



ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS
MARYLAND

**CHRONIC WASTING DISEASE DETECTION AND INITIAL
RESPONSE PLAN AND ENVIRONMENTAL ASSESSMENT
DRAFT FINAL INTERNAL SCOPING REPORT**

**ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS
NATIONAL PARK SERVICE**

February 13, 2007

Printed on recycled paper



**CHRONIC WASTING DISEASE DETECTION AND INITIAL
RESPONSE PLAN AND ENVIRONMENTAL ASSESSMENT
DRAFT FINAL INTERNAL SCOPING REPORT**

**ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS
NATIONAL PARK SERVICE**

February 13, 2007

Prepared for the National Park Service, U.S. Department of the Interior

by

The Louis Berger Group, Inc.

Denver, Colorado

CONTENTS

PURPOSE OF AND NEED FOR ACTION	1
Purpose of and Need for Action	3
Purpose of Action	3
Need for Action	3
Objectives in Taking Action.....	3
General.....	4
Deer Populations at Antietam and Monocacy National Battlefields	4
Cultural Resources	4
Human Health and Safety	4
Visitor Experience and Involvement of Interested Parties.....	4
Park Management and Operations	4
Study Area and Scope of the Analysis	5
BACKGROUND.....	7
Legislation and Planning Documents	7
Purpose and Significance of Antietam and Monocacy Park Units	7
Antietam and Monocacy National battlefields Planning Documents	9
Legislation, Regulations, and Policies.....	11
NPS Organic Act and Management Policies	12
Other National Legislation, Compliance, and NPS Policy	12
State and Local Laws, Regulations, and Policies.....	17
Deer Populations and Monitoring at Antietam and Monocacy National Battlefields	18
CHRONIC WASTING DISEASE SUMMARY AND RESEARCH OVERVIEW	21
Chronic Wasting Disease Background.....	21
Chronic Wasting Disease Diagnosis, Transmission, and Risk Factors	22
Chronic Wasting Disease in National Parks.....	24
Chronic Wasting Disease Response and Surveillance Plans.....	24
Ten-Step Process for Chronic Wasting Disease Surveillance	24
General National Park Service Chronic Wasting Disease Management Options.....	25
State Chronic Wasting Disease Response and Surveillance Plans	27
ISSUES AND IMPACT TOPICS	31
Issues Eliminated from Further Consideration.....	33
PRELIMINARY ALTERNATIVES	37
Preliminary Alternatives.....	37
Existing Management Continued (No-Action Alternative)	37
Actions Common to All Action Alternatives.....	38
Alternatives for CWD Detection	39

Alternatives for Initial Response	40
Alternatives Considered but not Carried Forward	42
CUMULATIVE IMPACT SCENARIO	45
AFFECTED ENVIRONMENT	55
Legislation	55
Antietam and Monocacy National Battlefields and Other NPS Planning Documents	55
Antietam and Monocacy National Battlefields Resource Information.....	56
ENVIRONMENTAL CONSEQUENCES.....	59
CONSULTATION AND COORDINATION.....	61
Congressional Delegates	62
Federal Agencies.....	62
District of Columbia and Local Governments	62
Organizations/Other	62
REFERENCES	65

LIST OF FIGURES

Figure 1. Deer Density at Antietam National Battlefield.....	18
--	----

LIST OF TABLES

Table 1. Sections of 36 Code of Federal Regulations Applicable to this Project	14
Table 2 CWD Risk Factors for Disease Exposure and Amplification.....	39
Table 3. Cumulative Action Scenario	46

APPENDIXES

APPENDIX A: NATIONAL PARK SERVICE CHRONIC WASTING DISEASE MEMORANDUMS	73
---	----

PURPOSE OF AND NEED FOR ACTION

Antietam National Battlefield is in the southern part of Washington County, Maryland. The Battle of Antietam (September 17, 1862) is considered by many historians as the turning point in the Civil War (NPS 1995a). Antietam today is considered one of the best preserved Civil War battlefields in the national park system (NPS 1995a). 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 3,256 acres within the legislative boundary, 1,927 acres are owned in fee by the federal government and managed by the National Park Service (NPS) to maintain the historic setting and provide for visitor use; 823 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. The Battle of Monocacy (July 9, 1864) was considered a success in delaying Confederate troops from advancing on Washington, D.C. before General U.S. Grant could mount a defense of the city. The battlefield lies on either side of the Monocacy River, and most of the land is currently used for cultivation or grazing (NPS 1993). 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.

