment.

Live Test for Monitoring Surveillance. The process for implementing live testing during the initial response phase would be the same as that described for the detection phase; however, as an initial response action, the goals would be to provide samples from across the landscape to assess the prevalence and distribution of the disease, and to remove a potential source of CWD prions from the environment (if CWD positive deer are found). During initial response, the NPS would be responsible for all aspects of the live test.

Lethal Removal of Healthy-Appearing Deer for Monitoring Surveillance. This option would involve lethally removing and testing deer to monitor and assess CWD prevalence and distribution. The use of this option gives the battlefields the ability to estimate the disease's prevalence with confidence, understand its spatial distribution, and to more fully cooperate with the state in its assessment and monitoring efforts. The process for implementing lethal removal during the initial response phase would be similar to that described for the detection phase, including details of the individuals who could conduct the removals, the required health and safety practices used, and the sampling and disposal practices used. Similar to detection, this option would be expected to result in the lethal removal of approximately 32–110 deer per surveillance effort at Antietam and 36–83 deer per surveillance effort at Monocacy, based on current and plausible future deer densities (see appendix B).

If there were a CWD detection in Zone 1, the immediate focus would shift to a more aggressive initial response, including assessment of CWD prevalence and distribution, and possibly shifting to the one-time population reduction option (see below). Detection within 5 miles of a park unit would lead to the assumption that CWD is within the park units, and the battlefields would coordinate with the state regarding the number of samples required to assess the distribution and prevalence of CWD within a given area. If a one-time population reduction was implemented, lethal removals for monitoring surveillance could be conducted in subsequent years for the same purposes as described above. Table 1 summarizes the use of lethal removal for initial response by implementation zone. Note that the intensity of initial response would increase as the distance of the positive case to the battlefields decreased.

Based on current (2008) deer densities, it is assumed (for cost estimating purposes) that about 50 deer per battlefield would be removed annually under monitoring surveillance, whether or not a one-time population reduction occurs. The exact number of removals per surveillance effort would depend on factors such as desired sampling confidence level and differences in deer density between the battlefields and surrounding areas. Annual removals at each battlefield would not exceed annual recruitment, which is the number of fawns that survive from birth to fall each year.

Lethal Removal of Healthy-Appearing Deer for One-Time Population Reduction Response. This option could involve a one-time population reduction to bring deer density inside the battlefields (for 2008, estimated at 115 and 155 deer per square mile at Antietam and Monocacy, respectively) to a density similar to surrounding areas (historically estimated at 25 to 45 deer per square mile). The purpose of this

action is to reduce the likelihood of CWD becoming established if it were found in the local area. The proximity of the CWD detection, as well as the intensity of and need to coordinate with state actions, would be considered when determining if this option would be used. If the one-time population reduction is not used, the NPS would implement lethal removals for monitoring surveillance as described above.

The process for implementing lethal removal for the one-time population reduction would be similar to that described for the detection phase, including details of the individuals who could conduct the removals, the required health and safety practices used, and the sampling and disposal practices used. This reduction would be expected to take place over approximately one to three years and result in a reduction of 67–88% of the deer population at Antietam and 80–88% at Monocacy. Based on current (2008) deer densities, removals would be expected to be about 250 deer per battlefield; this figure was used for cost estimating purposes on table 3. As shown in appendix B, the calculated removal range would vary from approximately 212–241 deer at Antietam and 252–294 deer at Monocacy, to up to 738–976 deer at Antietam and 520–687 deer at Monocacy at a density of 280 deer per square mile, which is eight times the current deer density of surrounding areas and used as a hypothetical “worst case” scenario. Appendix B explains the rationale behind the estimated numbers of deer that would be removed in more detail. Actual removals would depend on differences in deer densities between the battlefields and surrounding areas at the time the reduction was conducted (the NPS would work with the state to obtain the most accurate estimates of deer densities available), the duration of the reduction effort, and natural population growth during the effort. Deer removed lethally would be tested for CWD to estimate disease prevalence and distribution.

If a one-time population reduction is implemented, lethal removals for monitoring surveillance could be conducted in subsequent years for prevalence and distribution assessment, as described above. Although the deer herd would be smaller after the one-time population reduction, it is assumed a similar number of deer could be removed per surveillance effort as described above.

Implementation Costs

Implementation costs of alternative B are summarized on table 3. Costs related to the possible storage of carcasses pending testing for donation would be variable and subject to market forces at the time the plan is implemented, and are therefore not included in estimates at this time.

TABLE 3: COST ESTIMATE, ALTERNATIVE B, CWD DETECTION AND REDUCTION RESPONSE

Action (all for detection and initial response)	Assumptions	Annual Cost	Cost for the 10 Year Planning Period
Targeted Surveillance	Testing – for the purposes of these calculations, it is assumed that a total of 10 deer would be sampled annually at each battlefield using targeted surveillance, for a total of 20 deer and testing would cost \$30 per deer Surveillance labor – it is assumed that a half-time employee at an hourly rate of \$25 per hour would conduct this surveillance 20 hours per week or 1,040 hours per year	\$600 \$26,000	\$6000 \$260,000
Opportunistic Surveillance	Testing – for the purposes of these calculations, it is assumed that a total of 20 deer would be sampled annually at each battlefield using opportunistic surveillance, for a total of 40 deer; testing would cost \$30 per deer Labor – very minimal to none for surveillance – deer found during course of normal duties	\$1200	\$12,000
Live Tests	Assumes no more than 5 samples would be acquired annually as part of other projects at each battlefield, for at total of 10 samples; sampling would cost \$100 per deer (including testing and additional biopsy related labor)	\$1,000	\$10,000
Lethal Removal of Healthy-Appearing Deer for Detection and/or Monitoring Surveillance	For the purposes of these calculations, it is assumed that about 50 deer would be removed lethally at each battlefield (100 total) possibly annually at a cost of \$200 per deer; testing for CWD would cost \$30 per deer	\$23,000	\$230,000 (if done every year; \$161,000 if done only 7 years in conjunction with one-time reduction)
Lethal Removal of Healthy-Appearing Deer for One-time Population Reduction	For the purposes of these calculations, it is assumed that about 250 deer at Antietam and 250 deer at Monocacy (total of 500 deer) would be removed lethally over 3 years at a cost of \$200 per deer; temporary closure of the parks would cost \$50,000 per park; testing for CWD would cost \$30 per deer	One time (not annual) costs: Deer removal and testing: \$115,000 Park closure: \$100,000	\$115,000 \$100,000
Install Concrete Pad	\$3000 for construction of 20-foot X 20-foot concrete pad about 4 inches thick with a curb	One time cost - \$3000	\$3,000
Labor for carcass handling/transport, sampling, sending for disposal, any necessary decontamination Carcass Disposal	Approximately 3 hours per deer at 25 per hour = \$75 per deer – assuming a total of 100 deer per year for monitoring annually and 500 deer for the one-time reduction The cost of disposing of CWD-positive deer or contaminated materials is uncertain at this time, so any estimate would be too speculative (see text under alternative A).	\$7,500 One –time cost – \$37,500	\$75,000 (if done every year and \$52,500 if done only 7 years in conjunction with one-time reduction) \$37,500
Total for Planning Period without disposal			\$757,000 (assuming monitoring response is not done during the 3 years of the one-time reduction)

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Alternative C, like alternative B, would offer the battlefields a set of tools for CWD detection and initial response. Detection activities, which would be the same as those described for alternative B, would be aimed at determining whether CWD is present in the battlefields and assisting the state in its detection efforts. Initial response activities would follow a positive CWD detection in or very near the battlefields. Under alternative C, initial response would be exactly the same as those described for alternative B, except that lethal removal for population reduction would not be an option; response would be focused solely on monitoring and providing samples to coordinate with state efforts. Like alternative B, the implementation of detection and initial response tools would be based on the proximity of the nearest CWD detection to the battlefields, and in the event there are CWD detections in multiple zones, the detection and/or initial response actions taken would correspond with those proposed for the zone closest to the park.

Tools for Detection

The tools for detection under alternative C would be exactly the same as those described for alternative B. These tools are described below (see alternative B, above, for additional details).

Opportunistic Surveillance. Opportunistic surveillance would take advantage of deer that die in the battlefields due to disease, predators, vehicle collisions, other trauma-related mortality, lethal removal for other purposes (e.g., research), and as a result of injuries from hunting outside the park. This tool would be available should CWD be detected in any of the implementation zones.

Targeted Surveillance. As described under alternative B, this technique would involve battlefield staff looking for deer showing clinical signs of CWD. If observed, these deer would be reported and possibly lethally removed for testing. This tool would be available should CWD be detected in any of the implementation zones.

Live Test for Detection Surveillance. The live test would include anesthesia, collecting a tonsillar biopsy, and telemetry-marking the animal so it can be tracked for removal should the deer be CWD positive. Live testing for CWD would only be used for detection efforts when animals are being collared in the park units (by either NPS or other researchers) as part of other projects.

Lethal Removal of Healthy-Appearing Deer for Detection Surveillance. This would involve lethally removing deer that appear healthy and testing to detect CWD. The process for implementing lethal removal during the initial response phase would be similar to that described for the detection phase of alternative B, including details of the individuals who would conduct the removals, the required health and safety practices used, and the sampling and disposal practices used. As described in alternative B, based on current and plausible future deer densities, this option could be expected to result in the lethal removal of approximately 32–110 deer per detection effort from Antietam and 36–83 deer per detection effort at Monocacy, although the exact number of removals per detection effort would depend on factors such as desired sampling confidence level (i.e., 95/1 or 99/1) and differences in deer density between the battlefields and surrounding areas (the NPS would work with the state to obtain the most accurate estimates of deer densities available). Appendix B explains the derivation of the number of deer needed for sampling in more detail. Annual removals at each battlefield would not exceed annual recruitment.

Tools for Initial Response

As previously described, the NPS would only implement initial response actions if CWD is detected in implementation Zones 1 or 2. Under alternative C, initial response does not include the option of a one-time population reduction; lethal removals during initial response would be more limited in nature, focused solely on monitoring and providing samples to coordinate with state prevalence and distribution efforts. As a result, the following tools would be available for use in initial response under alternative C.

Opportunistic and Targeted Surveillance. Opportunistic and targeted surveillance for initial response would occur in the same manner described under detection; however, as an initial response action, the goals would be to provide samples from across the landscape to remove a potential source of CWD prions from the environment.

Live Test for Monitoring Surveillance. The process for implementing live testing during the initial response phase would be the same as that described for the detection phase; however, as an initial response action, the goals would be to provide samples from across the landscape to assess the prevalence and distribution of the disease, and to remove a potential source of CWD prions from the environment.

Lethal Removal of Healthy-Appearing Deer for Monitoring Surveillance. This option would involve lethally removing and testing deer to monitor and assess CWD prevalence and distribution. The use of this option gives the battlefields the ability to estimate disease prevalence with confidence, understand its spatial distribution, and to more fully cooperate with the state in its assessment and monitoring efforts. The process for implementing lethal removal during the initial response phase would be similar to that described for the detection phase, including details of the individuals who would conduct the removals, the required health and safety practices used, and the sampling and disposal practices used. Similar to alternative B, this option would be expected to result in the lethal removal of approximately 32–110 deer per surveillance effort at Antietam and 36–83 deer per surveillance effort at Monocacy, based on current and plausible future deer densities (see appendix B). The exact number of removals per surveillance effort would depend on factors such as desired precision for estimating disease prevalence and differences in deer density between the battlefields and surrounding areas (the NPS would work with the state to obtain the most accurate estimates of deer densities available). Annual removals at each battlefield would not exceed annual recruitment.

Implementation Costs

Implementation costs of alternative C are summarized on table 4.

TABLE 4: COST ESTIMATE, ALTERNATIVE C, CWD DETECTION AND MONITORING RESPONSE

Action (all for detection and initial response)	Assumptions	Annual Cost	Cost for the 10 Year Planning Period
Targeted Surveillance	Testing – for the purposes of these calculations, it is assumed that a total of 10 deer would be sampled annually at each battlefield using targeted surveillance, for a total of 20 deer and testing would cost \$30 per deer Surveillance labor – it is assumed that a half-time employee at an hourly rate of \$25 per hour would conduct this surveillance 20 hours per week or 1,040 hours per year (same as alternative B)	\$600 \$26,000	\$6000 \$260,000
Opportunistic Surveillance	Testing – for the purposes of these calculations, it is assumed that a total of 20 deer would be sampled annually at each battlefield using opportunistic surveillance, for a total of 40 deer; testing would cost \$30 per deer Labor – very minimal to none for surveillance – deer found during course of normal duties (same as alternative B)	\$1200	\$12,000
Live Tests	Assumes no more than 5 samples would be acquired annually as part of other projects at each battlefield, for a total of 10 samples; sampling would cost \$100 per deer (including testing and additional biopsy related labor) (same as alternative B)	\$1,000	\$10,000
Lethal Removal of Healthy-Appearing Deer for Detection and/or Monitoring Surveillance	For the purposes of these calculations, it is assumed that about 50 deer would be removed lethally at each battlefield (100 total) possibly annually at a cost of \$200 per deer; testing for CWD would cost \$30 per deer (same as alternative B)	\$23,000	\$230,000
Install Concrete Pad	\$3000 for construction of 20-foot X 20-foot concrete pad about 4 inches thick with curb	One time cost: \$3,000	\$3,000
Labor for carcass handling/transport, sampling, sending for disposal, any necessary decontamination Carcass Disposal	Approximately 3 hours per deer at 25 per hour = \$75 per deer – assuming 100 deer per year (above), annual costs would be \$7,500 (same as alternative B monitoring) The cost of disposing of CWD-positive deer or contaminated materials is uncertain at this time, so any estimate would be too speculative (see text under alternative A)	\$7,500	\$75,000
Total for Planning Period without disposal			\$596,000

USE OF ADAPTIVE MANAGEMENT IN THE CWD DETECTION AND INITIAL RESPONSE PLAN

Successful management of natural systems is a challenging and complicated undertaking. Adaptive management—learning by doing—is based on the assumption that current resources and scientific knowledge is limited and that a certain level of uncertainty exists. Nevertheless, an adaptive management approach attempts to apply available resources and knowledge and adjusts management techniques as new information is revealed. Holling (1978) first described the principle of adaptive management as requiring management decisions and policies to be viewed as hypotheses subject to change—as sources of continuous, experimental learning.

The Department of the Interior requires that its agencies “. . . use adaptive management, as appropriate, particularly in circumstances where long-term impacts may be uncertain and future monitoring will be needed to make adjustments in subsequent implementation decisions. The NEPA analysis conducted in

the context of an adaptive management approach should identify the range of management options that may be taken in response to the results of monitoring and should analyze the effects of such options. The environmental effects of any adaptive management strategy must be evaluated in this or subsequent NEPA analysis” (43 CFR 46.145). In addition, the Department of the Interior has recently outlined the adaptive management approach in a technical guide developed to provide guidance to all department bureaus and agencies (Williams et al. 2007).

The adaptive management process has six steps: assessing the problem; designing management actions; implementing those actions; monitoring the effects of the actions; evaluating the monitoring data; and adjusting future actions based on that data. This process works well when integrated with the process required by NEPA. As with adaptive management, the primary goal of NEPA is informed decision-making through an understanding of the impacts of a proposed federal action. The NEPA process can provide an adaptive management framework, define thresholds, outline actions, and assess their potential impacts, thereby allowing for the implementation of subsequent actions described in the adaptive management component of the plan. This approach allows resource managers more flexibility and a better chance of achieving the objectives stated in this plan/EA, and can reduce or limit future environmental review requirements. Ideally, the resulting management of an ecosystem will improve as more information is gathered, analyzed, and incorporated into the process.

The action alternatives (alternatives B and C) described in this plan incorporate adaptive management approaches to meeting the objectives of the plan. Each alternative includes actions that would be taken based on the occurrence of the disease in or near the area of the battlefields, and the associated risk for CWD in or near the park units. These actions require monitoring and assessment of results, with appropriate actions taken or adjustments made based on the results of the monitoring. The following would be monitored at various times as part of the adaptive management approach to this plan:

- results of CWD testing inside and outside the park units
- number and location of CWD positive cases outside the park units, especially in relation to the zones
- intensity of surrounding state CWD surveillance efforts
- effectiveness of sampling
- evidence that CWD has become established or is spreading

For example, the battlefields would monitor CWD test results from samples collected by the state outside of the park units. As new information is obtained regarding the location of positive CWD cases relative to the battlefields, detection actions would be altered. For example, with a detection of CWD in Zone 3 (or closer), options to increase the number of samples available for detection within the battlefields could be expanded to include lethal removal of healthy-appearing deer, depending on relative risk. Should these increased detection efforts identify a positive CWD case within the park unit, initial response actions would be implemented as described for Zone 1. The NPS would monitor the results of the assessment of prevalence and distribution to determine if the disease has become established.

ADAPTIVE MANAGEMENT IF CWD BECOMES ENDEMIC

The decision to forego or discontinue any response actions and let the disease run its course may be appropriate if CWD prevalence reaches a point that it is beyond the NPS ability to help control or contain the disease. This option may also be appropriate in the case that the state reaches the point that further actions related to CWD are ineffective; or if new scientific evidence indicates that no matter what actions are taken, the disease is established and/or spreading, and cannot be eradicated or controlled. The NPS, through consultation with the state and evaluation of data, would determine when and if initial response is no longer appropriate, and would then move to long-term management. The NPS may continue with

opportunistic and targeted surveillance, depending on the disease situation and staff resources available. Figure 6 illustrates the adaptive management approach that could be used for several aspects of this plan.

HOW ALTERNATIVES MEET OBJECTIVES

As stated in the “Purpose of and Need for Action” chapter, all action alternatives selected for analysis must meet all objectives to a large degree. The action alternatives must also address the stated purpose of taking action and resolve the need for action; therefore, the alternatives were individually assessed in light of how well they would meet the objectives for this plan/EA, which are stated in the “Purpose of and Need for Action” chapter. Alternatives that did not meet the objectives were not analyzed further (see the “Alternatives or Alternative Elements Considered but Rejected” section in this chapter).

Table 5 compares the alternatives by summarizing the elements being considered, while table 6 compares how each of the alternatives described in this chapter would meet the plan objectives. The “Environmental Consequences” chapter describes the effects of each alternative on each impact topic, including the impact on recreational values and visitor experience. These impacts are summarized in table 7.

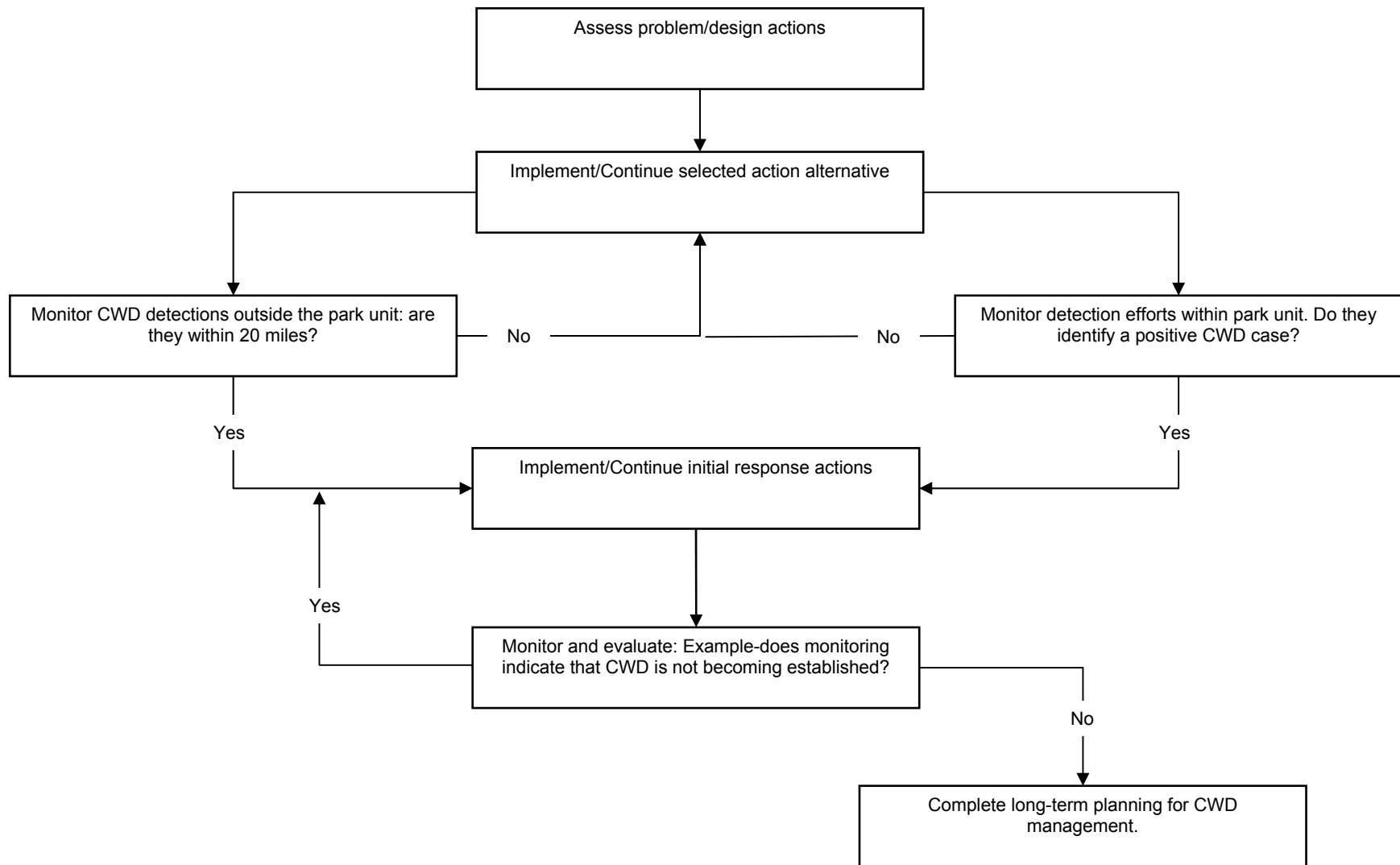


FIGURE 6: AN ILLUSTRATION OF THE ADAPTIVE MANAGEMENT APPROACH

TABLE 5: SUMMARY OF ALTERNATIVES

	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Tools available for detection	Opportunistic surveillance Targeted surveillance	Opportunistic surveillance Targeted surveillance Live test surveillance Lethal removal for detection surveillance	Opportunistic surveillance Targeted surveillance Live test surveillance Lethal removal for detection surveillance
Number of deer expected to be lethally removed during detection	Few - only those showing clinical signs	Antietam – 32–110 deer per disease detection effort; annual removals not to exceed annual recruitment Monocacy – 36–83 deer per disease detection effort; annual removals not to exceed annual recruitment	Antietam – 32–110 deer per disease detection effort; annual removals not to exceed annual recruitment Monocacy – 36–83 deer per disease detection effort; annual removals not to exceed annual recruitment
Tools available for initial response	None; however, opportunistic and targeted surveillance would continue	Opportunistic surveillance Targeted surveillance Live test and cull Lethal removal for monitoring surveillance Lethal removal for one-time population reduction	Opportunistic surveillance Targeted surveillance Live test and cull Lethal removal for monitoring surveillance
Number of deer expected to be lethally removed during initial response	Few - only those showing clinical signs	Antietam – 67–88% of battlefield population over period of approximately 1-3 years for population reduction and possibly 32-110 deer per monitoring surveillance effort in subsequent years Monocacy – 80–88% of battlefield population over period of approximately 1-3 years for population reduction and possibly 36-83 deer per monitoring surveillance effort in subsequent years	Antietam – 32–110 deer per monitoring surveillance effort; annual removals not to exceed annual recruitment Monocacy – 36–83 deer per monitoring surveillance effort; annual removals not to exceed recruitment
Coordination with state	Continue current coordination	Current coordination plus enhanced coordination to determine battlefields' contributions to detection and monitoring surveillance efforts and to determine the target density of battlefields' one-time population reduction	Current coordination plus enhanced coordination to determine battlefields' contributions to detection and monitoring surveillance efforts
Development of agreements with state and landowners	No agreements in place to obtain deer outside battlefield boundaries.	Agreements developed to allow removal of deer with clinical signs of CWD regardless of land ownership	Same as alternative B

TABLE 6: HOW THE ALTERNATIVES MEET THE OBJECTIVES IN TAKING ACTION

Objectives in taking Action	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
GENERAL			
Ensure actions are consistent with pertinent NPS management policies.	Partially meets objective: This alternative provides the minimum number of tools necessary to meet guidance on CWD from the NPS Director, National Capital Region, and the battlefields, as well as mandates from laws and policies such as the NPS <i>Organic Act</i> and <i>Management Policies 2006</i> .	Fully meets objective: This alternative provides the most flexibility to meet NPS guidance on CWD, as well as other laws and policies described for alternative A. This includes enhanced opportunities to cooperate and coordinate with state wildlife and agriculture agencies on CWD issues, as well as conduct outreach in surrounding communities and communicate with visitors regarding the disease.	Fully meets objective: Alternative C provides greater flexibility than alternative A to meet NPS guidance on CWD, as well as other laws and policies. Although there is enhanced opportunities to cooperate and coordinate with states, as well as educate community members and visitors, the lack of a one-time population reduction option does not provide as much flexibility as alternative B.
DEER POPULATIONS AT ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS			
Estimate ongoing risk of CWD infection in the white-tailed deer population of Antietam and Monocacy National Battlefields based on known disease risk factors.	Partially meets objective: Recognizing that CWD risk factors are currently present in the vicinity of the battlefields, this alternative limits the opportunities for CWD detection; assessment of prevalence and distribution if CWD is detected; and an initial response that could affect amplification, spread, and potential establishment of the disease.	Fully meets objective: This alternative provides the most tools for detecting, assessing, and responding initially to CWD based on the proximity of detections. For example, if CWD is detected 20 or more miles from the battlefields, lethal removals for detection surveillance would increase the potential for detections and sampling confidence. The testing conducted as part of a one-time population reduction would provide the most confidence when assessing prevalence and distribution of the disease should it be detected in or near the battlefields	Partially meets objective: Similar to alternative B, this alternative provides more tools for detecting, assessing, and responding initially to CWD based on the proximity of detections. However, initial response would be limited to lethal removals for monitoring and would not provide the same level of confidence as alternative B when assessing prevalence and distribution of the disease if it is detected in or near the battlefields.
Appropriate to the level of risk, develop adaptive management protocols for the detection of CWD presence, prevalence, and distribution, as well as an initial response to the disease.	Does not meet objective: Alternative A provides the fewest tools for determining if CWD is present and assessing prevalence/distribution. This alternative does not provide a framework for changing initial response actions based on proximity to known detections or state actions, and does not include an initial response option that could have measurable effects on the potential for amplification, spread, or establishment of the disease.	Fully meets objective: This alternative provides a flexible framework for taking actions based on factors including proximity of the disease and actions of the state. It also provides a framework for ceasing initial response activities if the science shows they are no longer warranted. This alternative also provides more opportunity to conduct CWD sampling in conjunction with the state and take action to minimize the potential for amplification, spread, or establishment of the disease.	Fully meets objective: As with alternative B, this alternative provides a flexible framework for detection and initial response to the disease, including considerations for ceasing initial response if no longer warranted. It also provides more opportunity to conduct CWD sampling in conjunction with the state, but does not provide all of the same tools to minimize the potential for amplification, spread, or establishment of the disease.

Objectives in taking Action	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
CULTURAL RESOURCES			
Minimize disruption to the natural resources and components of the cultural landscapes from CWD or implementation of detection and initial response activities for the disease.	Fully meets objective: This alternative would have the least potential to disrupt components of the cultural landscape as detection and initial response actions would be limited in scope and scale. Carcass handling requirements include moving sampled deer to areas far removed from historic structures, and if necessary, burial in previously disturbed areas in or near developed areas. Changes in deer density, a natural resource component would be minimal, unless CWD becomes established and has dramatic effects on the deer population (such effects are not expected during the life of the plan).	Fully meets objective: This alternative has the greatest potential to disrupt components of the cultural landscapes during implementation as it requires the largest effort. Initial response actions could result in noticeable changes to the deer population (e.g., density, movement patterns). However, the deer population would remain viable, and should the one-time reduction prevent CWD establishment, it would have long-term beneficial effects. As with alternative A, carcass handling and, if needed, burial requirements would also minimize disruption to components of the cultural landscapes.	Fully meets objective: When compared to alternative A, this alternative has more potential to disrupt components of the cultural landscape due to the scope of detection and initial response actions, but less potential than alternative B. As a result, changes to the deer population would be less noticeable when compared to alternative B, but there would be less potential to prevent impacts from CWD establishment. As with alternative A, carcass handling and, if needed, burial requirements would also minimize disruption to components of the cultural landscapes.
HEALTH AND SAFETY			
Minimize the potential for health and safety issues for park staff and visitors associated with CWD surveillance and initial response activities.	Fully meets objective: Because alternative A would involve the fewest tools for CWD detection and initial response, it has the least potential for health and safety issues. In addition, requirements for personnel using firearms during targeted surveillance, as well as requirements for carcass handling and disposal, would minimize potential health and safety issues for staff. Closures, if needed, for targeted surveillance, as well as educational and interpretive measures about the disease, would minimize the potential for visitor health and safety issues.	Fully meets objective: Because this alternative could involve a one-time population reduction, it has the potential for the greatest health and safety risks. However, requirements for qualified personnel (including authorized agents and skilled volunteers) involved in the use of firearms, as well as carcass handling/disposal would minimize the potential health and safety issues for staff. Detection and initial response actions could be taken at night, when the battlefields are closed, which would minimize potential visitor safety issues. Although this could create additional concerns for staff, job hazard analysis would be conducted to minimize safety issues. In addition, if necessary for visitor safety, more closures could occur over larger areas.	Fully meets objective: Similar to alternative B, this alternative could increase health and safety issues for staff and visitors because of the potential for increased use of firearms. However, the lack of a one-time population reduction would minimize the concerns when compared to alternative B. Requirements for qualified personnel (including authorized agents and skilled volunteers) involved in the use of firearms, as well as carcass handling/disposal would also minimize the potential health and safety issues for staff. Detection and initial response actions could be taken at night, when the battlefields are closed, which would minimize potential visitor safety issues. Although this could create additional concerns for staff, job hazard analysis would be conducted to minimize safety issues. In addition, if necessary for visitor safety, more closures could occur over larger areas.

Objectives in taking Action	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
		Educational and interpretive measures about the disease would also minimize the potential for visitor health and safety issues.	Educational and interpretive measures about the disease would also minimize the potential for visitor health and safety issues.
VISITOR USE AND EXPERIENCE			
Enhance the awareness and understanding of CWD and NPS resource management issues, policies, and mandates as they pertain to prevention, detection, and response to the disease for visitors and other interested parties.	Partially meets objective: Alternative A includes some educational measures (e.g., posting information online or in storefronts; press releases) that would focus mostly on the disease itself.	Fully meets objective: Educational measures would be expanded under this alternative to include not only information about disease, but also information about the purpose for the additional actions being taken, and what the results might be. More tools would be used to communicate with visitors and the public in general, including more ways to communicate information to the public, educating/training staff so accurate information is disseminated and targeted surveillance is enhanced; coordinating with state education/outreach efforts related to CWD; and coordinating with other stakeholders to reduce CWD risk factors.	Fully meets objective: This alternative would expand education measures to enhance public and staff awareness and understanding of CWD as described for alternative B.
During implementation of CWD detection and initial response activities, minimize disruption to visitor use and experience.	Fully meets objective: Currently, park staff are able to conduct opportunistic and targeted surveillance with no closures. Although targeted surveillance could require closures to protect visitor safety, it would not be routine, and disruption would be minimized by educating the public on why they are necessary, and providing advanced notice.	Fully meets objective: Because this alternative could involve a one-time population reduction, it has the most potential to disrupt visitor use and experience. However, detection and initial response actions could be taken at night, when the battlefields are closed, which would minimize this potential. In addition, educational and interpretive measures about the disease, as well as the need for management and closures (including advanced notices), would minimize disruption by enhancing public understanding.	Fully meets objective: Similar to alternative B, this alternative could increase disruption to visitor use and experience because of the potential for increased use of firearms. However, the lack of a one-time population reduction would minimize the potential when compared to alternative B. Conducting detection and initial response actions, as well as additional education and interpretive measures about CWD (including advance notice of closures) would also minimize the potential for disruptions to visitor use and experience.

Objectives in taking Action	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
PARK MANAGEMENT AND OPERATIONS			
Minimize impacts of CWD detection and response activities on current park operations, including budget and workload.	<p>Fully meets objective: This alternative has the least potential for impacts on park management and operations. Opportunistic surveillance, involves sampling deer found dead during other routine management actions. Targeted surveillance is conducted by seasonal summer staff once per week, and support and staffing are variable based on funding and availability.</p> <p>However, if CWD is detected and becomes established, addressing the disease could have the most impacts on park operations and management.</p>	<p>Partially meets objective: Although alternative B would have impacts on park operations, including budget and workload, steps would be taken to minimize these impacts, and the NPS would still be able to adequately manage and operate the battlefields to meet their mission. Steps that can be taken include analyzing the extent of actions needed based on disease proximity and actions of the state; and using contractors to minimize impacts on workloads (although this increases costs), but increase costs.</p> <p>In addition, if initial response precludes CWD from becoming established, it could decrease impacts from long-term disease management.</p>	<p>Partially meets objective: Similar to alternative B, this alternative would increase impacts on park management and operations, but because it does not involve a one-time population reduction, would minimize this potential. In addition, similar steps could be taken as described for alternative B. Although less likely in this alternative, initial response could help prevent CWD from becoming established, it could decrease impacts from long-term disease management.</p>
Cooperate and coordinate with state and federal resource management agencies, as well as other interested parties, with respect to detection of CWD and initial responses to positive cases.	<p>Partially meets objective: Although cooperation and coordination occurs now regarding test results and sharing of information, there is minimal opportunity under alternative A to work in conjunction with the state in response to detections.</p>	<p>Fully meets objective: Alternative B would provide the most tools to enhance cooperation and coordination with state regarding CWD detections and initial response actions.</p>	<p>Partially meets objective: Similar to alternative B, this alternative would increase the potential for cooperation and coordination with the state. However, there would be fewer tools to collect information due to the lack of a one-time population reduction would not provide</p>

TABLE 7: SUMMARY OF ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
White-tailed Deer	<p>Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on white-tailed deer and their habitat from temporary disturbances during implementation. There would be long-term, moderate, adverse impacts because alternative A would have minimal effects on CWD risk factors, and the potential for amplification, spread, and establishment, as well as exposure to possible population level effects, would remain high.</p> <p>Alternative A would have negligible contributions to cumulative impacts on white-tailed deer populations, which would be long-term, moderate, and adverse. No impairment to white-tailed deer would occur under this alternative.</p>	<p>Detection and initial response actions would have short-term, negligible to minor, adverse impacts on white-tailed deer and their habitat from temporary disturbances during implementation. After implementation, impacts on deer density, especially from the possibility of early detection and reduced CWD amplification risk associated with a one-time 60% to 89% reduction in deer densities at the battlefields, would have long-term, beneficial effects. Alternative B would have both adverse and beneficial contributions to cumulative impacts on white-tailed deer populations. However, overall cumulative impacts would be long-term, minor to moderate, and adverse. No impairment to deer would occur under this alternative.</p>	<p>Detection and initial response actions would have short-term, negligible to minor, adverse impacts on white-tailed deer and their habitat from temporary disturbances during implementation. Although not as extensive as alternative B, impacts on deer density after implementation would have long-term, beneficial effects on the population as a whole from the possibility of early detection and reduced CWD amplification risk associated with a 10% to 32% reduction in deer densities at the battlefields. Alternative C would have both adverse and beneficial contributions to cumulative impacts on white-tailed deer populations. However, overall cumulative impacts would be long-term, minor to moderate, and adverse. No impairment to deer would occur under this alternative.</p>
Vegetation	<p>Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on vegetation from temporary disturbances during implementation. Because these surveillance efforts would not measurably affect deer density, CWD surveillance actions that would occur under alternative A would not result in any indirect effects to the existing vegetation conditions. Cumulative impacts on vegetation would be long-term, moderate, and adverse. Surveillance actions under alternative A would contribute minimally to these effects. No impairment to vegetation would occur under this alternative.</p>	<p>Detection and initial response actions would have short-term, negligible to minor, adverse impacts on vegetation from temporary disturbances during implementation. After implementation, reductions in deer density, especially if a one-time population reduction would occur, would have long-term beneficial effects on vegetation from reduced browsing and grazing pressure. Cumulative impacts on vegetation would be long-term, minor to moderate, and adverse, and detection and initial response actions under alternative B would contribute minimally to these effects. No impairment to vegetation would occur under this alternative.</p>	<p>Detection and initial response actions would have short-term, negligible to minor, adverse impacts on vegetation from temporary disturbances during implementation. After implementation, reductions in deer density from lethal removal of deer for CWD detection and/or a monitoring surveillance response would have long-term beneficial effects, although not to the extent of alternative B. Cumulative impacts on vegetation would be long-term, moderate, and adverse, in light of the potential for some beneficial effects. Detection and initial response actions under alternative C would contribute minimally to cumulative impacts. No impairment to vegetation would occur under this alternative.</p>

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Other Wildlife and Wildlife Habitat	Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on wildlife and wildlife habitat mainly from temporary disturbances during implementation. Because these surveillance efforts would not measurably affect deer density, CWD surveillance actions that would occur under alternative A would not result in any indirect effects to the existing wildlife or habitat conditions. Cumulative impacts on wildlife and wildlife habitat would be long-term, minor, and adverse, and surveillance actions under alternative A would contribute minimally to these effects. No impairment to wildlife and wildlife habitat would occur under this alternative.	Detection and initial response actions would have short-term, negligible to minor, adverse impacts on wildlife and wildlife habitat from temporary disturbances during implementation. After implementation, reductions in deer density, especially if a one-time population reduction occurs, would have long-term beneficial effects by reducing browsing and grazing pressure on vegetation that provides food and cover for other wildlife. Cumulative impacts on wildlife and wildlife habitat would be long-term, minor, and adverse, and detection and initial response actions under alternative B would contribute minimally to these effects. No impairment to wildlife and wildlife habitat would occur under this alternative.	Detection and initial response actions would have short-term, negligible to minor, adverse impacts on wildlife and habitat from temporary disturbances during implementation. After implementation, reductions in deer density, although not as extensive as alternative B, would have long-term beneficial effects by reducing browsing and grazing pressure on vegetation that provides food and cover for other wildlife. Cumulative impacts on vegetation would be long-term, minor, and adverse, and the detection and initial response actions under alternative C would contribute minimally to cumulative impacts. No impairment to wildlife and wildlife habitat would occur under this alternative.
Cultural Resources: Cultural Landscapes	Actions associated with opportunistic and targeted surveillance would have short- and long-term, negligible impacts on cultural landscapes from temporary disturbances during implementation and negligible changes in deer density. Alternative A would have minimal contributions to cumulative impacts on cultural landscapes, which would be long-term, minor, and adverse. No impairment of cultural landscapes would occur under this alternative.	Actions associated with opportunistic and targeted surveillance, supplemented with live tests and lethal removal of healthy appearing deer would have short-term negligible to minor adverse impacts on cultural landscapes from temporary disturbances during implementation. There would be long-term, negligible beneficial effects as a result of benefits to the deer herd, which are a component of the cultural landscapes. Alternative B would have minimal contributions to cumulative impacts on cultural landscapes, which would be long-term, minor and adverse. No impairment of cultural landscapes would occur under this alternative.	Under alternative C, detection and initial response actions would have short-term, negligible to minor adverse impacts on cultural landscapes, with the more intense impacts related to the lethal removal action for monitoring response. There would be long-term, negligible beneficial effects as a result of benefits to the deer herd, which are a component of the cultural landscapes. Cumulative effects on cultural landscapes would be long-term, negligible, and adverse, and alternative C would contribute minimal impacts. No impairment of cultural landscapes would occur under this alternative.