Antietam National Battlefield and Monocacy National Battlefield are home to populations of white-tailed deer (*Odocoileus virginianus*), which occur throughout most of the contiguous U. S., 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 U.S. after European settlement. During recent years, the state of Maryland has seen a resurgence of white-tailed deer, which have been observed at Antietam and Monocacy National Battlefields. 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. Maryland's 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). As deer populations increase, risks related to transmission of contagious diseases, including chronic wasting disease (CWD), within these higher density populations may be a concern (NPS 2006c, Joly et al. 2006, Samuel et al. 2003; see "Chronic Wasting Disease Summary and Research Overview" section for more information on risks and transmission of CWD).

Chronic wasting disease is a fatal neurological disease that has been identified in free-ranging as well as captive mule deer (*Odocoileus hemionus*), white-tailed deer, elk (*Cervus elaphus*), and most recently moose (*Alces alces*). It is a transmissible spongiform encephalopathy (TSE) and at this time does not appear to affect either domestic livestock species such as cattle and sheep, or humans. While much is still unknown about the way this disease spreads among natural hosts and the long-term effects on them, there is the potential for long-term, population-level effects. Also there is much concern among both the public and scientific communities regarding CWD. Therefore, in 2002 the director of the NPS provided a memorandum with the following guidance (see appendix A):

- NPS units should cooperate and coordinate with state agencies regarding CWD response,
- NPS units within 60 miles of where CWD has been detected should initiate targeted and opportunistic surveillance by removing deer with clinical signs of CWD as well as submitting samples from all deer found dead,

- All translocations of deer in or out of NPS units would be prohibited without extensive CWD surveillance,
- Public outreach should be conducted, and
- The *National Environmental Policy Act* (NEPA) should be used as a decision-making tool if other actions for CWD detection or response are being considered (NPS 2002b).

Until 2005, the disease 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, it was first identified in a road-killed deer in West Virginia (subsequently, eight more deer have tested positive for CWD near Slanesville, West Virginia). Since this time, state agencies in the Northeast have been increasing CWD surveillance and creating CWD action plans. Many of these plans go beyond NPS opportunistic and targeted surveillance efforts. Opportunistic surveillance is defined as taking diagnostic samples for chronic wasting disease testing from deer found dead. These specimens must have died accidentally, naturally, through a removal effort documented through a specific planning/NEPA process, or by causes other than for the purpose of testing. Targeted surveillance is the lethal removal of any deer that exhibits signs consistent with chronic wasting disease.

To date, Rocky Mountain National Park, Colorado, and Wind Cave National Park, South Dakota, are the only two NPS units where the disease has been identified. However, because of their proximity (less than 60 miles) to positive CWD detections in Slanesville, West Virginia, the National Park Service is conducting a multi-regional planning effort and accompanying NEPA analysis for CWD detection and initial response at Antietam and Monocacy National Battlefields (NPS National Capital Region) and Shenandoah National Park (NPS Northeast Region). While Shenandoah's NEPA process will occur independently of the process for Antietam and Monocacy, the NPS is coordinating the efforts closely.

In accordance with the directive to use NEPA as a decision-making tool, the NPS conducted an internal scoping meeting on November 15 and 16, 2006, to discuss the CWD detection and initial response to positive CWD detections in or near Antietam and Monocacy National Battlefields. The goal of the meeting was to determine the purpose, need, objectives, and preliminary alternatives for CWD detection and initial response in white-tailed deer within the park units, as well as to identify issues and impact topics, and to develop a cumulative impact scenario for the Environmental Assessment (EA) to be prepared. As the Council on Environmental Quality (CEQ) requires an analysis of cumulative effects, cumulative impact scenarios are developed to identify affected resources that would be considered in the cumulative impacts analysis; temporal and spatial boundaries for the cumulative impacts analysis; and past, present, and reasonably foreseeable future actions within those boundaries that affect the same resource(s).

The purpose, need, and objectives developed during the internal scoping meeting were subsequently refined by the NPS during conference calls. The following sections provide the revised purpose, need, and objectives, while the version developed at the internal scoping meeting are provided in the meeting minutes.

PURPOSE OF AND NEED FOR ACTION

As defined in the DO-12 Handbook, section 2.2:

Purpose is a broad statement of goals and objectives that NPS intends to fulfill by taking action . . . Objectives are a more specific statement of purpose, i.e., what must be accomplished, in large part, for the action to be considered a success.