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Cultural Resources: Archeological Resources	Actions associated with opportunistic and targeted surveillance, including removal and the potential for on-site burial of carcasses could have long-term, negligible to minor, adverse impacts on archeological resources from ground disturbances during implementation. Alternative A would have minimal contributions to long-term negligible adverse cumulative impacts on archeological resources. No impairment of archeological resources would occur under this alternative.	Actions associated with opportunistic and targeted surveillance, supplemented with live tests and lethal removal of healthy appearing deer would have long-term minor, adverse impacts on archeological resources from ground disturbances during implementation. Alternative B would have minimal contributions to long-term negligible to minor adverse cumulative impacts on archeological resources. No impairment of archeological resources would occur under this alternative.	Detection and initial response actions would have long-term, negligible to minor, adverse impacts on archeological resources, with the more intense impacts related to the lethal removal action for monitoring response. Cumulative effects on archeological resources would be long-term, negligible, and adverse. Alternative C would have minimal contributions to cumulative impacts on archeological resources. No impairment of archeological resources would occur under this alternative.
National Historic Preservation Act Section 106 Summary	<p>In accordance with Section 106 of the <i>National Historic Preservation Act</i>, potential adverse impacts (as defined in 36 CFR 800) on cultural landscapes and archeological resources listed on or eligible for listing on the National Register of Historic Places would be coordinated between the National Park Service and the State Historic Preservation Officer to determine the level of effect on the property and to determine any necessary mitigation measures. Continuing implementation of the <i>Cultural Resource Management Guideline</i> (NPS 1998) and adherence to <i>NPS Management Policies 2006</i> (NPS 2006b) and the 2008 Servicewide programmatic agreement with the Advisory Council on Historic Preservation and National Conference of State Historic Preservation Officers would all aid in reducing the potential to adversely impact historic properties.</p> <p>Copies of this Chronic Wasting Disease Detection and Initial Response Plan / Environmental Assessment have been distributed to the Maryland State Historic Preservation Officer for review and comment related to compliance with Section 106 of the <i>National Historic Preservation Act</i>.</p>		

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Socioeconomics	<p>Actions associated with opportunistic and targeted surveillance would have long-term, negligible to minor adverse impacts on socioeconomics. CWD surveillance actions that would occur under alternative A would not result in any changes to the existing vegetation conditions, and adverse impacts resulting from deer-related crop and landscape damage would continue. Because alternative A would have minimal effects on CWD risk factors allowing the potential for amplification, spread, and establishment, as well as exposure to possible population level effects to remain high, there could be negligible to minor adverse impacts to hunting and tourism due to changes in deer numbers and/or the presence of the disease. However, the exact nature and level of impact would depend on what actions the state has taken in the communities surrounding the battlefields in response to the presence of CWD. Overall cumulative impacts on the local socioeconomic resources would be long-term and beneficial.</p>	<p>Actions taken under alternative B would result in short-term, negligible to minor adverse impacts to the socioeconomic resource, with the level of adverse impacts dependent upon the perceptions of visitors and hunters, the number of deer potentially affected by CWD, and the actions the state has taken in the communities surrounding the battlefields in response to CWD. Long-term beneficial effects could occur, primarily if initial response activities help preclude CWD from becoming established, offsetting potential losses in hunting related tourism, and as a result of reduced deer damage to crops and landscapes in the areas surrounding the battlefields due to lower deer densities.</p>	<p>Actions taken under alternative C would result in short-term, negligible to minor adverse impacts to the socioeconomic resource, with the level of adverse impacts dependent upon the perceptions of visitors and hunters, the number of deer potentially affected by CWD, and the actions the state has taken in the communities surrounding the battlefields in response to CWD. Although not to as extensive as the one-time population reduction discussed under alternative B, long-term beneficial effects could occur, primarily if initial response activities help preclude CWD from becoming established, offsetting potential losses in hunting related tourism; and as a result of reduced deer damage to crops and landscapes in the areas surrounding the battlefields due to lower deer densities.</p>

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Visitor Use and Experience	<p>Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on visitor use and experience. If CWD were to occur in or near the battlefields, those impacts would increase to minor due to the likely increase in seeing sick or dead deer. The overall cumulative impacts of all past, present and future actions at the battlefields would be long-term and beneficial.</p>	<p>Similar to alternative A, actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on visitor use and experience, while lethal removal of healthy-appearing deer for detection and/or monitoring surveillance would have short-term, minor, adverse impacts. Due to the need for more frequent temporary trail or area closures and the likely increase in visitors impacted by the closures, implementing a one-time population reduction would result in short-term, minor to moderate, adverse impacts to visitor use and experience (minor or moderate depending on the number and frequency of trail area closures). Long-term beneficial effects would occur from reduced deer densities that would create a more natural, healthy environment for the deer population at the battlefields; from decreased potential for CWD to become established; and from knowing that the NPS is taking actions to protect the deer herds in the battlefields. Cumulative effects on visitor use and experience would be long-term and beneficial.</p>	<p>Similar to alternative B, actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on visitor use and experience, while lethal removal of healthy-appearing deer for detection and/or monitoring surveillance would have short-term, minor, adverse impacts. Live testing would have no impacts on visitor use and experience. Long-term beneficial effects would occur from reduced deer densities that would create a more natural, healthy environment for the deer population at the battlefields; from decreased potential for CWD to become established; and from knowing that the NPS is taking actions to protect the deer herds in the battlefields. Cumulative effects on visitor use and experience would be long-term and beneficial.</p>

Impact Topic	Alternative A: No Action (Current Activities Continued)	Alternative B: CWD Detection and Reduction Response	Alternative C: CWD Detection and Monitoring Response
Health and Safety	Opportunistic and targeted surveillance activities employed under alternative A would result in long-term, negligible, adverse impacts on health and safety. Cumulative impacts on health and safety would be long-term, minor to potentially moderate and adverse; however, alternative A would contribute very little to any overall adverse impacts.	Opportunistic and targeted surveillance activities employed under alternative B would result in long-term, negligible, adverse impacts on health and safety as would live testing; lethal removal of healthy-appearing deer for both detection and monitoring surveillance, and lethal removal of healthy-appearing deer for a one-time population removal would have negligible to minor adverse effects. Alternative B would have negligible contributions to cumulative impacts on health and safety, which would be long-term, minor to potentially moderate, and adverse.	Opportunistic and targeted surveillance activities employed under alternative C would result in long-term, negligible, adverse impacts on health and safety as would live testing, and lethal removal of healthy appearing deer (detection) would have negligible to minor adverse effects. Alternative C would have negligible contributions to cumulative impacts on health and safety, which would be long-term, minor to potentially moderate and adverse.
Park Management and Operations	Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on park management and operations. Alternative A would have negligible contributions to cumulative impacts on park management and operations, which would be long-term, moderate, and adverse.	Detection and initial response actions would have short-term, negligible to moderate, adverse impacts on park management and operations, with the more intense impacts related to the removal actions included in this alternative and the need for additional public education and outreach, particularly if the one-time removal response is implemented. Cumulative effects on park management and operations would be long-term, moderate, and adverse.	Detection and initial response actions would have short-term, negligible to minor, adverse impacts on park management and operations, with the more intense impacts related to the lethal removal action for monitoring response. Cumulative effects on park management and operations would be long-term, minor to moderate, and adverse.

ALTERNATIVES OR ALTERNATIVE ELEMENTS CONSIDERED BUT REJECTED

Several alternatives or alternative elements were considered, but dismissed as described below.

Natural Regulation Response. An alternative that was considered throughout the planning process was one which would use “natural regulation” as a response to CWD occurring in or near the battlefields. Under this alternative, the battlefields would use tools for detection (as described under alternatives B and C) to determine whether CWD is present in the battlefields and to assist the state in its detection efforts. However, if CWD were detected in or very near the battlefields, the NPS would essentially allow CWD to “run its course” in the battlefields’ deer and limit disease monitoring to opportunistic and targeted surveillance. This alternative was dismissed because of its failure to resolve the purpose and need of the plan, as well as some objectives.

A stated need of the plan is to “address imminent or potential threats to park natural resources and components of the cultural landscapes, primarily white-tailed deer populations, from the establishment or spread of CWD.” The preliminary analysis of impacts for this alternative suggested that it would fail to address the threat of CWD establishment or spread; the risks for CWD establishment and potential population level effects under this alternative would be high. Also, this alternative would not fully meet the objective to “Cooperate and coordinate with state and federal resource management agencies, as well as other interested parties, with respect to detection of CWD and initial responses to positive cases.” Allowing the disease to run its course with minimal surveillance would not allow contribution to any state sampling effort. Finally, another plan objective was to “estimate ongoing risk of CWD infection in the white-tailed deer population of Antietam and Monocacy National Battlefields based on known disease risk factors.” After the disease is detected, the natural regulation option would not provide sufficient samples for estimating ongoing risk. For these reasons, this alternative was eliminated from further analysis.

Decreasing Deer Congregation (Habitat Modification). One option presented was to modify agricultural practices that attract deer to the battlefields, which could reduce deer densities and the potential for CWD transmission. Crops could be changed from corn or less grain could be left on the ground. However, this could put the NPS in the position of having to reimburse the landowners for any losses, which could create a burden for the battlefields. Park staff also agreed that deer dispersal from habitat modification would disperse problems associated with deer as well, and would be ineffective because development around the battlefields limits the available habitat. In addition, changes in these agricultural practices could affect a manmade component of the cultural landscape of the battlefields, and would not be consistent with the cultural resource objective; therefore, this alternative was dismissed from further consideration.

Predator Management. The intent of reintroducing predators into the battlefields would be to reduce the rate at which susceptible deer are infected in the populations. However, this is not feasible due to a lack of suitable habitat that is large enough to support predators that could prey on deer, such as gray wolves (*Canis lupus*) or cougars (*Puma concolor*). The proximity to humans is also inappropriate for reintroducing such predators. Other native animals, as well as domestic pets, could also become prey if predators were reintroduced to the park area. Encouraging existing predator populations, which are limited to coyotes in the battlefields, was also considered. However, as coyotes primarily take fawns at low rates, this is not likely to reduce the force of infection. Black bear (*Ursus americanus*), another fawn predator known to occur in Maryland, have been reported within the vicinity of both battlefields. However, their effects on the force of infection would be negligible. Therefore, this alternative was dismissed from further consideration.

Force of Infection – The rate at which susceptible individuals become infected by an infectious disease.

Hunting. A number of comments received from the public suggested the use of hunting in various forms to assist with lethal removal of deer. Ideas presented included managed or regulated hunts, a youth hunt, a “Make-a-Wish” related hunt, or offering hunting opportunities to veterans. However, NPS regulations, 36 CFR 2.2, and NPS *Management Policies 2006* state that hunting is prohibited in national parks unless specifically authorized as a discretionary activity under federal statutory law or treaty rights and may take place only after the NPS has determined that it is consistent with resource management principles (NPS 2006b). The enabling legislation for both Antietam and Monocacy National Battlefields does not allow hunting. Therefore, this alternative was dismissed from further consideration. Although the use of private individuals as skilled volunteers to assist with lethal removals was retained (see details under alternative B), the use of skilled volunteers does not constitute hunting because the lethal removal of deer described in the alternatives is an administrative activity that would be conducted in accordance with an approved resource management plan. In contrast to hunting, removal activities described in the alternatives would not be recreational in nature, would not involve personal taking of meat or other portions of the animal, and would not be bound by the principles of fair chase.

Dispersal of Deer to Neighboring Lands. Suggestions were made to drive deer from NPS property onto neighboring lands, where hunters could remove them on private property. However, the NPS team agreed that driving deer from the battlefields would not be considered because it would take a large effort to supervise and conduct such an action with a large number of deer involved. There are also locations where intensive development limits the habitat available around the battlefields that would be available to conduct this option. The battlefields also do not want to drive potentially infected deer onto private property or to shift the burden of sampling and recording a large number of dispersed deer to the state over the course of a short-term but intensive dispersal action. Finally, lethal reductions are likely to occur at the same time as hunting seasons, and any deer that leave park property to avoid removal actions would likely be subject to hunting removals on neighboring private properties, with oversight provided by the state with regard to sampling and handling during the normal course of the regular hunting season. Therefore, this alternative was dismissed from further consideration.

Eliminate the White-tailed Deer Population. Elimination of white-tailed deer would be inconsistent with NPS *Management Policies 2006*, which prescribes that “The National Park Service will maintain as parts of the natural ecosystems of parks all plants and animals native to park ecosystems” (NPS 2006b, sec. 4.4.1), and would be inconsistent with the objectives of this plan to ensure actions are consistent with pertinent NPS management policies. An up-front decision to eliminate the population would also not be consistent with the objective to select a response that is appropriate to the level of risk, and to develop adaptive management protocols for the detection of CWD presence, prevalence, and distribution, as well as an initial response to the disease. Therefore, this alternative was dismissed from further consideration.

“Hot Spot” (Localized) Lethal Removal. During development of the alternatives, one option considered and originally included in the alternatives was targeting “hot spots” (possible areas of high incidence or areas close to a positive case) for removal of deer during initial response. Research has shown that CWD occurs heterogeneously across landscapes (Joly et al. 2003; Miller and Conner 2005). This has even been demonstrated in relatively homogeneous white-tailed deer populations such as those found in Wisconsin (Joly et al. 2006). These studies demonstrate that CWD prevalence in localized areas is usually associated with land use patterns (Farnsworth et al. 2005), animal dispersal patterns (Blanchong et al. 2008), and habitat abundance (Joly et al. 2006). Also, although many CWD management strategies have incorporated removal of CWD susceptible species from areas close to where the disease has been identified, this becomes logistically impractical when applied to small land areas such as the battlefields. Antietam National Battlefield encompasses 3.01 square miles and Monocacy National Battlefield comprises 2.12 square miles, and neither of the battlefields has geographic features which would prevent deer movement though the parks. Because of the small size, irregular borders, and lack of geographic barriers in each battlefield, deer found in one area are nearly as likely to be found in another area within each unit. Therefore, the use of “hot-spot” or localized removals around a CWD case was considered, but rejected in

this plan. If lethal removal is selected as part of the preferred alternative, it could take place over the entire battlefield as is logistically feasible.

Demographic (Age- or Sex-based) Lethal Removal. During development of the alternatives, another option considered and originally included in the alternatives was targeting male deer or older deer during initial response, because CWD prevalence does not tend to be equal between sex and age classes of susceptible animals. This has been shown in both mule deer (Miller and Conner 2005) and white-tailed deer (Gear et al. 2006). In general, prime age adult males (3–5 years old) are nearly twice as likely to be affected by CWD as females of similar age. Additionally, CWD is a slowly progressing disease with a long period during which no clinical signs can be identified (49–76 months in white-tailed deer; Miller and Wild 2004). During this time individuals may shed prions into the environment and perpetuate disease transmission (Miller et al. 2004). Differences in disease prevalence among age and sex classes can likely be attributed to differences in social behaviors and number of contacts with infectious prions. However, demographic removals that are heavily biased may alter these disease dynamics. If mature males are not allowed to remain in the area because of intensive hunting pressure, then mature females may be more likely to be CWD positive. Because CWD prevalence among sex and age classes is likely influenced by human related factors such as hunting practices outside the battlefields, it did not make sense to use demographic factors to influence lethal removal decisions with one notable exception: when in the CWD detection phase, adult deer would be targeted for removal because the prion has never been found in a free-ranging, naturally exposed, animal younger than five months (Gear et al. 2006). If alternative B is selected and the one-time population reduction option is implemented, all available deer may be targeted for lethal removal due to logistical constraints of meeting population reduction objectives.

Do Nothing for either Detection or Response. One option was to do nothing to detect or respond to CWD. This is different from the natural regulation alternative, which would still involve detection but no active response. However, detection measures (opportunistic and targeted surveillance) are required by NPS guidance (2002 Director's Memorandum (NPS 2002b; appendix A of this plan/EA)) at Antietam and Monocacy due to their proximity (less than 60 miles) from a known CWD case. In addition, this would not meet the purpose, need, and many of the objectives of this plan/EA; therefore, this alternative was dismissed from further consideration.

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). Because the detection and initial response actions of the alternatives would all have similar effects on most of the natural and cultural resources evaluated, this analysis focused on which alternative would provide the most benefit to the deer herds as a result of the potential to prevent the amplification, spread, and establishment of CWD.

As a result, Alternative B was selected as the environmentally preferred alternative because it best protects the deer herds of the battlefields and surrounding lands from CWD. Deer are an important natural resource and component of the cultural landscapes in the battlefields, and also an important regional environmental resource. Although both alternatives B and C provide the same means for early detection, initial response under alternative B includes the possibility of a one-time population reduction that would bring deer densities within the battlefields to similar levels found outside the park units. This would better alleviate an important CWD amplification risk factor when compared to alternative C. If the disease were detected in or near the battlefields, the option of a one-time population reduction would also better prevent environmental (soil) contamination that contributes to CWD transmission by removing the greatest number of deer that could be sources of CWD prions. Alternative A was not considered the

environmentally preferred alternative because it is the least likely to prevent the amplification, spread, and establishment of CWD, which could have long-term, deleterious effects on the survival of the deer herds.

NPS PREFERRED ALTERNATIVE

To identify the preferred alternative, the planning team evaluated each alternative based on its ability to meet the plan objectives (see table 6) and the potential impacts on the environment (in the “Environmental Consequences” chapter and summarized in table 7). Alternative B was identified as the NPS preferred alternative. This alternative fully meets all objectives of the plan, with the exception of minimizing impacts to park management and operations. However, when compared to alternative A, both alternatives B and C include detection and initial response actions not currently available, but necessary to help prevent the amplification, spread, and establishment of CWD. In addition, even though there would be impacts on park operations and management, the NPS would still be able to manage and operate the battlefields to meet their missions.

Alternative B was selected as the preferred alternative over alternative C because it provides a full range of options, including a one-time population reduction under certain circumstances, which provides more flexibility to effectively and efficiently address CWD and coordinate with state actions. This flexibility also provides the most opportunity to take appropriate actions when necessary based on the ongoing evaluation of CWD risk factors. As discussed in the analysis of the environmentally preferred alternative and in the “Environmental Consequences” chapter, alternative B best protects the deer herd in the long-term. As a result, it would also provide the most benefit to this component of the cultural landscapes; to visitors by minimizing the potential for seeing CWD-infected deer; and to socioeconomic by minimizing potential impacts to hunting opportunities outside the battlefields by maintaining a viable deer herd in the long-term.

Alternative A (no action) fails to meet or fully meet many objectives of the plan, or the purpose and need for action. It does not provide a range of CWD detection and initial response actions to address threats to park natural resources and components of the cultural landscapes, primarily white-tailed deer populations, from the establishment or spread of CWD.

Affected Environment

AFFECTED ENVIRONMENT

The “Affected Environment” describes existing conditions for those elements of the natural and cultural environments that would be affected by the implementation of the actions considered in this EA. The natural environment components addressed include white-tailed deer, vegetation, and other wildlife and wildlife habitat. The cultural environment components include cultural landscapes and archeological resources. Socioeconomics, visitor use and experience, health and safety, and park management and operations are also addressed. Impacts for each of these topics are then analyzed in the “Environmental Consequences” chapter.

WHITE-TAILED DEER

Antietam and Monocacy National Battlefields provide habitat for the white-tailed deer (*Odocoileus virginianus*) populations that occur in their vicinity. White-tailed deer occur throughout most of the contiguous United States, except in portions of the West (Baker 1984). Before European settlement, North American white-tailed deer populations are estimated to have been between 23 and 24 million, or about 8 to 11 deer per square mile (McCabe and McCabe 1984). These deer population numbers declined dramatically in the eastern United States after European settlement. During recent years, the state of Maryland has seen a resurgence of white-tailed deer. Rare at the turn of the twentieth century, deer populations in Maryland have not only rebounded, but now number more than at any time in history. The white-tailed deer is an adaptable animal that has been favorably exploiting changes in habitat brought about by agricultural changes and the land use patterns associated with suburban development (MDNR 1998). Prior to the 2007–2008 deer hunting season, Maryland’s deer population was estimated to be 228,000 deer, a slight decline of about 2.5% over the 2006–2007 estimates of 234,000 (MDNR 2008).

GENERAL ECOLOGY

White-tailed deer are medium-sized ungulates, native to North America, and regarded as one of the most adaptable mammals in the world (Hesselton and Hesselton 1982). Among the reasons for this adaptability are the hardiness, reproductive capability, ability to accept a wide range of plant species as food, and tolerance/adaptability for close contact with humans.

Ungulate – A hoofed, typically herbivorous, animal; includes horses, cows, deer, elk, and bison.

Most abundant in the eastern woodlands, white-tailed deer are typically forest dwellers, but often frequent wetlands or woodland openings while feeding. Deer also forage along forest margins, in orchards, and on farmlands. When deer populations become excessive, damage to crops and woodlands may result, and, in addition, their winter food may be reduced to the point where starvation results (Martin et al. 1951).

The natural diet of white-tailed deer consists of twigs from shrubs and trees, as well as herbaceous (non-woody) plants, which are eaten frequently in spring and summer when they are abundant. Acorns, blackgum fruits, persimmons, and other kinds of fruits are consumed in late summer and fall. Some of the plants that deer browse heavily in the winter season are selected by necessity rather than choice (Martin et al. 1951).

ANTIETAM NATIONAL BATTLEFIELD

POPULATION DENSITY

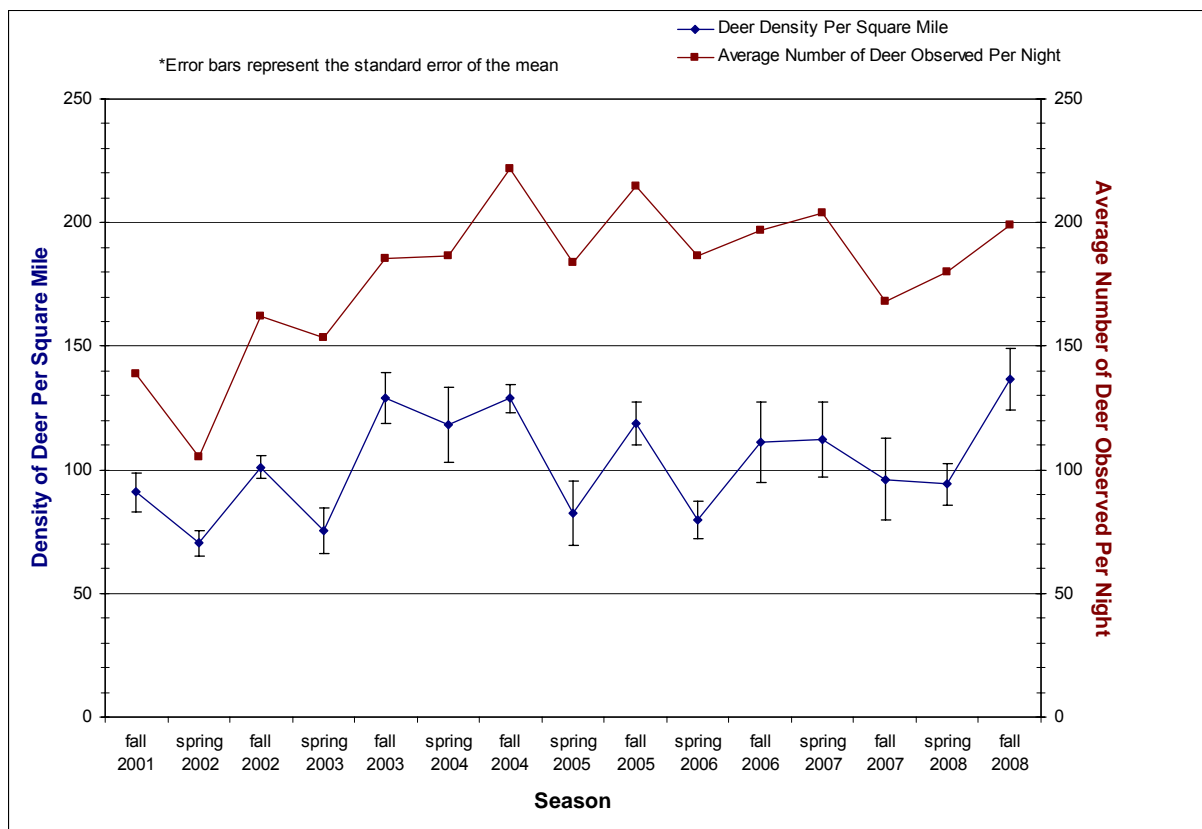
Deer density fluctuates based on factors such as herd health, habitat conditions, or weather conditions in any particular year. Deer density surveys at Antietam National Battlefield have been conducted every April and November since 2001 to estimate the size of the herd within the battlefield (see table 8 and figure 7, which shows density by season and the margin of error). Based on these surveys, the average fall

density in the battlefield from 2001 to 2008 was 114 deer per square mile, and the average spring density from 2001 to 2008 was 90 deer per square mile (Wenschhof 2009a) (Densities historically found in areas surrounding the battlefield are estimated at 25 to 45 deer per square mile (Bates 2009)). For the purposes of this EA, when considering deer density at Antietam National Battlefield, the fall density numbers, which ranged from 91 to 137 deer per square mile, are used.

TABLE 8: DEER DENSITY AT ANTIETAM NATIONAL BATTLEFIELD

Year	Spring Density (deer per square mile)	Fall Density (deer per square mile)
2001	Not Available	91
2002	70	101
2003	75	129
2004	118	129
2005	83	119
2006	80	111
2007	112	96
2008	94	137

Source: Wenschhof 2009a



Source: Donaldson 2007

FIGURE 7: DEER DENSITY AT ANTIETAM NATIONAL BATTLEFIELD

DEER MOVEMENT

Between August 2004 and January 2005, Antietam National Battlefield captured and tagged 117 deer (7 of which died initially) for movement studies. The results showed that 19 females, captured as fawns, traveled an average of 0.8 miles (1.29 km). Twenty males, captured as fawns, traveled an average of 2.4 miles (3.86 km), with one traveling as far as 5.0 miles (8.05 km) and one traveling 13 miles (20.92 km). Forty-two females, captured as adults, traveled an average of 0.9 miles (1.45 km), with one female traveling as far as 6.5 miles (10.5 km) before returning to the park. Five males, captured as adults, traveled an average of 1.3 miles (2.09 km). The study indicated that female deer likely will remain on or near Antietam National Battlefield, and that males may exhibit longer movements that could not be detected due to small sample size (only 35 fawn, yearling, and adult males were captured during this study, and 15 of those were seen/harvested off NPS property) (NPS 2006e).

DEER HERD HEALTH

The Southeastern Cooperative Wildlife Disease Study from the University of Georgia conducted a study of five deer in 2002 to determine the health of the herd at Antietam National Battlefield. The study examined a variety of health parameters to evaluate the syndrome of parasitism/malnutrition, which tends to be largely dependent on deer density. The results indicated there was no evidence of degraded body condition, but based on the moderately high number of parasites (stomach worms) detected in the five deer, the herd may be near the upper limit of nutritional carrying capacity. The study also showed that selected infectious diseases are not prevalent within the herd, and that substantial disease-related mortality is not occurring. However, there is little herd immunity to hemorrhagic disease (only animals four years of age or older may have antibodies to the disease), and a previous infection may have occurred around four years ago (Southeastern Cooperative Wildlife Disease Study 2002).

Antietam National Battlefield has a road kill and fatality monitoring database and conducts opportunistic surveillance for CWD. Because of the similarities in the symptoms of CWD and other diseases, it is important to do necropsies and diagnostic testing to confirm the cause of death or illness. To date, there have been no positive CWD tests.

MONOCACY NATIONAL BATTLEFIELD

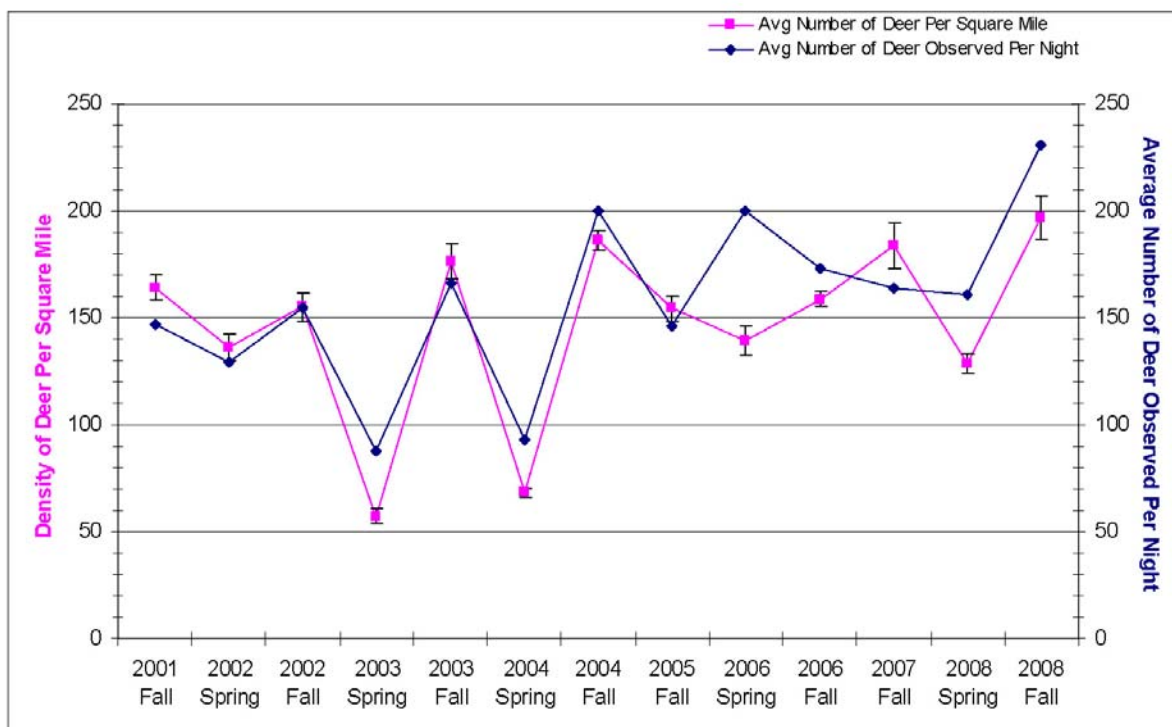
POPULATION DENSITY

Monocacy National Battlefield conducted deer density studies from 2001 to 2008 (see table 9 and figure 8, which shows density by season and the margin of error). Based on these studies, the average fall deer density from 2001 to 2008 was 164 deer per square mile; the average spring density from 2001 to 2008 was 134 deer per square mile (spring density data was not collected in 2004, 2005 or 2007) (Banasik 2006, 2009a) (Densities historically found in areas surrounding the battlefield are estimated at 25 to 45 deer per square mile (Bates 2009)). For the purposes of this EA, when considering deer density at Monocacy National Battlefield, the fall density numbers, which ranged from 121 to 197 deer per square mile, are used.

TABLE 9: DEER DENSITY AT MONOCACY NATIONAL BATTLEFIELD

Year	Spring Density (deer per square mile)	Fall Density (deer per square mile)
2001	199	152
2002	139	121
2003	63	155
2004	68	185
2005	Not Available	155
2006	139	159
2007	Not Available	184
2008	129	197

Source: Banasik 2006 and Banasik 2009a



Source: Banasik 2009c

FIGURE 8: DEER DENSITY AT MONOCACY NATIONAL BATTLEFIELD

DEER MOVEMENT

Deer movement studies have not been conducted for Monocacy National Battlefield. Given the similar nature of the habitats available at Antietam and Monocacy National Battlefields (protected forest and agricultural fields), it could be assumed that deer movements might be similar. However, the area surrounding Monocacy is more developed, providing less area for dispersal, which could restrict some movements.

DEER HERD HEALTH

The Southeastern Cooperative Wildlife Disease Study also conducted a study in 2002 at Monocacy National Battlefield to determine herd health. Based on examining five deer, researchers concluded that body condition was fair to good. The moderate number of parasites present indicated that the population is near nutritional carrying capacity, although parasite levels were not sufficient to be of immediate concern. The study also showed that most selected infectious diseases were not prevalent within the herd, and that substantial disease-related mortality was not occurring. However, pathologic evaluations showed damaged tissue in several organ systems, including moderate to severe pleuritis (inflammation of the lungs) in three deer, two of which showed unusually severe signs. In four out of the five deer, the researchers also noted high levels of antibodies to a virus known to cause pleuritis. However, the cause of the visible damage in the three deer with pleuritis was unknown, and researchers could not rule out a population-wide problem (Southeastern Cooperative Wildlife Disease Study 2002).

This study also showed that the deer at Monocacy National Battlefield have little or no herd immunity to hemorrhagic disease. As at Antietam National Battlefield, only the oldest members of the population may have antibodies to this disease (Southeastern Cooperative Wildlife Disease Study 2002). Battlefield staff have monitored for hemorrhagic disease since 2002, and attributed several deer mortalities to the disease (approximately 30 to 35) since then. In addition, some universities do research, including pellet counts and drives. Battlefield staff have also begun targeted and opportunistic surveillance for CWD. Because of the similarities in the symptoms of CWD and other diseases, it is important to conduct necropsies and diagnostic testing to confirm the cause of death or illness.

DISEASES OF CONCERN

There are a number of diseases of concern in eastern deer populations. These include parasites, malnutrition, bluetongue virus, and epizootic hemorrhagic disease. CWD has recently been documented within 60 miles of the battlefields. These diseases are briefly described below, in addition to pleuritis, a disease of potential concern as identified in the Monocacy National Battlefield herd health check.

PARASITISM

Parasitism occurs when an organism grows, feeds, and is sheltered on or in a different organism, resulting in a type of symbiosis in which one species benefits at the expense of the other. There are many varieties of parasites, both internal and external. Parasites can have a variety of consequences from minimal to marked on an individual or population.

MALNUTRITION

Malnutrition is the condition that develops when the body does not get adequate amounts of protein, fat, carbohydrates, water, vitamins, minerals, and other nutrients necessary to maintain healthy tissues and organ function.

BLUETONGUE VIRUS

Bluetongue virus is an insect-transmitted, viral disease of ruminant mammals, including white-tailed deer. A bluetongue virus infection causes inflammation, swelling, and hemorrhage of the mucous membranes of the mouth, nose, and tongue. Inflammation and soreness of the feet also are associated with bluetongue virus. Bluetongue virus is considered by the Office International des Epizooties (the international organization that sets animal health standards) to be a disease that has the potential to spread rapidly. White-tailed deer can be severely affected by bluetongue virus because virus infections cause hemorrhaging and sudden death, and the mortality rate can be extremely high (APHIS 2003).

Bluetongue virus is spread from animal to animal by biting gnats. Animals cannot directly contract the disease from other animals. The disease is most prevalent in the United States in the southern and

southwestern states. It is currently almost nonexistent in the upper north central and northeastern states, where biting flies do not appear able to transmit the viruses (APHIS 2003).

Bluetongue virus is a seasonal disease that is generally observed in the late summer and early fall. Virus transmission begins in the early spring with the onset of insect flight activity and continues until the first hard frosts (APHIS 2003).

EPIZOOTIC HEMORRHAGIC DISEASE

Epizootic hemorrhagic disease is an insect-borne viral disease of ruminants that is quite similar to bluetongue virus. The disease causes widespread hemorrhages in mucous membranes, skin, and viscera, the result of disseminated intravascular clotting (disorder in which the proteins that control blood clotting become abnormally active). Strains of epizootic hemorrhagic disease can cause widespread vascular lesions similar to those described for bluetongue virus. Degenerative changes (focal hemorrhage (localized hemorrhage) or dry and gray-white appearance, or both) in striated musculature are prominent in the esophagus, larynx, tongue, and skeletal muscles. Epizootic hemorrhagic disease in white-tailed deer can lead to death. Often deer are found dead around waterholes, suggesting that they had a high fever and were dehydrated (Stott 1998).

Not all deer infected with epizootic hemorrhagic disease or bluetongue virus will die; this is known because many normal deer have antibodies that indicate prior exposure to various viruses. Deer that recover develop immunity to the specific virus, which protects against reinfection by the same virus. However, it is not known how well this immunity cross-protects deer against other hemorrhagic viruses. When deer survive infection with a virus from one virus type (epizootic hemorrhagic disease or bluetongue virus), there is good evidence to indicate they are not protected from disease caused by subsequent infection with a different virus strain (Southeastern Cooperative Wildlife Disease Study 2000).

CHRONIC WASTING DISEASE

As described more fully in the “Purpose of and Need for Action” chapter, CWD belongs to a group of diseases known as transmissible spongiform encephalopathies, which include scrapie, bovine spongiform encephalopathy, and CJD. The diseases are grouped because of similarity in clinical features, pathology, and presumed etiology: the infectious agents are hypothesized to be prions (infectious proteins without associated nucleic acids). Transmissible spongiform encephalopathies cause distinctive lesions in the brain and consistently result in death.



Deer infected by CWD

Deer and elk affected by CWD show loss of body condition and changes in behavior. Affected animals may demonstrate a variety of behavioral signs, including decreased fear of humans and isolation from the remainder of the herd. Animals in the later stages of the disease become emaciated. Excessive drinking and urination are common in the terminal stages because of specific lesions in the brain. Many animals in terminal stages salivate and drool excessively. Death is inevitable once clinical signs are visible.

The clinical course of CWD varies from a few days to several months. While a protracted clinical course is typical,

occasionally death may occur suddenly; this may be more common in the wild than in the relative security of captivity.

The health risk for humans consuming elk or deer infected with CWD is unknown; however, the risk is likely extremely low. This risk is based on an analysis of existing research studies that indicate no established link between the disease and similar human transmissible encephalopathy diseases. Current literature reviews and experts agree that more information is needed and that many questions remain unanswered about the transmissibility of CWD to humans.

PLEURITIS

Pleuritis is an inflammation of the lining that covers both the outside of the lungs and the inside of the chest cavity (pleura). When either side gets inflamed, the pleura tends to thicken and get sticky, irritating the lungs and restricting lung movement within the chest. Pleuritis can be caused by a variety of problems, such as bacterial or viral infections of the pleura, trauma, tumors, toxins, parasites, etc. (Powers 2007).

VEGETATION

Vegetation at the battlefields consists of croplands, grasslands, and woodlands. Various actions taken as part of CWD detection and initial response could affect vegetation from trampling, inadvertent spread of exotic plant species, or by changing the number of deer that graze on vegetation.

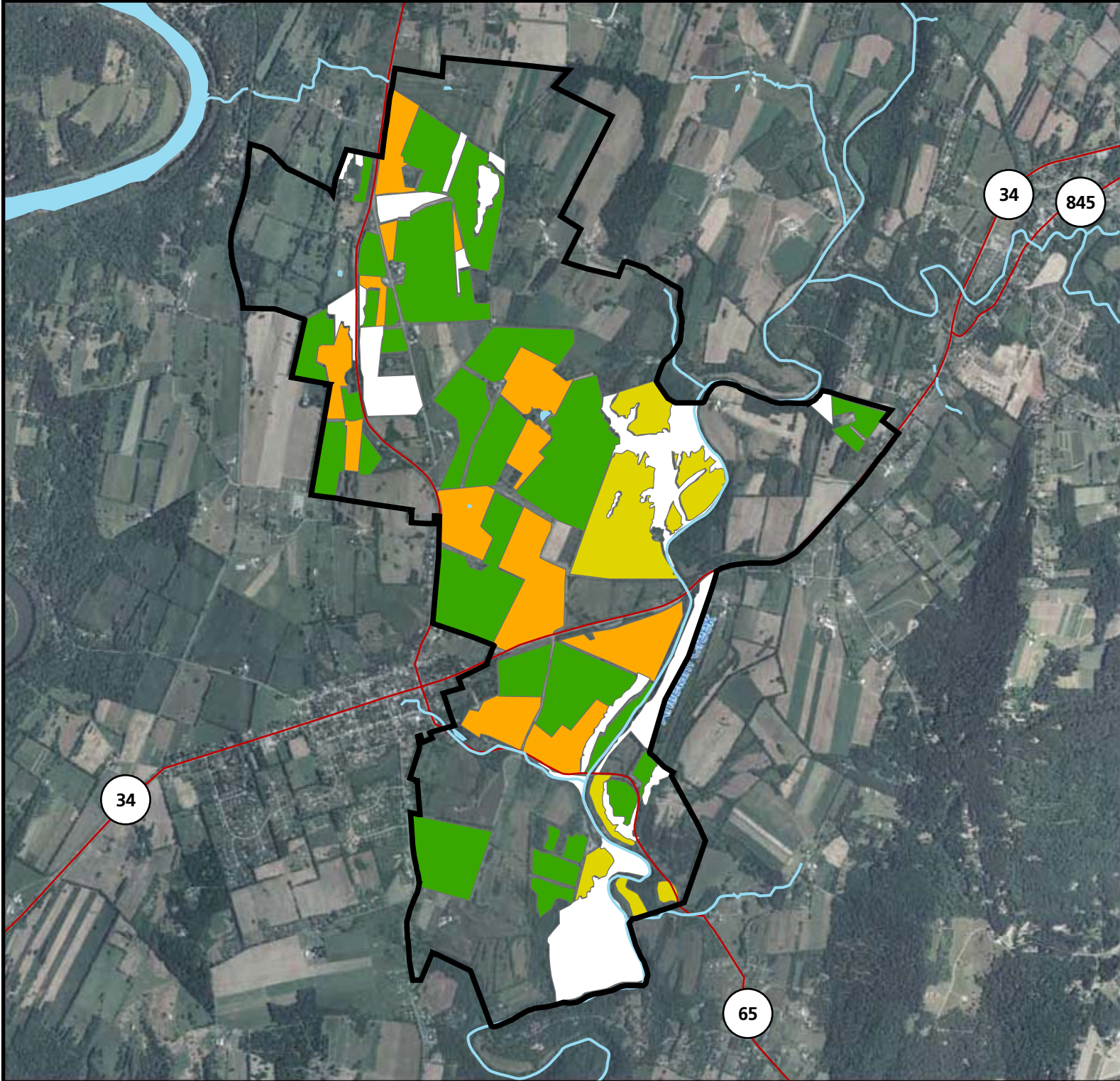
ANTIETAM NATIONAL BATTLEFIELD

A vascular plant survey was conducted at several National Capital area parks, including Antietam, in 2003–2004 (Engelhardt 2005). This study documented 576 species at Antietam National Battlefield, including species of the highly diverse limestone woodlands (Snively Ford Woods) and a relatively extensive riparian woodlands along Antietam Creek. As shown on figure 9, the majority of the land within the battlefield is in agricultural production (crops, grass/hay, or pasture), with large woodland stands scattered throughout.