Need is a discussion of existing conditions that need to be changed, problems that need to be remedied, decisions that need to be made, and policies or mandates that need to be implemented . . . Need is why action is being taken at this time.

The NPS seeks to implement CWD detection and initial response procedures at Antietam and Monocacy National Battlefields by completing a plan and EA. NPS and Antietam and Monocacy National Battlefield policies, as well as NEPA and other related requirements, will guide the plan/EA. The NPS will also address concerns voiced by the public and other agencies.

PURPOSE OF ACTION

The purpose of this plan is to develop a range of strategies for the detection of and initial response to chronic wasting disease 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

A detection and initial response plan is needed at this time to address:

- The use of a range of CWD surveillance and initial response actions in light of recent detections in nearby geographic areas and how they affect Antietam and Monocacy National 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.
- Cooperation and coordination with state wildlife and agricultural agencies, as well as other interested parties, regarding prevention, surveillance, research, and initial response actions for CWD.

OBJECTIVES IN TAKING ACTION

All alternatives selected for detailed analysis 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, significance, and mission goals, and must be compatible with direction and guidance provided by each park unit's general management plan, strategic plan, and other management guidance. Any plan the park develops must be consistent with the laws, policies, 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, significance, and mission goals, which were considered in developing objectives. The following objectives related to CWD detection and initial response were derived at the internal scoping meeting.

GENERAL

- Ensure actions are consistent with pertinent National Park Service 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 components of the cultural landscapes from CWD or implementation of surveillance and initial response activities for the disease.

HUMAN HEALTH AND SAFETY

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

VISITOR EXPERIENCE AND INVOLVEMENT OF INTERESTED PARTIES

- Cooperate and coordinate with state wildlife and agricultural agencies, as well as other interested parties, with respect to detection of CWD and initial responses to positive cases.
- Enhance the awareness and understanding of CWD and NPS resource management issues, policies, and mandates as they pertain to prevention, surveillance, and response to the disease for visitors and other interested parties.
- During implementation of CWD surveillance and initial response activities, minimize disruption to visitor use and experience.

PARK MANAGEMENT AND OPERATIONS

- Minimize impacts of CWD surveillance and response activities on current park operations, including budget and workload.

STUDY AREA AND SCOPE OF THE ANALYSIS

While the presence and spread of CWD in the eastern U.S. is a broader regional issue, the focus of this plan is to develop strategies for the detection and initial response to CWD in white-tailed deer populations in Antietam and Monocacy National Battlefields. While this plan cannot address a “cure” for CWD, it provides flexibility for managers at Antietam and Monocacy to use new research techniques related to detection and initial response of the disease, if appropriate. In addition, this plan will not address overall deer management at the battlefields. Overpopulation of deer or the effects of deer browsing on vegetation and wildlife are outside of the scope of the analysis, which will focus on strategies for detecting, and the initial response to, CWD.

Any NPS actions taken as a result of this plan would occur only within the boundaries of the battlefields. As a result, those resources that have the potential to be affected by CWD detection and initial response activities at the battlefields will be characterized and the impacts of the potential actions will be evaluated. However, these actions could have effects on resources outside of the park units that have yet to be determined. The science team that has been convened for this project will assist the NPS in identifying the extent of the area outside the battlefields in which impacts will be analyzed.

BACKGROUND

NPS units were established by Congress to fulfill specified purposes, based on the park's unique and significant resources. A park's purpose, as established by Congress, is the fundamental building block for its decisions to conserve resources while providing for "enjoyment of future generations."

The following were explored with the park during internal scoping: why each unit was established as a park; what resources Congress recognized as needing NPS protection; and what purpose, mission, and objectives must be fulfilled by the park.

Antietam National Battlefield's General Management Plan and Monocacy National Battlefield's Draft General Management Plan summarize the authorizing legislation for each unit, its purpose and significance, as well as broad mission goals for the future. These statements were reviewed at the internal scoping meeting and are presented in this section.

LEGISLATION AND PLANNING DOCUMENTS

Antietam National Battlefield and Monocacy National Battlefield are two separate park units within the State of Maryland. The park legislation and planning documents differ for each park unit.

PURPOSE AND SIGNIFICANCE OF ANTIETAM AND MONOCACY PARK UNITS

Antietam National Battlefield

Establishment — Congress established Antietam National Battlefield on August 30, 1890, 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)).