Chronic Wasting Disease EA

Antietam National Battlefield, Maryland

National Park Service
U.S. Department of the Interior



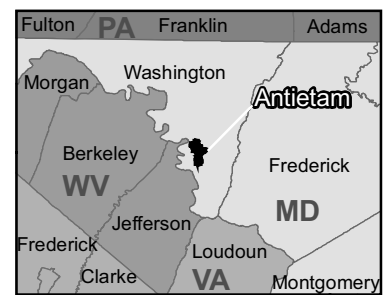
Land Cover

- Crop Field
- Grass / Hay
- Pasture
- Woodland

Figure 9. Land Cover

- Park Boundary
- Roads
- Streams / Rivers / Waterbodies

0 1,500 3,000 4,500
Feet



Source: GIS files provided by the National Battleground

These woodlands include oak (*Quercus* spp.)/hickory (*Carya* spp.) wooded areas with excellent structure that support many canopy and understory species. Canopy trees include northern red oak (*Quercus rubrum*), American beech (*Fagus grandifolia*), bitternut hickory (*Carya cordiformis*), red maple (*Acer rubrum*), and tulip poplar (*Liriodendron tulipifera*). The understory is well developed and includes shrubs such as flowering dogwood (*Cornus florida*), spicebush (*Lindera benzoin*), and witch hazel (*Hamamelis virginiana*), as well as a herbaceous layer that includes spring wildflowers such as toadshade (*Trillium sessile*), bloodroot (*Sanguinaria canadensis*), yellow trout lily (*Erythronium rostratum*), Dutchman's britches (*Dicentra cucullaria*), toothwort (*Cardamine* spp.), spring beauty (*Claytonia* spp.), Virginia bluebells (*Mertensia virginica*), and hepatica (*Hepatica* spp.) (NPS 2006h).

Although Antietam's flora is comprised of many native plants, invasive exotic species are very common and in late summer they form a dominant ground layer of garlic mustard, (*Allaria petiolata*), Japanese stiltgrass (*Microstegium vimineum*), and Japanese honeysuckle (*Lonicera japonica*). Other invasive species of concern in these areas, as well as the agricultural lands at Antietam National Battlefield, include tree-of-heaven (*Ailanthus altissima*), multi-flora rose (*Rosa multiflora*), Johnson grass (*Sorghum halepense*), Canada thistle (*Cirsium arvense*), and bull thistle (*Cirsium vulgare*), as well as Japanese hops (*Humulus japonicus*) in riparian areas (NPS 2006h; Donaldson 2008).

Farmers currently using land at Antietam National Battlefield under a Special Use Permit grow a variety of grains, as well as pasture and hay grasses. Primary crops are corn and soybeans; other grains grown include oats, wheat, barley, and rye. Farms also produce a mixed hay crop of clover, orchardgrass, timothy, and periodically alfalfa. Pastures contain primarily cool season fescues and bluegrass, although some orchardgrass and warm season grasses including little bluestem are present (Wenschhof 2007a). In addition, several areas have been planted with trees, shrubs, or other vegetation. Ornamental trees and shrubs planted at the farmsteads include walnut (*Juglans* sp.), silver maple (*Acer saccharinum*), eastern white pine (*Pinus strobus*), and lilac (*Syringa vulgaris*) (NPS 2003, 2004a, 2005b). Landscaping plantings of trees, shrubs, and groundcover also occur around the visitor center. These include dogwoods (*Cornus* spp.), holly (*Ilex* spp.), oaks, juniper (*Juniperus* spp.), rhododendron (*Rhododendron carolinianum*), ferns, and ivy (*Hedera* spp.) (NPS 2003).

"Successional" refers to the process of ecosystem development as brought about by changes in the populations of species that results in the creation of a geographic region with particular characteristics.

MONOCACY NATIONAL BATTLEFIELD

Several vegetation studies have been conducted or are being conducted at Monocacy National Battlefield. The 2003–2004 survey (Engelhardt 2005) documented 438 species of vascular plants; many of which are considered exotic. Approximately 40% of the land within the battlefield is wooded (see figure 10), and contains a mix of upland and riparian communities.



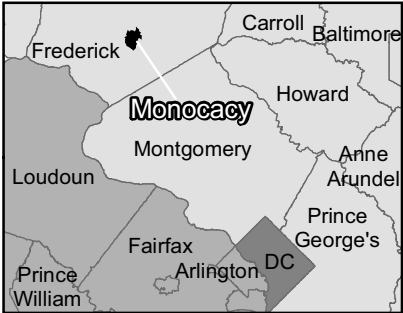
Land Cover

- Crop Field
- Grass / Hay
- Pasture
- Woodland

Figure 10. Land Cover

- Park Boundary
- Roads
- Streams / Rivers / Waterbodies

0 1,000 2,000 3,000 Feet



These woodlands are a mix of old-field successional and second- and third-growth mature hardwood woodlands. Drier upland woodlands support canopy trees such as oak, hickory, and American beech (NPS 2006a). Although native understory vegetation in these woodlands is limited, subcanopy and shrub layers support flowering dogwood, spicebush, witch hazel, and pokeweed (*Phytolacca americana*); goldenrod (*Solidago* spp.) and asters (*Aster* spp.) occur in the herbaceous layer. The battlefield has placed a high priority on removing the following exotic species, which have invaded these woodlands: Japanese barberry (*Berberis thunbergii*), Japanese honeysuckle, garlic mustard, and Japanese stiltgrass (Banasik 2007a; NPS 2006a).

Riparian woodlands found in the floodplain of the Monocacy River and along other streams are dominated by maple (*Acer* spp.), sycamore (*Platanus occidentalis*), hackberry (*Celtis occidentalis*), and ash (*Fraxinus* spp.). As with the upland woodlands, the understory of these woodlands support a mix of native and exotic species including those described above. In addition, the exotic species Japanese hops and mile-a-minute (*Polygonum perfoliatum*) also occur in riparian woodlands. Other native species include grapevine (*Vitis* spp.), as well as several herbaceous species, including Virginia bluebells, spring beauty, yellow trout lily, and other wildflowers (Banasik 2007a).

Recently disturbed (old-field) areas are characterized by tree species such as tulip poplar, black cherry (*Prunus serotina*), black locust (*Robinia pseudoacacia*), box elder (*Acer negundo*), and the exotic tree-of-heaven (NPS 2006a).

Farmers currently renting land from the NPS at Monocacy National Battlefield grow a variety of grains, corn, soybeans, and pasture and hay grasses on the Thomas, Best, Worthington, Baker and Lewis farms. Grains include winter wheat and winter barley, and pasture and hay grasses include orchardgrass, timothy, and alfalfa (NPS 2002a; Banasik 2007a). In addition, several areas have been planted with trees, shrubs, or other vegetation. There are lines of Osage orange (*Maclura pomifera*) trees, originally planted to act as “living fences,” and stands of white pine trees around the battlefield. More recently, perennial and annual flower beds have been planted near Gambrill Mill, along with other ornamental landscaping plants such as crab apple (*Malus* sp.) and serviceberry (*Amelanchier arborea*) (NPS 2002a). The battlefield has placed a high priority on removing the following exotic species from the agricultural areas: Johnson grass, Canada thistle, and bull thistle (NPS 2006a).

OTHER WILDLIFE AND WILDLIFE HABITAT

The mix of fields and wooded areas at both battlefields provide habitat for a variety of mammals, birds, reptiles, and amphibians, which could be affected by actions taken for CWD detection and initial response. Because impacts to fish and fish habitat would not occur, as described in the “Issues Considered but Dismissed from Further Analysis” section of the “Purpose of and Need for Action” chapter. Fish are not discussed below.

ANTIETAM NATIONAL BATTLEFIELD

MAMMALS

In addition to the white-tailed deer, a number of other mammals occur at the battlefield. Common small mammals include the eastern cottontail (*Sylvilagus floridanus*), white-footed mouse (*Peromyscus leucopus*), deer mouse (*Peromyscus maniculatus*), gray squirrel (*Sciurus carolinensis*), chipmunk (*Tamias striatus*), and short-tailed shrew (*Blarina brevicauda*) (NPS 2006h). Medium-sized mammals commonly observed at the battlefield include red fox (*Vulpes vulpes*) and groundhog (*Marmota monax*) (NPS 2006h). The coyote (*Canis latrans*) is known to occur at Antietam National Battlefield, and black bear (*Ursus americanus*) have been reported in the vicinity.

BIRDS

Surveys throughout Antietam National Battlefield have identified more than 77 bird species, including raptors (birds of prey), wading birds, and migratory birds. Barred owl (*Strix varia*) and great horned owl (*Bubo virginianus*) and raptors such as red-tailed hawk (*Buteo jamaicensis*) and red shoulder hawk (*Buteo lineatus*) that are known to live at the battlefield depend on other birds and mammals for food. Scavengers like the crow (*Corvus brachyrhynchos*) and turkey vulture (*Carthartes aura*) rely on the remains of other animals, including deer, for food.

Many of the bird species found at Antietam National Battlefield nest on or near the ground, using grasses and other low-growing vegetation for building nests and concealment. These include the wild turkey (*Meleagris gallopavo*), grasshopper sparrow (*Ammodramus savannarum*), and eastern towhee (*Pipilo erythrophthalmus*). Birds that nest in the upper understory or canopy include indigo bunting (*Passerina cyanea*) and northern cardinal (*Cardinalis cardinalis*) (NPS 2006h). The upper canopy also supports cavity-nesting birds such as the red-headed woodpecker (*Melanerpes erythrocephalus*) and black-capped chickadee (*Poecile atricapillus*) (NPS 2006h). Many of these birds depend on older trees that have natural cavities or weakened sections that can be hollowed out for nesting.

REPTILES AND AMPHIBIANS

Snakes and turtles are abundant in the habitats of Antietam National Battlefield, inhabiting wet or wooded areas as well as open grassy fields (NPS 2006h). These habitats provide important sun and shade for regulating body temperatures in reptiles. Some species that occur at the battlefield include the eastern garter snake (*Thamnophis sirtalis sirtalis*), northern ringneck snake (*Diadophis punctatus edwardsii*), common snapping turtle (*Chelydra serpentina serpentina*), and eastern painted turtle (*Chrysemys picta*) (NPS 2006h).

Nearly all amphibians live the first part of their lives in water and the second part on land. Those that occur in Antietam National Battlefield include frogs, toads, salamanders, and caecilians (rare, limbless amphibians that live and burrow in the soil or in aquatic areas). Species observed at the battlefield in a 2000 to 2001 survey included long-tailed salamander (*Eurycea longicauda*), northern dusky salamander (*Desmognathus fuscus*), bullfrog (*Rana catesbeiana*), American toad (*Bufo americanus*), northern spring peeper (*Pseudacris crucifer*), and wood frog (*Rana sylvatica*) (NPS 2006h).

MONOCACY NATIONAL BATTLEFIELD

MAMMALS

A total of 34 different species of mammals have been known to occur at Monocacy National Battlefield. Most of these are small mammals that live underground in small burrows, including northern short-tailed shrew, the woodland vole (*Microtus pinetorum*), the muskrat (*Ondatra zibethicus*), the meadow jumping mouse (*Zapus hudsonius*), and the hairy-tailed mole (*Parascalops breweri*). Other small mammals commonly observed include the gray squirrel and chipmunk (NPS 2006a, 2006i). Medium-sized mammals commonly observed at the battlefield include red fox, groundhog and raccoon (*Procyon lotor*). In addition to white-tailed deer, other large mammals that have been observed include coyote and transient black bear (NPS 2006, 2006i).

BIRDS

Approximately 80 species of birds, including raptors (birds of prey), waterfowl, wading birds, shorebirds, and migrants, are known to occur in the habitat provided at the battlefield (NPS 2006i). The barred owl and great horned owl, and raptors such as red-tailed hawk and red shoulder hawk, depend on other birds and mammals for food. Scavengers like the crow and turkey vulture rely on the remains of other animals, including deer, for food.

Many of the bird species found at Monocacy National Battlefield nest on or near the ground, using grasses and other low-growing vegetation for building nests and concealment. These include the northern harrier (*Circus cyaneus*), mallard (*Anas platyrhynchos*), killdeer (*Charadrius vociferous*), spotted sandpiper (*Actitis macularius*), vesper sparrow (*Pooecetes gramineus*), field sparrow (*Spizella pusilla*), eastern meadowlark (*Sturnella magna*), and wild turkey (NPS 2006i).

Birds that nest in the upper understory or canopy include the red-eyed vireo (*Vireo olivaceus*), wood thrush (*Hylocichla mustelina*), acadian flycatcher (*Empidonax virescens*), northern cardinal, and yellow-throated vireo (*Vireo flavifrons*) (NPS 2006i).

The upper canopy also supports cavity-nesting birds such as various woodpeckers, Carolina chickadee (*Parus carolinensis*), and tufted titmouse (*Parus bicolor*) (NPS 2006i). Many of these birds depend on older trees that have natural cavities or weakened sections that can be hollowed out for nesting.

REPTILES AND AMPHIBIANS

The battlefield provides diverse habitat for reptiles and amphibians. Reptiles, which include snakes, turtles, lizards, and skinks, can be found in moist floodplains or shaded woodlands, as well as within open grassland and agricultural fields. The variety of habitats available is important for reptiles because they move between shady and sunny spots to regulate body temperatures (NPS 2006i).

Habitats for amphibians are typically associated with aquatic environments and nearby upland areas. Frogs and toads at the battlefield include the American toad and the northern spring peeper. Other amphibians found at Monocacy National Battlefield include several species of salamanders: spotted (*Ambystoma maculatum*), marbled (*Ambystoma opacum*), long-tailed, and red-backed (*Plethodon cinereus*) salamanders (NPS 2006i).

CULTURAL RESOURCES

Both Antietam and Monocacy National Battlefields were designated as national battlefields because of the important roles they played during the American Civil War. Antietam National Battlefield was listed in the National Register of Historic Places for military, conservation, and politics/government significance and place in national events of the time period 1850-1874 (36 CFR 60.4 – criterion (a)) (NPS 2009a). Monocacy National Battlefield was also listed in the National Register of Historic Places for its military significance and place in national events of the time period 1850-1874 (36 CFR 60.4 – criterion (a)) (NPS 2009b). The purpose of these battlefields reflects the need to protect and preserve the cultural resources of these areas, and options considered for CWD detection and initial response could affect both cultural landscapes and archeological resources.

CULTURAL LANDSCAPES

The NPS is charged with the stewardship of many of the nation's most important natural and cultural resources and is responsible for preserving these resources for the enjoyment of present and future generations. Cultural landscapes, as defined by The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, consist of "a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values" (NPS 1996). Cultural landscapes are the result of the long interaction between people and the land, the influence of human beliefs, and actions over time upon the natural landscape. These landscapes provide a living record of an area's past, a visual chronicle of its history. The dynamic nature of modern human life, however, contributes to the continual reshaping of cultural landscapes, making them a good source of information about specific times and places, but at the same time rendering their long-term preservation a challenge (NPS 2004b).

By their nature, cultural resources are finite and *nonrenewable*; as a result, national battlefield management activities and policies must reflect awareness of their *irreplaceable* character. Therefore, NPS cultural resource management involves research, evaluation, documentation, and registration of national battlefield resources, along with the establishment of priorities to ensure that these resources are appropriately preserved, protected, and interpreted to the public (NPS 2006a). The National Register of Historic Places recognizes the cultural landscape categories defined in NPS policy as descriptive terms; however, it officially lists the landscapes as either “districts” or “sites.”

ANTIETAM NATIONAL BATTLEFIELD

Antietam National Battlefield was designated as a historic battlefield in 1890. It was listed on the National Register of Historic Places on October 15, 1966. The entire battlefield, including the private properties within the boundary, is listed on the National Register of Historic Places as a historic district. Contributing features to the cultural landscape of the battlefield include farm fields, woods, orchards, and fence lines that were known to exist just before the battle. Also contributing are the commemorative period features, which include the observation tower, battle markers, and monuments (NPS n.d.).

Antietam National Battlefield preserves an area that has deep national significance. The battlefield is considered one of the best-preserved Civil War areas in the national park system. The farms and farmlands in and near the national battlefield appear much as they did on the eve of the battle in 1862. In the 1890s, veteran organizations from the various states erected monuments commemorating the regiments that engaged in the battle as well as larger state monuments honoring all the military units from a particular state (NPS n.d.).

Cultural landscape inventories have been conducted for four major areas of this battlefield. These inventories identify and document each landscape’s location, size, physical development, condition, landscape characteristics, and character-defining features, as well as other valuable information useful to park management. These cultural landscapes and their areas of significance are described briefly in table 10 and shown on figure 2.

TABLE 10: CULTURAL LANDSCAPES AT ANTIETAM NATIONAL BATTLEFIELD

Name	Description	Area of Significance
Mumma Farmstead	Property associated with the Samuel Mumma Farmstead at the time of the Battle of Antietam on September 17, 1862; buildings include the main farm house and large bank barn, both constructed less than a year after they were burned by Confederates during the Battle of Antietam, as well as numerous smaller outbuildings.	
Roulette Farm Component Landscape	Consists of the entire 179.5-acre property constituting the William Roulette Farmstead as it existed at the time of the Battle of Antietam.	(1) military history (1861–1865) results from its involvement with the Battle of Antietam during the Civil War; (2) conservation for its association with early Civil War battlefield preservation efforts (1890–1933) and the numerous monuments, markers, and tour roads that are its by-products; (3) agricultural history for the high level of integrity that it possesses as an intact late eighteenth to early nineteenth century agricultural landscape (1761–1861).
Miller Farm	Consists of 141.41 acres of the property constituting the D. R. Miller Farmstead as it existed at the time of the Battle of Antietam. The D. R. Miller Farmstead Component Landscape is significant in three distinct periods of history.	(1) military history (1861–1865) because of its involvement with the Battle of Antietam; (2) conservation for its association with early Civil War battlefield preservation efforts (1890–1964) and the numerous monuments, markers, and tour roads that are its by-products; (3) agricultural history as a late eighteenth/early nineteenth century agricultural landscape (1799–1861).
Antietam National Cemetery	Stands out for its concentration of large evergreen trees, predominantly Norway spruce and hemlock, which are not native to the immediate area; an imposing limestone wall, dating from 1867, but rebuilt in 1939, encloses the 10-acre cemetery and its landscaped grounds on the east, south and west.	

MONOCACY NATIONAL BATTLEFIELD

Monocacy National Battlefield was listed in the National Register of Historic Places in 1966, and its nomination was updated recently to include new properties (NPS 2006a). Except for the Gambrill House, which was individually listed on the National Register of Historic Places in 1984, the other historic structures in the national battlefield are listed as contributing resources to the battlefield's National Register nomination (NPS 2006a).

In 1973, the Secretary of the Interior designated the national battlefield a National Historic Landmark, recognizing it as a site of exceptional importance possessing national significance. A cultural resource study for the national battlefield was undertaken in 1999 and has been updated several times to reflect new research and property acquisitions (NPS 2006a).

The NPS completed a cultural landscape inventory of the entire national battlefield in 2000 (NPS 2000) and a number of recent architectural, archeological, and historic research projects have contributed greatly

to understanding the national battlefield's cultural landscape. Such studies also have helped to establish the historic context of the national battlefield's many cultural resources.

Before the Civil War, the area now occupied by the battlefield was a productive agricultural and milling community surrounding Monocacy Junction and other important transportation features in the vicinity. The rolling hills of the Monocacy River Valley were fertile lands on which a variety of crops were produced, ranging from corn, wheat, and other small grains to vegetables and dairy products.

The properties that make up Monocacy National Battlefield reflect nearly three centuries of historic occupation and development around the Monocacy River crossroads. The buildings, structures, circulation systems, materials, organization, and open space all contribute to the historic agricultural, milling, and early twentieth century commemorative landscape qualities of the battle site. Monocacy National Battlefield's many remaining historic structures combine with the railroad, highways, and farm fields to form a remarkably intact eighteenth and nineteenth century agrarian landscape.

The five component farmsteads that make up the cultural landscape for Monocacy National Battlefield include: the Hermitage, the Araby community, Baker Farm, Hill Farm, and Clifton. A number of eighteenth and nineteenth century dwelling houses and agricultural outbuildings were clustered on the battlefield's five component farmsteads, along with mills, warehouses, and other structures associated with the Gambrill milling complex. Many of these structures are still extant on the battlefield landscape. The five farmsteads are described briefly in table 11 and in figure 3.

TABLE 11: FARMSTEADS AT MONOCACY NATIONAL BATTLEFIELD

Name	Description
Hermitage Farmstead	748 acres, located generally within the area shown as "Best Farm"; the number of slaves recorded to work the area suggests plantation type agriculture.
Araby Community	1,111-acre property; between 1812 and 1832, John McPherson and his son assembled various portions of adjacent tracts that became known as the Araby community, which generally encompasses the areas shown as the Gambrill and Thomas Farms; composed mainly of farms with a few mills throughout the property; Araby Mills, operated profitably for many years, significantly influencing the development of the Monocacy area.
Baker Farm	Purchased in 1841 and is composed of 500-acres; Baker Farm shared the characteristics of neighboring farms: fertile soil, access to water, woodlands, and links to both the Georgetown and Buckeystown pikes via Baker Valley Road.
The Hill Farm	10 acres of land purchased in 1819; includes that area located south and east of the Baker Valley Road, the southernmost portion of the battlefield.
Clifton Farmstead	Located in the general area shown as "Worthington Farm"; Clifton had a very productive agricultural enterprise during the period before the Battle of Antietam. After the battle the agricultural industry continued to prosper in this area. By 1860 the properties that would one day make up the Monocacy National Battlefield were in their present recognizable form (NPS 2000).

Layered upon this eighteenth and nineteenth century agrarian (agricultural or farming) landscape is an early twentieth century Civil War commemorative component, along with other features associated with NPS management functions. Monocacy National Battlefield preserves a unique "crossroads community" whose diverse history spans more than 250 years. These landscape layers combine to result in a high level of integrity, character, and feeling (NPS 2006a).

ARCHEOLOGICAL RESOURCES

Archeological resources are the remains of past human activity and records documenting the scientific analysis of these remains. These resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the National Park system reflect a commitment to the conservation of archeological resources as elements of our national heritage.

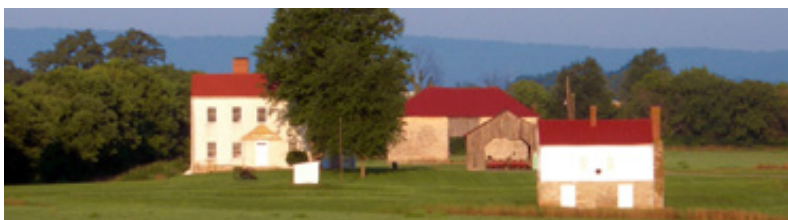
ANTIETAM NATIONAL BATTLEFIELD

Since 1994, the NPS has been conducting surveys to locate, identify, and inventory archeological sites within Antietam National Battlefield. Many projects are focused on the archeological remains of the Battle of Antietam, its aftermath, and the farms and small plantations that made up the cultural landscape (NPS 2002c). Approximately 5 percent of the park has been surveyed for archeological data (Custer 2009), including approximately 40 percent of the North Woods, portions of the East Woods on the D.R. Miller Farm, West Woods, Burnside Bridge Area, portions of the Piper Farm, and other smaller areas. Hundreds of military artifacts, as well as Native American artifacts, have been uncovered within the boundaries of the Battlefield.

MONOCACY NATIONAL BATTLEFIELD

Monocacy National Battlefield has conducted, or is in the process of conducting, surveys for archeological resources. The Best Farm has had extensive inventory and evaluation, and the Thomas Farm is in the process of receiving the same. Varying degrees of other archeological resource information exist for the component properties sometimes conducted in compliance with Section 106 of the *National Historic Preservation Act* of 1966, as amended.

Intensive prehistoric occupations occurred in the Monocacy River Valley, particularly in association with the river. Prehistoric occupations of Monocacy National Battlefield have been documented archeologically at the Best, Thomas, and Worthington farms, and there is probably evidence of such occupations at other component properties.



Farm at Monocacy

At the Best and Thomas farms, eighteenth century historic occupations have been documented in the form of previously unrecorded structures, features, and activity areas. Archeological research at these properties has yielded important information about eighteenth and early nineteenth century occupations of these sites.

A number of Civil War-era archeological resources also have been discovered at the Monocacy Battlefield. There are outbuildings and other features associated with nineteenth century component properties such as the Lewis, Worthington, and Baker farms and the Gambrill tract. It is likely that archeological investigations at the Gambrill Mill and in the Wallace's headquarters site will reveal more about the composition and chronology of these sites.

During the 1862 Maryland and 1863 Gettysburg campaigns, troops from the Union and Confederate armies encamped on what would become Monocacy National Battlefield. A long-term encampment, known historically as Camp Hooker, exists within the battlefield's congressional boundary and has been identified archeologically. Archeological evidence of short-term campsites also has been documented on the Best Farm, and subsurface remains of the battle itself (dropped and fired small arms projectiles, artillery shell fragments, weapons, personal items) also have been documented on the Best Farm.

However, because the 1864 battle encompassed a large area, the potential exists for the presence of military artifacts almost anywhere within the national battlefield's boundaries.

SOCIOECONOMICS

Options for CWD detection and initial response could affect deer populations both within and outside the battlefields, with associated impacts on hunting, crops, and park visitation, which contribute to the local economy. The focus of this overview is the area immediately surrounding the battlefields, with an emphasis on deer-related crop damage or landscape damage to neighboring properties.

REGIONAL AND SOCIOECONOMIC OVERVIEW FOR ANTIETAM NATIONAL BATTLEFIELD

Antietam National Battlefield is located in southern Washington County, approximately 10 miles south of the city of Hagerstown, Maryland. Washington County's population grew 10.0% between 2000 and 2007, from 131,923 to 145,113, compared to 6.1% statewide (Maryland Department of Planning 2009a).

The battlefield is bisected by State Route 65, which runs north-south, and by State Route 34, which runs east-west. The town of Sharpsburg is located along a portion of the southwestern boundary of the park. The nearby towns of Keedysville and Boonsboro lie east of the battlefield along State Route 34. The Potomac River lies to the west of the battlefield.

The battlefield is surrounded mainly by agricultural land, with forested areas along the east bank of the Potomac River and in pockets among the various agricultural parcels that surround the park. Expanding residential development is replacing some of the agricultural land use, particularly in the Keedysville and Boonsboro areas. There are numerous residential structures immediately adjacent to the park boundary in the Sharpsburg area. However, through state conservation easements and the Washington County Rural Legacy program, nearly 5000 acres of land around the battlefield have been preserved.

The predominant land use in the county is agriculture, and the 2002 Washington County Comprehensive Plan identifies preservation of agriculture as a top priority for the county (Washington County 2002). The plan identifies the area around Antietam National Battlefield as located in either the Preservation District or the Antietam Overlay District. The goal of both areas is to limit development in support of preserving the resources in the area. More specifically to the Antietam Overlay District, the goal is to provide special protection to the environment around the battlefield and to ensure that development of the land adjacent to the major roads providing access to the battlefield is compatible with the agricultural and historic character of the area. The dominant county zoning district designation surrounding the battlefield is "preservation", which is a zoning category for those areas where, because of natural geographic factors and existing land uses, it is considered feasible and desirable to conserve open spaces, water supply sources, woodland areas, wildlife and other natural resources (see figure 11).

The total market value of agricultural products sold in the county was over \$83 million in 2007. Approximately 76% of the agricultural value for the county comes from animal agriculture, with 54% from dairy farming (NASS 2009a).

The battlefield contributes to the overall surrounding economy. The estimated economic benefits arise from spending by park visitors and park employees outside the park. For 2007, it was estimated that the economic benefit contributed by Antietam National Battlefield to the local area was over \$16 million (Stynes 2008). In addition, the battlefield supports local jobs, including park staff as well as non-park jobs supported by the needs of visitors and park staff. In 2007, it was estimated that Antietam National Battlefield supported 302 jobs in the local area (Stynes 2008).

REGIONAL AND SOCIOECONOMIC OVERVIEW FOR MONOCACY NATIONAL BATTLEFIELD

Monocacy National Battlefield is in Frederick County, Maryland, approximately 3 miles south of the city of Frederick. Frederick County's population grew 15.1% between 2000 and 2007, from 195,276 to 224,705, compared to 6.1% statewide (Maryland Department of Planning 2009a). The city of Frederick had a population of 59,220 in 2007 (Maryland Department of Planning 2009b).

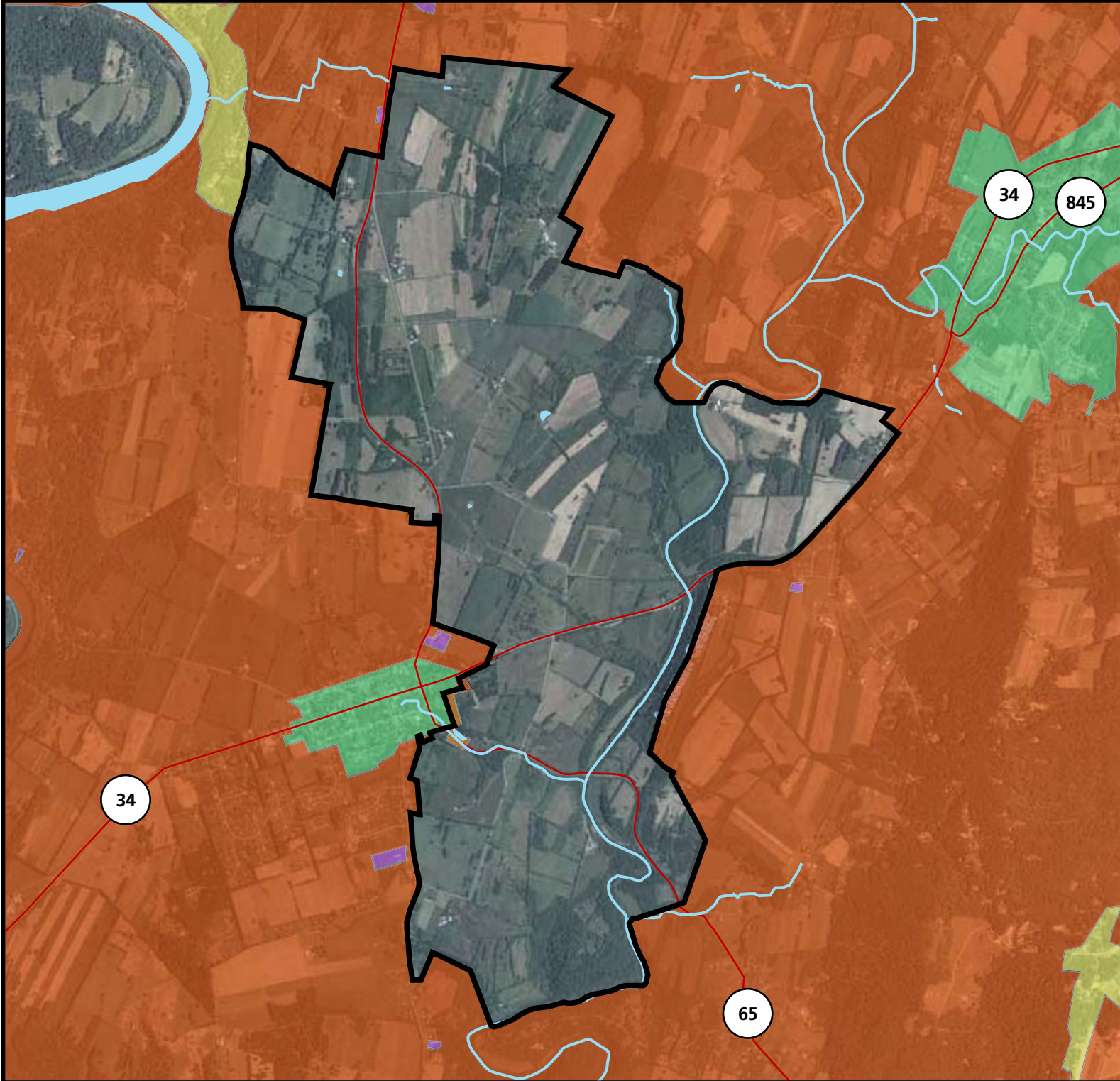
The battlefield is at the southern edge of a heavily developed commercial area south of the city of Frederick. On the north boundary is an office complex and a lumber yard. Across the Monocacy River on the west boundary are industrial development and warehouses. The land on the east boundary is a mix of heavily forested land, agricultural fields, and single-family homes. Land on the south is still mostly agricultural, with some residential development mainly along MD-355 in the Araby Church rural village. Residential development is encroaching from the south as the planned community of Urbana expands north. Zoning around the battlefield reflects the current land use, with industrial and commercial zones to the north and west, and agricultural zones to the south and east (figure 12).

Farmland preservation efforts are identified as a goal in the Frederick Region Plan in 2002. In 2007, over 202,087 acres were identified as farmland, an increase of over 6,200 acres since 2002 (NASS 2009b). The total market value of agricultural products sold in the county was over \$127 million in 2007.

Chronic Wasting Disease EA

Antietam National Battlefield, Maryland

National Park Service
U.S. Department of the Interior



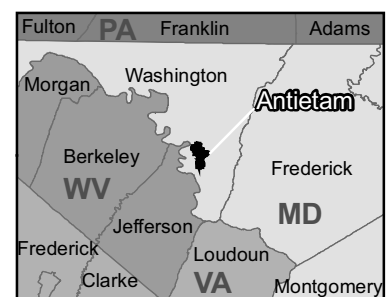
Zoning

- Preservation
- Rural Business - Existing
- Rural Village

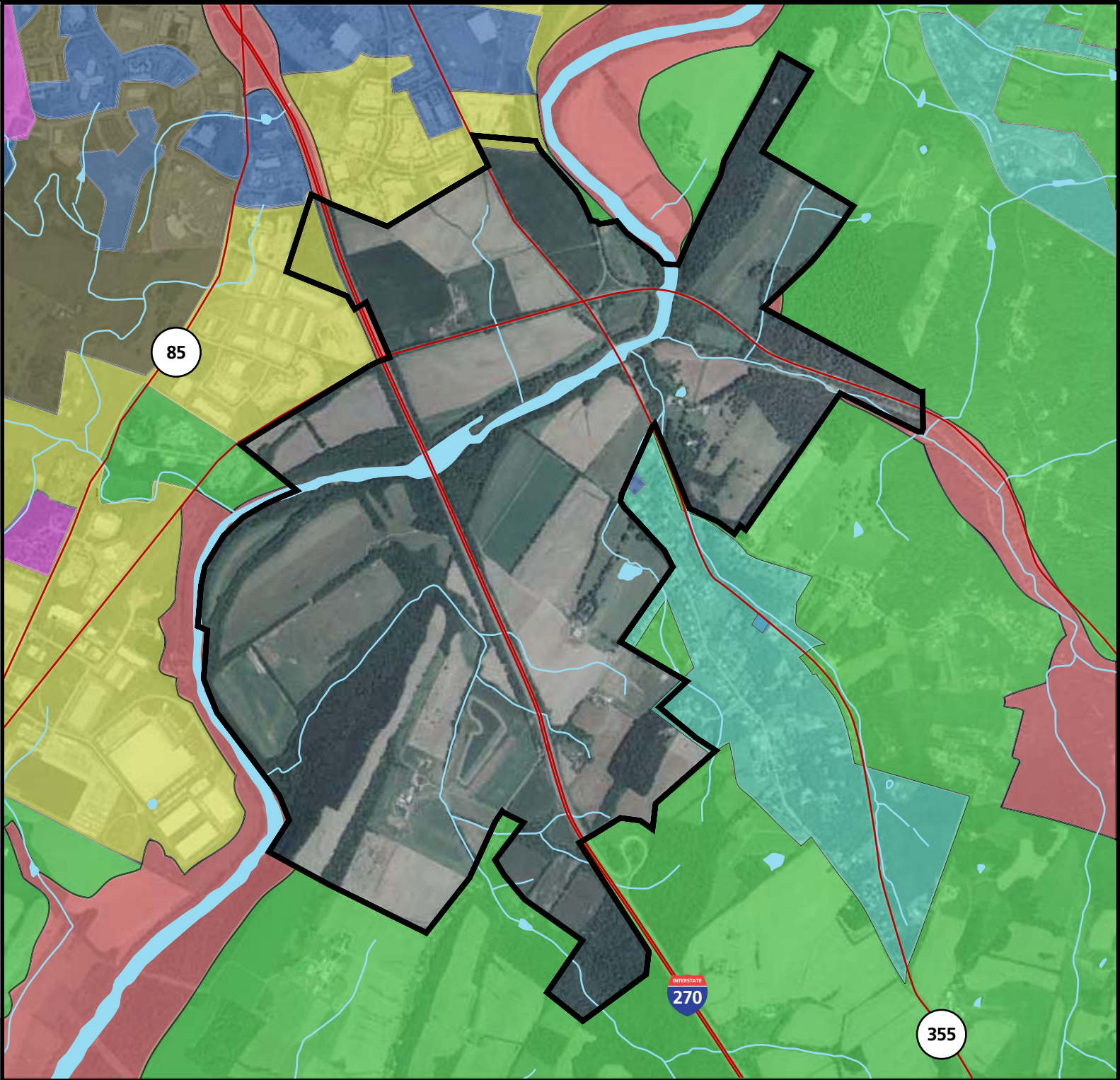
Figure 11. Zoning

- Town
- Park Boundary
- Roads
- Streams / Rivers / Waterbodies

0 1,500 3,000 4,500
Feet



Source: GIS files provided by the County



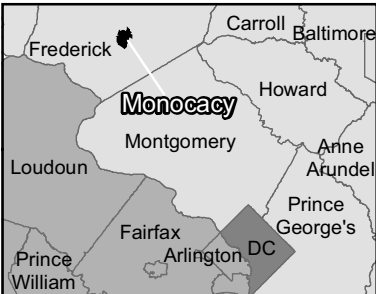
Zoning

- Commercial
- Industrial
- Resource Conservation
- Low Density Residential
- Medium Density Residential
- Mixed Use
- Agriculture

Figure 12. Zoning

- Park Bound22ary
- Roads
- Streams / Rivers / Waterbodies

0 1,000 2,000 3,000 Feet



Source: GIS files provided by the County

Approximately 72% of the agricultural value for the county comes from animal agriculture, with 41% from dairy farming (NASS 2009b).

The battlefield contributes to the overall surrounding economy. The estimated economic benefits arise from spending by park visitors and park employees outside the park. For 2007, it was estimated that the economic benefit contributed by Monocacy National Battlefield to the local area was over \$1.5 million (Stynes 2008). In addition, the battlefield supports local jobs, including park staff as well as non-park jobs supported by the needs of visitors and park staff. In 2007, it was estimated that Monocacy National Battlefield supported 17 jobs in the local area (Stynes 2008).

DEER DAMAGE TO CROPS

The agricultural areas surrounding both Antietam and Monocacy National Battlefields are experiencing crop loss due to deer. Common damage to row and forage crops includes deer eating and trampling the crops. According to the National Agricultural Statistics Service, Maryland farms lost \$9 million in potential crop production due to wildlife damage in 2007 (NASS 2008). The greatest loss was seen in the North Central Maryland area, which includes Frederick and Washington counties, with losses of \$2.6 million, accounting for 29% of the total estimated state losses. Deer accounted for 84% of the damage. There is no information available for the amount of damage caused by deer to landscapes on neighboring properties.

To assist landowners in controlling deer numbers, the MDNR oversees a program to issue Deer Management Permits. This program allows landowners to harvest antlerless deer on their property outside deer hunting season. An investigator from the MDNR is assigned to review a request for eligibility and will consider the type, extent, and severity of damage, time of year, and deer population estimates for the specific locale (MDNR 2007a). In 2007, a total of 5,612 deer were taken statewide on Deer Management Permits compared to 4,752 deer in 2006, an increase of approximately 18%, but still less than the 7,178 deer taken in 2005 (MDNR 2007b and 2008). In 2007, harvests on Deer Management Permits in Washington and Frederick Counties were 233 and 312 deer respectively (MDNR 2008).

While there is no specific county information, in a 2006 survey by the U.S. Fish and Wildlife Service, it was estimated that over 120,000 hunters spent 1.8 million days pursuing big game in Maryland (predominantly white-tailed deer) in 2006 (Timko 2009), and a recent survey sponsored by the Association of Fish and Wildlife Agencies found that deer hunting in 2006 generated over \$113 million in retail sales with a total multiplier effect of over \$190 million contributed to Maryland's economy (MDNR 2008).

While it is possible to estimate the amount of money generated through deer-related hunting activities, the amount of money saved in preventing deer-related damage through regulated hunting has not been estimated. Without hunting, deer populations would be much higher and losses to the agricultural, forest products, and automobile insurance industries would be far greater. The Association of Fish and Wildlife Agencies estimated that \$934.2 million to \$9.3 billion of taxpayers' money would be required to manage deer that deer hunters currently manage and that more money would be needed to control habitat damage by deer not relocated or culled (Timko 2009).

VISITOR USE AND EXPERIENCE

Several of the potential CWD detection or initial response actions may require limiting public access within the battlefields. Other actions, including potential deer removals, could affect visitor experience of both the natural and cultural resources at the battlefields.