Purpose — The following park purpose statement was developed during the Core Operations Analysis process at Antietam National Battlefield in May 2006 and has as its basis various legislative directives and general management planning:

To preserve, protect and improve the Antietam National Battlefield 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; to inspire and educate

future generations through the sacrifice made by soldiers and citizens upon these hallowed grounds; and 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.

Significance — 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. The following significance statements were provided by Antietam National Battlefield staff before the internal scoping meeting:

- 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 that President Abraham Lincoln issued 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.

Monocacy National Battlefield

Establishment — Monocacy National Battlefield was established in 1934 and opened to the public in 1991:

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 Section 430j).

Purpose — The following purpose statement was developed by the battlefield during a recent core operations evaluation.

The purpose of Monocacy National Battlefield is to:

- Preserve and protect the landscape, historic structures, archeological sites and monuments that contribute to the national significance of the Battle of Monocacy;
- Commemorate the Battle of Monocacy; and
- 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.

Significance — The Draft General Management Plan for Monocacy National Battlefield (NPS 2006b) states that it is nationally significant because:

- 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.

ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS PLANNING DOCUMENTS

The purpose, need, and objectives need to be, to a significant degree, consistent with park planning documents. These documents include the 1992 Antietam National Battlefield General Management Plan/Final Environmental Impact Statement, the 2006 Monocacy National Battlefield Draft General Management Plan/Environmental Impact Statement, and various cultural and natural resource management documents.

Antietam National Battlefield General Management Plan/Final Environmental Impact Statement (1992)

The NPS approved the General Management Plan/Final Environmental Impact Statement (GMP/EIS) 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/EIS 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/EIS 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 will be developed within the overall framework of the battlefield's GMP/EIS.

Antietam National Battlefield Resources Management Plan (1995)

The Resources 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 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 park:

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 the plan will be considered when developing alternatives.

Antietam National Battlefield Land Protection Plan (1983)

The guiding principle of the Antietam National Battlefield Land Protection Plan 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/Environmental Impact Statement (2006)

The NPS is currently revising the 1979 GMP and preparing a Draft General Management Plan/Environmental Impact Statement (GMP/EIS) for Monocacy National Battlefield. The purpose of this management plan, which is in its final draft stages of completion, 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 provides specific management objectives for the landscape and resources at the park:

- 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 park.

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 park's prioritization of park resources and issues. The plan addresses the damage by white-tail deer to row crops that are planted to maintain the cultural landscape of the park. 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 contains four component landscapes (the Hermitage, Araby, Clifton, and Baker Farm component landscapes) defined by individual histories, characteristics, and significance. 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 park, 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 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 reiterate the battlefield's goal of preserving and protecting the natural resources in the area and allowing public use of these resources (NPS 1983b).

LEGISLATION, REGULATIONS, AND POLICIES

The following laws, policies, and plans by the NPS, the state of Maryland government, or agencies with neighboring land or relevant management authority are described in this section to show the constraints this plan/EIS 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 AND MANAGEMENT POLICIES

By enacting the NPS *Organic Act of 1916 (Organic Act)*, 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 National Park Service latitude when making resource decisions. Because conservation remains predominant, the National Park Service seeks to avoid or to minimize adverse impacts on park resources and values. However, the NPS *Organic Act* does give 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 *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 environmental impact statement will analyze the context, duration, and intensity of impacts related to CWD detection and response activities within Antietam and Monocacy National Battlefield, as well as the potential for resource impairment, as required by Director’s Order 12 (NPS 2001).

OTHER NATIONAL 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 Sec 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 of 1969, as Amended

NEPA section 102(2)(c) requires that an environmental impact statement be prepared for proposed major federal actions that may significantly affect the quality of the human environment.

Endangered Species Act of 1973, as Amended

The *Endangered Species Act* requires all federal agencies to consult with the Secretary of the Interior Commerce on all projects and proposals having potential impact on federally endangered or threatened plants and animals.

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 is considered in developing potential actions.

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 the parks’ cultural resources must comply with this legislation.

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.

Title 36, Code of Federal Regulations

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 Code of Federal Regulations (CFR) 1.1(a)). The applicable sections of 36 CFR are summarized in table 1.

TABLE 1. SECTIONS OF 36 CODE OF FEDERAL REGULATIONS APPLICABLE TO THIS PROJECT

Applicable 36 CFR Sections	Summary
36 CFR 1.1 (a, b)	These provisions state 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.
36 CFR 2.1 (a)(1)(i)	This provision states that destroying or harming any living or dead wildlife (parts or products thereof) is prohibited.
36 CFR 2.2 (a)(1-3)	These provisions state that the taking, feeding, touching, teasing, frightening, intentionally disturbing or possessing wildlife or nesting habitats, except by authorized hunting, is prohibited.
36 CFR 2.2 (b)(2); (d)	These provisions state that hunting is allowed within park areas where the activity is mandated in specific areas by Federal statutory law, if the superintendent determines that such activity is consistent with public safety and enjoyment and sound resource management principals. Hunting shall be allowed only pursuant to a special regulation. The superintendent may establish procedures by which to transport lawfully taken wildlife throughout the park.

Title 43, Code of Federal Regulations

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.”

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.

NPS-77: Natural Resources Management Guideline (1991)

The Natural Resources Management Guideline provides guidance to park managers for all planned and ongoing natural resource management activities. Managers must follow all federal laws, regulations, and policies. This document provides the guidance for park management to design, implement, and evaluate a comprehensive natural resource management program.

Director’s Order 28: Cultural Resource Management (1998)

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 principals contained in the *NPS Management Policies 2006*.

Animal Welfare Act, as Amended (7 USC, 2131-2159)

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.

A National Park Service Manager’s Reference Notebook to Understanding Chronic Wasting Disease, Version 3 (October 2006)

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 2006c). 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, sampling collection, handling, and storage, NPS CWD policy and recommendations, as well as several appendices.

Director’s CWD Guidance Memorandum (2002)

This memo 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 US 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 (2006)

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 of 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 (Directors Order 12, 3.3M). However, if CWD is found within 5 radial miles of a park, the park should coordinate with state natural resource organizations 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 2006d).

Antietam National Battlefield Standard Operating Procedure: Surveillance for Chronic Wasting Disease (CWD)

This standard operating procedure provides park level direction for implementing the guidance provided in the 2002 Director's CWD Guidance Memorandum and the National Capital Region Deputy Regional Director's February 10, 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.

National Chronic Wasting Disease Plan (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).

STATE AND LOCAL LAWS, REGULATIONS, AND POLICIES

Maryland Guide to Hunting and Trapping and Deer Regulations

The Maryland Department of Natural Resources 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 U.S.C. § 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 Cavern National Park is allowed pursuant to 16 U.S.C. § 3, if it is for the purpose of protecting park resources from animals that have a negative impact on its lands. The NPS’s 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 Chronic Wasting Disease Response Plan (2005)

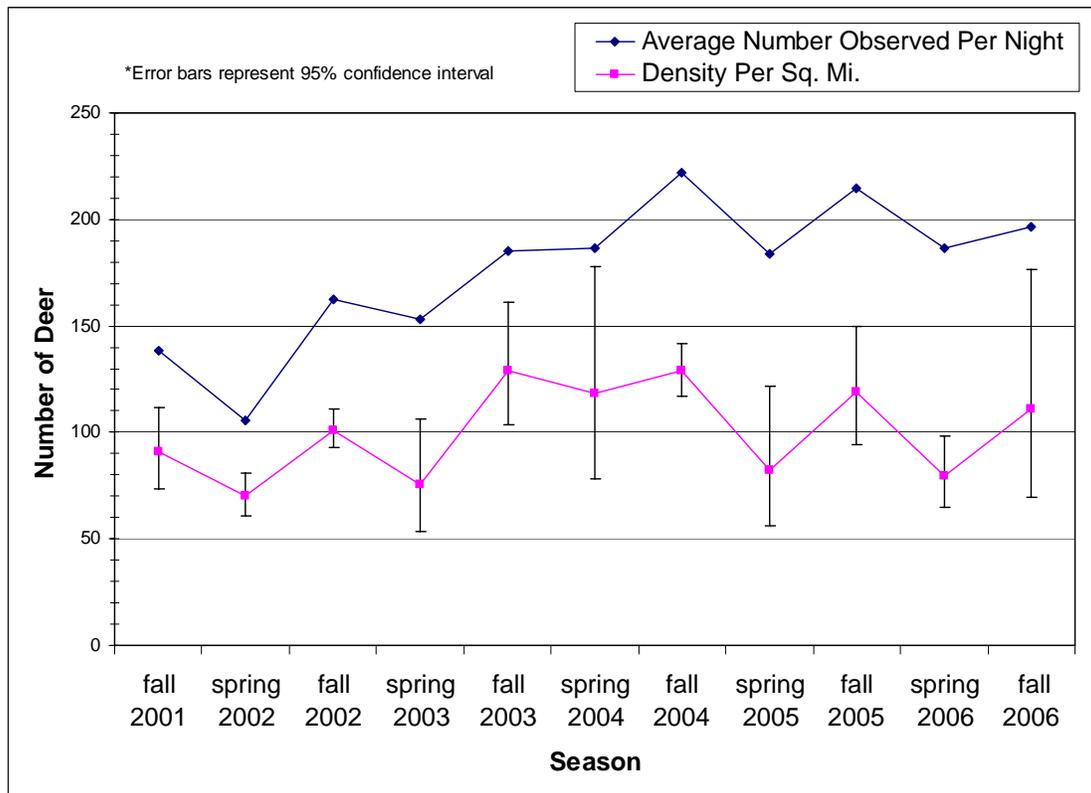
This response plan issued by the Maryland Department of Natural Resources Wildlife and Heritage Service (WHS) outlines WHS management activities that address the disease’s presence, determine the magnitude and geographic extent of the infection, and attempt to eliminate or control transmission of the disease. The plan outlines a surveillance strategy for monitoring efforts should CWD be reported within 50 miles of Maryland’s borders. Additionally, the plan lists response activities for both free-ranging and captive deer (MDNR 2005). Please see the discussion of jurisdictional issues under the hunting and trapping regulations above, as they would apply to the CWD Response Plan as well.