ANTIETAM NATIONAL BATTLEFIELD

VISITATION

Approximately 288,000 people visit Antietam National Battlefield annually, as shown in table 12. Visitation has fluctuated greatly over the past 13 years, with an average annual growth of 3.4%. Visitation is highest in July, with over 72,000 visitors in 2008, and lowest in February, with just over 5,600 visitors in 2008, as shown in table 13 (NPS 2009c). Visitors typically spend about a half day at the battlefield, participating in programs at the visitor center and driving the tour route (NPS 1992). Visitor surveys are completed annually by the battlefield and are a source of information on visitor satisfaction. Since 2004, on average, 98% of visitors to Antietam National Battlefield each year have indicated that they were satisfied with appropriate park facilities, services, and recreational opportunities (Wenschhof 2009a).

TABLE 12: ANTIETAM NATIONAL BATTLEFIELD YEARLY VISITATION

Year	Visitation	Percent Change from Previous Year
1996	246,082	--
1997	275,639	12.0%
1998	275,385	-0.1%
1999	268,897	-2.4%
2000	286,896	6.7%
2001	303,599	5.8%
2002	303,209	-0.1%
2003	279,694	-7.8%
2004	237,885	-14.9%
2005	295,309	24.1%
2006	286,676	-4.3%
2007	337,569	17.8%
2008	352,548	4.4%
Average	288,414	3.4%

Source: NPS 2009c

TABLE 13: ANTIETAM NATIONAL BATTLEFIELD 2008 MONTHLY VISITATION

Month	Visitation
January	5,988
February	5,681
March	19,057
April	30,874
May	38,259
June	43,059
July	72,131
August	39,254
September	30,094
October	34,940
November	18,134
December	15,077

Source: NPS 2009c

VISITOR ACTIVITIES

Visitors come to the battlefield because it is one of the best-preserved Civil War battlefields in the country. A 9-mile tour road allows for a self-guided tour of the battlefield (see figure 2). Included along the tour route are several hundred War Department markers that provide detailed descriptions of the actions during the battle.

Other outdoor activities include the following:

- Hiking—Trails are located throughout the battlefield, including the Cornfield Trail, the Antietam Remembered Trail, the Union Advance Trail, the Final Attack Trail, the Snively Ford Trail, and the Sherrick Farm Trail (see figure 2). These trails provide access to the battlefields' major sites.
- Bicycling—Bicycling is permitted on paved park tour roads and parking lots.
- Horseback Riding—Horseback riding is permitted on all paved roads and the Snively Ford and Final Attack trails. Groups of 11 or more riders need a permit.
- Fishing—Fishing is permitted on the Antietam Creek with a valid Maryland fishing license, except within 500 feet of the Burnside Bridge.
- Picnicking—Picnicking is allowed except in the Antietam National Cemetery, Mumma Cemetery, inside the Dunker Church, inside the Observation Tower, on the Burnside Bridge, or on any monument.
- Boating and Tubing—These activities are popular on Antietam Creek; however, docking, removing, or putting in a boat or tube, or loading a person within 500 feet of the Burnside Bridge are prohibited.
- Camping—Camping is only allowed by permit at the Rohrbach Group Campground; only organized groups (such as Boy Scouts, Church, and School Groups) are permitted to camp.

The visitor center has a theater, exhibits, observation room, and a museum store. The center shows various audiovisual programs, and interpretive talks are conducted daily. The new Pry House Field Hospital Museum served as Union Commander General George B. McClellan's headquarters during the battle and is open daily during the summer. Exhibits include a re-creation of an operating theater, interpretive panels and objects relating to the care of wounded and the effects on the civilian population in the area, and information on the Pry House.

MONOCACY NATIONAL BATTLEFIELD

VISITATION

Prior to 2007 when the new visitor center opened at Monocacy National Battlefield, approximately 16,000 people visited the battlefield annually (table 14). However, since the visitor center opened in late June 2007 visitation has increased dramatically, with the number of visitors in 2008 (31,276) nearly doubling the annual average number of visitors prior to 2007 (NPS 2009c). Historically visitation is highest in July; however, in 2008 July had the third lowest number of visitors with just under 2,000 visitors. For 2008, visitation was highest in October, with almost 4,500 visitors, while January had the lowest visitation, with just under 1,000 visitors as shown in table 15 (NPS 2009c). A visitor use survey was conducted in the summer of 2006 (NPS 2006f). Data gathered from the survey showed that visitors to Monocacy National Battlefield come primarily from Maryland (43%), Pennsylvania (9%), and Virginia (7%), with the remainder from other states. International visitors comprised 1% of the total visitation (table 15). The majority of visitors (73%) spend one to two hours at the battlefield. The primary reason for visiting the battlefield was to learn about history (58%). The most common sites visited in the park

included Gambrill Mill Visitor Center (85%) and Monocacy River (57%). The most common activities in the park were visiting the visitor center (91%) and learning history (81%). Wildlife viewing was mentioned by 19% of the respondents and was 7th in importance out of the 14 activities listed on the survey.

TABLE 14: MONOCACY NATIONAL BATTLEFIELD YEARLY VISITATION

Year	Visitation	Percent Change from Previous Year
1996	11,312	--
1997	11,804	4.3%
1998	15,563	31.8%
1999	14,834	-4.7%
2000	18,198	22.7%
2001	18,095	-0.6%
2002	15,592	-13.8%
2003	14,566	-6.6%
2004	18,145	24.6%
2005	17,985	-0.9%
2006	18,579	3.3%
2007	22,125	19.1%
2008	31,276	41.4%
Average	17,544	10.1%

Source: NPS 2009c

TABLE 15: MONOCACY NATIONAL BATTLEFIELD 2008 MONTHLY VISITATION

Month	Visitation
January	956
February	2,074
March	2,114
April	2,979
May	3,772
June	2,675
July	1,971
August	3,767
September	2,710
October	4,468
November	2,420
December	1,370

Source: NPS 2009c

VISITOR ACTIVITIES

Primary visitor activities at Monocacy National Battlefield include a 6-mile, self-guided auto tour of the battlefield and several hiking trails (see figure 3). The trails located at the Gambrill Mill and on the

Worthington and Thomas farms provide interpretation of the Battle of Monocacy and access to scenic areas of the park. Fishing and canoeing on the Monocacy River, which runs through the national battlefield, are also popular pastimes.

Monocacy National Battlefield opened a new visitor center on the north end of the Best Farm in June 2007. This visitor center includes interactive and multimedia exhibits related to the battle, historical artifacts interpretive displays, and a bookstore. Special interpretive events are offered, usually in summer, to attract more visitors to the national battlefield and to reach out to new audiences. These events often focus on specific themes or activities and also incorporate events that help to explain the importance of the battle, and the park, in the larger context of the American Civil War.

HEALTH AND SAFETY

CWD detection and initial response activities that involve capturing and immobilizing live animals for marking, collaring, or performing tonsillar biopsies have the potential to affect the health and safety of the individuals involved. Options that involve the removal of deer also have the potential to affect the safety of park staff and possibly visitors.

ANTIETAM NATIONAL BATTLEFIELD

VISITOR SAFETY

An injury is described as physical harm or illness that is observed by or reported to NPS that requires medical attention beyond the basic first aid level. Visitor injuries at Antietam National Battlefield have been primarily falls, cuts, and bicycle accidents. Table 16 shows the number of visitor injuries reported at Antietam National Battlefield from 2001 to 2008 (Wenschhof 2007d and 2009b).

TABLE 16: VISITOR INJURIES AT ANTIETAM NATIONAL BATTLEFIELD

Year	Visitor Injuries
2001	4
2002	2
2003	1
2004	1
2005	2
2006	3
2007	2
2008	2

Safety inspections are conducted for all visitor use and public areas, both by the Risk Management Committee and staff during their daily duties. Protection rangers (law enforcement) are responsible for visitor safety monitoring on a daily basis and provide visibility and investigation for the protection of persons and property, traffic safety programs, and monitoring of visitor activity patterns (NPS 2007c).

EMPLOYEE SAFETY

Employee injuries mostly have been caused by insect bites, equipment handling, falls, and poison ivy. Table 17 shows employee injuries that were reported at Antietam National Battlefield between 2001 and 2008 (Wenschhof 2009b).

TABLE 17: EMPLOYEE INJURIES AT ANTIETAM NATIONAL BATTLEFIELD

Year	Number of Employee “Lost-Time” Injuries
2001	2
2002	2
2003	2
2004	4
2005	2
2006	2
2007	1
2008	2

The superintendent, division chiefs, and supervisors consider safe work practices a primary element of all park management activities at Antietam National Battlefield. The battlefield’s safety committee is responsible for developing an annual work plan that includes training, facility inspections, and reviews of accident and injury reports and near miss situations. The safety committee, in conjunction with appropriate supervisors and park staff, tracks and reports the progress of safety audits in the areas of risk management, structural fire, industrial hygiene, housekeeping, public health, and others (NPS 2007c). Types of activities that may impact employee safety are listed below (Wenschhof 2007d):

- Equipment Use—Chainsaws, lab equipment (scalpels, formalin, chemicals), immobilization equipment/drugs, firearms, knives;
- Vehicle Use—Trucks, off-road vehicles, etc.;
- Footing Hazards—Off-road pedestrian travel, woodchuck holes, rocks, uneven terrain; or
- Miscellaneous—Bees, poison ivy, stinging nettle, ticks, chiggers, and snakes.

MONOCACY NATIONAL BATTLEFIELD

Accidents and injuries to both visitors and staff are rare at Monocacy National Battlefield.

VISITOR SAFETY

Most visitor injuries have been routine in nature, such as cuts, scrapes, and other injuries requiring minor first aid. None of these injuries was serious enough to be officially reported (Banasik 2007d; Wenschhof 2009b).

EMPLOYEE SAFETY

There were two injuries to Monocacy staff between 2004 and 2005. One of these injuries was a strained back and the other was a shoulder injury. Over the past three years there have been only 16 Continuation of Pay hours and two Lost-Time Injuries at the battlefield (Wenschhof 2009b). The two staff members from the Natural Resource division who are involved in field research would be most likely to be affected by deer management and CWD monitoring activities (Banasik 2007d). Monocacy National Battlefield considers safety of the utmost importance, and incorporates safe work practices into all facets of park management activities. The park’s safety committee is also responsible for reviewing accident injury reports and near misses, developing training opportunities for all employees, and conducting facility inspections on a regular basis.

PARK MANAGEMENT AND OPERATIONS

ANTIETAM NATIONAL BATTLEFIELD

The staff of Antietam National Battlefield are organized into five operating divisions: Administration and Management, Cultural Resource Management, Facility Management, Natural Resources Management and Visitor Protection, and Resource Education and Visitor Services. The fiscal year 2008 appropriation for the battlefield was \$3,332,800 (table 18), which included 44 full-time employees, 38 seasonal employees, and 1,775 volunteers (Wenschhof 2009c and 2009d). Seasonal employees typically vary between 30 and 40 employees each year.

TABLE 18: ANTIETAM NATIONAL BATTLEFIELD 2008 OPERATING BUDGET

Division	Full-time Employees	2008 Operating Budget
Administration and Management	6	\$537,268
Cultural Resource Management	4	\$287,718
Facility Management	15	\$1,040,470
Natural Resources Mgmt/Visitor Protection	10	\$819,161
Resource Education & Visitor Services	9	\$648,183
Total	44	\$3,332,800

ADMINISTRATION AND MANAGEMENT

The Administration and Management division's responsibilities include human resource management, budget, procurement and contracting, property management, travel management, payroll and benefits programs, excess/surplus property program, and utility program management. This division also includes the Superintendent's office and is responsible for budget (Wenschhof 2007b).

CULTURAL RESOURCES MANAGEMENT

The Cultural Resources Management division's responsibilities include *National Historic Preservation Act* compliance activities, historic structures management, preservation and restoration, contract management and oversight, national cemetery management, Mumma cemetery management, and research (Wenschhof 2007b).

FACILITY MANAGEMENT

The responsibilities of the Facility Management Division include general operational maintenance, preservation maintenance, contract management, fleet management and maintenance, turf management, landscape restoration, historic structure preservation and restoration, national cemetery maintenance and burials, fencing program oversight and operations, trail management and construction, general and custodial services, and support for special events (Wenschhof 2007b).

NATURAL RESOURCES MANAGEMENT AND VISITOR PROTECTION

The branch of Natural Resources Management employs five full-time equivalent employees whose responsibilities include vegetation management, wildlife management (including targeted and opportunistic surveillance activities for CWD detection and general deer surveys), agricultural lease program, trail management and construction, contract management, fencing program management, youth

programs, native plant nursery, water quality program, soils program, research, and NEPA compliance (Wenschhof 2007b). This division also coordinates with the MDNR Wildlife Staff, Natural Resources Police, the NPS National Capital Region Regional Wildlife Biologist, and other interested parties regarding deer and wildlife management issues. This coordination includes sharing information on deer density, spotlighting survey periods, and involving of MDNR staff in the CWD planning process.

The branch of Visitor Protection employs five full-time equivalent employees whose responsibilities include law enforcement, resource protection, boundary management, fire and security alarm programs, special use management program, special events programs, wildfire and structural fire program, cooperative agreement program management, risk management and safety operations, and investigative services (Wenschhof 2007b).

RESOURCE EDUCATION AND VISITOR SERVICES

The Resource Education and Visitor Services division's responsibilities include interpretive planning and operations, visitor services, education program operations, curatorial services research, library management, collections management, contract management, living history program coordination, volunteer program oversight, and the black powder safety program (Wenschhof 2007b). The battlefield does not have regular interpretive programming related to deer habitat and management. However, battlefield staff have developed brochures, wildlife displays, news releases, and other information as public outreach for CWD. Battlefield staff have also produced educational materials about their deer movement study and general natural resources management programs (Wenschhof 2007c).

MONOCACY NATIONAL BATTLEFIELD

The staff of Monocacy National Battlefield are organized into six operational divisions: Management, Resource Education and Visitor Services, Law Enforcement, Natural Resources, Cultural Resources, and Facility Management. The fiscal year 2008 appropriation for the battlefield was \$1,393,900 (table 19), which included 17 full-time equivalent employees and 209 volunteers, 13 of which were weekly Visitor Center volunteers (Banasik 2009a and 2009b).

TABLE 19: MONOCACY NATIONAL BATTLEFIELD 2008 OPERATING BUDGET

Division	Full-time Employees	2008 Operating Budget
Management	2	\$239,000
Resource Education and Visitor Services	4	\$328,000
Law Enforcement	3	\$312,000
Natural Resources	2	\$117,000
Cultural Resources	2	\$90,000
Maintenance	4	\$307,900
Total	17	\$1,393,900

MANAGEMENT

The Management Division for Monocacy National Battlefield is comprised of the park superintendent and a historian who serves as the NPS liaison with the Catocin Center for Regional Studies based at Frederick Community College. Administrative services are provided by Antietam National Battlefield and there are no administrative personnel assigned to Monocacy National Battlefield (Banasik 2007c).

RESOURCE EDUCATION AND VISITOR SERVICES

The Resource Education and Visitor Services Division is responsible for operation of the visitor center, interpretation and education operations, curatorial services and collections management, living history program coordination and black powder safety, and Volunteers-In-Parks program (NPS 2006a). Although the battlefield does not currently have interpretive materials or programs related to deer habitat and management, there are plans for these types of deer-related interpretive programs in the future (Banasik 2007c).

LAW ENFORCEMENT

The responsibilities of the Law Enforcement Division include enforcing federal and state laws within battlefield boundaries; responding to motor vehicle accidents (including assisting state and local authorities with traffic control and patient care); and investigating crimes that harm NPS resources in the national battlefield, such as vandalism to historic structures, illegal relic hunting, trash dumping, and wildlife poaching. The Law Enforcement Division also monitors the recreational use of the Monocacy River, which runs through the national battlefield. Rangers patrol the river on foot and by vehicle (NPS 2006a).

NATURAL RESOURCE MANAGEMENT

The Natural Resources Management Division's responsibilities include vegetation and wildlife management (including all CWD surveillance activities), trail maintenance, landscape rehabilitation, water resources management, the agricultural permit program, contract management and oversight, youth programs, and NEPA compliance activities. The Division's Natural Resource Manager and Biological Science Technician are responsible for current deer management activities at the battlefield, including coordination with the State and other interested parties. The battlefield also engages in deer density surveys in the Spring and Fall and actively engages in opportunistic and targeted surveillance of deer for CWD (Banasik 2007b).

CULTURAL RESOURCE MANAGEMENT

The Cultural Resources Management Division's responsibilities include the *National Historic Preservation Act* Section 106 compliance activities; historic structures management, preservation, and restoration; archeology; contract management and oversight; and research.

FACILITY MANAGEMENT

The Facility Management Division is responsible for operational maintenance activities, contract management and oversight, fleet management and vehicle maintenance, fencing, maintenance and operation of battlefield structures, grounds maintenance, and custodial services.

Environmental Consequences

ENVIRONMENTAL CONSEQUENCES

This “Environmental Consequences” chapter analyzes both beneficial and adverse impacts that would result from implementing any of the alternatives considered in this plan/EA. This chapter also includes a brief summary of applicable laws and policies relevant to each impact topic, definitions of impact thresholds (for example, negligible, minor, moderate, and major), a description of methods used to analyze impacts, and the analysis methods used for determining cumulative impacts. A summary of the environmental consequences for each alternative is provided in table 7, which can be found in the “Alternatives” chapter. The resource topics presented in this chapter and the organization of the topics correspond to the resource discussions included in the “Affected Environment” chapter.

GENERAL METHODOLOGY FOR ASSESSING IMPACTS

The following elements are used in the approach for establishing impact thresholds and measuring the effects of the alternatives on each resource category:

- general analysis methods as described in guiding regulations, including the context and duration of environmental effects
- basic assumptions used to formulate the specific methods used in this analysis
- thresholds used to define the level of impact resulting from each alternative
- methods used to evaluate the cumulative impacts of each alternative in combination with unrelated factors or actions affecting park resources
- methods and thresholds used to determine if impairment of specific resources would occur under any alternative

These elements are described in the following sections.

GENERAL ANALYSIS METHODS

The analysis of impacts follows CEQ guidelines and Director’s Order 12 procedures (NPS 2001) and is based on the underlying goal of the long-term protection, conservation, and restoration of the resources and values at the battlefields. This analysis incorporates the best available scientific literature applicable to the region and setting, the species being evaluated, and the actions being considered in the alternatives.

As described in the “Purpose of and Need for Action” chapter, the NPS created an a science team to provide important input to the impact analysis. For each resource topic addressed in this chapter, the applicable analysis methods are discussed, including assumptions and impact intensity thresholds. The analysis presented is valid for both battlefields unless otherwise specified.

BASIC ASSUMPTIONS

Several guiding assumptions were made to provide context for this analysis. These assumptions are described below.

Analysis Period

The analysis period used for assessing impacts is up to 10 years. The impact analysis for each alternative is based on the principles of adaptive management, which would allow the NPS to change management actions as new information emerges from monitoring the results of management actions and ongoing research throughout the life of this plan.

Geographic Area Evaluated for Impacts (Area of Analysis)

The geographic study area (or area of analysis) for this plan includes the area included in the legislative boundaries of both battlefields. The area of analysis may extend beyond the battlefield boundaries for some cumulative impact assessments. The specific area of analysis for each impact topic is defined at the beginning of each topic discussion.

Duration and Type of Impacts

The following assumptions are used for all impact topics (the terms “impact” and “effect” are used interchangeably throughout this document):

- *Short-term impacts* — Impacts would last from a few days up to three years following an action.
- *Long-term impacts* — Impacts would last longer than three years up to the life of the plan (approximately 10 years).
- *Direct impacts* — Impacts would occur as a direct result of CWD detection or initial response actions.
- *Indirect impacts* — Impacts from CWD detection or initial response actions and would occur later in time or farther in distance from the action.

Future Trends

Visitor use and demand are anticipated to follow trends similar to recent years. The number of yearly visitors to both battlefields has fluctuated in the past 12 years. Although decreases in visitation have occurred from year to year, visitation has generally increased, with a large increase at Monocacy National Battlefield from 2007 to 2008, boosted by the new visitor center (see the “Visitor Use and Experience” discussion in the “Affected Environment” chapter). Over the past 12 years, the change in yearly visitation has averaged +3.4% at Antietam National Battlefield, and +10.1% at Monocacy National Battlefield. With the anticipated growth in surrounding counties, it is likely that visitation to both battlefields would continue to increase, although it is not possible to predict the amount of increase expected over the life of this plan.

Impact Thresholds

Determining impact thresholds is a key component in applying NPS *Management Policies 2006* and Director’s Order 12. These thresholds provide the reader with an idea of the intensity of a given impact on a specific topic. The impact threshold is determined primarily by comparing the effect to a relevant standard based on regulations, scientific literature and research, or best professional judgment. Because definitions of intensity vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this document. Intensity definitions are provided throughout the analysis for negligible, minor, moderate, and major impacts. In all cases the impact thresholds are defined for adverse impacts. Beneficial impacts are addressed qualitatively.

CUMULATIVE IMPACTS ANALYSIS METHOD

The CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). As stated in the CEQ handbook, “Considering Cumulative Effects” (CEQ 1997), cumulative impacts need to be analyzed in terms of the specific resource, ecosystem, and

human community being affected and should focus on effects that are truly meaningful. Cumulative impacts are considered for all alternatives, including alternative A.

Cumulative impacts were determined by combining the impacts of the alternative being considered with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects and plans at the battlefields and, if applicable, the surrounding areas. Table 20 summarizes these actions that could affect the various resources at the battlefields. Many of these plans are described in more detail in the “Related Policies, Laws, Plans, and Constraints” section of this document (see the “Purpose of and Need for Action” chapter) and those requiring additional explanation are discussed in the following narrative.

The analysis of cumulative impacts was accomplished using four steps:

Step 1 — Identify Resources Affected: fully identify resources affected by any of the alternatives.

Step 2 — Set Boundaries: identify an appropriate spatial and temporal boundary for each resource.

Step 3 — Identify Cumulative Action Scenario: determine which past, present, and reasonably foreseeable future actions to include with each resource.

Step 4 — Cumulative Impact Analysis: summarize impacts of these other actions (x) plus impacts of the proposed action (y), to arrive at the total cumulative impact (z).

Table 20 identifies the past, present, and future actions that could result in cumulative impacts to the resources of interest for this plan. The plans listed in table 20 are described in the “Related, Laws, Policies, Plans, and Constraints” section in the “Purpose of and Need for Action” chapter. As can be seen from the table, some of the primary actions contributing to cumulative impacts to resources in the area of the battlefields include

- the changes that have occurred and continue to occur in land use and land cover (loss of forest and rural lands; suburban development; recent agricultural preservation efforts, projected development)
- construction both inside and outside the battlefields, including highways and utilities
- historic and current deer management and hunting on surrounding lands
- presence of and increase in non-native (exotic) species and various introduced pests
- changes in visitation and increased offerings of visitor activities and facilities

TABLE 20. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
White-tailed Deer	Battlefields plus 5 miles around boundaries (based on average deer movement around parks and Maryland CWD Response Plan)	1950s (hunting resumes in Maryland) through the life of the plan (10 years)	<p>Clear cutting</p> <p>Suburban/Rural Developments (edge effects; loss of forested habitat)</p> <p>Increase in traffic</p> <p>Loss of agricultural land use</p> <p>Increase in conservation easements</p> <p>Hunting</p> <p>Poaching</p> <p>Historic deer management in Maryland</p> <p>CWD Response Plans</p> <p>Captive deer facilities in nearby states</p> <p>Maintenance of agricultural uses in the park</p> <p>Park operations (mowing, maintenance setbacks, etc.)</p> <p>Maintenance of rights-of-way</p> <p>Decline of potential predators</p> <p>Highway expansion</p> <p>White-tailed deer monitoring and research/other diseases</p>	<p>Same as past actions, with the exception of highway expansion</p> <p>Also:</p> <p>Change in predator composition</p> <p>Active reforestation</p>	<p>Same as current actions, plus:</p> <p>Monocacy National Battlefield – Town of Urbana (to the south) projected to grow towards the park</p> <p>Antietam National Battlefield – residential growth pressure in Boonsboro and Keedysville</p> <p>Change in predator composition</p> <p>Fire management (prescribed burning)</p> <p>Long-term deer management</p>
Vegetation	Legislated Boundary of Antietam and Monocacy National Battlefields	<p>Antietam National Battlefield: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years)</p> <p>Monocacy National Battlefield: 1934 (legislated creation of the battlefield) through the life of the plan (10 years)</p>	<p>Clear cutting</p> <p>Park development (including private activities)</p> <p>Loss of agricultural land use</p> <p>Increase in conservation easements</p> <p>Historic deer management in Maryland</p> <p>Maintenance of agricultural uses in the parks</p> <p>Park operations (mowing, maintenance setbacks, etc.)</p> <p>Maintenance of rights-of-way</p> <p>Highway expansion</p> <p>Non-native species introduction</p>	<p>Same as past actions, with the exception of highway expansion or clear cutting</p> <p>Also:</p> <p>Active reforestation</p> <p>Exotic plant management</p> <p>Cultural Landscape Management plans</p> <p>Orchard management</p>	<p>Same as current actions, plus:</p> <p>Fire management (prescribed burning)</p> <p>Long-term deer management</p>

TABLE 20. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
			Introduced pests (Gypsy moth, chestnut blight) Pest control (gypsy moth, wooly adelgid)		
Other Wildlife and Wildlife Habitat	Battlefields plus 5 miles around boundaries (based on average deer movements around parks and Maryland CWD Response Plan)	1950s (hunting resumes in Maryland) through the life of the plan (10 years)	Clear cutting Suburban/Rural Developments (edge effects; loss of forested habitat) Increase in traffic Loss of agricultural land use Increase in conservation easements Hunting Poaching Historic deer management in Maryland Captive deer facilities in nearby states Maintenance of agricultural uses in the park Park operations (mowing, maintenance setbacks, etc.) Maintenance of rights-of-way Decline of potential predators Highway expansion	Same as past actions, with the exception of highway expansion Also: Change in predator composition Active reforestation	Same as current actions, plus: Monocacy National Battlefield – Town of Urbana (to the south) projected to grow towards the park Antietam National Battlefield – residential growth pressure in Boonsboro and Keedysville Change in predator composition Fire management (prescribed burning) Long-term deer management
Cultural Resources (cultural landscapes and archeological resources)	Legislated Boundary of Antietam and Monocacy National Battlefields	Antietam National Battlefield: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years) Monocacy National Battlefield: 1934 (legislated creation of the battlefield) through the life of the plan (10 years)	Increased visitor services and visitor uses Vandalism Clear cutting Park development (including private activities) Loss of agricultural land use Increase in conservation easements Historic deer management in Maryland Maintenance of agricultural uses in the park Park ops (mowing, maintenance setbacks, etc.)	Same as past actions, with the exception of highway expansion and clear cutting Also: Active reforestation Exotic plant management Cultural landscape management plans – restoration of landscape to 1862 Orchards	Same as current actions, plus: Fire management (prescribed burning) Long-term deer management

TABLE 20. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
			Maintenance of rights-of-way Highway expansion Non-native species introduction Introduced pests (gypsy moth, chestnut blight) Pest control (gypsy moth, wooly adelgid) Changes in agricultural practices and field patterns Commemoration and memorialization		
Socio-economics (Neighboring land uses)	Battlefields plus 5 miles around boundaries	Antietam National Battlefield: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years) Monocacy National Battlefield: 1934 (legislated creation of the battlefield) through the life of the plan (10 years)	Suburban/Rural Developments Loss of agricultural land use Highway expansion Hunting Crop damage Changes in Maryland deer management Increased visitation	Same as past actions, plus: County comprehensive plans Changes in demographics Creation of state Civil War heritage areas	Same as current actions, plus: Widening Interstate 270 through the park Long-term deer management
Visitor Use and Experience	Legislated Boundary of Antietam and Monocacy National Battlefields	Antietam National Battlefield: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years) Monocacy National Battlefield: 1934 (legislated creation of the battlefield) through the life of the plan (10 years)	Land acquisition Increased access/use of vehicles Development of visitor facilities Annual activities (e.g., living history demonstrations, artillery demonstrations) Increased visitation Interpretation/Education programs Recreational use of river Vandalism Antietam National Battlefield – Special interpretive events: Illumination, Salute to Independence, Memorial day and some Special Use Permits (from Core Ops Spreadsheet)	Annual activities (e.g., living history demonstrations, artillery demonstrations) Increased visitation Cultural landscape management plans – restoration of landscape to 1862 Interpretation/Education programs Recreational use of river Trail development Monocacy National Battlefield – new visitor center Monocacy National Battlefield – increased crime	Same as Current Actions, except for new Monocacy visitor center and possibly reduced maintenance schedules; possibly increased visitation plus: Fire management (prescribed burning) Long-term deer management

TABLE 20. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
			White-tailed deer monitoring and research Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet)	Increased access Reduced maintenance schedules White-tailed deer monitoring and research Antietam National Battlefield – Special interpretive events: Illumination, Salute to Independence, Memorial day and some Special Use Permits (from Core Ops Spreadsheet) Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet)	
Health and Safety	Legislated Boundary of Antietam and Monocacy National Battlefields	Antietam National Battlefield: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years) Monocacy National Battlefield: 1934 (legislated creation of the battlefield) through the life of the plan (10 years)	Vehicle collision White-tailed deer monitoring and research Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet) Monocacy National Battlefield – increased crime	Same as past actions	Same as past actions, plus: Fire management (prescribed burning) Long-term deer management
Park Management and Operations	Legislated Boundary of Antietam and Monocacy National Battlefields	Antietam National Battlefield: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years) Monocacy National Battlefield: 1934 (legislated creation of the battlefield) through the life of	Land acquisition Increased access/use of vehicles Development of visitor facilities Annual activities (e.g., living history demonstrations, artillery demonstrations) Increased visitation Interpretation/Education programs Recreational use of river Vandalism	Annual activities (e.g., living history demonstrations, artillery demonstrations) Increased visitation Cultural Landscape Management plans – restoration of landscape to 1862 Interpretation/Education programs Recreational use of river Trail development	Same as Current Actions except for new Monocacy visitor center and possibly reduced maintenance schedules; possibly increased visitation plus: Fire management (prescribed burning) Long-term deer

TABLE 20. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
		the plan (10 years)	<p>Changes in ownership</p> <p>Increases in management responsibilities over time</p> <p>White-tailed deer monitoring and research</p> <p>Antietam National Battlefield – Maintaining archeological, natural history, and museum collections ; special interpretive events: Illumination, Salute to Independence, Memorial Day and some Special Use Permits</p> <p>Both battlefields - Wildland and Prescribed Fire Program</p>	<p>Monocacy National Battlefield – new visitor center</p> <p>Monocacy National Battlefield – increased crime</p> <p>Increased access</p> <p>Reduced maintenance schedules</p> <p>White-tailed deer monitoring and research</p> <p>Battlefield operations - same actions as listed in past</p>	management

IMPAIRMENT ANALYSIS

The *NPS Management Policies 2006* require an analysis of potential effects to determine whether actions would have the potential to impair park resources. The fundamental purpose of the NPS, as established by the *Organic Act* and reaffirmed by the *Redwood National Park Act*, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values. However, the laws do give the NPS the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS the management discretion to allow certain impacts within a park system unit, that discretion is limited by the statutory requirement that the agency must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values.

NPS Management Policies 2006 explain that an impact would be more likely to constitute impairment to the extent that it adversely 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
- identified as a goal in the park's GMP or other relevant NPS planning documents.

The following process was used to determine whether the alternatives had the potential to impair park resources and values:

1. The enabling legislation, GMP, Strategic Plan, and other relevant background information from the battlefields were reviewed with regard to the units' purpose and significance, resource values, and resource management goals or desired future conditions.
2. Management objectives specific to resource protection goals at battlefields were identified.
3. Thresholds were established for each resource of concern to determine the context, intensity and duration of impacts, as defined above.
4. An analysis was conducted to determine if the magnitude of impact reached the level of "impairment," as described above.

The impact analysis includes findings of impairment of park resources for each of the management alternatives. Visitor use, park operations and management, and socioeconomics are not considered resources per se, although they are dependent on the conservation of park resources. Impairment findings are not included as part of the impact analysis for these topics.

WHITE-TAILED DEER

GUIDING REGULATIONS AND POLICIES

The *NPS Organic Act*, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the NPS to mean that native animal life should be protected and perpetuated as part of the park's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible; otherwise native species are protected from harvest, harassment, or harm by human activities. Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and the ecological integrity of plants and animals.

NPS has specific policies related to CWD. As described in the “Purpose of and Need for Action” chapter, these include cooperation and coordination with states, opportunistic and targeted surveillance when CWD has been detected within 60 miles, and preparation of NEPA documents for larger scale or multiple animal actions. In addition, section 4.4.2 of the *NPS Management Policies 2006* provides guidance for management of plant and animal species, stating that natural processes will be relied upon whenever possible to maintain native plant and animal species and the natural fluctuations of their populations of these species but that the NPS may intervene to manage individual wildlife or their populations (NPS 2006b).

The NPS does not consider the introduction or amplification of CWD as a “natural process” because human influences are a substantial component of observed CWD distribution and prevalence. There is good epidemiological evidence that human associated movement of cervids has aided in the spread of the disease in captive, and likely free-ranging, deer and elk (Miller and Williams 2003; Salman 2003; Williams and Miller 2003). Additionally, localized artificial concentration of cervids in areas with few natural predators, such as those surrounding the battlefields, likely aids in the transmission of CWD (Spraker et al. 1997; Samuel et al. 2003; Farnsworth et al. 2005). There is also strong evidence to suggest that anthropogenic factors, such as land use, influence prevalence of CWD in the historic area (Farnsworth et al. 2005).

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

The evaluation of impacts to deer was based on a qualitative assessment of how actions directly related to CWD detection and initial response, and the outcome of these actions, could affect the white-tailed deer populations and habitat in the battlefields. Although researchers believe CWD could have population level effects on deer herds, it is still unknown if these would include dramatic effects on localized populations as a result of large scale declines, or if the disease would eventually reach an equilibrium state and stabilize at an endemic level. As a result, the analysis considered how each alternative would influence risk related to amplification, spread, and establishment of CWD, as well as exposure to possible population level effects, should the disease be detected inside or near the battlefields.

Available information on the white-tailed deer populations (density, movement, condition, and disease) in the battlefields was compiled and analyzed in relation to the management actions. Information on the risk factors for amplification and spread of CWD was also considered. These risk factors are found in areas with the following characteristics:

- a history of CWD animals or CWD contaminated environments;
- high deer or elk population density;
- low abundance of large predators; and
- free-ranging deer or elk are artificially concentrated (baiting, feeding, water development, and other human related habitat modifications) (Samuel et al. 2003).

The thresholds for the intensity of an impact on the deer herd were based on this available information, as follows:

<i>Negligible:</i>	There would be no observable or measurable impacts to the deer population (e.g., density, movement, herd health, risk of diseases) and/or their habitat. Impacts would be well within natural fluctuations.
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<i>Minor:</i>	Small changes to the deer population (e.g., density, movement, herd health, or risk of diseases) and/or their habitat might occur from implementation or outcome of management actions. Occasional responses to disturbance by some individuals could be expected but without interference to factors affecting population levels. Impacts would be detectable but would not be outside the natural range of variability.
<i>Moderate:</i>	Impacts on the deer population (e.g., density, movement, herd health, risk of diseases) and/or their habitat could be outside the natural range of variability, but the deer population would remain stable and viable. Frequent responses to disturbance by some individuals could be expected, with some adverse impacts to factors affecting population levels.
<i>Major:</i>	Impacts on the deer population (e.g., density, movement, condition, risk of diseases) and/or their habitat would be detectable, would be expected to be outside the natural range of variability, and would be extensive. Impacts would potentially result in decreased viability or stability of the deer population. Frequent responses to disturbance by some individuals would be expected, with adverse impacts to factors negatively affecting population levels.

AREA OF ANALYSIS

The area of analysis for assessment of impacts is the land within the battlefields. The area of analysis for cumulative impacts consists of the battlefields and the area within 5 miles of the boundaries, which is based on the average deer movement around the battlefields and the Maryland CWD response plan surveillance area.

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A: NO ACTION (CURRENT ACTIVITIES CONTINUED)

Analysis

Under this alternative, opportunistic and targeted surveillance for CWD would continue in the battlefields. It is assumed that 20 deer would be removed annually during opportunistic surveillance, and five deer would be removed by targeted surveillance. With the exception of using firearms for targeted surveillance, activities directly associated with these actions would have impacts similar to those associated with routine field work conducted in the battlefields. For example, the presence of people could disturb deer causing them to temporarily disperse. Although the use of firearms in the battlefields would cause more changes in deer movement, they would also be temporary. Ultimately, these changes would be detectable during opportunistic and targeted surveillance, but would return to pre-disturbance levels once actions are finished. They would not cause deer to disperse further than they do naturally, and would not have any measurable, long-term population level impacts. In addition, there would be no measurable impacts during opportunistic or targeted CWD surveillance as a result of people walking through vegetated areas of the battlefields that provide deer habitat.

Because opportunistic surveillance involves removing deer that have died for other reasons in the battlefields, it would not affect the density of the deer population in the park. Targeted surveillance could result in the removal of deer that show clinical signs of CWD, but is not likely to influence deer density in the battlefields. As described in the “Current Conditions in the Battlefields” section of the “Purpose of and Need for Action” chapter, no deer have been removed using targeted surveillance since it was started in 2007. As a result, there would be minimal change in deer density, which would have little effect on the

potential deer herd health impacts as a result of the population being near nutritional carrying capacity. This could result in an increase in deer range as they leave the battlefields more regularly to find food.

Should CWD be detected in or near the park, opportunistic and targeted surveillance would likely increase, which could increase the frequency of impacts that result from these actions, as described previously. However, the changes to the deer population (e.g., density, movement, herd health, or risk of diseases other than CWD) and their habitat would be small, would not have population level effects, and would not be considered outside the natural range in variability.

As a result, activities directly associated with opportunistic and targeted surveillance would have short-term, negligible to minor (depending on whether or not CWD is detected), adverse impacts on white-tailed deer. There would be no change in risks associated with diseases of concern other than CWD.

In the event CWD is introduced in or near the battlefields, detection prior to the point at which clinical signs become apparent would provide an early opportunity to remove diseased deer. This could ultimately affect the amplification and spread of the disease by removing a source of CWD prions that could be transmitted to the deer indirectly (through the environment) or directly (animal to animal contact). Continued opportunistic and targeted surveillance under alternative A would facilitate detection of CWD-positive deer, but primarily after clinical signs are apparent, which could be up to one year after an individual deer becomes infected. Although this would still have the effect of removing some diseased animals, once CWD is detected under alternative A, the NPS could not implement any actions beyond continued opportunistic and targeted surveillance. Therefore, this alternative would provide limited opportunity for early detection and removal of diseased deer, which would have a limited effect on the potential for amplification and spread of CWD.

Because surveillance actions would not cause deer to disperse further than they do naturally, surveillance would not increase short-term potential for infectious contacts outside the park units. However, deer could disperse further in search of food over the long term should nutritional carrying capacity be reached in the battlefields. This would result in an increased geographic area where potential infectious contacts could occur. Also, prions could remain in the soil or water, which could serve as reservoirs or pathways for spread of the disease to exposed deer. Infected carcasses serve as a source of prions that persist in the environment and may serve as a source of the disease following removal of CWD-positive deer (Miller et al. 2004). Results of recent studies suggest that these prions bind to soil particles and continue to be infectious, and can remain in soil environments for at least three years (Johnson et al. 2006; Schramm et al. 2006). Recent studies also suggest that these prions tend to bind to clay minerals at the soil surface, which could increase the likelihood of transmission of CWD to other animals that come in contact with contaminated surface soil (Johnson et al. 2006). It is unknown to what extent such contamination contributes to CWD transmission, but it is likely an important factor (Williams and Young 1992; Miller et al. 1998; Miller et al. 2000; Williams and Miller 2003; Miller et al. 2004).

Also, as described in the “CWD Description and Distribution” section of the “Purpose of and Need for Action” chapter, and repeated in the “Assumptions, Methodology, and Intensity Thresholds” section for this impact topic, high deer density—such as that found in the battlefields—is an amplification risk factor for CWD. As described in the analysis of the surveillance actions, opportunistic surveillance would not affect the density of the deer population in the park. Although targeted surveillance has the potential to remove some deer from the battlefields, it would result in imperceptible changes to the relatively high deer densities.

Considering the minimal effect this alternative would have on risk factors, the potential for CWD amplification and spread, which could lead to establishment of the disease, would be high. Although the exact effects are unknown at this time, establishment of the disease could eventually impact survival rates of the deer herd; however, these effects would not affect the stability and viability of the deer herd during the life of this plan. Therefore, the impacts from alternative A would be long-term, moderate, and adverse.

Cumulative Impacts

Actions that have contributed to adverse cumulative effects on deer surrounding the battlefields include loss and fragmentation of habitat that result from clear cutting of forests, loss of agricultural land uses, suburban/rural developments, and past highway expansion. This habitat loss is expected to continue into the future with continued development, especially in the towns of Urbana, Boonsboro, and Keedysville. The maintenance of right-of-ways outside the battlefields as well as park operations (e.g., mowing, maintenance setbacks) also reduce vegetative cover available to deer. Coupled with increases in traffic surrounding the battlefields, this may also contribute to cumulative effects as a result of the increased potential for deer–vehicle collisions.