DEER POPULATIONS AND MONITORING AT ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS

Presentations at the internal scoping meeting characterized the deer populations of Antietam and Monocacy National Battlefields and associated monitoring programs in each park unit. It is important to understand the deer populations at the battlefields to help assess the potential impacts of CWD detection and response activities, including the potential dynamics of the disease in the herd (e.g., the potential for future transmission, environmental contamination).

Deer density surveys at Antietam National Battlefield have been conducted every April and November since 2001. Based on these surveys, the average fall density in the battlefield from 2001 to 2006 was 113 deer per square mile, and the average spring density from 2001 to 2006 was 85 deer per square mile (see Figure 1, which shows density by season and the margin of error). Between August 2004 and January 2005, Antietam National Battlefield captured and tagged 117 deer (seven of which died initially) for movement studies. The results showed that nineteen 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 thirty-five fawn, yearling, and adult males were captured during this study, and fifteen of those were seen/harvested off National Park Service property) (NPS 2006f).

FIGURE 1. DEER DENSITY AT ANTIETAM NATIONAL BATTLEFIELD



The following conclusions are based on a herd health study of five deer completed by the Southeastern Cooperative Wildlife Disease Study from the University of Georgia in 2002 at Antietam National Battlefield:

- Overall population health status indicates that substantial disease-related mortality is not occurring.
- Selected infectious diseases are not prevalent within the herd, although the population is susceptible to hemorrhagic disease.
- There is no evidence of physiologic degradation (e.g., low weights, overall physical condition, etc.)
- The herd is near the point where density dependent processes of nutritional stress and parasitism could be expected to begin degrading herd health.

The battlefield also conducts forest regeneration monitoring using exclosures, and has initiated an agricultural inventory consisting of crop field mapping and crop yields report, as well as the use of enclosures for monitoring. Antietam National Battlefield has a road kill and fatality monitoring database that is maintained on an ongoing basis. Antietam National Battlefield staff has also begun targeted surveillance for CWD.

Monocacy National Battlefield has also conducted deer density studies, as well as necropsy studies of five deer in 2002 for evaluating herd health. Based on these studies, the average fall deer density from 2001 to 2005 was 151 deer per square mile (59 deer per square kilometer); the average spring density from 2001 to 2003 was 133 deer per square mile (52 deer per square kilometer)..

The following conclusions are based on a herd health study of five deer completed by the Southeastern Cooperative Wildlife Disease Study from the University of Georgia in 2002 at Monocacy National Battlefield:

- The herd is near nutritional carrying capacity.
- The levels of important pathogenic parasites are not sufficient to be of immediate concern.
- Most selected infectious diseases are not prevalent within the population, although the population appears to have experienced substantial PI3 virus activity and has little or no herd immunity to hemorrhagic disease.
- Pathologic evaluations disclosed tissue damage in several organ systems including unusually severe pleuritis (inflammation of the lungs) in two deer. The cause of the damage is unknown.
- Overall population health status does not indicate significant disease-related mortality is occurring, although the possibility of a population level health problem with pleuritis cannot be excluded.