Although there has been an increase in conservation easements and active reforestation near or in the battlefields, this loss and fragmentation of deer habitat serves to increase densities in areas where suitable habitat remains. This includes the agricultural fields that are maintained in the battlefields. As discussed in the analysis of impacts, increased deer density is a risk factor for the amplification and spread of CWD. In addition, the large number of captive deer facilities that occur in nearby states is a CWD risk factor. Despite the observation of potential predators (e.g., bear, coyote) in the vicinity of the battlefields, their general decline in the area, which is another risk factor for CWD, has reduced a source of natural mortality that helps control deer density.

Managing deer populations has a beneficial effect by reducing density, the potential for overuse that can degrade habitat, competition for resources that can affect herd health, and disease transmission. The traditional use of hunting as a deer management tool in Maryland has offset some of these increases in density, but deer densities are still well above historic levels (see the “White-tailed Deer” section of the “Affected Environment” chapter). Although illegal, poaching also removes deer from the landscape. Future deer management actions that could also contribute to reductions in deer density include the preparation of a white-tailed deer management plan for the battlefields and the potential implementation of the CWD response plan for the state of Maryland (see “CWD Plans in States Near the Battlefields” section in the “Purpose of and Need for Action” chapter). The state plan would also create additional opportunities for CWD detection and removal of deer that are CWD positive, which could affect the amplification and spread of the disease.

Although fire management would have short-term adverse impacts from prescribed burns (including associated field activities), there would be long-term beneficial effects on white-tailed deer habitat from nutrient release and regrowth of native plants.

Despite beneficial effects from other past, present, and reasonably foreseeable future actions, cumulative impacts to white-tailed deer would be long-term, moderate, and adverse (although population level effects could occur, the population would remain stable and viable). Actions directly related to alternative A would have negligible contributions to impacts on white-tailed deer populations. However, this alternative would have substantial contributions to the potential for CWD amplification, spread, and establishment, as well as exposure to possible long-term population level effects.

Conclusion

Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on white-tailed deer from temporary disturbances during implementation. There would be long-term, moderate, adverse impacts because alternative A would have minimal effects on CWD risk factors, and the potential for amplification, spread, and establishment, as well as exposure to possible population level effects, would remain high. Actions associated with opportunistic and targeted surveillance would have temporary negligible contributions to cumulative impacts on white-tailed deer populations, which would be long-term, moderate, and adverse. However, this alternative would have substantial contributions to cumulative impacts from the potential for CWD amplification, spread, and establishment. No impairment to white-tailed deer would occur under this alternative because adverse

impacts, including cumulative effects, would be moderate or less (i.e., the deer population would remain stable and viable). Consequently, there would be no change to the natural integrity of the battlefields during the life of this plan, and the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established, or other resource management goals.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Analysis

Under alternative B, opportunistic and targeted surveillance would be used for CWD detection and could be supplemented with live tests and lethal removal of healthy appearing deer for CWD testing under specific criteria. As described for alternative A, effects on deer movement during opportunistic and targeted surveillance would be similar to those associated with routine field work conducted in the battlefields (temporary dispersal from the presence of people). Although the limited use of firearms for targeted surveillance could cause more changes, they would also be temporary, and deer movement would return to pre-disturbance levels once the actions are complete. Samples for live CWD tests would only be taken when deer are captured and collared in the park units as part of other projects. Therefore, this would not increase impacts on deer movement beyond those associated with these other projects.

As with targeted surveillance, the use of firearms to lethally remove deer for detection surveillance would result in more changes to deer movement. Although lethal removal of healthy appearing deer would involve a larger, more sustained effort than targeted surveillance (at Antietam National Battlefield, anywhere from 32 to 110 deer could be removed per sampling event, and at Monocacy National Battlefield, it would range from 36 to 83 deer), it would not exceed recruitment, and the impacts would be temporary and dissipate once these activities are complete.

All of these options would also be available as initial response tools should the disease be detected within 20 miles of the battlefields, although the focus of lethal removals would shift from detection to monitoring surveillance and/or population reduction. Lethal removals for monitoring surveillance would involve removing the same number of deer annually as described for detection, and these initial response tools would have the same impacts.

The lethal removal of healthy appearing deer for a one-time population reduction would attempt to bring deer density inside the battlefields (2008 spring/fall estimates were 94 and 137 deer per square mile for Antietam National Battlefield; 129 and 197 deer per square mile for Monocacy National Battlefield) to a level historically found in surrounding areas (estimated at 25 to 45 deer per square mile; see appendix B). Should this population reduction effort take place, it would occur over one to three years, and the associated use of firearms would cause changes in deer movement during implementation. Once the population reduction is complete, the NPS would conduct lethal removals of healthy appearing deer for monitoring surveillance.

Ultimately, these changes in movement would be detectable during both detection and initial response activities, but movement would return to pre-disturbance levels once the associated actions are finished. Deer would not be expected to disperse further than they do naturally. In addition, there would be no measurable impacts to deer habitat during detection or initial response actions from people walking through vegetated areas of the battlefields. Taking into consideration these potential changes in deer movement and habitat, the detection and initial response actions themselves under alternative B would have short-term, negligible to minor, adverse impacts on the deer population.

As described for alternative A, opportunistic and targeted surveillance would have little effect on deer densities. This would also hold true for live tests, which would result in deer being removed only if positive results are received. However, lethal removal of healthy deer as a detection and/or initial response tool could affect deer densities. If lethal removal of healthy deer is used for detection or monitoring surveillance, deer density would be reduced approximately 10% to 32% at Antietam National

Battlefield and approximately 10% to 25% at Monocacy National Battlefield. If lethal removal of healthy appearing deer is used for a one-time population, it would bring deer densities down approximately 60% to 70% at Antietam National Battlefield and approximately 75% to 89% at Monocacy National Battlefield¹. These changes to deer density in the battlefields would be detectable; however, they would not be outside the natural range of variation given densities would still be well above or similar to those found surrounding the battlefields, depending on the action taken.

Although survival rates would be affected—more so if lethal removal of healthy appearing deer is used for a one-time population reduction—sustained lower densities would result in long-term beneficial impacts to the deer herd. These long-term benefits would primarily result from the changes to the potential for CWD amplification, spread, and establishment. The use of live tests and lethal removal of healthy appearing deer for detection surveillance would increase the potential for early detection if CWD is introduced in or near the battlefields. This would provide an early opportunity to remove diseased deer, which would ultimately reduce the potential amplification and spread of the disease by removing a source of CWD prions that could be transmitted to the deer indirectly (through the environment) or directly (animal to animal contact).

Any reduction in density would also decrease one of the amplification risk factors for CWD, but the population reduction would have the greatest impact. Although the deer population would increase after lethal removals, annual monitoring surveillance would maintain a lower density when compared to alternative A, especially if preceded by a one-time population reduction.

Considering the potential for early detection and the potential to reduce the risk factor associated with high density deer herds, the potential for CWD amplification and spread would be reduced compared to alternative A, more so if a one-time population reduction occurs. The higher quality habitat and forage found in the battlefields after implementing lethal removal of healthy appearing deer could reduce the area used by some deer (females more than males), which would reduce the geographic area where infectious contacts could be made compared to alternative A. In addition, the increased opportunity for coordinating actions with the MDNR would also reduce the potential for amplification or spread of the disease. As a result, alternative B would reduce the potential for CWD establishment and exposure to possible population level effects.

Long-term benefits to deer would also occur as a result of decreased grazing and browsing pressure, which would have beneficial effects on their habitat. Considering the attractiveness of the habitat and the historically high deer population densities in the battlefields, the herds would remain stable and viable.

Lower deer densities would also reduce the potential for nutritional restriction that could occur if the herd reaches nutritional carrying capacity—more so if lethal removal of healthy appearing deer is used for a one-time population reduction.

Cumulative Impacts

The same past, present, and future impacts from cumulative actions described for alternative A would also occur under alternative B. Alternative B would have negligible to minor contributions to impacts on white-tailed deer movements and habitat during implementation, and changes in density, especially if a one-time population reduction is used, would have beneficial effects. Although the deer population would

¹ Calculated based on the numbers used in appendix B, as follows. Assumes a deer density of 115 deer per square mile at Antietam National Battlefield, which covers approximately 3 square miles and removal of anywhere from 32 to 110 deer for monitoring surveillance and 212 to 241 deer for one-time population reduction at this battlefield (the one-time population reduction is based on a target density of a target density 35 deer per square mile). For Monocacy National Battlefield, which covers approximately 2.12 square miles, assumes a deer density of 155 deer/mi², and removal of anywhere from 36 to 83 deer for monitoring surveillance and anywhere from 252 to 294 deer for one-time population reduction (the one-time population reduction is based on a target density of a target density 35 deer per square mile).

increase after lethal removals, annual monitoring surveillance would maintain a lower density when compared to alternative A, especially if preceded by a one-time population reduction. Coupled with other cumulative impacts to white-tailed deer, long-term, minor to moderate, adverse effects would still occur (although population level effects could occur, the population would remain stable and viable).

Conclusion

Detection and initial response actions would have short-term, negligible to minor, adverse impacts on white-tailed deer and their habitat from temporary disturbances during implementation. After implementation, impacts on deer density would have long-term beneficial effects on the population as a whole primarily by increasing the potential for early detection of CWD, and reducing the potential for amplification, spread, and establishment of the disease. Alternative B would have both adverse and beneficial contributions to cumulative impacts on white-tailed deer populations, which would be long-term, minor to moderate, and adverse. No impairment to white-tailed deer would occur under this alternative because adverse impacts, including cumulative effects, would be moderate or less (i.e., the deer population would remain stable and viable). Additionally, there would be long-term beneficial impacts to white-tailed deer. Consequently, there would be no change to the natural integrity of the battlefields, and the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established or other resource management goals.

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Analysis

Detection and initial response tools described for alternative C—opportunistic and targeted surveillance, live tests, lethal removal of healthy appearing deer for CWD testing (detection), and lethal removal of healthy appearing deer for monitoring surveillance—would also be available under alternative B; however, this alternative would not involve a one-time population reduction. As described for alternatives A and B, these activities would result in temporary dispersal of deer from the presence of people. The use of firearms for targeted surveillance, lethal removals for CWD testing, and lethal removals for monitoring surveillance would contribute more effects on deer movement during detection and initial response.

Ultimately, these changes would be detectable during both phases, but would not cause deer to disperse further than they do naturally, and movements would return to pre-disturbance levels once the associated actions are finished. In addition, there would be no measurable impacts during detection or initial response actions from people walking through vegetated areas of the battlefields that provide deer habitat. Taking these potential changes in deer movement and habitat into consideration, the detection and initial response actions under alternative C would have short-term, negligible to minor, adverse impacts on the deer population.

As described for alternative B, lethal removal of deer for CWD testing or monitoring surveillance would reduce the deer density approximately 10% to 32% at Antietam National Battlefield and approximately 10% to 25% at Monocacy National Battlefield. These changes to deer density in the battlefields would be detectable; however, they would not be outside the natural range of variation given densities would still be well above those found surrounding the battlefields. Although survival rates would be affected, lower densities would result in slight long-term beneficial impacts to the deer herd when compared to alternative A. These long-term benefits would primarily result from changes to the potential for CWD amplification, spread, and establishment. The use of live tests and lethal removal of healthy appearing deer would increase the potential for early detection if CWD is introduced in or near the battlefields. As described for alternative B, this would provide an early opportunity to remove diseased deer and reduce the potential amplification and spread of the disease by removing a source of CWD prions.

This reduction in deer density at the battlefields would slightly decrease an amplification risk factor for CWD. Although the deer population would increase after lethal removals, annual detection or monitoring surveillance efforts would maintain a lower density when compared to alternative A, although not to the extent of the one-time population reduction discussed under alternative B.

Although not as much as alternative B, long-term benefits to deer would also occur as a result of decreased grazing and browsing pressure, which would have beneficial effects on their habitat. Considering the attractiveness of the habitat and the historically high deer population densities in the battlefields, the herds would remain stable and viable. Lower deer densities would also reduce the potential for nutritional restriction that could occur if the herd reaches nutritional carrying capacity.

Cumulative Impacts

The same past, present, and future impacts from cumulative actions described for alternative A would also occur under alternative C. Alternative C would have negligible to minor contributions to impacts on white-tailed deer movements and habitat during implementation, and changes in density would have beneficial effects. Coupled with other cumulative impacts to white-tailed deer, long-term, minor to moderate, adverse effects would still occur (although population level effects could occur, the population would remain stable and viable).

Conclusion

Detection and initial response actions would have short-term, negligible to minor, adverse impacts on white-tailed deer and their habitat from temporary disturbances during implementation. After implementation, impacts on deer density would have beneficial effects on the population as a whole, although not to the extent of the one-time population reduction discussed under alternative B. Alternative C would have both adverse and beneficial contributions to cumulative impacts on white-tailed deer populations, which would be long-term, minor to moderate, and adverse. No impairment to white-tailed deer would occur under this alternative because adverse impacts, including cumulative effects, would be moderate or less (i.e., the deer population would remain stable and viable). Additionally, the alternative would have long-term beneficial impacts to white-tailed deer. Consequently, there would be no change to the natural integrity of the battlefields, and the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established, or other resource management goals.

VEGETATION

GUIDING REGULATIONS AND POLICIES

The NPS *Organic Act of 1916* and the NPS *Management Policies 2006* (NPS 2006b) direct parks to provide for the protection of park resources. The NPS *Management Policies 2006* state that “the Service will not attempt to solely preserve individual species (except threatened or endangered species) or individual natural processes; rather, it will try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological ecosystems” (NPS 2006b, sec. 4.1).

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

Various actions taken as part of CWD detection and initial response could affect native vegetation through trampling, inadvertent spread of exotic plant species, and changes in the number of deer that graze on vegetation.

Maps showing vegetation cover types within the battlefields, communications with NPS staff, and past surveys were used to identify baseline conditions within the study area. Impacts to vegetation were

focused on impacts to native vegetation and were estimated based on the assumed direct disturbance from any detection or initial response actions taken, as well as indirect effects from changes in numbers of deer that would result from the actions, using knowledge of the area and best professional judgment.

Although researchers believe that if it becomes established, CWD could have population level effects on deer herds, it is still unknown if these would include dramatic effects on localized populations as a result of large scale declines, or if the disease would eventually come to an equilibrium state and stabilize at an endemic level. Therefore, the evaluation does not address impacts to vegetation as a result of changes in deer populations should CWD become established.

The thresholds for the intensity of an impact were defined as follows:

<i>Negligible:</i>	Actions would cause no measurable or perceptible changes in plant community size, integrity, or continuity. Any reduction in vegetation would be so small that it would not be of measurable or perceptible consequence.
<i>Minor:</i>	Actions would cause perceptible changes but would be localized within a relatively small area. The overall viability of the plant community would not be affected, and if left alone would recover.
<i>Moderate:</i>	Actions would cause a change in the plant community (e.g., abundance, density, distribution, or quality); the impact would be measurable and of consequence to the resource but localized.
<i>Major:</i>	Actions would cause changes in plant community properties that would be readily apparent over a large area. The natural character of the plant community would be substantially altered.

AREA OF ANALYSIS

The area of analysis for assessing impacts on vegetation is the area contained within the legislated boundaries of the battlefields.

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A: NO ACTION (CURRENT ACTIVITIES CONTINUED)

Continued opportunistic and targeted surveillance under alternative A would result in limited impacts to vegetation, such as occasional trampling from people, which would occur during routine field work and research in the battlefields. Trampling would also occur during the periodic removal of deer carcasses found dead or lethally removed as part of targeted surveillance. In woodlands, this would impact herbaceous and short woody plants (e.g., shrubs or tree saplings), but would not alter the overall vegetative structure. In agricultural fields, trampling would affect crops, hay grasses, and pasture grasses. Surveillance could occur during the growing season and there would be a perceptible reduction in vegetation in small areas where trampling occurs. The impacts would be temporary, and if left alone, vegetation would recover and there would be no long-term, measurable consequences to the overall viability of the plant community. Any large pits dug for carcass burial (if needed) would be located in previously disturbed areas in or near developed areas of the battlefields and would not affect native vegetation. As described in the analysis of impacts to white-tailed deer, any changes in movement as a result of surveillance activities would be within the range of natural variation. Therefore, deer dispersal would not increase impacts to vegetation outside the battlefields.

People and vehicles associated with surveillance actions could inadvertently transport seeds of exotic species into the battlefields. These introductions could cause changes in species diversity or abundance of native plants, which would have perceptible effects on native plant communities. The potential for long-

term impacts to the size, integrity, continuity, and ultimately viability of these plant communities would be limited by exotic species control programs in both battlefields.

Considering these effects, actions directly related to opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on vegetation. Should CWD be detected in or near the park, opportunistic and targeted surveillance would likely increase, which could increase the frequency of impacts that result from these actions; however, these impacts would remain short-term and would not affect the overall viability of the plant communities.

As described in the impacts analysis for white-tailed deer, there would be minimal change in deer density under alternative A, unless CWD effects reduced the number of deer through death. Sustained browsing and grazing at high population densities would continue to have measurable effects on the diversity and abundance of understory shrubs and grasses found in woodlands. Therefore, the CWD surveillance actions that would occur under alternative A would not result in any effects to the existing conditions.

Cumulative Impacts

Adverse cumulative effects on vegetation include loss and fragmentation that resulted from past clear cutting of forests, conversion of agricultural land uses, and highway expansion. Development within the park, including private activities, also contributes to these effects. In addition, park operations such as mowing and maintenance setbacks reduce vegetative cover. With the exception of clear cutting and highway expansion, these actions would be expected to result in vegetation loss and fragmentation of plant communities into the future. Some of the effects would be offset by an increase in conservation easements as well as active reforestation in the battlefields. Cultural landscape management plans and orchard management at the battlefields also provide for the maintenance of vegetated areas in the battlefields, including agricultural fields.

Although the battlefields now manage exotic species, past introductions affect the abundance and diversity of native species and the quality of native vegetation communities. The health of woodland communities at the park units has also been affected by chestnut blight, gypsy moths, and the hemlock woolly adelgid. The fungus associated with chestnut blight, which was accidentally introduced from Asia, causes chestnut trees to die. Outbreaks of gypsy moths, which feed on the leaves of other hardwood trees, can cause complete defoliation and affect the vigor and general health of wooded areas, ultimately leading to tree mortality. The hemlock woolly adelgid is an exotic insect native to Japan that feeds by sucking sap from young needles, causing them to drop prematurely. Extensive tree death can occur as a result. The battlefields have initiated control of gypsy moth and hemlock woolly adelgid, which reduces the potential for impacts.

The traditional use of hunting as a deer management tool in Maryland has maintained deer densities outside the battlefields at lower levels relative to deer densities found inside the park units. Sustained browsing and grazing at high population densities inside the battlefields continues to contribute substantially to adverse effects as a result of effects on diversity and abundance of understory shrubs and grasses found in woodlands. However, this potential would be reduced in light of potential future deer management activities that would reduce deer densities and browsing/grazing pressure at the battlefields. In addition, although fire management would have short-term adverse impacts from prescribed burns (including associated field activities), there would be long-term beneficial effects on vegetation from nutrient release and regrowth of native plants.

In light of the adverse and beneficial effects from past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation of the battlefields would be long-term, moderate, and adverse (there would be measurable consequence to localized plant communities). Actions directly related to surveillance under alternative A would have negligible to minor contributions to impacts on vegetation.

Conclusion

Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on vegetation from temporary disturbances during implementation. Because these surveillance efforts would not measurably affect deer density, CWD surveillance actions that would occur under alternative A would not result in any indirect effects to existing vegetation conditions. Cumulative impacts on vegetation would be long-term, moderate, and adverse. Surveillance actions under alternative A would contribute minimally to these effects. No impairment to vegetation would occur under this alternative because impacts, including cumulative effects, would be moderate or less (i.e., impacts would be localized and would not affect the overall viability of the plant community). Consequently, this alternative would not result in changes to the natural integrity of the battlefields; and would not preclude the NPS from fulfilling either the purposes for which the battlefields were established, or other resource management goals.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Analysis

Under alternative B, opportunistic and targeted surveillance would be used for CWD detection and could be supplemented with live tests and lethal removal of healthy appearing deer for CWD testing under specific criteria. As described for alternative A, effects on vegetation during opportunistic and targeted surveillance would be similar to those associated with routine field work conducted in the battlefields. This would include temporary reductions in vegetation in small areas from trampling and the potential for the inadvertent introduction or spread of exotic species in the battlefields. Such impacts would also occur during sampling for live CWD tests conducted when deer are captured and collared for other projects in the battlefields. Lethal removal of healthy appearing deer for testing would involve a larger, more sustained effort than targeted surveillance (at Antietam National Battlefield, anywhere from 32 to 110 deer could be removed per sampling event, and at Monocacy National Battlefield, it would range from 36 to 83 deer). The vegetation impacts would also be the same, but would likely occur in more parts of the battlefields and more frequently.

All of these options would also be available as initial response tools should the disease be detected within 20 miles of the battlefields, although the focus of lethal removals would shift from detection to monitoring surveillance and/or population reduction. Lethal removals for monitoring surveillance would involve removing the same number of deer annually as described for detection, and these initial response tools would have the same impacts.

The lethal removal of healthy appearing deer for a one-time population reduction would attempt to bring deer density inside the battlefields (2008 spring/fall estimates were 94 and 137 deer per square mile for Antietam National Battlefield; 129 and 197 deer per square mile for Monocacy National Battlefield) to a level historically found in surrounding areas (estimated at 25 to 45 deer per square mile; see appendix B). Should this population reduction effort take place, it would occur over one to three years, and would be followed by lethal removals of healthy appearing deer for monitoring surveillance. This would have the same effects as other detection and initial response actions, but would have the most potential for impacts to vegetation because it is the largest effort in terms of scope.

Detection and initial response activities would result in perceptible impacts to shrubby and herbaceous species in woodlands as well as vegetation found in agricultural fields. But these activities would not alter the vegetative structure of native plant communities, which would remain viable. If left alone, vegetation would recover where trampling had occurred. Any pits dug for carcass burial (if needed) would be located in previously disturbed areas in or near developed areas of the battlefields and would not affect native vegetation. The potential for long-term impacts to the size, integrity, continuity, and ultimately viability of these plant communities from exotic species introduction or spread would be limited by the exotic

species control programs in both battlefields. Therefore, impacts of activities directly related to detection and initial response would have short-term, negligible to minor adverse impacts on vegetation. As described for alternative A, deer dispersal during these types of actions would not increase impacts to vegetation outside the battlefields.

As described in the impacts analysis for white-tailed deer, opportunistic and targeted surveillance would have little effect on deer densities. This would also hold true for live tests, which would only result in deer being removed if positive results are received. However, lethal removal of healthy deer could reduce deer densities by 10% to 32% at Antietam National Battlefield and 10% to 25% at Monocacy National Battlefield if used for detection or monitoring surveillance. If lethal removal is used for a one-time population reduction to minimize the likelihood of CWD becoming established, it would bring deer densities down approximately 60% to 70% at Antietam National Battlefield and approximately 75% to 89% at Monocacy National Battlefield.

Reduced grazing pressure associated with sustained lower deer densities, especially if a one-time population reduction is used, would decrease potential impacts to understory plants (shrubs and herbaceous species) that provide deer forage in woodlands, vegetation in agricultural fields, and ornamental vegetation. However, potential benefits on the regeneration of woodland species, as well as woodland community structure, would not be realized during the life of this plan. This option would also decrease the potential for the herd to reach nutritional carrying capacity when compared to alternative A, which would minimize deer range expansion and reduce the potential for impacts to vegetation outside the battlefield. Although the deer population would increase after lethal removals, annual monitoring surveillance would maintain a lower density when compared to alternative A, especially if preceded by a one-time population reduction. Therefore reduced deer browsing and grazing pressure from lower deer densities would have long-term beneficial effects on vegetation, more so if a one-time population reduction is used.

Cumulative Impacts

The same past, present, and future impacts from cumulative actions described for alternative A would occur under alternative B. Detection and initial response actions under alternative B would have negligible to minor contributions to adverse cumulative impacts on vegetation, but changes in density associated with lethal removal of deer, especially if a one-time population reduction is used, would have long-term beneficial effects. Coupled with other cumulative impacts to vegetation, long-term, minor to moderate, adverse effects would occur (localized impacts would cause perceptible if not measurable changes, but would not affect the overall viability of the plant community).

Conclusion

Detection and initial response actions would have short-term, negligible to minor, adverse impacts on vegetation from temporary disturbances during implementation. After implementation, reductions in deer density from lethal removal of deer for CWD detection, a monitoring surveillance response, or a one-time population reduction would have long-term beneficial effects. Cumulative impacts on vegetation would be long-term, minor to moderate, and adverse. Detection and initial response actions under alternative B, including benefits from reduced deer densities, would contribute minimally to these effects. No impairment to vegetation would occur under this alternative because adverse impacts, including cumulative effects, would be moderate or less (i.e., impacts would be localized and would not affect the overall viability of the plant community). Additionally, there would be long-term beneficial impacts to vegetation. Consequently, there would be no change to the natural integrity of the battlefields; and the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established or other resource management goals.

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Analysis

Detection and initial response tools described for alternative B—opportunistic and targeted surveillance, live tests, lethal removal of healthy appearing deer for CWD testing (detection), and lethal removal of healthy appearing deer for monitoring surveillance—would also be available under alternative C; however, this alternative would not involve a one-time population reduction. As described for alternatives A and B, these activities would result in effects on vegetation similar to those associated with routine field work conducted in the battlefields, and would include temporary reductions in vegetation in small areas from trampling, and the potential for the inadvertent introduction or spread of exotic species in the battlefields.

As described for alternative B, detection and initial response activities would result in perceptible impacts to shrubby and herbaceous species in woodlands as well as vegetation found in agricultural fields. However, native plant communities would remain viable, vegetation affected by trampling would recover if left alone, and there would be few or no impacts to native vegetation from any carcass burial. The potential for long-term impacts to the size, integrity, continuity, and ultimately viability of these plant communities from exotic species introduction or spread would be limited by the exotic species control programs in both battlefields. Therefore, impacts of activities directly related to CWD detection and initial response would have short-term, negligible to minor adverse impacts on vegetation. As described for alternative A, deer dispersal during these types of actions would not increase impacts to vegetation outside the battlefields as a result of deer being dispersed.

As described for alternative B, reduced grazing pressure from lethal removals for CWD testing or under the monitoring surveillance initial response option would decrease potential impacts to woodland plant communities, vegetation in agricultural fields, ornamental vegetation, and vegetation outside the battlefields. Although the deer population would increase after lethal removals, annual detection or monitoring surveillance would maintain a lower density when compared to alternative A. Therefore, there is a potential for long-term, indirect beneficial effects on vegetation, although not to the extent of those related to the one-time population reduction discussed under alternative B.

Cumulative Impacts

The same past, present, and future impacts from cumulative actions described for alternative A would also occur under alternative C. Detection and initial response actions under alternative C would have negligible to minor contributions to cumulative impacts on vegetation. Limited changes in density associated with lethal removal of deer would have short-term beneficial effects. Considering other cumulative impacts to vegetation, long-term, moderate, adverse effects would occur (localized impacts would cause measurable changes).

Conclusion

Detection and initial response actions would have short-term, negligible to minor, adverse impacts on vegetation from temporary disturbances during implementation. After implementation, reductions in deer density from lethal removal of deer for CWD detection and/or a monitoring surveillance response would have long-term beneficial effects, although not to the extent of the one-time population reduction discussed under alternative B. Cumulative impacts on vegetation would be long-term, moderate, and adverse, in light of the potential for some beneficial effects. Detection and initial response actions under alternative C would contribute minimally to cumulative impacts. No impairment to vegetation would occur under this alternative because adverse impacts, including cumulative effects, would be moderate or less (i.e., impacts would be localized and would not affect the overall viability of the plant community). Additionally, there would be long-term beneficial impacts to vegetation. Consequently, there would be no

change to the natural integrity of the battlefields; and the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established or other resource management goals.

OTHER WILDLIFE AND WILDLIFE HABITAT

GUIDING REGULATIONS AND POLICIES

The NPS *Organic Act of 1916*, NPS *Management Policies 2006* and NPS *Reference Manual 77: Natural Resource Management* direct NPS managers to provide for the protection of park resources. The *Organic Act* requires that wildlife be conserved unimpaired for future generations, which has been interpreted to mean that native animal life are to be protected and perpetuated as part of a park unit's natural ecosystem. Parks rely on natural processes to control populations of native species to the greatest extent possible; otherwise, native species are protected from harvest, harassment, or harm by human activities. Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and ecological integrity of plants and animals (NPS 2006b, sec. 4.1). Policies in the NPS *Natural Resource Management Guideline* state, "the National Park Service will seek to perpetuate the native animal life as part of the natural ecosystem of parks" and that "native animal populations will be protected against . . . destruction . . . or harm through human actions."

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

The mix of fields and wooded areas at both battlefields provide habitat for a variety of mammals, birds, reptiles, and amphibians, which could be affected by actions taken for CWD detection and initial response. The evaluation of wildlife (other than deer) was based on a qualitative assessment of the anticipated impacts from the actions themselves (sounds, human disturbance within habitat), and also how expected changes to the deer populations and battlefield vegetation would indirectly affect the habitat of other wildlife. Wildlife species at the battlefields are directly affected by the natural abundance, biodiversity, and the ecological integrity of the vegetation that comprises their habitat.

Available information on known wildlife was compiled from the battlefields staff and publications and analyzed in relation to the possible detection and initial response actions, using best professional judgment. The thresholds for the intensity of an impact are defined as follows:

- | | |
|--------------------|--|
| <i>Negligible:</i> | There would be no observable or measurable impacts to native species, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations. |
| <i>Minor:</i> | Impacts would be detectable, but would not be outside the natural range of variability. Small changes to population numbers, population structure, genetic variability, and other demographic factors might 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. |

<i>Moderate:</i>	Impacts on native species, their habitats, or the natural processes sustaining them would be detectable and could be outside the natural range of variability. Changes to population numbers, population structure, genetic variability, and other demographic factors would occur, but species would remain stable and viable. Frequent responses to disturbance by some individuals could be expected, with some negative impacts to factors affecting population levels. Sufficient habitat would remain functional to maintain the viability of all native species. Some impacts might occur during critical periods of reproduction or in key habitat.
<i>Major:</i>	Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, would be expected to be outside the natural range of variability, and would be permanent. Population numbers, population structure, genetic variability, and other demographic factors might experience large declines. Frequent responses to disturbance by some individuals would be expected, with negative impacts to factors resulting in a decrease in population levels. Loss of habitat might affect the viability of at least some native species.

AREA OF ANALYSIS

The area of analysis for assessment of impacts is the land within the battlefields. The area of analysis for cumulative impacts consists of the battlefields and the area within 5 miles of the boundaries, which is based on the average deer movement around the battlefields.

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A: NO ACTION (CURRENT ACTIVITIES CONTINUED)

Analysis

Continued opportunistic and targeted surveillance activities under alternative A would result in limited impacts to wildlife and wildlife habitat. This would include occasional trampling of soils and ground vegetation by staff involved in these actions. Trampling could also occur during the periodic removal of deer carcasses found dead or lethally removed as part of targeted surveillance. As described in impacts analysis for vegetation, this would impact mostly herbaceous and short woody plants, which could temporarily disturb battlefield wildlife that are ground, herbaceous layer, and shrub dwellers such as mice and shrews, rabbits, foxes, as well as ground nesting birds and snakes, turtles, and reptiles. Surveillance could occur during the growing season, and there would be a perceptible reduction in vegetation in small areas where trampling occurs. Trampling could also affect small burrows used by mice, shrews, and voles. The impacts would be temporary, and if left alone, habitat would recover and there would be no long-term, measurable consequences to the overall wildlife community of the battlefields. Any large pits dug for carcass burial (if needed) would be located in previously disturbed areas in or near developed areas of the battlefields and would not affect wildlife.

Also, the presence of people could disturb wildlife, and the use of firearms (for targeted surveillance) in the battlefields would cause short-term noise disturbance, causing mobile wildlife to disperse from the affected areas. Impacts related to noise are usually temporary, with wildlife avoiding or moving away from the source, but returning after noise is reduced or eliminated. These actions would not have measurable, long-term population level impacts, and any changes in movement as a result of surveillance activities would be within the range of natural variation.

People and vehicles associated with surveillance actions could also inadvertently transport seeds of exotic species into the battlefields. These introductions could cause changes in species diversity or abundance of native plants, which would have perceptible effects on native plant communities and the quality and type of wildlife habitat in the battlefields. The potential for long-term impacts to the size, integrity, continuity, and ultimately viability of these plant communities would be limited by exotic species control programs in both battlefields.

Considering these effects, actions directly related to opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on wildlife and wildlife habitat. Impacts would be detectable, but would not be outside the natural range of variability. Occasional responses to disturbance by some individuals could be expected, but without interference to factors affecting population levels, and sufficient habitat would remain functional to maintain viability of all species. Should CWD be detected in or near the park, opportunistic and targeted surveillance may increase, which could increase the frequency of impacts that result from these actions; however, these impacts would remain short-term and would not affect the overall viability of any wildlife species or habitat.

As described in the impacts analysis for white-tailed deer, there would be minimal change in deer density under alternative A, unless CWD effects reduced the number of deer through death. Sustained browsing and grazing at high population densities would continue to have measurable effects on the diversity and abundance of understory shrubs and grasses found in woodlands, and the CWD surveillance actions that would occur under alternative A would not result in any effects to the existing wildlife habitat conditions.

Cumulative Impacts

Adverse cumulative effects on wildlife and wildlife habitat would include loss and fragmentation of habitat that resulted from past clear cutting of forests, conversion of agricultural land uses, and highway expansion. Development within and around the park, including private activities, also contributes to these effects, and future growth expected in communities around the battlefields is expected to continue to reduce the amount of natural habitat. In addition, park operations such as mowing and maintenance setbacks reduce vegetative cover, and the quality of habitat has been affected by exotic plant infestations and diseases. With the exception of clear cutting and past highway expansion, these actions are expected to result in vegetation loss and fragmentation of wildlife habitat into the future. Some of the effects are offset by an increase in conservation easements, active reforestation in the battlefields, and the creation of edge habitat that could increase plant diversity in limited areas and provide enhanced food and cover for many wildlife species. Cultural landscape management plans and orchard management at the battlefields would also provide for the maintenance of vegetated areas in the battlefields, including the agricultural fields, all of which would provide habitat for various species in the battlefields.

Predator dynamics have affected wildlife in and around the battlefields. Over the past years, some predators have declined, allowing an increase in prey populations. There has also been a change in predator composition, which is anticipated to continue in the future. Hunting and poaching have had limited effects in the battlefields, where hunting is prohibited, but hunting for such species as rabbits, pheasants, doves, and squirrels has occurred and will continue outside the park boundaries, and may help in keeping populations in check. Increased traffic on local roads and associated road kill contributes negligibly to wildlife losses.

The traditional use of hunting as a deer management tool in Maryland has maintained deer densities outside the battlefields at lower levels relative to deer densities found inside the battlefields, which helps minimize impacts to wildlife habitat. Sustained browsing and grazing at high population densities inside the battlefields continues to contribute substantially to adverse effects on wildlife and wildlife habitat as a result of impacts on diversity and abundance of understory shrubs and grasses found in woodlands. However, this potential would be reduced in light of potential future deer management activities that would reduce deer densities and browsing/grazing pressure at the battlefields. In addition, although fire

management would have short-term adverse impacts from prescribed burns (including associated field activities), there would be long-term beneficial effects on wildlife habitat from nutrient release and regrowth of native plants.

In light of the beneficial effects from some past, present, and reasonably foreseeable future actions, as well as adverse effects due to fragmentation, development, high deer density, and other actions, overall cumulative impacts on wildlife and wildlife habitat of the battlefields and surrounding lands would be long-term, minor, and adverse. Actions directly related to surveillance under alternative A would have negligible contributions to impacts on wildlife and habitat.

Conclusion

Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on wildlife and wildlife habitat mainly from temporary disturbances during implementation. Because these surveillance efforts would not measurably affect deer density, CWD surveillance actions that would occur under alternative A would not result in any indirect effects to the existing wildlife or habitat conditions. Cumulative impacts on wildlife and wildlife habitat would be long-term, minor, and adverse, and surveillance actions under alternative A would contribute minimally to these effects. No impairment to wildlife and wildlife habitat would occur under this alternative because adverse impacts, including cumulative effects, would be minor or less (i.e., impacts would not be outside the range of natural variability, and species populations/habitat would remain viable). Consequently, there would be no change to the natural integrity of the battlefields, and the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established or other resource management goals.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Analysis

Under alternative B, opportunistic and targeted surveillance would be used for CWD detection, and could be supplemented with live tests and lethal removal of healthy appearing deer for CWD testing under specific criteria. As described for alternative A, effects on wildlife habitat would include temporary impacts to vegetation and soils/ground cover in small areas from trampling, which would also occur during sampling for live CWD tests. Lethal removal of healthy appearing deer for testing would involve a larger, more sustained effort than targeted surveillance (at Antietam National Battlefield, anywhere from 32 to 110 deer could be removed per sampling event, and at Monocacy National Battlefield, it would range from 36 to 83 deer), and the vegetation and associated habitat and noise impacts would likely occur in more parts of the battlefields and more frequently.

All of these options would also be available as initial response tools should the disease be detected within 20 miles of the battlefields, although the focus of lethal removals would shift from detection to monitoring surveillance and/or population reduction. Lethal removal for monitoring surveillance would involve removing the same number of deer annually as described for detection, and these initial response tools would have the same impacts.

The lethal removal of healthy appearing deer for a one-time population reduction could involve removal of several hundred deer at each battlefield (see appendix B), and would be followed by annual monitoring surveillance. This would have the same effects as other detection and initial response actions, but would cause the most impacts to wildlife because it is the largest effort in terms of scope.

The effects of detection and initial response activities would result in slight but perceptible impacts to shrubby and herbaceous species in woodlands and create temporary noise disturbance to species that use these areas for nesting, food, and cover, such as rabbits, foxes, mice, snakes, turtles, and ground-nesting birds (e.g., wild turkey, sparrows, eastern towhee). Any pits dug for carcass burial (if needed) would be

located in previously disturbed areas in or near developed areas of the battlefields and would not affect native vegetation.

Wildlife other than deer could also be temporarily disturbed by the presence of humans placing bait stations and shooting deer especially under the more intense one-time removal effort. Bait could provide a beneficial food source to other wildlife during the time when reduction activities are conducted; however, the small quantity and short time periods that bait would be available would have a negligible impact on any species. These disturbances would be adverse, but temporary and negligible to minor, as they would not cause any measurable change to the habitat or responses by other wildlife species.

As described in the impacts analysis for white-tailed deer, opportunistic and targeted surveillance and live tests would have little effect on deer densities. However, lethal removal of healthy deer for monitoring could reduce deer densities by 10% to 32% at Antietam National Battlefield and 10% to 25% at Monocacy National Battlefield, and lethal removal used for a one-time population reduction would bring deer densities down approximately 60% to 70% at Antietam National Battlefield and approximately 75% to 89% at Monocacy National Battlefield. Reduced browsing and grazing pressure associated with sustained lower deer densities, especially if a one-time population reduction is used, would decrease potential impacts to understory plants (shrubs and herbaceous species) that provide wildlife habitat in woodlands, as well as vegetation in agricultural fields and ornamental vegetation. This would increase the availability of food and cover for species that depend on ground/shrub layer vegetation for survival. Species such as ground and/or shrub-nesting birds (ovenbirds, cardinals, song and chipping sparrows, and prairie warblers.), turtles, toads, rabbits, and mice, could benefit from these changes. Although the deer population would increase after lethal removals, annual monitoring surveillance would maintain a lower density when compared to alternative A, especially if preceded by a one-time population reduction. Therefore reduced deer browsing and grazing pressure from lower deer densities would have long-term beneficial effects on wildlife, more so if a one-time population reduction is used.

Predators that use deer as a food source, such as coyotes, as well as other animals that feed on deer carcasses, such as crows and turkey vultures, are not likely to be affected as none of these species solely depend on deer as a food source.

Cumulative Impacts

The same past, present, and future impacts from cumulative actions described for alternative A would occur under alternative B. Detection and initial response actions under alternative B would have negligible to minor contributions to cumulative impacts on wildlife and wildlife habitat, and changes in density associated with lethal removal of deer, especially if a one-time population reduction is used, would have long-term beneficial effects. Coupled with other cumulative impacts, long-term, minor adverse effects would still occur to wildlife and wildlife habitat in and around the battlefields.

Conclusion

Detection and initial response actions would have short-term, negligible to minor, adverse impacts on wildlife and wildlife habitat from temporary disturbances during implementation. After implementation, reductions in deer density from lethal removal of deer for CWD detection and/or initial response would have long-term beneficial effects. Cumulative impacts on wildlife and wildlife habitat would be long-term, minor, and adverse, and detection and initial response actions under alternative B would contribute minimally to these effects. No impairment to wildlife and wildlife habitat would occur under this alternative because adverse impacts, including cumulative effects, would be minor or less (i.e., impacts would not be outside the range of natural variability, and species populations/habitat would remain viable). In addition, there would be long-term beneficial impacts to wildlife and wildlife habitat. Consequently, there would be no change to the natural integrity of the battlefields, and the NPS would not

be precluded from fulfilling either the purposes for which the battlefields were established or other resource management goals.

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Analysis

Detection and initial response tools described for alternative B—opportunistic and targeted surveillance, live tests, lethal removal of healthy appearing deer for CWD testing (detection), and lethal removal of healthy appearing deer for monitoring surveillance—would also be available under alternative C; however, this alternative would not involve a one-time population reduction. As described for alternative B, detection and initial response activities would result in perceptible impacts to shrubby and herbaceous species in woodlands, as well as vegetation found in agricultural fields, and wildlife may be temporarily displaced by noise associated with the actions. However, native plant communities would remain viable, vegetation affected by trampling would recover if left alone, and there would be few or no impacts to native vegetation from any carcass burial. Impacts of activities directly related to CWD detection and initial response would have short-term, negligible to minor adverse impacts on wildlife and habitat.

As described for alternative B, reduced grazing pressure from lethal removals for CWD testing or under the monitoring surveillance initial response option would decrease potential impacts to woodland plant communities, vegetation in agricultural fields, ornamental vegetation, and vegetation outside the battlefields. Therefore, there would be long-term, indirect beneficial effects on this habitat and the species that use it, although not to the extent of the one-time population reduction discussed under alternative B.

Cumulative Impacts

The same past, present, and future impacts from cumulative actions described for alternative A would also occur under alternative C. Detection and initial response actions under alternative C would have negligible to minor contributions to cumulative impacts on wildlife and habitat. Limited changes in density associated with lethal removal of deer would have short-term beneficial effects. Considering other cumulative impacts to vegetation, long-term, minor, adverse effects would occur.

Conclusion

Detection and initial response actions would have short-term, negligible to minor, adverse impacts on wildlife and habitat from temporary disturbances during implementation. After implementation, reductions in deer density from lethal removal of deer for CWD detection and/or a monitoring surveillance response would have long-term beneficial effects, but these benefits would be limited because deer density would eventually rebound (unless CWD resulted in lower deer density). Cumulative impacts on wildlife and wildlife habitat would be long-term, minor, and adverse, and the detection and initial response actions under alternative C would contribute minimally to cumulative impacts. No impairment to wildlife and wildlife habitat would occur under this alternative because adverse impacts, including cumulative effects, would be minor or less (i.e., impacts would not be outside the range of natural variability, and species populations/habitat would remain viable). In addition, there would be long-term beneficial impacts to wildlife and wildlife habitat. Consequently, there would be no change to the natural integrity of the battlefields, and the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established or other resource management goals.

CULTURAL RESOURCES

GUIDING REGULATIONS AND POLICIES

Federal actions that have the potential to affect cultural resources are subject to a variety of laws. The *National Historic Preservation Act* (1966, as amended) is the principal legislative authority for managing cultural resources associated with NPS projects. Generally, Section 106 of the act requires all federal agencies to consider the effects of their actions on cultural resources listed on or determined eligible for listing on the National Register of Historic Places. Such resources are termed historic properties.

Agreement on how to mitigate effects to historic properties is reached through consultation with the State Historic Preservation Officer; the Tribal Historic Preservation Officer, if applicable; and the Advisory Council on Historic Preservation, as necessary. In addition, federal agencies must minimize harm to historic properties that would be adversely affected by a federal undertaking. Section 110 of the act requires federal agencies to establish preservation programs for the identification, evaluation, and nomination of historic properties to the National Register.

The *National Historic Preservation Act* established the National Register of Historic Places, the official list of the nation's historic places worthy of preservation. Administered by the NPS, the National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources. The criteria applied to evaluate properties are contained in 36 CFR 60.4. The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) that are associated with the lives of persons significant in our past; or
- (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) that have yielded or may be likely to yield, information important in prehistory or history.

Cultural resources that meet the eligibility criteria for listing on the National Register of Historic Places are considered “significant” resources and must be taken into consideration during the planning of federal projects.

Other important laws or Executive Orders designed to protect cultural resources include, but are not limited to:

- NPS Organic Act—to conserve the natural and historic objects within parks unimpaired for the enjoyment of future generations;
- American Indian Religious Freedom Act—to protect and preserve for American Indians access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites;
- Archeological Resources Protection Act—to secure, for the present and future benefit of the American people, the protection of archeological resources and sites that are on public lands and Indian Lands;

- *National Environmental Policy Act* (NEPA)—to preserve important historic, cultural, and natural aspects of our national heritage; and
- Executive Order 11593 (Protection and Enhancement of the Cultural Environment)—to provide leadership in preserving, restoring and maintaining the historic and cultural environment of the Nation.
- Executive Order 13007 (Indian Sacred Sites)—to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.

Through legislation and the Executive Orders listed above, the NPS is charged with the protection and management of cultural resources in its custody. This is furthered implemented through Director's Order 28: Cultural Resource Management, *NPS Management Policies 2006* (NPS 2006b), and the 2008 "Programmatic Agreement among the National Park Service (U.S. Department of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers for Compliance with Section 106 of the National Historic Preservation Act" (NPS 2008). These documents charge NPS managers with avoiding, or minimizing to the greatest degree practicable, adverse impacts on park resources and values. Although the NPS has the discretion to allow certain impacts in parks, that discretion is limited by the statutory requirement that park resources and values remain unimpaired, unless a specific law directly provides otherwise.

ASSUMPTIONS AND METHODOLOGY

The NPS categorizes cultural resources as archeological resources, cultural landscapes, historic structures, museum objects, and ethnographic resources. As noted in the "Scoping Process and Public Participation" section in the "Purpose of and Need for Action" chapter, only impacts to cultural landscapes and archeological resources have been retained for detailed analysis in this EIS.

The descriptions of effects on cultural resources that are presented in this section are intended to comply with the requirements of both NEPA and Section 106 of the *National Historic Preservation Act*. In accordance with the regulations of the Advisory Council on Historic Preservation implementing Section 106 (36 CFR 800, "Protection of Historic Properties"), impacts on cultural resources are to be identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that are either listed on or eligible to be listed on the National Register of Historic Places; (3) applying the criteria of an adverse effect to affected cultural resources either listed on or eligible to be listed on the national register; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the Advisory Council's regulations, a determination of either *adverse effect* or *no adverse effect* must also be made for affected cultural resources eligible for listing on the National Register of Historic Places. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any of the characteristic that qualifies the resource for inclusion on the national register (for example, diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association). Adverse effects also include reasonably foreseeable effects caused by the proposal that would occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5, "Assessment of Adverse Effects"). A determination of *no adverse effect* means there would either be no effect or that the effect would not diminish in any way the characteristics that qualify the cultural resource for inclusion on the National Register of Historic Places.

CEQ regulations and the NPS Director's Order 12 also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g., reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in the intensity of an impact due to mitigation, however, is an estimate of the effectiveness of

mitigation under NEPA only. Cultural resources are non-renewable resources, and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under Section 106 of the *National Historic Preservation Act* may be mitigated, the effect remains adverse.

A Section 106 summary is included at the end of the impact analysis sections for cultural landscapes and archeological resources. The Section 106 summary is an assessment of the effect of the undertaking (implementation of the alternative) only on cultural resources listed on or eligible for the National Register of Historic Places, based on the criteria of effect and criteria of adverse effect found in the regulations of the Advisory Council on Historic Preservation (36 CFR 60.4).

CULTURAL LANDSCAPES

METHODOLOGY AND INTENSITY THRESHOLDS

Cultural landscapes are landscapes that have been adapted for or influenced by human use. Cultural landscapes that are so designated within national parks have been determined to have historic significance and integrity.

In analyzing how alternative approaches to CWD detection and initial response would affect the cultural landscape of Antietam and Monocacy National Battlefields, attention was paid to the effects on native deer as a character-defining feature of the cultural landscape and on views and vistas.

For the assessment of potential impacts to cultural landscapes, the principal sources reviewed at Antietam National Battlefield, were the descriptions of the Mumma Farmstead, Roulette Farm Component Landscape, Miller Farm, and Antietam National Cemetery (NPS 2003, 2004a, 2005a, 2005b). For Monocacy National Battlefield, the sources were the description of Hermitage Farmstead, Araby Community, Baker Farm, The Hill Farm, and Clifton Farmstead in the Monocacy cultural landscape inventories (NPS 2000; NPS 2002a).

For purposes of analyzing potential impacts to cultural landscapes, the thresholds of change for the intensity of an impact are defined as follows:

- | | |
|--------------------|--|
| <i>Negligible:</i> | The impact would be at the lowest level of detection, with neither adverse nor beneficial consequences. For purposes of Section 106 of the <i>National Historic Preservation Act</i> , the determination of effect would be <i>no adverse effect</i> . |
| <i>Minor:</i> | <p><u>Adverse impact</u> – Alteration of a pattern(s) or feature(s) of the cultural landscape listed on or eligible for listing on the National Register of Historic Places would not diminish the overall integrity of the landscape. For purposes of Section 106 of the <i>National Historic Preservation Act</i>, the determination of effect would be <i>no adverse effect</i>.</p> <p><u>Beneficial impact</u> – Preservation of landscape patterns and features would be in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes (NPS 1996), therefore maintaining the integrity of the cultural landscape. For purposes of Section 106 of the <i>National Historic Preservation Act</i>, the determination of effect would be no adverse effect.</p> |

- Moderate:* Adverse impact – The impact would alter a pattern(s) or feature(s) of the cultural landscape, diminishing the overall integrity of the landscape. For purposes of Section 106 of the *National Historic Preservation Act*, the determination of effect would be *adverse effect*. A memorandum of agreement would be executed among the National Park Service and the State Historic Preservation Officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement to minimize or mitigate adverse impacts would reduce the intensity of impact under NEPA from major to moderate.
- Beneficial impact – The landscape or its features would be rehabilitated in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties, with Guidelines for the Treatment of Cultural Landscapes (NPS 1996), to make possible a compatible use of the landscape while preserving its character-defining features. For purposes of Section 106 of the *National Historic Preservation Act*, the determination of effect would be no adverse effect.
- Major:* Adverse impact – The impact would alter a pattern(s) or feature(s) of the cultural landscape, diminishing the overall integrity of the resource. For purposes of Section 106 of the *National Historic Preservation Act*, the determination of effect would be *adverse effect*. Measures to minimize or mitigate adverse impacts could not be agreed upon, and the National Park Service and the State Historic Preservation Officer and/or Advisory Council on Historic Preservation would be unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
- Beneficial impact – The cultural landscape would be restored in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties, with Guidelines for the Treatment of Cultural Landscapes (NPS 1996) to accurately depict the features and character of a landscape as it appeared during its period of significance. For purposes of Section 106 of the *National Historic Preservation Act*, the determination of effect would be no adverse effect.
- Duration:* Impacts to cultural landscapes can be short-term (up to 3 years) or long-term.

AREA OF ANALYSIS

The area of analysis, including the cumulative impacts analysis area, is limited to the lands within the legislated boundaries of the two battlefields.

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A: NO ACTION (CURRENT ACTIVITIES CONTINUED)

Analysis

Under this alternative, opportunistic and targeted surveillance for CWD would continue in the battlefields. Targeted surveillance could result in the removal of deer that show clinical signs of CWD, but would not likely influence deer density in the park. No new CWD management actions would be taken, and it is assumed that about five deer per park would be taken annually with targeted surveillance,

and 20 deer with opportunistic surveillance, at each park annually. This level is assumed to be similar to what has been experienced. Should CWD be detected in or near the park, opportunistic and targeted surveillance may increase, which could increase the impacts that result from these actions, but not substantially.

At Antietam National Battlefield, 1,927 of the 3,256 acres within the battlefield boundary are managed by the NPS to maintain the historic setting. Of the four cultural landscapes at Antietam National Battlefield, three are farmsteads and one is a cemetery. The farms and farmlands in and near the national battlefield appear much as they did on the eve of the battle in 1862. At Monocacy National Battlefield, five component properties that make up the cultural landscapes are farmsteads or mills. Although the cultural landscapes were created to commemorate the historical setting of the period, it is assumed that native deer were part of the landscape at that time.

Given the current and anticipated level of removal efforts under this alternative, there would be minimal effects on cultural landscapes. It is assumed that opportunistic and targeted surveillance activities would not be conducted in the immediate vicinity of the cultural landscape farmstead structures or cemetery, unless absolutely necessary. Although opportunistic and targeted surveillance could affect the visitor experience of the cultural landscapes at the park, the temporary presence of people and the associated noise, including gunshots during these surveillance efforts, would have no impacts on the cultural landscapes themselves. If needed, excavation of pits for any burial of carcasses within the battlefields should not disrupt the view of the cultural landscapes because they would be constructed within previously disturbed areas, avoiding areas of known cultural resources. This would not permanently introduce modern elements into a 1860s era landscape because these areas are away from visitor use areas. There would be no effects to the existing physical, historic, visual, or aesthetic landscapes for which the battlefields were created, and impacts from implementation of alternative B would be short-term and negligible.

As described in the impacts analysis for white-tailed deer, any changes in deer density from opportunistic and targeted surveillance would be imperceptible. Because deer would still be present as a natural resource component of the cultural landscapes at the battlefields, long-term impacts would be negligible under alternative A.

Cumulative Impacts

Actions that have contributed to adverse cumulative effects on cultural landscapes within the battlefields include loss and fragmentation of vegetation and landscaping that result from clear cutting of forests, loss of agricultural land uses, suburban/rural developments, and past highway expansion. Some of the effects are offset by an increase in conservation easements as well as active reforestation in the battlefields. Cultural landscape management plans and orchard management also provide for the maintenance of vegetated areas in the battlefields, including the agricultural fields. Deer management outside the park units, coupled with future deer management inside the battlefields, would maintain viable deer herds at lower densities, which would benefit natural resource components of the landscapes. In addition, although fire management would have short-term adverse impacts from prescribed burns (including associated field activities), there would be long-term beneficial effects on cultural landscapes through the benefits this has on vegetation and wildlife components.

Despite some beneficial effects from other past, present, and reasonably foreseeable future actions, cumulative impacts to cultural landscapes would be long-term, minor, and adverse. Actions directly related to alternative A would have negligible contributions to impacts on cultural landscapes.

Conclusion

Opportunistic and targeted surveillance would have short-and long-term, negligible impacts on cultural landscapes from temporary disturbances during implementation and negligible changes in deer density.

Cumulative impacts to cultural landscapes would be long-term, minor, and adverse. Alternative A would have minimal contributions to cumulative impacts on cultural landscapes. No impairment to cultural landscapes would occur under this alternative because adverse impacts, including cumulative effects, would be minor or less (the key criteria for which the cultural landscapes were listed [military, conservation, politics/government, and/or place in national events of the time period 1850–1874] would not be affected by this plan/EA, and cultural integrity of the battlefields would not be diminished). In addition, the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established, or other resource management goals.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Analysis

Under alternative B, opportunistic and targeted surveillance would be used for CWD detection, and could be supplemented with live tests and lethal removal of healthy appearing deer for CWD testing under specific criteria. Effects on cultural landscapes from opportunistic and targeted surveillance would be similar to those described in alternative A—short-term and negligible. Samples for live CWD tests would only be taken when deer are captured and collared in the park units as part of other projects. Therefore, this would not increase impacts on cultural landscapes beyond those associated with these other projects. Although lethal removal of healthy appearing deer would involve a larger, more sustained effort than targeted surveillance (at Antietam National Battlefield, anywhere from 32 to 110 deer could be removed per sampling event, and at Monocacy National Battlefield, it would range from 36 to 83 deer) the temporary impacts would be similar to those described for targeted surveillance. If needed, excavation of pits for any burial of carcasses within the battlefields should not disrupt the view of the cultural landscapes because they would be constructed within previously disturbed areas, avoiding areas of known cultural resources. This would not permanently introduce modern elements into a 1860s era landscape because these areas are away from visitor use areas. There would be no effects to the existing physical, historic, visual, or aesthetic landscapes for which the battlefields were created, and impacts from implementation of detection actions would be short-term and negligible to minor adverse.

All of these options would also be available as initial response tools should the disease be detected within 20 miles of the battlefields, although the focus of lethal removals would shift from detection to monitoring surveillance and/or population reduction. Lethal removals for monitoring surveillance would involve removing the same number of deer annually as described for detection, and these initial response tools would have the same impacts described above during implementation.

This alternative could also include the lethal removal of healthy appearing deer for a one-time population reduction that would attempt to bring deer density inside the battlefields to a level historically found in surrounding areas. This would have similar impacts on cultural landscapes as described for monitoring surveillance, but because it would require more extensive actions, there would be long-term, minor, adverse impacts to cultural landscapes if a one-time population reduction is used.

As described in the analysis for white-tailed deer, opportunistic and targeted surveillance would have little effect on deer densities. This would also hold true for live tests, which would only result in deer being removed if positive results are received. However, lethal removal of healthy deer as a detection and/or initial response tool could affect deer densities. If lethal removal of healthy deer is used for detection or monitoring surveillance, deer density would be reduced approximately 10% to 32% at Antietam National Battlefield and approximately 10% to 25% at Monocacy National Battlefield. If lethal removal of healthy appearing deer is used for a one-time population, it would bring deer densities down approximately 60% to 70% at Antietam National Battlefield and approximately 75% to 89% at Monocacy National Battlefield. Annual monitoring surveillance, whether used in conjunction with a one-time population reduction or not, would maintain a lower density when compared to alternative A. These changes to deer density in the battlefields would be detectable; however, it would not diminish the overall

integrity of the landscape. Alternative B would actually have long-term benefits for the deer herds, which are parts of the cultural landscapes, which would help maintain the integrity of the cultural landscape. As a result, there would be long-term, negligible beneficial effects from implementation of alternative B.

Cumulative Impacts

As with alternative A, actions that have contributed to adverse cumulative effects on cultural landscapes within the battlefields would be offset by an increase in conservation easements as well as active reforestation in the battlefields. Cultural landscape management plans, orchard management, deer management, and fire management, provide for the maintenance of vegetated areas in the battlefields, including the agricultural fields. Despite some beneficial effects from alternative B, as well as other past, present, and reasonably foreseeable future actions, cumulative impacts to cultural landscapes would be long-term minor and adverse. Actions directly related to alternative A would have negligible contributions to impacts on cultural landscapes.

Conclusion

Actions associated with opportunistic and targeted surveillance, supplemented with live tests and lethal removal of healthy appearing deer would have short-term, negligible to minor adverse impacts on cultural landscapes from temporary disturbances during implementation. There would be long-term, negligible beneficial impacts as a result of the benefits to the deer herds, which are components of the cultural landscapes in the battlefields. Cumulative impacts to cultural landscapes would be long-term, minor and adverse. Alternative B would have minimal contributions to cumulative impacts on cultural landscapes. No impairment to cultural landscapes would occur under this alternative because adverse impacts, including cumulative effects, would be minor or less (the key criteria for which the cultural landscapes were listed [military, conservation, politics/government, and/or place in national events of the time period 1850–1874] would not be affected, and the cultural integrity of the battlefields would not be diminished). Additionally, there would be long-term beneficial effects to cultural landscapes, and the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established, or other resource management goals.

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Analysis

Detection and initial response tools described for alternative B (opportunistic and targeted surveillance, live tests, lethal removal of healthy appearing deer for CWD testing (detection), and lethal removal of healthy appearing deer for monitoring surveillance) would be available under alternative C; however, alternative C would not involve a one-time population reduction. Therefore, implementation of the detection and surveillance actions alternative C would be essentially same as described above for alternative B, without the added impacts related to the one-time population reduction. If needed, excavation of pits for any burial of carcasses within the battlefields should not disrupt the view of the cultural landscapes because they would be constructed within previously disturbed areas, avoiding areas of known cultural resources. This would not permanently introduce modern elements into a 1860s era landscape because these areas are away from visitor use areas. There would be no effects to the existing physical, historic, visual, or aesthetic landscapes for which the battlefields were created, and impacts from implementation of alternative C would be short-term, negligible to minor adverse.

As described for alternative B, if lethal removal of healthy appearing deer for detection and/or monitoring surveillance is implemented, deer density would initially be reduced approximately 10% to 32% at Antietam and approximately 10% to 25% at Monocacy. Although the deer herd could increase in numbers, if conducted annually, this monitoring surveillance would maintain a lower density when compared to alternative A, although not to the extent of the one-time population reduction discussed

under alternative B. As described in the analysis of impacts to white tailed deer, this would have long-term benefits for the deer herds, which are parts of the cultural landscapes, which would help maintain the integrity of the cultural landscape. As a result, there would be long-term, negligible beneficial effects from implementation of alternative C.

Cumulative Impacts

The same past, present, and future impacts from cumulative actions described for alternatives A and B would also occur under alternative C. Alternative C would have negligible to minor contributions to impacts on cultural landscapes from the actions proposed, with more short-term effects rather than continuous adverse impacts. As a result, cumulative effects on cultural landscapes would remain long-term, minor, and adverse.

Conclusion

Under alternative C, detection and initial response actions would have short-term, negligible to minor adverse impacts on cultural landscapes, with the more intense impacts related to the lethal removal action for monitoring response. Although not to the extent of the one-time population reduction discussed under alternative B, changes in deer density would have long-term, negligible beneficial impacts as a result of benefits to the deer herds, a natural resource component of the cultural landscapes. Cumulative effects on cultural landscapes would be long-term, minor, and adverse. No impairment to cultural landscapes would occur under this alternative because adverse impacts, including cumulative effects, would be minor or less (the key criteria for which the cultural landscapes were listed [military, conservation, politics/government, and/or place in national events of the time period 1850–1874] would not be affected, and the cultural integrity of the battlefields would not be diminished). Additionally, there would be long-term beneficial effects to cultural landscapes, and the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established, or other resource management goals.

ARCHEOLOGICAL RESOURCES

Archeological resources consist of buried prehistoric and historic remains and artifacts significant to our study of prehistory and history. As these resources exist primarily in subsurface contexts, potential impacts to archeological resources are assessed according to the extent to which the proposed alternatives would involve ground-disturbing activities such as excavation or grading. Analysis of possible impacts to archeological resources was based on a review of previous archeological studies, consideration of the proposed alternatives, and other information provided by the NPS. The analysis of potential impacts to archeological resources begins with the identification and evaluation of archeological sites in the study area. Information concerning site location, type, age and National Register eligibility provides an essential understanding of not only known sites, but where *potential* undocumented archeological resources sites *may be* found. National Register listed and eligible archeological sites are then assessed for potential impacts from the proposed alternatives.

METHODOLOGY AND INTENSITY THRESHOLDS

IMPACT THRESHOLDS

For purposes of analyzing potential impacts to archaeological resources, the thresholds of change for the intensity of an impact are defined as follows:

<i>Negligible:</i>	The impact on archeological sites is at the lowest level of detection, barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i> .
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<i>Minor:</i>	The impact on archeological sites is measurable or perceptible, but it is slight and localized within a relatively small area of a site or group of sites. The impact does not affect the character-defining features of a listed or eligible National Register of Historic Places archeological site and would not have a permanent effect on the integrity of any archeological sites. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i> .
<i>Moderate:</i>	The impact is measurable and perceptible. The impact changes one or more character-defining feature of an archeological resource but does not diminish the integrity of the resource to the extent that its National Register eligibility is jeopardized. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i> .
<i>Major:</i>	The impact on archeological sites is substantial, noticeable, and permanent. The impact is severe or is of exceptional benefit. For National Register-eligible or listed archeological sites, the impact changes one or more character-defining feature of an archeological resource, diminishing the integrity of the resource to the extent that it is no longer eligible for listing in the National Register. For purposes of Section 106, the determination of effect would be <i>adverse effect</i> . A major impact can also be one of exceptional benefit. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i> .
<i>Duration:</i>	All impacts to archeological resources are considered long-term.

AREA OF ANALYSIS

The area of analysis, including the cumulative impacts analysis area, is limited to the lands within the legislated boundaries of the two battlefields.

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A: NO ACTION (CURRENT ACTIVITIES CONTINUED)

Analysis

Under this alternative, opportunistic and targeted surveillance for CWD would continue in the battlefields. Targeted surveillance could result in the removal of deer that show clinical signs of CWD, but is not likely to influence deer density in the park. No new CWD management actions would be taken, and it is assumed that about five deer per park would be taken annually with targeted surveillance, and 20 deer with opportunistic surveillance, at each park annually. This level is assumed to be not much different from what has been experienced. Should CWD be detected in or near the park, opportunistic and targeted surveillance may increase, which could increase the impacts that result from these actions, but not substantially.

Under this alternative, if off-site disposal is not possible, CWD-positive carcasses could be buried in pits that would be located in previously disturbed areas within the battlefields, avoiding areas of known cultural resources. However, if needed, excavation of pits with heavy equipment within the battlefields could disturb previously unrecorded subsurface archeological resources. Surveys would be conducted prior to any ground disturbance in areas that have not yet been surveyed for archeological resources, and work would be stopped if any artifacts were discovered during excavation.

At Antietam National Battlefield, 1,927 of the 3,256 acres within the battlefield boundary are managed by the NPS; however, only approximately 5 percent of Antietam National Battlefield has been surveyed for

archeological data (Custer 2009). Monocacy National Battlefield has not been systematically surveyed or inventoried for archeological resources. It is assumed that opportunistic and targeted surveillance activities would not be conducted in the immediate vicinity of known archeological sites. However, it is possible that permanent adverse impacts would occur to archeological sites during removal or excavation activities. Given the current and anticipated level of removal and on-site burial of carcasses under this alternative, there would be long-term, negligible to minor, adverse impacts on archeological resources under alternative A.

Cumulative Impacts

Actions that have contributed to adverse cumulative effects on archeological resources within the battlefields include disruption of soils, loss and fragmentation of vegetation and landscaping that result from clear cutting of forests, agricultural activities, suburban/rural developments, and past highway expansion. Cultural landscaping and orchard management also could have disturbed archeological sites. In addition, future fire management activities could have long-term, negligible adverse effects on archeological resources if they are inadvertently disturbed or lost during field activities or burning. Some of the effects are offset by an increase in conservation easements, which tend to preserve and protect archeological resources. In addition, future fire management activities could have long-term, negligible adverse effects on archeological resources if they are inadvertently disturbed or lost during field activities or burning.

Despite some adverse effects from other past, present, and reasonably foreseeable future actions, cumulative impacts to archeological resources would be long-term, negligible, and adverse. Actions directly related to alternative A would have minimal contributions to impacts on archeological resources.

Conclusion

Actions associated with opportunistic and targeted surveillance, including removal and on-site burial of carcasses, could have long-term, negligible to minor, adverse impacts on archeological resources from ground disturbance under alternative A. Cumulative impacts to archeological resources would be long-term, negligible, and adverse and alternative A would have minimal contributions to these effects. No impairment to archeological resources would occur under this alternative because adverse impacts, including cumulative effects, would be minor or less (i.e., would not affect the character-defining features of a listed or eligible National Register of Historic Places archeological site and would not have a permanent effect on the integrity of any archeological sites, and the cultural integrity of the battlefields would not be diminished). In addition, the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established, or other resource management goals.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Analysis

Under alternative B, opportunistic and targeted surveillance would be used for CWD detection, and could be supplemented with live tests and lethal removal of healthy appearing deer for CWD testing under specific criteria. Effects on archeological resources during opportunistic and targeted surveillance would be similar to those described for alternative A—long-term, negligible to minor, adverse impacts on archeological resources from disturbances during implementation. Samples for live CWD tests would only be taken when deer are captured and collared in the park units as part of other projects. Therefore, this would not increase impacts on archeological resources beyond those associated with these other projects.

Although lethal removal of healthy appearing deer would involve a larger, more sustained effort than targeted surveillance (at Antietam National Battlefield, anywhere from 32 to 110 deer could be removed

per sampling event, and at Monocacy National Battlefield, it would range from 36 to 83 deer) these the temporary impacts would be similar to those described for targeted surveillance.

Under this alternative, if off-site disposal is not possible, carcasses could be buried annually in pits that would be located in previously disturbed areas within the battlefields, avoiding areas of known cultural resources. However, if needed, excavation of pits with heavy equipment within the battlefields could disturb previously unrecorded subsurface archeological resources. Surveys would be conducted prior to any ground disturbance in areas that have not yet been surveyed for archeological resources, and work would be stopped if any artifacts were discovered during excavation.

All of these options would also be available as initial response tools should the disease be detected within 20 miles of the battlefields, although the focus of lethal removals would shift from detection to monitoring surveillance and/or population reduction. Lethal removals for monitoring surveillance would involve removing the same number of deer annually as described for detection, and these initial response tools would have the same impacts. This alternative could also include the lethal removal of healthy-appearing deer for a one-time population reduction that would attempt to bring deer density inside the battlefields to a level historically found in surrounding areas, as described under alternative A. Since the removal could target several hundred deer, impacts to archeological resources could occur from the construction of bait piles, deer handling, and disposal. Excavation of pits for disposal (if needed) with heavy equipment within the battlefields could disturb previously unrecorded archeological resources. In addition, installation of a cement pad in or near the existing areas in the maintenance yards used for temporary storage of carcasses would involve ground disturbance, but would occur in previously disturbed areas, minimizing the potential for adverse impacts to archeological resources. Given the current and anticipated level of removal and on-site burial of carcasses under this alternative, there could be long-term, minor, adverse impacts on archeological resources under alternative B.

Cumulative Impacts

As with alternative A, actions that have contributed to adverse cumulative effects on archeological resources within the battlefields include soil disturbance, clear cutting of forests, agricultural activities, suburban/rural developments, and past highway expansion. Cultural landscaping and orchard management, as well as future fire management, could also cause disturbances to archeological sites. Some of the effects are offset by an increase in conservation easements, which tend to preserve and protect archeological sites. Despite some adverse effects from other past, present, and reasonably foreseeable future actions, cumulative impacts to archeological resources would be long-term, negligible to minor, and adverse. Actions directly related to alternative B would have minimal contributions to impacts on archeological resources.

Conclusion

Actions associated with opportunistic and targeted surveillance, supplemented with live tests and lethal removal of healthy appearing deer could have long-term, minor, adverse impacts on archeological resources from ground disturbances during implementation. Cumulative impacts to archeological resources would be long-term, negligible to minor, and adverse. Alternative B would have minimal contributions to these cumulative effects. No impairment to archeological resources would occur under this alternative because adverse impacts, including cumulative effects, would be minor or less (i.e., would not affect the character-defining features of a listed or eligible National Register of Historic Places archeological site and would not have a permanent effect on the integrity of any archeological sites, and the cultural integrity of the battlefields would not be diminished). In addition, the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established, or other resource management goals.

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Analysis

Detection and initial response tools described for alternative B would be available under alternative C; however, alternative C would not involve a one-time population reduction. Therefore, impacts of alternative C would be essentially same as described above for alternative B, without the added impacts related to the one-time population reduction. Therefore, implementation of the detection and initial response actions alternative C would be essentially same as described above for alternative B, without the added impacts related to the one-time population reduction. Under this alternative, if off-site disposal is not possible, carcasses could be buried annually in pits that would be located in previously disturbed areas within the battlefields, avoiding areas of known cultural resources. However, if needed, excavation of pits with heavy equipment within the battlefields could disturb previously unrecorded subsurface archeological resources. Surveys would be conducted prior to any ground disturbance in areas that have not yet been surveyed for archeological resources, and work would be stopped if any artifacts were discovered during excavation. In addition, installation of a cement pad in or near the existing areas in the maintenance yards used for temporary storage of carcasses would involve ground disturbance, but would occur in previously disturbed areas, minimizing the potential for adverse impacts to archeological resources. Given the current and anticipated level of removal and on-site burial of carcasses under this alternative, there would be long-term, negligible to minor, adverse impacts on archeological resources under alternative C.

Given the current and anticipated level of removal and on-site burial of carcasses under this alternative, there would be long-term, negligible to minor, adverse impacts on archeological resources under alternative C.

Cumulative Impacts

The same past, present, and future impacts from cumulative actions described for alternatives A and B would also occur under alternative C. Alternative C would have minimal contributions to impacts on archeological resources from the actions proposed. As a result, cumulative effects on archeological resources would remain long-term, negligible to minor, and adverse.

Conclusion

Detection and initial response actions would have long-term, negligible to minor, adverse impacts on archeological resources, with the more intense impacts related to the lethal removal action for monitoring response. Cumulative effects on archeological resources would be long-term, negligible, and adverse. Alternative C would have minimal contributions to cumulative impacts on archeological resources. No impairment to archeological resources would occur under this alternative because adverse impacts, including cumulative effects, would be minor or less (i.e., would not affect the character-defining features of a listed or eligible National Register of Historic Places archeological site and would not have a permanent effect on the integrity of any archeological sites, and the cultural integrity of the battlefields would not be diminished). In addition, the NPS would not be precluded from fulfilling either the purposes for which the battlefields were established, or other resource management goals.

NATIONAL HISTORIC PRESERVATION ACT SECTION 106

SUMMARY

The Chronic Wasting Disease Detection and Initial Response Plan / Environmental Assessment analyzes the impacts of three alternatives on cultural landscapes and archeological resources in Antietam National Battlefield and Monocacy National Battlefield. The alternatives include a no-action alternative and two

action alternatives. Antietam National Battlefield was listed on the National Register of Historic Places on October 15, 1966. Monocacy National Battlefield was also listed in the National Register in 1966.

ALTERNATIVE A: NO ACTION (CURRENT ACTIVITIES CONTINUED)

Under alternative A, actions associated with opportunistic and targeted surveillance, including removal and on-site burial of carcasses, would have long-term, negligible, adverse impacts on cultural landscapes from disturbances during implementation. Any changes in deer density from opportunistic and targeted surveillance would be imperceptible. Because deer would still be present as a natural resource component of the cultural landscapes at the battlefields, long-term impacts would be negligible and adverse under alternative A. Alternative A would also have minimal contributions to cumulative impacts on cultural landscapes. Therefore, implementation would result in *no adverse effect* on the battlefields' cultural landscapes.

Actions associated with opportunistic and targeted surveillance, including removal and on-site burial of carcasses, could have long-term, negligible to minor, adverse impacts on archeological resources from ground disturbance under alternative A. Alternative A would have minimal contributions to cumulative impacts on archeological resources. Therefore, implementation of alternative A would result in *no adverse effect* on the battlefields' archeological resources.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Under alternative B, actions associated with opportunistic and targeted surveillance, supplemented with live tests and lethal removal of healthy appearing deer would have short-term, minor, adverse impacts on cultural landscapes from temporary disturbances during implementation. There would be long-term, negligible beneficial impacts as a result of the benefits to the deer herds, which are components of the cultural landscapes in the battlefields. Alternative B would have minimal contributions to cumulative impacts on cultural landscapes. Therefore, alternative B would result in *no adverse effect* on cultural landscapes.

Actions associated with opportunistic and targeted surveillance, supplemented with live tests and lethal removal of healthy appearing deer could have long-term, minor, adverse impacts on archeological resources from ground disturbances during implementation. Alternative B would have minimal contributions to cumulative impacts on archeological resources. Therefore, alternative B would result in *no adverse effect* on the battlefields' archeological resources.

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Under alternative C, detection and initial response actions would have short-term, negligible to minor, adverse impacts on cultural landscapes, with the more intense impacts related to the lethal removal action for monitoring response. There would be long-term, negligible beneficial impacts as a result of the benefits to the deer herds, which are components of the cultural landscapes in the battlefields. Cumulative effects on cultural landscapes would be long-term, negligible, and adverse. Therefore, alternative C would result in *no adverse effect* on the battlefields' cultural landscapes.

Actions associated with opportunistic and targeted surveillance, supplemented with live tests and lethal removal of healthy appearing deer could have long-term, negligible to minor, adverse impacts on archeological resources from disturbances during implementation and ground disturbance from disposal operations. Alternative C would have minimal contributions to cumulative impacts on archeological resources. Therefore, alternative C would result in *no adverse effect* on the battlefields' archeological resources.

CONCLUSION

In accordance with Section 106 of the *National Historic Preservation Act*, potential adverse impacts (as defined in 36 CFR 800) on cultural landscapes and archeological resources listed on or eligible for listing on the National Register of Historic Places would be coordinated between the National Park Service and the State Historic Preservation Officer to determine the level of effect on the property and to determine any necessary mitigation measures. Continuing implementation of the *Cultural Resource Management Guideline* (NPS 1998) and adherence to *NPS Management Policies 2006* (NPS 2006b) and the 2008 Servicewide programmatic agreement with the Advisory Council on Historic Preservation and National Conference of State Historic Preservation Officers would all aid in reducing the potential to adversely impact historic properties.

Copies of this Chronic Wasting Disease Detection and Initial Response Plan / Environmental Assessment have been distributed to the Maryland State Historic Preservation Officer for review and comment related to compliance with Section 106 of the *National Historic Preservation Act*.

SOCIOECONOMICS

GUIDING REGULATIONS AND POLICIES

NEPA requires that economic and social impacts be analyzed when they are interrelated with natural or physical impacts. Primary economic impacts of concern were potential changes in deer browsing damage to crops and landscaping on private lands adjacent to the park as a result of changes in deer populations at the battlefields, possible visitor avoidance of the park and surrounding communities and the economic effect on tourism, and impacts to hunting as a part of the local economy.

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

Options for CWD detection and initial response could affect deer populations both within and outside the battlefields, with associated impacts on hunting, crops, and park visitation, which contribute to the local economy. The focus of this overview is the area immediately surrounding the battlefields.

Impact threshold definitions for socioeconomic conditions focus on crop and landscaping depredation to neighboring lands and to possible loss of revenues to the battlefields and surrounding towns, and were defined as follows:

<i>Negligible:</i>	No effects would occur, or the effects on neighboring landowners or other socioeconomic conditions would be below or at the level of detection.
<i>Minor:</i>	The effects on neighboring landowners or other socioeconomic conditions would be small but detectable. The impact would be slight, but would not be detectable outside the neighboring lands and would affect only a few adjacent landowners.
<i>Moderate:</i>	The effects on neighboring landowners or other socioeconomic conditions would be readily apparent. Changes in economic or social conditions would be limited and confined locally, and they would affect more than a few landowners.
<i>Major:</i>	The effects on neighboring landowners or other socioeconomic conditions would be readily apparent. Changes in social or economic conditions would be substantial, extend beyond the local area, and affect the majority of landowners.

AREA OF ANALYSIS

The area of analysis includes the battlefields and the surrounding area within 5 miles of the boundaries, based on movement of deer in this area.

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A: NO ACTION (CURRENT ACTIVITIES CONTINUED)

Analysis

Given the limited number of deer expected to be taken by continued opportunistic and targeted surveillance under alternative A, there would be few impacts to regional socioeconomic resources. As described in the impacts analyses for deer and vegetation, there would be minimal change in existing deer density due to actions taken under alternative A, unless CWD effects drastically reduced survival rates. Sustained browsing and grazing at high population densities would continue to have measurable effects on surrounding vegetation on adjacent properties, including landscaping and crops. While there is no data on the economic damage that deer currently do to landscapes, crop damage in the North Central Maryland area (which includes Frederick and Washington Counties) during 2007 was estimated at \$2.6 million, with deer accounting for 84% of that damage (NASS 2008). The degree of physical and economic damage on adjacent lands would be dependent on the size of the local deer population, the types of crops or planting, the market value of crops or plantings, and the actions that landowners use to manage deer. However, the CWD surveillance actions that would occur under alternative A would not result in any change to the existing conditions.

Should CWD be detected in or near the battlefields, opportunistic and targeted surveillance may increase, but increased opportunistic and targeted surveillance would only have limited effects on minimizing the potential for amplification and spread of CWD. Therefore, if CWD is detected in or near the battlefields the potential for the establishment of CWD and possible exposure to population level effects for deer would be high. If CWD becomes prevalent in the deer populations of the battlefields and nearby lands, the deer densities would likely decrease, but it is uncertain whether this would occur or if the herd would stabilize at an endemic level. If CWD has population effects on deer, this could possibly influence hunting-related tourism by reducing the number of animals available to hunt or making it less desirable to hunt. Impacts would likely be long-term, minor, and adverse to the local economy immediately surrounding the battlefields from these effects. However, the exact nature and level of impact would depend on what actions the state has taken in the communities surrounding the battlefields in response to the presence of CWD.

Population level impacts to deer from CWD could have an adverse impact on visitor experience (fewer deer to see and an increase in the number of dead or sick deer seen). For many visitors whose main concern is the historic context and cultural features of the battlefields and surrounding communities, the presence of CWD or surveillance actions would not likely deter them from visiting the battlefields to learn about their history and to participate in popular events. However, for others, the presence of CWD could deter visitation in the battlefields and in the surrounding communities, if the disease and its health implications were not fully understood. Public information and outreach would help mitigate adverse perceptions; however impacts related to tourism could range from negligible impacts to long-term minor adverse effects.

Cumulative Impacts

Actions that have contributed to long-term beneficial cumulative effects on socioeconomic resources include suburban/rural developments, past highway expansions which have served increasing traffic volumes, future expansion of Interstate 270 through Monocacy National Battlefield which would seek to

enhance capacity, county comprehensive plans, the creation of state Civil War heritage areas and increased visitation at the battlefields. Since the opening of the new Monocacy National Battlefield visitor center in 2007 annual visitation has nearly doubled and in 2007 the battlefields combined to contribute over \$17 million and nearly 320 jobs in economic benefits to the local areas (Stynes 2008).