Monocacy National Battlefield staff has monitored for hemorrhagic disease since 2002, and have attributed several deer mortalities to it (approximately 30 to 35). In addition, some universities do research, including pellet counts and drives. Battlefield staff have also begun targeted surveillance for CWD.

CHRONIC WASTING DISEASE SUMMARY AND RESEARCH OVERVIEW

CHRONIC WASTING DISEASE BACKGROUND

Chronic wasting disease is in a family of diseases known as transmissible spongiform encephalopathy (TSE) and is an infectious, self propagating, neurological disease. Free-ranging mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), 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 can be in the same family as other TSEs such as bovine spongiform encephalopathy (BSE), also known as “mad cow” (NPS 2006c).

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. It is possible that CWD resulted from spontaneous changes in the folding of a normal prion to the infectious prion with subsequent transmission to susceptible cervids (Williams et al. 2002). The sporadic form of Creutzfeldt-Jakob Disease (CJD) is thought to arise in this manner. However, unlike CWD, sporadic CJD does not appear infectious. Additionally, 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 U.S., 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 is 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).

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).

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 body condition, despite having an appetite. These signs may start out very subtle and then over several weeks to several months become more pronounced and increase. 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 2006c).

CHRONIC WASTING DISEASE DIAGNOSIS, TRANSMISSION, AND RISK FACTORS

A conclusive diagnosis of CWD can only occur through laboratory testing. The two most common tests use histopathology techniques and immunohistochemistry. Histopathology techniques use a specific portion of the brain to observe changes and degeneration of certain areas. Although this test is effective at diagnosing advanced cases, it is not sensitive enough to detect animals in the early stages of CWD as prions can begin to accumulate before the changes can be seen. The second technique, immunohistochemistry, is considered the gold standard in CWD diagnosis and can be used to detect the disease early on. In this process, tissue samples are put onto slides and then treated with heat and chemicals to block normal prion proteins. Unlike histopathology, this process can use tissues from a variety of places, not just the brain; the lymph nodes and tonsils are preferred tissues. A series of stains applied to the slide will turn any prions responsible for the disease deep red, resulting in a diagnosis of CWD for the animal being tested. Neither of these two methods are 100% accurate, meaning that a negative test result does not guarantee a CWD-free animal. In addition to these methods, a number of rapid tests exist that provide results in a shorter time frame (NPS 2006c).

Although originally detected in the western U.S., CWD is now found in free-ranging populations in 11 states. The natural path of transmission of CWD in deer and other affected animals is unknown, 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 (NPS 2006c). 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 that 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). In addition, this research has shown that prevalence may be related to deer density, based on correlations with the abundance of deer habitat. For the purposes of this study, the researchers used deer habitat, defined as follows, as a surrogate for deer density: 1) forests, shrublands, and wetlands greater than 10 acres (approximately 4 hectares) in size; 2) forests, shrublands, and wetlands greater than 2.5 acres (approximately 1 hectare) within approximately 0.1 miles (200 meters) of larger tracts of the same; and 3) agriculture and grassland within approximately 330 feet (100 meters) of forest, shrubland, or wetlands. This surrogate for density was used because it was not possible to obtain density information needed for the area, and because deer habitat had previously been shown to be a good predictor of deer density in this study area (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 individuals a diseased animal can infect and a reduction in population density.

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 study, conducted in Wisconsin, found that CWD prevalence was 3 to 4% in yearling males and females, but that this increased to 13% and 7% for 3-year old males and females, respectively (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 use rubs and scrapes of infected males; or the fact that males have larger home ranges and broader movements during the breeding season, which increase the chances of infectious contacts (Great 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 susceptible to CWD. Risk factors fall into two categories: exposure related and amplification related. The first category addresses the likelihood that CWD will be introduced to a given population and includes identifying the following:

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

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;
- Areas with high deer or elk population density;
- Areas with low abundance of large predators; and
- Areas where free-ranging deer or elk are artificially concentrated (baiting, feeding, water development, and other human related habitat modifications).

CHRONIC WASTING DISEASE IN NATIONAL PARKS

As of January 2007, CWD has been found in 10 states and two Canadian provinces in captive and farmed populations. In free-ranging populations, CWD has been found in 11 states and two provinces. However, 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 in Slanesville, West Virginia, within 60-miles of several national park units, including Antietam and Monocacy National Battlefields.