Hunting also contributes beneficially to the cumulative impact on local socioeconomic resources with deer hunting generating over \$113 million in retail sales in the state of Maryland. Maryland's deer management contributes to the success of hunting by promoting it as a means of controlling expanding deer populations while also promoting the present and future well-being of deer and their habitats; ensuring compatibility with human land uses, natural communities and the recreational use and enjoyment of the deer resource (MDNR 2008). Future deer management at the battlefields would also contribute to these benefits.

Actions that contribute adverse impacts to the local socioeconomic resources include loss of agricultural land use, and crop as well as landscape wildlife-related damage. Though there is no estimate of monetary value for the damage done to landscapes by wildlife/deer, deer caused \$2.6 million in crop damages in the North Central Maryland area during 2007 (NASS 2008).

Actions taken under alternative A would contribute long-term, negligible to minor adverse impacts to the socioeconomic resource. Despite this and adverse impacts from other past, present and future actions, they would not be enough to outweigh the benefits provided by development in the local area and the economic contributions of the battlefields. Therefore, the overall cumulative impacts on the local socioeconomic resources would be long-term and beneficial.

Conclusion

Actions associated with opportunistic and targeted surveillance would have long-term, negligible to minor adverse impacts on socioeconomics. CWD surveillance actions that would occur under alternative A would not result in any changes to the existing socioeconomic conditions, and adverse impacts resulting from deer-related crop and landscape damage would continue. Because alternative A would have minimal effects on CWD risk factors allowing the potential for amplification, spread, and establishment, as well as exposure to possible population level effects to remain high, there could be negligible to minor adverse impacts to hunting and tourism due to changes in deer numbers and/or the presence of the disease. However, the exact nature and level of impact would depend on what actions the state has taken in the communities surrounding the battlefields in response to the presence of CWD. Overall cumulative impacts on the local socioeconomic resources would be long-term and beneficial.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Analysis

Under alternative B, opportunistic and targeted surveillance would be used for CWD detection, and could be supplemented with live tests and lethal removal of healthy appearing deer for CWD testing under specific criteria. Impacts from opportunistic and targeted surveillance would be similar to those under alternative A with long-term, negligible to minor adverse impacts.

Lethal removal of healthy-appearing deer as a detection method would involve a larger, more sustained effort (at Antietam National Battlefield, anywhere from 32 to 110 deer could be removed per sampling event, and at Monocacy National Battlefield, it would range from 36 to 83 deer) and would reduce the deer density in the battlefields by approximately 10% to 32% at Antietam National Battlefield and approximately 10% to 25% at Monocacy National Battlefield.

This alternative could also include the lethal removal of healthy-appearing deer for a one-time population reduction that would attempt to bring deer density inside the battlefields (2008 spring/fall estimates were

94 and 137 deer per square mile for Antietam National Battlefield; 129 and 197 deer per square mile for Monocacy National Battlefield) to a level historically found in surrounding areas (estimated at 25 to 45 deer per square mile; see appendix B). Should this population reduction effort be implemented, it would take place over a period of 1 to 3 years.

If lethal removal of deer within the battlefields is conducted during the normal operating hours of the battlefields some trail areas would be closed to visitors for their safety. The public would be notified of the closures ahead of time via newspapers, etc. Depending on the number and location of the closures at any given time, some visitors may avoid going to the battlefields on the days of the closures. Impacts due to closures would be temporary, and would likely not deter people from visiting the battlefields all together; they would just visit another day. However, as described under alternative A, some visitors may stay away just because of the presence of the disease. Public information and outreach would be used to help mitigate this situation. Therefore, the impact from the change in visitor use on socioeconomics would range from short to long-term, negligible to minor, and adverse.

The population reduction could have short-term minor adverse impacts on hunting by reducing the number of deer available to hunters. The nature and level of this impact would depend on what actions the state has taken in the communities surrounding the battlefields in response to the presence of CWD, and the effect of CWD itself on hunting in the area.

As discussed in the analysis for white-tailed deer, alternative B would result in lower deer densities in the battlefields when compared to alternative A, especially if preceded by a one-time population reduction. This could reduce the amount of deer-related damage to crops and landscapes in the areas surrounding the battlefields due to lower deer numbers. Should initial response activities help preclude CWD from becoming established, this could possibly offset potential losses in hunting-related tourism described for alternative A. As a result, there would be long-term beneficial effects on socioeconomics under alternative B. Beneficial effects could also occur as a result of the potential for hiring contractors that would spend money in local communities; the potential to donate meat; and the potential expenditures associated with disposal activities.

Cumulative Impacts

The same past, present, and future adverse impacts from cumulative actions described for alternative A would also occur under alternative B. Actions taken under alternative B contribute both adverse and beneficial impacts to the socioeconomic resource. Adverse impacts resulting from actions taken under alternative B and adverse impacts from other past, present and future actions would not be enough to outweigh the benefits provided by development in the local area and the economic contributions of the battlefields. Therefore, the overall cumulative impacts on the local socioeconomic resources would be long-term and beneficial.

Conclusion

Actions taken under alternative B would result in short-term, negligible to minor adverse impacts to the socioeconomic resource, with the level of adverse impacts dependent upon the perceptions of visitors and hunters, the number of deer potentially affected by CWD, and the actions the state has taken in the communities surrounding the battlefields in response to CWD. Long-term beneficial effects could occur, primarily if initial response activities help preclude CWD from becoming established, offsetting potential losses in hunting related tourism, and as a result of reduced deer damage to crops and landscapes in the areas surrounding the battlefields due to lower deer densities. Overall cumulative impacts would be long-term and beneficial.

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Analysis

Detection and initial response tools under alternative C would be the same as those described under alternative B—opportunistic and targeted surveillance, live tests, lethal removal of healthy appearing deer for CWD testing (detection), and lethal removal of healthy-appearing deer for monitoring surveillance; however, alternative C would not involve a one-time population reduction. Therefore, the impacts of alternative C would be similar to those described for alternative B, except without the more widespread effects of a large drop in deer density and reduced tourism effects relating to closures. Removal of deer for detection or monitoring would have negligible to minor adverse effects on deer hunting due to the fewer number of deer, though the nature and level of this impact would depend on what actions the state has taken in the communities surrounding the battlefields in response to the presence of CWD and the effect of the disease itself.

As discussed for alternative B, lower deer densities in the battlefields when compared to alternative A could reduce the amount of deer-related damage to crops and landscapes in the areas surrounding the battlefields due to lower deer numbers. Should initial response activities help preclude CWD from becoming established, this could possibly offset potential losses in hunting-related tourism described for alternative A. As a result, there would be long-term beneficial effects on socioeconomics under alternative C, although not to the extent of the one-time population reduction discussed under alternative B. Beneficial effects could also occur as a result of the potential for hiring contractors that would spend money in local communities; the potential to donate meat; and the potential expenditures associated with disposal activities.

Cumulative Impacts

The same past, present, and future beneficial and adverse impacts from cumulative actions described for alternatives A and B would also occur under alternative C. The adverse impacts resulting from actions taken under alternative B and adverse impacts from other past, present and future actions would not be enough to outweigh the benefits provided by development in the local area and the economic contributions of the battlefields. Therefore, the overall cumulative impacts on the local socioeconomic resources would be long-term and beneficial.

Conclusion

Actions taken under alternative C would result in short-term, negligible to minor adverse impacts to the socioeconomic resource, with the level of adverse impacts dependent upon the perceptions of visitors and hunters, the number of deer potentially affected by CWD, and the actions the state has taken in the communities surrounding the battlefields in response to CWD. Although not as extensive as the one-time population reduction discussed under alternative B, long-term beneficial effects could occur, primarily if initial response activities help preclude CWD from becoming established, offsetting potential losses in hunting related tourism; and as a result of reduced deer damage to crops and landscapes in the areas surrounding the battlefields due to lower deer densities. Overall cumulative impacts would be long-term beneficial.

VISITOR USE AND EXPERIENCE

GUIDING REGULATIONS AND POLICIES

The *NPS Management Policies 2006* (NPS 2006b) state that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks.

Management goals include making available to the public traditional outdoor recreational opportunities that are not detrimental to the natural or cultural resources of the park.

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

Several of the potential CWD detection or initial response actions may require limiting access within the battlefields. Other actions, including potential deer removals, could affect visitor experience of both the natural and cultural resources at the battlefields.

Past visitor use data, comments from the public, and personal observations of visitation patterns were used to estimate the effects of the alternative actions on visitors. The impact on the ability of visitors to experience a full range of park resources and facilities was analyzed by examining resources mentioned in the park's significance statement and making assumptions about the likely effects of disease-related detection and initial response on visitation, assuming that visitation would likely continue to fluctuate but slowly increase as it has for the past 10 years. The thresholds for the intensity of an impact are defined as follows:

<i>Negligible:</i>	The impact would be barely detectable and/or would affect few visitors. Visitors would not likely be aware of the effects associated with management actions.
<i>Minor:</i>	The impact would be detectable and/or would only affect some visitors. Visitors would likely be aware of the effects associated with management actions. The changes in visitor use and experience would be slight but detectable; however, visitor satisfaction would not be measurably affected.
<i>Moderate:</i>	The impact would be readily apparent and/or would affect many visitors. Visitors would be aware of the effects associated with management actions. Visitor satisfaction might be measurably affected (visitors could be either satisfied or dissatisfied). Some visitors would choose to pursue activities in other available local or regional areas.
<i>Major:</i>	The impact would affect the majority of visitors. Visitors would be highly aware of the effects associated with management actions. Changes in visitor use and experience would be readily apparent. Some visitors would choose to pursue activities in other available local or regional areas.

AREA OF ANALYSIS

The area of analysis, including cumulative analysis, is the lands within the legislated boundaries of the battlefields.

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A: NO ACTION (CURRENT ACTIVITIES CONTINUED)

Analysis

Under this alternative, opportunistic and targeted surveillance for CWD would continue at the battlefields, and it is expected that the deer herd populations would stay at relatively high levels. As described in the "Purpose of and Need for Action" chapter, current conditions in the battlefields, about 20 deer per year have been removed opportunistically at the battlefields while no deer have been removed using targeted surveillance since it was started in 2007. For this plan, it is assumed that opportunistic surveillance would

continue at about its current rate and about five deer per park would be taken annually with targeted surveillance.

Opportunistic surveillance of deer at the battlefields would continue to have a beneficial impact on visitor use and experience by removing dead deer carcasses visible along road and trail sides. Depending on the location of a deer exhibiting clinical signs of CWD, sampling deer through targeted surveillance may require the temporary closure of selected trail areas if sampling were to occur during normal daytime operating hours for the battlefields. If sampling were to take place outside of normal operating hours, no closures would be necessary. The sound of gunshots from firearms would temporarily impact the soundscape of the battlefields and adjacent neighbors; however, with the assumed removal of about five deer per year, the number of closures would be minimal and temporary in nature as would the number of gunshot sounds. For their safety, visitors at the park would be informed of the closures, where they are located and the reason for them. Excavation of pits for any burial of carcasses within the battlefields should not disrupt visitor use or experience because they would be constructed within previously disturbed areas away from visitor use areas. Overall, targeted surveillance actions would have short-term negligible to minor adverse impacts on visitor use and experience. The removal of deer showing clinical signs of CWD would provide some benefits to visitor experience by helping to prevent visitors from seeing sick deer; however, given the small number of deer assumed to be removed under this plan, any benefits would be negligible.

Should CWD be detected in or near the battlefields, opportunistic and targeted surveillance may increase, which could increase the impacts that result from these actions, but not substantially. As described under the analysis for white-tailed deer for alternative A, opportunistic and targeted surveillance would only have limited effects on minimizing the potential for amplification and spread of CWD. Therefore, if CWD is detected in or near the battlefields the potential for the establishment of CWD and possible exposure to population level effects for deer would be high. This would likely result in a greater frequency of seeing sick or dead deer and could adversely affect visitor experience. Currently visitor satisfaction rates are extremely high at both battlefields, near 99%. While there is no data with regards to wildlife viewing for Antietam National Battlefield, at Monocacy National Battlefield wildlife viewing was only mentioned by 19% of the respondents during the 2006 Visitor Use Survey and only ranked 7th in importance out of the 14 activities listed. Therefore, if CWD were to be detected in or near the battlefields, impacts to visitor use and experience would be long-term, minor and adverse.

Cumulative Impacts

Many past, current, and future actions, plans, and programs at the battlefields enhance the visitor's experience and contribute to beneficial cumulative effects on visitor use and experience. These include increasing the size of the battlefields through land acquisitions, developing new trails, providing better or more access for use by vehicles, annual activities such as living history demonstrations, etc., special interpretive/education programs, recreational use of the river, and restoring the cultural landscape to 1862. Future deer management and prescribed burning at the battlefields would also contribute to these benefits by helping to maintain native plant communities and wildlife populations in the battlefields. Construction of the new visitor center at Monocacy National Battlefield has increased visitor services and improved visitor experience, a long-term beneficial impact.

There are also some past current and future actions that contribute to adverse cumulative effects on visitor use and experience. These include vandalism and increased crime, reduced maintenance schedules which may allow some facilities to become rundown, and increased visitation. Since the new visitor center opened in 2007 at Monocacy National Battlefield the number of visitors in 2008 almost doubled from the previous annual average of approximately 16,000 visitors, and with increase visitation also comes some crowding and a decrease in satisfaction at busy times. In addition, deer management activities and fire management may require temporary closures, or in the case of prescribed burning, could temporarily affect the visual quality in the battlefields.

Overall, when the adverse impacts of CWD management under alternative A are considered with all other actions that affect visitor use and experience, cumulative impacts to visitor use and experience would be long-term and beneficial.

Conclusion

Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on visitor use and experience. If CWD were to occur in or near the battlefields, those impacts would increase to minor due to the likely increase in seeing sick or dead deer. The overall cumulative impacts of all past, present and future actions at the battlefields would be long-term and beneficial.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Analysis

Under alternative B, opportunistic and targeted surveillance would be used for CWD detection, and could be supplemented with live tests and lethal removal of healthy appearing deer for CWD testing under specific criteria. For this plan, it is assumed that under alternative B 20 deer per park would be taken via opportunistic surveillance and 10 deer per park would be taken annually with targeted surveillance. As described for alternative A, taking deer by opportunistic surveillance would be beneficial to visitor experience as it would remove dead deer from road and trail sides. The impacts from targeted surveillance would also be similar to those under alternative A, with no effects if the lethal taking of deer were to occur outside of normal operating hours and short-term, negligible to minor, adverse impacts if a few trail areas needed to be temporarily closed for safety reasons while deer were lethally taken during normal operating hours. Similar to alternative A, visitors would be notified of any closures, where they were and what they were for, and any burial pits would be located away from visitor use areas. Should CWD be detected in or near the park, opportunistic and targeted surveillance may increase, which could increase the impacts that result from these actions, but not substantially. Samples for live CWD tests would only be taken when deer are being captured and collared in the park units as part of other projects and would have no impact on visitor use or experience. Therefore, impacts on visitor use and experience from targeted and opportunistic surveillance and live testing would be limited to short-term, negligible to minor adverse effects.

Lethal removal of healthy appearing deer would involve a larger, more sustained effort (at Antietam National Battlefield, anywhere from 32 to 110 deer could be removed per sampling event, and at Monocacy National Battlefield, it would range from 36 to 83 deer) and may require more temporary trail or area closures if the activities were to take place during normal operating hours. This would result in short-term, minor, adverse impacts. If lethal removal activities were to take place outside of normal operating hours, no closures would be needed.

This alternative could also include the lethal removal of healthy-appearing deer for a one-time population reduction that would attempt to bring deer density inside the battlefields (2008 spring/fall estimates were 94 and 137 deer per square mile for Antietam National Battlefield; 129 and 197 deer per square mile for Monocacy National Battlefield) to a level historically found in surrounding areas (estimated at 25 to 45 deer per square mile (Bates 2009)). Should this population reduction effort be implemented, it would take place over a period of 1 to 3 years, with removals concentrated as much as possible to avoid prolonged visitor impacts. This could be followed by annual monitoring surveillance. Given the larger scope of this effort, it would have the greatest impact on visitor use and experience, resulting in short-term, minor to moderate, adverse impacts (minor or moderate depending on the number and frequency of the closures). Visitors would be informed of the closures, where they are and why they were occurring, and additional public information about the need for the action and the logistics would help alleviate some of the adverse visitor use effects.

In addition, should lethal removals for detection, monitoring surveillance, and/or population reduction effort be implemented, deer densities would be reduced and would result in a decreased ability to view deer, more so with a one-time population reduction. While viewing deer is usually a positive experience for people, it is not a high priority as indicated in the 2006 Visitor Use Survey conducted at Monocacy National Battlefield. Reduced numbers would create a more natural, healthy environment for at the battlefields, and though deer viewing opportunities would initially be reduced, the deer population would be expected to remain viable. Implementation of actions that reduce deer density would decrease the potential for CWD to become established, which would reduce the likelihood of seeing sick or dead deer, which would positively affect visitor experience. Visitors may also benefit from knowing that the NPS is taking actions to protect the deer herds in the battlefields. This alternative would also involve increased educational and interpretive activities, especially if the one-time reduction is initiated. Therefore, alternative B would also have long-term benefits.

Cumulative Impacts

The same past, present, and future beneficial and adverse impacts from cumulative actions described for alternative A would also occur under alternative B. The adverse impacts from actions taken under alternative B would not outweigh the beneficial impacts from the other past, present and future actions at the battlefields; therefore, the overall cumulative impacts would be long-term and beneficial.

Conclusion

Similar to alternative A, actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on visitor use and experience, while lethal removal of healthy-appearing deer for detection and/or monitoring surveillance would have short-term, minor, adverse impacts. Due to the need for more frequent temporary trail or area closures and the likely increase in visitors impacted by the closures, implementing a one-time population reduction would result in short-term, minor to moderate, adverse impacts to visitor use and experience (minor or moderate depending on the number and frequency of trail area closures). Long-term beneficial effects would occur from reduced deer densities that would create a more natural, healthy environment for the deer population at the battlefields; from decreased potential for CWD to become established; and from knowing that the NPS is taking actions to protect the deer herds in the battlefields. Cumulative effects on visitor use and experience would be long-term and beneficial.

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Analysis

Detection and initial response tools under alternative C would be the same as those described under alternative B—opportunistic and targeted surveillance, live tests, lethal removal of healthy-appearing deer for CWD testing (detection), and lethal removal of healthy appearing deer for monitoring surveillance; however, alternative C would not involve a one-time population reduction. Therefore, the impacts of alternative C would be essentially the same as for alternative B, except without the added short-term, minor to moderate, adverse impacts associated with the one-time population reduction. Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on visitor use and experience, while lethal removal of healthy appearing deer for detection and/or monitoring surveillance would have short-term, minor, adverse impacts. Live testing would have no impacts on visitor use and experience. Although the potential is reduced when compared to alternative B, implementation of initial response actions could create a more natural, healthy environment at the battlefields; and decrease the potential for CWD to become established, which would reduce the likelihood of seeing sick or dead deer, positively affecting visitor experience. Visitors may also benefit from knowing that the NPS is taking actions to protect the deer herds in the battlefields. Coupled with

increased educational and interpretive activities, alternative C would result in long-term beneficial impacts to visitor use and experience.

Cumulative Impacts

The same past, present, and future beneficial and adverse impacts from cumulative actions described for alternatives A and B would also occur under alternative C. The adverse impacts from actions taken under alternative C are not enough to outweigh the beneficial impacts from the other past, present and future actions at the battlefields; therefore, the overall cumulative impacts would remain long-term and beneficial.

Conclusion

Similar to alternative B, actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on visitor use and experience, while lethal removal of healthy-appearing deer for detection and/or monitoring surveillance would have short-term, minor, adverse impacts. Live testing would have no impacts on visitor use and experience. Although not as extensive as alternative B, long-term beneficial effects to visitor use and experience could occur from slightly reduced deer densities that would create a more natural, healthy environment for the deer population at the battlefields; from decreased potential for seeing deer infected with CWD; and from knowing that the NPS is taking actions to protect the deer herds in the battlefields. Cumulative effects on visitor use and experience would be long-term and beneficial.

HEALTH AND SAFETY

GUIDING REGULATIONS AND POLICIES

The NPS *Management Policies 2006* state that, “while recognizing that there are limitations on its capability to totally eliminate all hazards, the Service . . . will seek to provide a safe and healthful environment for visitors and employees.” The policies also state that “the Service will reduce or remove known hazards and apply other appropriate measures, including closures, guarding, signing, or other forms of education” (NPS 2006b, sec. 8.2.5.1).

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

The safety of both visitors and NPS employees at the battlefields could be affected by implementation of the proposed detection and initial response actions. CWD detection and initial response activities that involve capturing and immobilizing live animals for marking/collaring, and performing tonsillar biopsies have the potential to affect the health and safety of the individuals involved. Options that involve the removal of deer and the use of firearms also have the potential to affect the safety of park staff and possibly visitors.

As noted earlier, current research consensus indicates that the health risk for humans that consume elk and deer infected with CWD is any, is extremely low, and there is currently no established link between CWD and similar TSE diseases. Therefore, CWD human health impacts were not addressed in this analysis.

The purpose of this analysis is to identify the level of impact that implementing each of the proposed alternatives would have on the safety of visitors and employees at the battlefields. Past accident data, park goals, and personal observations of safety issues, as well as current knowledge of CWD health effects, were used to assess the effects of the alternative actions on the safety of visitors and employees.

The impact thresholds for health and safety are defined below.

<i>Negligible:</i>	There would be no discernible effects to health or safety; slight injuries could occur and may be reportable.
<i>Minor:</i>	Any reported injury would require first aid provided by park staff or require a doctor's attention.
<i>Moderate:</i>	Any reported injury would require further medical attention beyond what was available at the park and would result in time off.
<i>Major:</i>	An injury would result in permanent disability or death.

AREA OF ANALYSIS

The study area for this analysis, including analysis of cumulative impacts, is within the legislated boundaries of the battlefields.

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A: NO ACTION (CURRENT ACTIVITIES CONTINUED)

Analysis

Under this alternative, opportunistic and targeted surveillance for CWD would continue at the battlefields, and it is expected that the deer herd populations would stay at relatively high levels. For this plan, it is assumed that opportunistic surveillance would continue at about its current rate and about five deer per park would be taken annually with targeted surveillance.

Opportunistic surveillance includes taking diagnostic samples for CWD testing from deer that have died in the battlefields due to disease, predators, vehicle collisions, other trauma-related mortality; those lethally removed from the battlefields for other purposes (e.g., research); and those that die in the park units as a result of injuries from hunting outside the battlefields. There are standard operating procedures in place for this type of sampling at both battlefields. Since opportunistic surveillance began in 2007 a total of 54 samples have been taken opportunistically (42 at Antietam National Battlefield and 12 at Monocacy National Battlefield) and no accidents or injuries have occurred as a result of these activities, and no accidents are anticipated from their continuation. These activities would result in long-term, negligible adverse impacts on health and safety.

Since the option was made available in 2007, there has been no deer removed by targeted surveillance at either battlefield. Target surveillance involves identifying deer with clinical signs of CWD, and then either the Chief Ranger or Natural Resource Manager making a determination as to whether or not a suspect deer should be lethally removed for CWD testing as part of targeted surveillance. To ensure the safety of all personnel involved, only law enforcement rangers or natural resource management staff qualified to use firearms would be authorized to remove a clinically suspect deer. All procedures for shooting, collecting samples, handling, cleanup, and storage of the deer would be provided the Chief Ranger or Natural Resource Manager and would be based on information provided in "A National Park Service Manager's Reference Book to Understanding Chronic Wasting Disease, Version 4" (NPS 2007a). If the lethal removal activities occur outside of normal operational hours at the battlefields, no closures of trails or areas would be needed. However, if activities take place during normal daytime operating hours, areas in the vicinity of firearms use would be closed to visitors for their safety. The safety measures implemented under this alternative would ensure the safety of all visitors and battlefield staff. This would result in a long-term, negligible, adverse impact.

Cumulative Impacts

Several past, present, and future action would contribute to the cumulative impact on health and safety of visitors and employees. These include vehicle-deer collisions, deer monitoring and research, Antietam National Battlefield – Wildland and Prescribed Fire Program, and increased crime at Monocacy National Battlefield.

While there have been no reports of injuries from vehicle–deer collisions, the chance of such impacts would continue, with the intensity of impacts depending on the severity of any injuries sustained during a collision. However, no fatalities have been reported to date. Personnel involved in deer monitoring and research have the potential to be injured while handling deer or using tranquilizing darts/firearms. This could also occur as a result of future deer management actions. Being properly trained and qualified as well as following standard operating protocols would minimize any impacts to long-term, minor, and adverse. Personnel involved in the Wildland and Prescribed Fire Program at Antietam National Battlefield run the risk of getting burned as well as encountering other injuries resulting from trips and falls; however, following standard protocols would keep any adverse impacts at the long-term, minor to moderate levels. Though there have been no injuries reported due to incidences of crime, some long-term, negligible to minor adverse impacts would continue. Impacts from past, present and future actions when combined with impacts from alternative A would result in long-term, minor to potentially moderate, adverse cumulative impacts. However, actions directly related to alternative A would have negligible contributions to impacts on health and safety.

Conclusion

Opportunistic and targeted surveillance activities employed under alternative A would result in long-term, negligible, adverse impacts on health and safety. Cumulative impacts on health and safety would be long-term, minor to potentially moderate and adverse; however, alternative A would contribute very little to any overall adverse impacts.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Analysis

CWD Detection and Initial Response Actions

Under alternative B, opportunistic and targeted surveillance would be used for CWD detection, and could be supplemented with live tests and lethal removal of healthy appearing deer for CWD testing under specific criteria. For this plan, it is assumed that under alternative B 20 deer per park would be taken via opportunistic surveillance and 10 deer per park would be taken annually with targeted surveillance. As described for alternative A, taking deer by opportunistic surveillance would result in long-term, negligible, adverse impacts. The impacts from targeted surveillance would also be similar to those under alternative A and would be long-term, negligible, and adverse as long as standard operating procedures are followed, only law enforcement rangers or natural resource management staff certified to use firearms are authorized to lethally remove suspect deer, and areas in the vicinity of firearms activity are closed off to the visitors with visitors and the public being notified of the closures.

Should CWD be detected in or near the park, opportunistic and targeted surveillance may increase, which could increase the impacts that result from these actions, but not substantially. Samples for live CWD tests would only be taken when deer are being captured and collared in the park units as part of other projects and would only be taken by qualified personnel. Therefore, impacts on health and safety would be long-term, negligible, and adverse.

Lethal removal of healthy appearing deer would involve a larger, more sustained effort (at Antietam National Battlefield, anywhere from 32 to 110 deer could be removed per sampling event, and at Monocacy National Battlefield, it would range from 36 to 83 deer) and may require more temporary trail area closures if the activities were to take place during normal operating hours to protect visitors. Because lethal removal of healthy-appearing deer would be a larger more intense effort requiring additional people, authorized agents who are non-NPS personnel may be used to supplement NPS personnel in the shooting of deer. Authorized agents could include, but are not limited to, other agency personnel, contractors and skilled volunteers. To ensure health and safety are not compromised, a contractor would be a fully insured business entity, nonprofit group, or other entity engaged in wildlife management activities that include the direct reduction with firearms and would be required to possess all necessary permits. Skilled volunteers would be private citizens supervised by NPS staff and would need to demonstrate appropriate level of skills and abilities and undergo training. Requirements for all authorized agents would include a specific level of firearm proficiency and experience in the use of firearms for wildlife removal. Training of authorized agents would include all actions related to disposal and decontamination, and because prions are so difficult to decontaminate, part of the training would be related to minimizing contact with infectious materials; though it should be noted again that there is no evidence to suggest that CWD is naturally transmitted to humans. As with the targeted surveillance, if closures are needed, the battlefields would notify the public of the closures, where they are and when they would occur. These activities with all of their safety measures and protocols would result in long-term, negligible to minor, adverse impacts.

This alternative could also include the lethal removal of healthy-appearing deer for a one-time population reduction that would attempt to bring deer density inside the battlefields (2008 spring/fall estimates were 94 and 137 deer per square mile for Antietam National Battlefield; 129 and 197 deer per square mile for Monocacy National Battlefield) to a level historically found in surrounding areas (estimated at 25 to 45 deer per square mile (Bates 2009)). Should this population reduction effort be implemented, it would take place over a period of 1 to 3 years, with removals concentrated as much as possible to avoid prolonged visitor impacts. This could then be followed by annual monitoring surveillance.

The process for implementing this one-time population reduction would be similar to that described for the detection phase, including details of the individuals who conduct the removals, required health and safety practices used, and the sampling and disposal practices used. The reduction in the deer herds would also likely decrease the likelihood of a collision between a deer and vehicle as well. However, as the deer population rebounded over the years this benefit would be reduced. These actions would result in short-term, negligible to minor adverse impacts. Overall, all of the actions taken under alternative B would have long-term, negligible to minor, adverse impacts on health and safety.

Cumulative Impacts

The same past, present, and future adverse impacts from cumulative actions described for alternative A would also occur under alternative B. The adverse impacts from actions taken under alternative B would only contribute negligibly to the cumulative impacts; overall, cumulative impacts would be long-term minor to potentially moderate, and adverse.

Conclusion

Opportunistic and targeted surveillance activities employed under alternative B would result in long-term, negligible, adverse impacts on health and safety as would live testing; lethal removal of healthy-appearing deer for both detection and monitoring surveillance, and lethal removal of healthy-appearing deer for a one-time population removal would have negligible to minor adverse effects. Alternative B would have negligible contributions to cumulative impacts on health and safety, which would be long-term, minor to potentially moderate, and adverse.

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Analysis

Detection and initial response tools under alternative C would be the same as those described under alternative B—opportunistic and targeted surveillance, live tests, lethal removal of healthy appearing deer for CWD testing (detection), and lethal removal of healthy-appearing deer for monitoring surveillance; however, alternative C would not involve a one-time population reduction. Therefore, the impacts of alternative C would be essentially the same as for alternative B, except without the added short-term, negligible to minor adverse impacts associated with the one-time population reduction. Opportunistic and targeted surveillance activities and live testing employed under alternative C would result in long-term, negligible, adverse impacts on health and safety, and lethal removal of healthy appearing deer (detection) would result in negligible to minor adverse effects.

Cumulative Impacts

The same past, present, and future beneficial and adverse impacts from cumulative actions described for alternatives A and B would also occur under alternative C. The adverse impacts from actions taken under alternative C would only contribute negligibly to the cumulative impacts; however, cumulative impacts would be long-term minor to potentially moderate and adverse.

Conclusion

Opportunistic and targeted surveillance activities employed under alternative C would result in long-term, negligible, adverse impacts on health and safety as would live testing, and lethal removal of healthy appearing deer (detection) would have negligible to minor adverse effects. Alternative C would have negligible contributions to cumulative impacts on health and safety, which would be long-term, minor to potentially moderate and adverse.

PARK MANAGEMENT AND OPERATIONS

Park management and operations refers to the staff and budget available to protect and preserve vital park resources, provide for an effective visitor experience, and implement any selected plan.

METHODOLOGY AND INTENSITY THRESHOLDS

The discussion of impacts to park operations focuses on (1) the amount of staff available to ensure visitor and resident safety; and (2) the ability of park staff to protect and preserve resources given current funding and staffing levels. It was assumed that under all alternatives the park's annual budget would be increased to implement a particular alternative. However, this funding is not guaranteed; each alternative discusses the impacts of receiving or not receiving additional funding. Park staff knowledge was used to evaluate the impacts of each alternative, and the evaluation is based on the description of park operations presented in the "Affected Environment" chapter. Definitions of impact levels are as follows:

<i>Negligible:</i>	Park operations would not be affected.
<i>Minor:</i>	Park operations would be affected, and the effect would be detectable, but current levels of funding and staff would be adequate and other park operations would not be reduced.
<i>Moderate:</i>	Park operations would be affected, the effect would be readily apparent, and increased staff and funding would be needed or other park operations would have to be reduced and/or priorities changed.

Major: Park operations would be affected, the effect would be readily apparent, increased staff and funding would be needed or other park programs would have to be eliminated.

AREA OF ANALYSIS

The area of analysis, including the cumulative impacts analysis area, is limited to the lands within the legislated boundaries of the two battlefields.

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A: NO ACTION (CURRENT ALTERNATIVES CONTINUED)

Analysis

Under this alternative, opportunistic and targeted surveillance for CWD would continue in the battlefields, and it is expected that the deer herd would stay at relatively high levels. No new CWD management actions would be taken, and information provided to visitors and shared with other governmental entities would remain at levels similar to what is now handled. As described in the “Current Conditions in the Battlefields” section in the “Purpose of and Need for Action” chapter, no deer have been removed using targeted surveillance since it was started in 2007, and about 20 deer per year have been removed opportunistically. For this plan, it is assumed that about five deer per park would be taken annually with targeted surveillance, and 20 deer with opportunistic surveillance, at each park annually, not much different from what has been experienced, at an annual cost of about \$9,000 for both battlefields, excluding carcass disposal costs. Should CWD be detected in or near the park, opportunistic and targeted surveillance may increase, which could increase the impacts that result from these actions, but not substantially. Given the current and anticipated level of removal under this alternative, there would be minimal change in duties for the natural resources division, little if any change in demand for the cultural resources or visitor services staff, and minimal effect on the annual budget. Therefore, impacts to park management and operations from the actions under alternative A would be long-term, negligible to minor, and adverse.

Cumulative Impacts

Many actions, plans, and programs place demands on battlefield staff and budget, and contribute to adverse cumulative effects on park management and operations. These include the demand on staff time and resources from normal daily operational duties, as well as special events such as holiday events and annual activities such as living history and artillery demonstrations. Management and handling of land acquisitions, permits, vandalism, development of new visitor facilities, and development and oversight of visitor use opportunities such as recreational use of the river and interpretation programs all require staff time and money. The natural resources staff has additional demands related to white-tailed deer monitoring and research, which would likely continue at current levels. These demands are expected to continue into the future with continued and possible increased visitation and future planning needs related to general deer management and implementation of cultural landscape management plans. Implementation of a fire management program at the battlefields would also contribute to demands on park staff.

Therefore, the effects of all other actions that place demands on park management and operations, along with the expected demands of CWD management, would result in long-term, moderate adverse impacts to park operations and management. Actions directly related to alternative A would have negligible to minor contributions to impacts on park management and operations.

Conclusion

Actions associated with opportunistic and targeted surveillance would have short-term, negligible to minor, adverse impacts on park management and operations. Alternative A would have negligible contributions to cumulative impacts on park management and operations, which would be long-term, moderate, and adverse.

ALTERNATIVE B: CWD DETECTION AND REDUCTION RESPONSE

Analysis

Under alternative B, opportunistic and targeted surveillance would be used for CWD detection, and could be supplemented with live tests and lethal removal of healthy appearing deer for CWD testing under specific criteria. As described for alternative A, effects on park management and operations would be similar to those associated with current surveillance work conducted in the battlefields. Under alternative B, about 10 deer per park would be taken annually at each park with targeted surveillance, and 20 deer would be taken annually at each park with opportunistic surveillance, with dedicated targeted surveillance having the most impact on costs. Should CWD be detected in or near the park, opportunistic and targeted surveillance may increase, which could increase the impacts that result from these actions, but not substantially. Samples for live CWD tests would only be taken when deer are being captured and collared in the park units as part of other projects. Annual costs for targeted and opportunistic surveillance and live testing are estimated at about \$28,800 for both battlefields, excluding carcass disposal costs. Therefore, impacts on park management and operations from these actions would have limited to short-term, negligible to minor adverse effects.

Lethal removal of healthy appearing deer would involve a larger, more sustained effort (at Antietam National Battlefield, anywhere from 32 to 110 deer could be removed per sampling event, and at Monocacy National Battlefield, it would range from 36 to 83 deer). The demands on staff and budget would increase, especially the need for natural resources staff, and resource education and visitor services. This effort would require additional staff support for training, testing, coordination with the state, possible park closures or restrictions, and public information, in addition to the actual removal exercise itself. Each removal effort is estimated to cost about \$23,000, so this would add up to \$230,000 over the life of the plan if these actions are taken every year, excluding carcass disposal costs. Since the removal would target only about 50 deer, with an annual cost of \$23,000, impacts to park management and operations would be short-term, minor, and adverse, although the intensity would increase if this type of detection or monitoring response is implemented several times during the life of the plan.

This alternative could also include the lethal removal of healthy appearing deer for a one-time population reduction that would attempt to bring deer density inside the battlefields (2008 spring/fall estimates were 94 and 137 deer per square mile for Antietam National Battlefield; 129 and 197 deer per square mile for Monocacy National Battlefield) to a level historically found in surrounding areas (estimated at 25 to 45 deer per square mile (Bates 2009)). Should this population reduction effort be implemented, there would be a short-term but more intense need for additional staff in all divisions, including law enforcement, contracting (possibly), natural resources staff, and resource education and visitor services. The one-time total cost estimate of about \$250,000 (\$107,000 for each park), not including carcass handling and waste disposal, is about the same as the current total natural resources budget for Monocacy National Battlefield. Park staff support would be needed for training, testing, contracting (if needed), coordination with the state, park closure and security, and increased public information, in addition to the actual removal exercise itself. Because of the large number of deer that could be removed, this option would take 1 to 3 years to implement, with removals concentrated as much as possible to avoid visitor impacts. This could then involve annual monitoring surveillance. Therefore, the one-time population reduction response under alternative B would have short-term, moderate adverse impacts on park management and operations.

As described for alternative A, lethal removal of healthy deer as an initial response tool could affect deer densities. If lethal removal of healthy deer for monitoring surveillance is implemented, deer density would be reduced approximately 10% to 32% at Antietam National Battlefield and approximately 10% to 25% at Monocacy National Battlefield. If a one-time population reduction is implemented, it would bring deer densities down approximately 60% to 70% at Antietam National Battlefield and approximately 75% to 89% at Monocacy National Battlefield. This reduction may change the time staff spend on deer population monitoring, although that is not likely given the need for information on deer herd dynamics during the time of active CWD management.

This alternative would also involve increased educational and interpretive and management activities at all times, and would therefore require additional funding and/or additional staff time to implement these activities. Additional time would also be needed to answer public inquiries about the actions taken, particularly sharpshooting and the one-time reduction if implemented. Costs for these efforts would depend on current staffing and level of outreach needed, and would vary over the life of the plan. These efforts would result in long- and short-term minor to moderate adverse impacts to resource education and resource protection staff.

Cumulative Impacts

The same past, present, and future impacts from cumulative actions described for alternative A would also occur under alternative B. Alternative B would have negligible to moderate contributions to impacts on park management and operations from the actions proposed, with more short-term effects rather than continuous adverse impacts. As a result, cumulative effects on park management and operations would remain long-term, moderate, and adverse.

Conclusion

Detection and initial response actions would have short- and long-term, negligible to moderate, adverse impacts on park management and operations, with the more intense impacts related to the removal actions included in this alternative and the need for additional public education and outreach, particularly if the one-time removal response is implemented. Cumulative effects on park management and operations would be long-term, moderate, and adverse.

ALTERNATIVE C: CWD DETECTION AND MONITORING RESPONSE

Analysis

Detection and initial response tools described for alternative C—opportunistic and targeted surveillance, live tests, lethal removal of healthy appearing deer for CWD testing (detection), and lethal removal of healthy appearing deer for monitoring surveillance—would also be available under alternative B; however, alternative C would not involve a one-time population reduction. Therefore, impacts of alternative C would be essentially the same as described for alternative B, without the added impacts related to the one-time population reduction. Impacts on park management and operations from opportunistic and targeted surveillance and live testing would be limited to short-term, negligible to minor adverse effects. Lethal removal of healthy appearing deer (at Antietam National Battlefield, anywhere from 32 to 110 deer, and at Monocacy National Battlefield, 36 to 83 deer) would increase demands on staff and budget, especially the need for natural resources staff, and resource education and visitor services. This effort would require additional staff support for training, testing, coordination with the state, possible park closures or restrictions, and public information, in addition to the actual removal exercise itself. As with alternative B, the annual cost for this effort is estimated at about \$23,000 for both battlefields, excluding carcass disposal costs. Since the removal would target only about 50 deer, impacts to park management and operations would be short-term, minor, and adverse, although the intensity

would increase if this type of detection or monitoring response is implemented several times during the life of the plan.

As described for alternative B, lethal removal of healthy deer as an initial response tool could affect deer densities. If lethal removal of healthy deer for monitoring surveillance is implemented, deer density would be reduced approximately 10% to 32% at Antietam National Battlefield and approximately 10% to 25% at Monocacy National Battlefield. This reduction may change the time staff spend on deer population monitoring, although that is not likely given the need for information on deer herd dynamics during the time of active CWD management.

This alternative would also involve increased educational and interpretive and management activities at all times, and would therefore require additional funding and/or additional staff time to implement these activities. Additional time would also be needed to answer public inquiries about the actions taken, particularly sharpshooting any closures that may be needed. This would result in long- and short-term minor adverse impacts to resource education and resource protection staff.

Cumulative Impacts

The same past, present, and future impacts from cumulative actions described for alternatives A and B would also occur under alternative C. Alternative C would have negligible to minor contributions to impacts on park management and operations from the actions proposed, with more short-term effects rather than continuous adverse impacts. As a result, cumulative effects on park management and operations would be long-term, minor to moderate, and adverse.

Conclusion

Detection and initial response actions would have short- and long-term, negligible to minor, adverse impacts on park management and operations, with the more intense impacts related to the lethal removal action for monitoring response. Cumulative effects on park management and operations would be long-term, minor to moderate, and adverse.

Consultation and Coordination

CONSULTATION AND COORDINATION

The intent of NEPA is to encourage the participation of federal and state-involved agencies and affected citizens in the assessment procedure, as appropriate. This chapter describes the consultation that occurred during development of this Chronic Wasting Disease Detection and Initial Response Plan / Environmental Assessment, including consultation with scientific experts and other agencies. This chapter also includes a description of the public involvement process and a list of the recipients of the document.

HISTORY OF PUBLIC INVOLVEMENT

The public involvement activities for this plan/EA fulfill the requirements of NEPA and the NPS Director's Order 12 (NPS 2001).

THE SCOPING PROCESS

The NPS divides the scoping process into two parts: internal scoping and external or public scoping. Internal scoping involved discussions among NPS personnel regarding the purpose of and need for management actions, issues, management alternatives, mitigation measures, the analysis boundary, appropriate level of documentation, available references and guidance, and other related topics.

Public scoping is the early involvement of the interested and affected public in the environmental analysis process. The public scoping process helps ensure that people have an opportunity to comment and contribute early in the decision-making process. For this planning document and assessment, project information was distributed to individuals, agencies, and organizations early in the scoping process, and people were given opportunities to express concerns or views and to identify important issues or other alternatives.

Taken together, internal and public scoping are essential elements of the NEPA planning process. The following sections describe the various ways scoping was conducted for this impact statement.

INTERNAL SCOPING

The internal scoping process began on November 15 and 16, 2006. During the two-day meeting held in Hagerstown, Maryland, NPS employees identified the purpose of and need for action, management objectives, issues, and impact topics. NPS employees also discussed the CWD detection and initial response to positive CWD detections in or near Antietam and Monocacy National Battlefields. The results of the meetings were captured in an Internal Scoping Report, now on file as part of the administrative record.

A team of experts on CWD and deer management was also identified to provide scientific expertise and technical input during the NEPA process. The park established a science team to provide input to this plan, as described in the "Purpose of and Need for Action" chapter. Comprised of subject matter experts, the science team was chartered to advise and provide technical recommendations to the NPS on matters regarding scientific data and analysis. The team convened via conference calls, meeting six times over a five-month period. The topics of discussion included existing conditions surrounding each park unit; existing data and CWD monitoring; CWD detection and initial response goals; approach to establishing action thresholds for detection and initial response; and issues related to implementation of various actions. The purpose of the science team discussions was to provide a technical framework for the development of action thresholds and alternatives for the CWD detection and initial response plan. The team also recommended impact analysis techniques and various management options. Members of the science team are listed with the document preparers in this chapter.

PUBLIC SCOPING

Public Meetings and Comments

In addition to internal scoping within the NPS and with other public officials, public scoping for the plan/EA began with in February 2007. Two public scoping meetings were held, which included an open house, presentation by the NPS, and an opportunity for formal public comment. The first meeting was held on February 12, 2007, at the Antietam National Battlefield Visitor Center. Due to an ice storm, the February 13, 2007, meeting at Monocacy National Battlefield was rescheduled and was instead held on February 20, 2007, at the battlefield's Gambrill House. At the Antietam meeting, 11 people signed in, representing mostly private individuals. One representative from the U.S. Fish and Wildlife Service National Conservation Training Center also attended. At the Monocacy National Battlefield meeting, seven people signed in, all private individuals. The purpose of these meetings was to provide the public information about the disease and the planning process and to solicit public input. Notices of the meetings were posted on the NPS Planning, Environment, and Public Comment (PEPC) website. Additionally, a newsletter was mailed 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, need, and objectives for the CWD plan/EA.

The comment period for the public scoping information, which was extended due to the delay in the Monocacy National Battlefield meeting, ended on March 27, 2007. During this time, all NPS scoping materials available at the meetings, including the newsletter, were posted on the NPS PEPC website for download. This provided another opportunity to review and comment on the purpose, need, objectives, and preliminary alternatives, especially for those stakeholders who could not attend the meetings.

During the first comment period four pieces of correspondence were received. One comment was received through the PEPC website, and the remaining three comments were received as letters to the park. Three comments discussed the different methods of detection and/or initial response presented at the meetings, and one comment was a request to be kept updated on the progress of the project.

A second set of public meetings was held on December 3 and 4, 2008, to solicit public input on the draft alternative approaches to CWD detection and initial response at the battlefield. Twenty people signed in at the December 3, 2008, meeting, which was held at the Antietam National Battlefield Visitor Center. Fourteen people signed in at the December 4, 2008, meeting, which was held at the Gambrill House at Monocacy National Battlefield. The meetings included presentations about the alternatives being considered and an open house forum where comments from the public were recorded on flipcharts. Following the public meetings, eight pieces of correspondence were sent to the park. A number of comments received at the meetings and during the second comment period suggested incorporating public hunting into lethal removal efforts. Other comments were related to sharing information about the deer herd and the disease and its effects, as well as concerns about the use of skilled volunteers for hunting, deer damage to agricultural crops, the implementation of deer dispersal as an alternative, and donation of meat.

AGENCY CONSULTATION

Letters of consultation under Section 7 of the Endangered Species Act and Section 106 of the *National Historic Preservation Act*, and and/or requesting information or comments were sent to the U.S. Fish and Wildlife Service and the Maryland Historic Preservation Office on March 6, 2009. The U.S. Fish and Wildlife Service replied in a letter dated June 4, 2009, that no further Section 7 consultation would be required. Copies of these letters are provided in appendix C. A copy of this plan/EA has been sent to the Historic Preservation Office to complete Section 106 compliance.

LIST OF RECIPIENTS OF THE PLAN / ENVIRONMENTAL ASSESSMENT

This plan/EA has been sent to the following agencies, organizations, and businesses, as well as to other entities and individuals who requested a copy.

CONGRESSIONAL DELEGATES

- Honorable Ben Cardin
- Honorable Barbara A. Mikulski
- Honorable Roscoe Bartlett

FEDERAL GOVERNMENT

- U.S. Fish and Wildlife Service, Chesapeake Bay Field Office
- U.S. Fish and Wildlife Service, National Conservation Training Center
- National Park Service

National Capital Parks – East
Appalachian National Scenic Trail
Catoctin Mountain Park
Chesapeake and Ohio Canal National Historical Park
George Washington Memorial Parkway
Harpers Ferry National Historical Park
Manassas National Battlefield Park
National Mall and Memorial Parks
Potomac Heritage National Scenic Trail
Presidents Park
Prince William Forest Park
Rock Creek Park
Wolf Trap National Park for the Performing Arts

STATE AND LOCAL GOVERNMENT

- Maryland Division of Historical and Cultural Programs, Maryland Historical Trust
- Maryland Department of Natural Resources Wildlife and Heritage Service
- South Mountain State Battlefield
- Frederick County, MD Government
- Maryland Wildlife Services
- Jefferson County, WV Government
- Washington County, MD Government
- Boonsboro, MD Government
- Hagerstown, MD Government
- Sharpsburg, MD Government
- Keedysville, MD Government

- Maryland Natural Resources Police
- West Virginia Department of Natural Resources
- Pennsylvania Game Commission

ORGANIZATIONS/OTHER

- Maryland Sportsmen's Association
- Urbana Civic Association
- Thurmont Conservation & Sportsman's Club
- Civil War Preservation Trust
- Frederick Community College
- Isaac Walton League of America, Inc.
- Frederick County Civil War Round Table
- Community Commons
- Frederick County Sportsman's Council
- Catocin Fish & Game Protective Association
- Appalachian Conservation League
- Cold Deer Hunting & Fishing Club
- Frederick County Fish & Game Protective Association
- Institute for Environmental Studies, Shepherd University
- NZP Conservation and Research Center
- Baltimore Civil War Round Table
- Antietam Battlefield Advisory Committee
- Save Historic Antietam Foundation
- Hagerstown-Washington County Convention and Visitors Bureau
- Hagerstown-Washington County Chamber of Commerce
- The Conservation Fund
- Conococheague Sportman's Club
- McClellan Gun Club
- Funkstown Rod and Gun Club
- North American Rod and Gun Club
- Potomac Fish and Game Club
- South Mountain Rod and Gun Club
- Sharpsburg Historical Society
- National Park Foundation

- Shepherdstown Battlefield Preservation Association
- National Museum of Civil War Medicine
- The Humane Society of the US
- Animal Welfare Institute
- Civil War Preservation Trust
- Defenders of Wildlife
- People for the Ethical Treatment of Animals
- Quality Deer Management Association
- Friends of Animals
- Friends of Frederick County
- Historical Society of Frederick County
- Maryland Farm Bureau
- National Wildlife Federation
- National Audubon Society
- Sierra Club
- The Nature Conservancy

SCIENCE TEAM MEMBERS

Name	Title	Organization / Location
Joe Calzarette	Natural Resource Manager	Antietam National Battlefield
Lindsey Donaldson	Biological Science Technician	Antietam National Battlefield
Ed Wenschhof	Chief, Natural Resources and Protection	Antietam National Battlefield
Andrew Banasik	Natural Resources Manager	Monocacy National Battlefield
Jim Atkinson	Wildlife/Fisheries Biologist	Shenandoah National Park
Michelle Batcheler	Wildlife Biologist	NPS Northeast Region
John Karish	Chief Scientist	NPS Northeast Region
Scott Bates	Wildlife Biologist	NPS / National Capital Region (NCR) – Center for Urban Ecology
Margaret Wild	Wildlife Veterinarian	NPS Biological Resources Management Division (BRMD)
Jenny Powers	Wildlife Veterinarian	NPS BRMD
Michael Mayer	Environmental Protection Specialist (former)	NPS Environmental Quality Division
Melissa (Behrent) Stedeford	Environmental Protection Specialist	NPS Environmental Quality Division
George Timko	CWD response coordinator	Maryland Department of Natural Resources
Jonathan Sleeman	Wildlife Veterinarian	Virginia Department of Game and Inland Fisheries
Nelson LaFon	Deer Project Coordinator	Virginia Department of Game and Inland Fisheries
Bill McShea	Deer Biologist	Smithsonian
Dan Niosi	Environmental Scientist	Louis Berger Group
Beth Kunkel	Wildlife Biologist – Team Facilitator	Kimley-Horn and Associates, Inc.

Additional information was also requested from state resource managers from West Virginia and Pennsylvania respective to their CWD plans. These managers participated in at least one of the science team calls.

LIST OF PREPARERS AND CONSULTANTS

Name	Title
National Park Service: Antietam National Battlefield	
John Howard	Superintendent
Ed Wenschhof	Chief, Natural Resources and Protection
Joe Calzarette	Natural Resources Manager
Debbie Cohen	Natural Resources Manager / GIS Specialist
Jane Custer	Chief, Cultural Resources
Lindsay Donaldson	Bio Science Technician
Stephanie Gray	Chief, RE&VS
Tom Jones	Supervising Park Ranger
National Park Service: Monocacy National Battlefield	
Susan Trail	Superintendent
Andrew Banasik	Natural Resources Manager
Tina Cartwright	Facility Manager
Brett Spaulding	Park Ranger
Todd Stanton	Chief Ranger

Name	Title	Education/Responsibility	Experience
National Park Service: Environmental Quality Division			
Tom Flanagan	Environmental Protection Specialist (Environmental Quality Division)	B.A. History M.A. Geography Environmental Quality Division Project Manager: Responsible for NEPA policy, guidance and technical review.	3 years
Michael Mayer	Environmental Protection Specialist (Environmental Quality Division) – no longer with NPS	B.S. Wildlife and Fisheries Biology; M.S. Wildlife Conservation; J.D. Environmental Law. Responsible for NEPA policy, guidance, and technical review and first Environmental Quality Division project manager.	10 years
Center for Urban Ecology			
James Sherald	Chief of Natural Resources and Science,	B.S. Ornamental Horticulture, M.S., Ph.D. in Plant Pathology. Provided input and review.	
Dan Sealy	Deputy Chief of Natural Resources and Science,	B.S. Natural Resource Management. Provided input and review.	33 years with NPS
Scott Bates	Regional Wildlife Biologist NPS	B.S. Biology; M.S. Wildlife Management. Provided technical input.	8 years with NPS National Capital Region and 9 years with DoD as a wildlife biologist
Diane Pavek	Research Coordinator and Botanist	B.S. in Botany and Zoology; M.S., Ph.D. in Botany. Provided technical input.	25 years in botany; 9 years with NPS

Name	Title	Education/Responsibility	Experience
Biological Resources Management Division			
Jenny Powers	Wildlife Veterinarian	BS Veterinary Science DVM	7 years; 6 years with NPS as CWD coordinator
Mark Graham	Wildlife Biologist	BS Biology BS Electrical Engineering PhD Wildlife Biology Provided technical input and review related to CWD, white-tailed deer, and appendix B.	11 years in wildlife biology; 4 years with NPS
Margaret Wild	Wildlife Veterinarian	BS Wildlife Biology DVM PhD Zoology Provided technical input on CWD and review	19 years as wildlife veterinarian; 8 years with NPS 20 years researching CWD
Kimley-Horn and Associates, Inc.			
Beth Kunkel	Wildlife Biologist and Environmental Planner	B.S. Wildlife Management. Responsible for facilitation of science team meetings.	20 years
The Louis Berger Group, Inc.			
Nancy Van Dyke	Senior Consultant	B.A. Biology and Geography; M.S. Environmental Sciences. Project manager; responsible for project management and senior technical review and content additions to all sections; internal scoping, second public meetings; alternatives development; chapter 2 revisions; wildlife and park management /operations topics in chapters 3 and 4; chapter 5.	28 years
Dan Niosi	Environmental Scientist	B.A. Environmental Studies – Natural Resources. Deputy project manager; responsible for Science team documentation and coordination; internal and first public scoping meetings; alternatives development; deer and vegetation topics in chapters 3 and 4; other chapter 3 topics, chapters 1 and 2	9 years
Juanita Barboa	Technical Editor – The Final Word (subcontractor)	B.S. Technical Communication. Responsible for editing document.	19 years
Lucy Bambrey	Senior Cultural Resources Specialist Planner / Environmental Scientist	M.A. Anthropology. Responsible for cultural resources topics	30 years
Rebecca Byron	Planner / Environmental Scientist	B.S. Environmental Science and Policy. Responsible for internal scoping notes and first public meetings.	3 years
Toby Dachman	Environmental Planner	Responsible for first draft of chapter 5.	1 year

List of Preparers and Consultants

Name	Title	Education/Responsibility	Experience
Spence Smith	Environmental Scientist	M.A. Biology B.S. Zoology Responsible for visitor use, health and safety and socioeconomics analysis in chapter 4.	12 years
Lisa Pine	Former Independent Environmental Consultant – President, Seamless Composition (subcontractor)	M.A. Geography B.A. History Responsible for first drafts of chapters 1, 2, and part of 3.	11 years

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- 2007c Personal Communication between Andrew Banasik, Monocacy National Battlefield, and Doug Wetmore, The Louis Berger Group, regarding the Management Division at the battlefield. December 5, 2007.
- 2007d Personal Communication between Andrew Banasik, Monocacy National Battlefield, and Doug Wetmore, The Louis Berger Group, regarding employee and visitor safety. November 30, 2007.
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- 2009c Personal Communication via email to Dan Niosi, The Louis Berger Group, RE: deer density graph. May 6 and June 2, 2009.

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Glossary and Acronyms

GLOSSARY

Action Alternative — An alternative that proposes a different management action or actions to address the purpose, need, and objectives of the plan; one that proposes changes to the current management. Alternatives B and C are the action alternatives in this planning process. See also: “No-Action Alternative.”

Adaptive Management — The rigorous application of management, research, and monitoring to gain information and experience necessary to assess and modify management activities. A process that uses feedback from research and the period evaluation of management actions and the conditions they produce to either reinforce the viability of objectives, strategies, and actions prescribed in a plan or to modify strategies and actions in order to more effectively accomplish management objectives.

Affected Environment — A description of the existing environment that may be affected by the proposed action (40 CFR 1502.15).

Authorized Agent — For the purposes of this plan, authorized agents could include, but are not limited to, other agency personnel, contractors, and skilled volunteers.

Bluetongue Virus — An insect-transmitted, viral disease of ruminant animals, including white-tailed deer, which causes inflammation, swelling, and hemorrhage of the mucous membranes of the mouth, nose, and tongue.

Carrying Capacity — The maximum number of organisms that can be supported in a given area or habitat.

Cervid — A member of the deer family, such as white-tailed deer, mule deer, elk, moose, and caribou.

Chronic Wasting Disease (CWD) — A slowly progressive, infectious, self-propagating neurological disease of captive and free-ranging deer, elk, and moose. CWD belongs to the transmissible spongiform encephalopathy (TSE) group of diseases and is characterized by accumulations of abnormal prion proteins in neural and lymphoid tissue.

Contractor — For the purposes of this plan, a contractor would be a fully insured business entity, nonprofit group, or other entity engaged in wildlife management activities that include the direct reduction with firearms.

Cultural Landscape — A geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

Cumulative Impacts — Those impacts on the environment that result from the incremental effect of the action when added to the past, present, and reasonable foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Deer Herd — The group of deer that have common characteristics and interbreed among themselves. For the purposes of this plan, this term is synonymous with deer population.

Deer Population — See Deer Herd, above.

Depopulation — Elimination of a population.

Disseminated Intravascular Clotting — Disorder in which the proteins that control blood clotting become abnormally active.

Ecosystem — An ecological system; the interaction of living organisms and the nonliving environment producing an exchange of materials and energy between the living and nonliving.

Encephalopathy — Any disorder or disease of the brain.

Endemic — Native to or confined to a particular region.

Environment — The sum total of all biological, chemical, and physical factors to which organisms are exposed; the surroundings of a plant or animal.

Environmental Assessment (EA) — A concise public document, prepared in compliance with NEPA, that briefly discusses the purposes and need for an action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

Environmental Consequences — Environmental effects of project alternatives, including the proposed action, any adverse environmental effects which cannot be avoided, the relationship between short-term uses of the human environment, and any irreversible or irretrievable commitments of resources which would be involved if the proposal should be implemented (40 CFR 1502.16).

Environmental Impact Statement (EIS) — A detailed written statement required by Section 102(2)(C) of NEPA, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources (40 CFR 1508.11).

Epizootic Hemorrhagic Disease (EHD) — An insect-borne viral disease of ruminants that causes widespread hemorrhages in mucous membranes, skin, and visceral organs.

Ethnographic Resource — Any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it.

Etiology — Relating to the cause of a disease.

Euthanasia — Ending the life of an animal by humane means.

Exotic Species — Any introduced plant, animal or protist species that is not native to the area and may be considered a nuisance; also called non-native or alien species.

Focal Hemorrhage — Localized hemorrhage.

Force of Infection — The rate at which susceptible individuals become infected by an infectious disease.

Habitat — The environment in which a plant or animal lives (includes vegetation, soil, water, and other factors).

Herbaceous Plants — A non-woody plant; includes grasses, wildflowers, and sedges and rushes; does not include trees or shrubs.

Hemorrhage — Uncontrolled bleeding or loss of a large amount of blood.

Homogeneous — Having the same genetic structure.

Heterogeneous — Derived from a different individual or species.

Impairment (NPS Policy) — As used in NPS Management Policies, "impairment" means an adverse impact on one or more park resources or values that interferes with the integrity of the park's resources or values, or the opportunities that otherwise would exist for the enjoyment of them, by the present or a future generation. Impairment may occur from visitor activities, NPS activities in managing a

park, or activities undertaken by concessioners, contractors, and others operating in a park. As used here, the impairment of park resources and values has the same meaning as the phrase "derogation of the values and purposes for which these various areas have been established," as used in the General Authorities Act.

Monitoring — A process of collecting information to evaluate if an objective and/or anticipated or assumed results of a management plan are being realized (effectiveness monitoring) or if implementation is proceeding as planned (implementation monitoring).

National Environmental Policy Act of 1969 — A law that requires all Federal agencies to examine the environmental impacts of their actions, incorporate environmental information, and utilize public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA with other planning requirements and prepare appropriate NEPA documents to facilitate better environmental decision making. NEPA requires Federal agencies to review and comment on Federal agency environmental plans/documents when the agency has jurisdiction by law or special expertise with respect to any environmental impacts involved (42 U.S.C. 4321-4327) (40 CFR 1500-1508).

No-Action Alternative — The alternative in which baseline conditions and trends are projected into the future without any substantive changes in management (40 CFR 1502.14(d)). Alternative A is the no-action alternative in this planning process.

Opportunistic Surveillance — Taking diagnostic samples for CWD testing from deer found dead or harvested through a management activity within a national park unit.

Parasitism — A symbiotic relationship in which one species, the parasite, benefits at the expense of the other, the host.

Population (or Species Population) — A group of individual plants or animals that have common characteristics and interbreed among themselves and not with other similar groups.

Population Reduction — removing animals randomly within a population in an attempt to reduce animal density, and thus decrease CWD transmission rates.

Prion — Proteinaceous infectious particle; a microscopic particle similar to a virus but lacking nucleic acid, thought to be the infectious agent for certain degenerative diseases of the nervous system such as CWD.

Riparian — Relating to or living or located on the bank of a natural watercourse (as a river) or sometimes of a lake or a tidewater.

Ruminant — An animal that chews the cud and has a complex digestive system with a four-part stomach enabling bacteria to break down food. Ruminants lack upper incisor teeth and their complex stomach allows them to store and digest large amounts of bulky and fibrous food.

Scoping — An early and open process for determining the extent and variety of issues to be addressed and for identifying the significant issues related to a proposed action (40 CFR 1501.7).

Successional — "Successional" refers to the process of ecosystem development as brought about by changes in the populations of species that results in the creation of a geographic region with particular characteristics. Early successional refers to species that tend to more quickly give way to other species (weeds, nonnative varieties, etc.), typically representing lower quality habitat. Late-successional refers to more persistent species, and tend to be associated with higher value habitat.

Targeted Surveillance — Lethal removal of deer that exhibit clinical signs of CWD, such as changes in behavior and body condition, and testing to determine if CWD is present.

Transect — A line along which sampling is performed.

Transmissible Spongiform Encephalopathies (TSEs) — A group of diseases characterized by accumulations of abnormal prion proteins in neural and lymphoid tissues, which cause distinctive lesions in the brain and result in death.

Ungulate — A hoofed, typically herbivorous, animal; includes horses, cows, deer, elk, and bison.

Vaccine — A suspension of killed or attenuated microorganisms that, when introduced into the body, stimulates an immune response against that microorganism.

Vascular Plant — A plant that contains a specialized conducting system consisting of phloem (food-conducting tissue) and xylem (water-conducting tissue). Ferns, trees, and flowering plants are all vascular plants.

ACRONYMS

BRMD	(National Park Service) Biological Resources Management Division
BSE	bovine spongiform encephalopathy (mad cow disease)
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIZ	CWD infection zone
CJD	Creutzfeldt-Jakob disease
CWD	chronic wasting disease
EA	Environmental Assessment
EIS	Environmental Impact Statement
GMP	general management plan
MDNR	Maryland Department of Natural Resources
NEPA	National Environmental Policy Act
NPS	National Park Service
PEPC	Planning, Environment, and Public Comment
SSA	selected surveillance area
TSE	transmissible spongiform encephalopathy
USC	United States Code
VDGIF	Virginia Department of Game and Inland Fisheries
WVDNR	West Virginia Division of Natural Resources
WHS	Wildlife and Heritage Service

Appendix A: Director's CWD Guidance
Memorandum (July 26, 2002)

12.2 Director's CWD Guidance Memorandum (July 26, 2002)

July 26, 2002

N16 (2300)

Memorandum

To: Regional Directors

From: Director /s/ Randy Jones (for)

Subject: National Park Service response to chronic wasting disease of deer and elk

The purpose of this memo is to provide regions and parks with guidance on the National Park Service (NPS) response to chronic wasting disease (CWD), which is a fatal neurologic disease of deer and elk. The disease has occurred in a limited geographic area of northeastern Colorado and southeastern Wyoming for over 20 years. Recently, CWD has been detected in captive and free-ranging deer and elk in several new locations in the United States, including western Nebraska, southwestern South Dakota, western Colorado, southern New Mexico, and for the first time east of the Mississippi River in Wisconsin.

Although Rocky Mountain National Park is the only NPS unit where CWD is known to occur, several NPS units are at high risk due to their close proximity to the newly identified areas of disease occurrence. In addition, there is a definite likelihood that CWD will be detected in other areas of the country following increases in surveillance for the disease. Therefore, CWD has become an issue of national importance to wildlife managers and other interested publics, including the NPS.

CWD is in the family of diseases known as the transmissible spongiform encephalopathies (TSEs) or prion diseases. Other TSEs include scrapie in sheep, bovine spongiform encephalopathy (BSE or mad cow disease), and Creutzfeldt-Jacob disease (CJD) in humans. CWD causes brain lesions that result in progressive weight loss, behavioral changes, and eventually death in affected deer and elk. There is currently no evidence that CWD is transmissible to humans or domestic livestock; however, the disease could limit populations of deer and elk and could result in profound impacts on the recreational value of these species. In an attempt to control chronic wasting disease, the states of Colorado and Wisconsin are drastically reducing free-ranging deer and elk numbers in affected areas.

The NPS, working within our mission and management policies, should cooperate with states in preventing and controlling CWD in park units. Although the origin of CWD is unknown, it is strongly suspected that CWD is a non-native disease of deer and elk in parks. Therefore, I am asking each region and park to:

- o Cooperate and coordinate with state wildlife and agriculture agencies regarding proposed prevention, surveillance, research, and control actions for CWD.
- o Parks in close proximity (60 miles) to areas where CWD has been detected should initiate a targeted surveillance program to monitor for deer and elk with clinical signs of the disease and submit samples for diagnostic testing from all deer and elk found dead.
- o Immediate action should be taken, on a limited scale, to address imminent threats such as a deer or elk exhibiting clinical signs of CWD. Euthanasia of CWD suspect deer or elk with samples submitted for diagnostic evaluation is a reasonable response.
- o Prior to undertaking larger scale or multiple animal actions within a park (e.g., population reduction of deer and elk) environmental planning documents, including NEPA and, if applicable, Section 7 consultation with the US Fish and Wildlife Service, will need to be prepared.
- o Proposed translocations of live deer or elk into or out of NPS units must receive critical review and CWD risk assessment. Deer or elk will not be translocated from areas where CWD is known to occur or where there is inadequate documentation to confirm absence of the disease (i.e., prevalence <1 percent with a 99 percent confidence interval).
- o Use of park or regional public affairs staff to assist in outreach to surrounding communities and communications to park visitors regarding CWD and CWD management is encouraged.
- o Remain alert to potential threats from CWD and contact the NPS Biological Resource Management Division (BRMD) or state wildlife agencies if further information or animal testing is needed.

Chronic wasting disease is currently in the spotlight with the public, States, Department of the Interior (DOI), United States Department of Agriculture (USDA), and Congress. A Congressional hearing on CWD has been held and a joint DOI-USDA-State Working Group Task Force has been established to address the CWD issue. The NPS has been an active participant in these processes. This broad level of participation increases our need to remain internally connected and coordinated at the park, regional, and national level, and to assure that our actions are consistent with agency policy.

The BRMD will provide assistance to regions and parks in prevention, surveillance, and control of CWD. The BRMD has also partnered with the USGS National Wildlife Health Center to provide additional assistance. General information and links to other websites on CWD are available through the BRMD section of InsideNPS. If you have technical questions, need more information or animal testing, please contact Dr. Margaret Wild, NPS Wildlife Veterinarian, BRMD, at (970) 225-3593. If you have policy questions regarding NPS response to CWD, please contact Michael Soukup at (202) 208-3884.

cc: Max Peterson, IAFWA
 Steve Williams, USFWS
 Kathleen Clarke, BLM
 Denny Fenn, USGS
 Jake Hoogland, NPS EQD

Appendix B: Discussion of Numbers of Deer
that Could Be Lethally Removed during CWD
Detection and Initial Response Activities

Appendix B: Discussion of numbers of deer that could be lethally removed during CWD detection and initial response activities

Detection and Monitoring Surveillance

Alternatives B and C would provide for the lethal removal of apparently healthy deer for surveillance during the detection and initial response phases of the plan. The battlefields would adopt a surveillance framework based on the Maryland Department of Natural Resources Wildlife and Heritage Service's CWD Response Plan. Under its plan, the state would conduct surveillance in 79 square mile "surveillance areas" defined by a five mile radius around a positive CWD case. The state would initially sample deer at the level needed have 95% confidence of detecting an additional CWD-positive animal if disease prevalence is at or above 1% (95/1). The state could possibly move to a 99/1 sampling level in the future. Rather than developing a unique population estimate for each surveillance area, the state would assume an infinite deer population, meaning that 300 deer would be sampled from the surveillance area to meet the 95/1 standard. If the state chose to meet the 99/1 standard, 458 samples would be needed.

The number of deer that the NPS could lethally remove from a battlefield during a single detection or monitoring surveillance effort is proportional to the number of samples that the state would take from a surveillance area as described above. The method used to calculate battlefield lethal removal numbers takes into account the size of the battlefields relative to the size of a state surveillance area and differences in deer densities between the battlefields and surrounding areas. The number of deer that could be lethally removed by the NPS from the battlefields during a single detection or monitoring surveillance effort can be represented by the equation:

$$n = (L) \frac{ad}{(S - a)o + ad}$$

where:

n = number of deer that could be removed by the NPS from the battlefield during a surveillance effort

L = sampling level, in number of deer (at 95/1, L=300; at 99/1, L=458)

S = state surveillance area, in mi² (S = 79)

a = area of park, in mi², that is federally owned land (Antietam National Battlefield = 3.01, Monocacy National Battlefield = 2.12)

d = deer density inside park, in deer/mi²

o = deer density outside park, in deer/ mi²

Table B-1 displays the number of deer that could be removed by the NPS from the battlefields during detection or monitoring surveillance efforts. The table includes numbers for both battlefields at both the 95/1 and 99/1 sampling levels. Current average deer densities at Antietam and Monocacy National Battlefields are approximately three

and five times the density of surrounding areas, respectively. Since deer densities may change over time, the table includes information for lethal removals based on current density estimates as well as a range of realistically possible differences in densities. Density differences are expressed in the number of times the battlefield density is greater than that of surrounding areas.

Table B-1: Possible number of lethal removals per detection or monitoring surveillance effort by sampling level and density difference. Density difference is expressed in number of times the battlefield density is greater than that of surrounding areas. Highlighted numbers represent removals that would occur based on current estimates of deer density.

		Antietam National Battlefield		Monocacy National Battlefield		Sampling Level
		95/1	99/1	95/1	99/1	
Density Difference	3x	32	49	23	35	
	4x	41	63	30	45	
	5x	50	76	36	55	
	6x	58	88	43	65	
	7x	65	99	49	74	
	8x	72	110	54	83	

Because the battlefields are relatively small and because deer found on the battlefields do not represent distinct populations, it is not practicable to obtain statistically meaningful data for detection and monitoring surveillance efforts based solely on tests conducted on deer removed from the battlefields. Therefore, following a detection or monitoring surveillance effort, the battlefields would pool CWD testing data obtained from their respective removals with data collected by the state from areas surrounding the battlefields. The pooling of data would allow the battlefields to obtain a statistically meaningful sample size at the desired sampling level. In the event that a state surveillance area encompassed a battlefield, samples collected by the NPS inside the battlefield could be used by the state to help achieve its desired sampling level for that surveillance area. In all cases, the battlefields would exchange results of CWD testing with the state.

One-time Population Reduction

Under alternative B, the initial response phase would provide for a one-time population reduction to bring the deer density to a density similar to that of surrounding areas. The purpose of the reduction would be to lessen the chance of CWD becoming established in the deer population. The percentage by which a battlefield's deer population would need to be reduced to make it equal in density to that of surrounding areas can be represented by the equation:

$$p = 100 \left(\frac{d - o}{d} \right)$$

where:

p = percentage by which battlefield deer population would be reduced during a one-time population reduction action

d = deer density inside park, in deer/mi²

o = deer density outside park, in deer/ mi²

Table B-2 displays the percentage, for different density differences, by which the populations of the battlefields would need to be reduced to be equal to that of surrounding areas. Since deer densities may change over time, the table includes information based on current density estimates as well as a range of realistically possible differences in densities. Density difference is expressed in number of times the battlefield density is greater than that of surrounding areas. In percentage terms, population reductions would be the same for Antietam National Battlefield and Monocacy National Battlefield for a given density difference.

Table B-2: Percentage of population reduction, by density differences, for the one-time population reduction. Density difference is expressed in number of times the battlefield density is greater than that of surrounding areas.

Density Difference	Population Reduction	
	3x	67% ^a
	4x	75%
	5x	80% ^b
	6x	83%
	7x	86%
	8x	88%

^a Approximate reduction that would occur at Antietam based on current density estimates

^b Approximate reduction that would occur at Monocacy based on current density estimates

Based on current density estimates, the one-time population reduction would entail reducing the deer population Antietam National Battlefield by 212 and the deer population Monocacy National Battlefield by 252. However, because the reduction may take place over a period of several years, the actual number of deer removed may exceed these numbers, owing to factors such as natural population growth during the duration of the reduction action.

Table B-3 is intended to provide insight into how the duration of the one-time population reduction action could affect the total number of deer removals needed to achieve the target population density. For each battlefield, the total numbers of removals needed to achieve a target density of 35 (the current density estimate for surrounding areas) were calculated for actions of one, two, and three years' duration. Calculations were made for current densities at Antietam and Monocacy National Battlefields as well as for a "worst case" scenario in which battlefield densities were eight times those of surrounding areas. Calculations were made using the Beverton-Holt model, a discrete-time population model used to predict population change over time in a manner accounting for factors such as density-dependent mortality. It was assumed that reductions would be equally divided among years in multi-year efforts.

It should be noted that the number of removals that would actually occur under a one-time population reduction action could differ from those presented in the table if assumptions or circumstances within the battlefields change. The primary purpose of table B-3 is to demonstrate the concept that the longer the duration of the one-time population reduction action, the greater the number of total deer removals needed to achieve the target density.

Table B-3: Estimated total removals needed to achieve target density of 35 deer/mi² for one-time population reduction actions of 1-3 years in duration. Total reductions were calculated for current densities and for battlefield densities 8 times greater than those of surrounding areas.

Antietam				Duration of action (years)
	1	2	3	
Current Densities ^a	212	227	241	
8x Density Difference	738	865	976	

Monocacy				Duration of action (years)
	1	2	3	
Current Densities ^b	252	274	294	
8x Density Difference	520	609	687	

^a Antietam density = 115/mi²

^b Monocacy density = 155/mi²

Appendix C: Letters of Consultation



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE

Antietam National Battlefield

P.O. Box 158

Sharpsburg, MD 21782-0158



March 6, 2009

Leopoldo Miranda, Field Supervisor
U.S. Fish and Wildlife Service
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401

Dear Mr. Miranda:

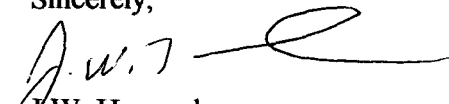
The National Park Service (NPS), in accordance with the National Environmental Policy Act, is currently preparing a plan and environmental assessment (plan/EA) for Chronic Wasting Disease (CWD) Detection and Initial Response at Antietam and Monocacy National Battlefields. The purpose of the plan/EA is to develop a range of strategies for the detection of and initial response to CWD in white-tailed deer at the battlefields, since the disease has been detected near the park units and may threaten park resources.

The battlefields' proximity to known positive CWD cases represents a risk for disease introduction, and their relatively large white-tailed deer populations represent a risk for disease amplification. Accordingly, the plan/EA will examine a range of options for determining whether the disease is present in the battlefields' deer and options for responding to the disease if it is found.

We welcome your input on any aspect of the project. However, we specifically seek information about the presence of listed threatened and endangered species in the vicinity of the park units. To the knowledge of the NPS, no listed threatened or endangered species occur in the vicinity of either Antietam or Monocacy National Battlefields.

Your input will help ensure that the environmental impacts of the proposal are properly considered. If you have any questions or require any further information please contact Ed Wenschhof, Chief Ranger, Antietam National Battlefield at (301) 432-2243 or Andrew Banasik, Natural Resources Program Manager, Monocacy National Battlefield at (301) 696-0130. Thank you for your assistance.

Sincerely,


J.W. Howard
Superintendent



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573-4575



June 4, 2009

J.W. Howard
Superintendent
NATIONAL PARK SERVICE
Antietam National Battlefield
P.O. Box 158
Sharpsburg, MD 21782-0158

RE: Environmental Assessment (plan/EA) for Chronic Wasting Disease (CWD) Detection and Initial Response at Antietam and Monocacy National Battlefields

Dear: Mr. Howard:

This responds to your letter, received March 6, 2009, requesting information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the vicinity of the above reference project area. We have reviewed the information you enclosed and are providing comments in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project impact area. Therefore, no Biological Assessment or further section 7 Consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

Effective August 8, 2007, under the authority of the Endangered Species Act of 1973, as amended, the U.S. Fish and Wildlife Service (Service) removed (delist) the bald eagle in the lower 48 States of the United States from the Federal List of Endangered and Threatened Wildlife. However, the bald eagle will still be protected by the Bald and Golden Eagle Protection Act, Lacey Act and the Migratory Bird Treaty Act. As a result, starting on August 8, 2007, if your project may cause "disturbance" to the bald eagle, please consult the "National Bald Eagle Management Guidelines" dated May 2007.

If any planned or ongoing activities cannot be conducted in compliance with the National Bald Eagle Management Guidelines (Eagle Management Guidelines), please contact the Chesapeake

Bay Ecological Services Field Office at 410-573-4573 for technical assistance. The Eagle Management Guidelines can be found at:

<http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf>.

In the future, if your project can not avoid disturbance to the bald eagle by complying with the Eagle Management Guidelines, you will be able to apply for a permit that authorizes the take of bald and golden eagles under the Bald and Golden Eagle Protection Act, generally where the take to be authorized is associated with otherwise lawful activities. This proposed permit process will not be available until the Service issues a final rule for the issuance of these take permits under the Bald and Golden Eagle Protection Act.

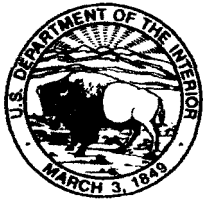
An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interests in these resources. If you have any questions or need further assistance, please contact Devin Ray at (410) 573-4531.

Sincerely,

A handwritten signature in black ink, appearing to read "Leopoldo Miranda", written in a cursive style.

Leopoldo Miranda
Field Supervisor



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE

Antietam National Battlefield

P.O. Box 158

Sharpsburg, MD 21782-0158



March 6, 2009

J. Rodney Little
State Historic Preservation Officer
Maryland Historical Trust
100 Community Place
Crownsville, MD 21032

Dear Mr. Little:

The National Park Service (NPS), in accordance with the National Environmental Policy Act (NEPA), is currently preparing a plan and environmental assessment (plan/EA) for Chronic Wasting Disease (CWD) Detection and Initial Response at Antietam and Monocacy National Battlefields. The purpose of the plan/EA is to develop a range of strategies for the detection of and initial response to CWD in white-tailed deer at the battlefields, since the disease has been detected near the park units and may threaten park resources.

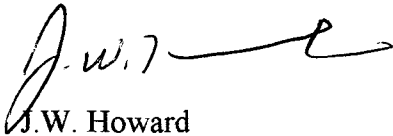
The battlefields' proximity to known positive CWD cases represents a risk for disease introduction, and their relatively large white-tailed deer populations represent a risk for disease amplification. Accordingly, the plan/EA will examine a range of options for determining whether the disease is present in the battlefields' deer and options for addressing the disease if it is found.

The NPS believes that the actions described in the plan/EA may have the potential to affect properties that are listed or may be eligible for inclusion in the National Register of Historic Places. Therefore, in accordance with the Advisory Council on Historic Preservation regulations, 36 CFR Part 800, the NPS is initiating consultation with your office. The NPS plans to use the environmental assessment process to accomplish compliance with both Section 106, in accordance with the National Historic Preservation Act, and NEPA.

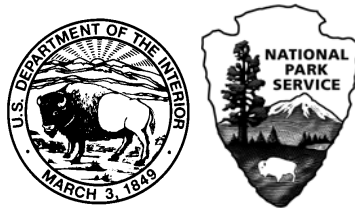
As soon as the plan/EA is completed, we will submit it to your office for your review, comment, and concurrence that the Section 106 process has been completed. Please note, however, that the NPS welcomes your input on any aspect of the project at any time during the preparation of the plan/EA.

Your input will help ensure that the environmental impacts of the proposal are properly considered. If you have any questions or require any further information please contact Ed Wenschhof, Chief Ranger, Antietam National Battlefield at (301) 432-2243 or Andrew Banasik, Natural Resources Program Manager, Monocacy National Battlefield at (301) 696-0130. Thank you for your assistance.

Sincerely,

A handwritten signature in black ink, appearing to read "J.W. Howard", with a long horizontal flourish extending to the right.

J.W. Howard
Superintendent



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

July 2009

United States Department of the Interior • National Park Service