CHRONIC WASTING DISEASE RESPONSE AND SURVEILLANCE PLANS

As stated above, 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 a February 2006 memorandum the National Capital Region of the NPS directed parks in the region 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. To further assist NPS managers in responding to CWD, the NPS developed the “A National Park Service Manager’s Reference Notebook to Understanding Chronic Wasting Disease;” the third edition was released in October 2006 (CWD Handbook). 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. The handbook also presents a 10-step step process to surveillance, which is discussed below.

TEN-STEP PROCESS FOR CHRONIC WASTING DISEASE SURVEILLANCE

The 2006 CWD Handbook describes this process in a series of questions as follows:

1. Determine whether surveillance is needed
 - a) How close is the nearest case of CWD?
 - b) What is the level of CWD risk?
 - c) What will the implications of detecting/not detecting CWD be?
 - d) What is the benefit of beginning surveillance?
 - e) What is the cost of beginning surveillance?
2. Identify potential partners and affected agencies
 - a) State wildlife agency
 - b) State veterinarian
 - c) State agricultural agency
 - d) U.S. Department of Agriculture
 - e) U.S. Department of the Interior
3. Develop management goals
 - a) Prevention
 - b) Detection
 - c) Elimination
 - d) Meeting translocation standards
 - e) Combination of more than one
4. Determine how internal and external communication will be handled
 - a) Contact Biological Resources Management Division and affected agencies
 - b) Identify someone to be point of contact

- c) Participate in monthly NPS CWD calls
 - d) Stress open communication with all parties but the park needs to have first access to results and their interpretation
5. Develop surveillance goals
 - a) Depends on detection level goals
 6. Design surveillance program, sample size and sample distribution
 - a) Involve a biometrician (e.g., National Wildlife Health Center, U.S. Geological Survey)
 7. Decide how carcass and tissue disposal will be conducted
 - a) Depends on which state the NPS unit resides in
 - b) Work with BRMD and/or local laboratory for best plan
 - c) Be aware of local EPA and federal Food and Drug Administration regulations
 8. Determine which diagnostic tests will be used
 - a) Histopathology – good for late stage diagnosis poor for early diagnosis
 - b) Immunohistochemistry
 - c) Bio-Rad
 - d) Other Enzyme-Linked ImmunoSorbent Assays
 9. Determine logistics and procedures for sample collection, handling, preservation, and shipping
 - a) Training for parks on detection, sample collection, submission, interpretation, etc. – BRMD
 - b) Determine how excess biological samples will be stored and used in the future.
 10. Decide how data will be managed
 - a) How will it be disseminated to other agencies and the public?
 - b) Is it part of a research project?
 - c) Is it to be published?
 - d) Is there a database? (National Biological Information Infrastructure?)
 - e) Be prepared for the volume of data that may be produced.

GENERAL NATIONAL PARK SERVICE CHRONIC WASTING DISEASE MANAGEMENT OPTIONS

Based on this process, the NPS has identified numerous management options can be implemented, considering the site-specific CWD goals and objectives of a park unit. Possible actions that could be taken at NPS units include the following, some of which may not apply for Antietam and Monocacy National Battlefields (NPS 2006c):

- **No Action:** This conservative approach is most appropriate where the threat of CWD is remote or the park does not have available resources to dedicate to CWD detection. Under this management strategy, there would be no disease surveillance or detection and could result in failing to detect the disease and the inability to work with neighboring land management agencies in assessing, understanding, or controlling the disease.
- **Opportunistic Surveillance:** Under this management action, park units would take samples for CWD testing from animals found dead or harvested within the unit. Cause of death may be hunting, culling, predators, disease, trauma (hit by car), or undetermined. Opportunistic surveillance has little, if any, negative impact on current populations. However, unless deer are harvested or culled, relatively small sample sizes may be available for opportunistic testing.

Opportunistic surveillance is an excellent way to begin surveying for the presence of CWD without changing management of the host resource, and is covered by a categorical exclusion (Director's Order 12, 3.4 E(3)). This is a good first step option for NPS units where CWD is a moderate risk but where it has not yet been encountered.

- Targeted surveillance: Under this management action, NPS units would perform lethal removal of deer that exhibit clinical signs consistent with CWD. Lethal removal of sick individuals from a population can be covered by a categorical exclusion (Director's Order 12, 3.4 E(3)). Targeted surveillance has negligible negative effects on the current population, removes a potential source of CWD infection, and is an efficient means of detecting new foci of infection (Miller et al. 2000). One limitation to targeted surveillance is that clinically affected animals presumably shed infectious prions before they are visibly ill. Thus, environmental contamination and direct transmission may occur before the animal is removed. Additionally, there is no available method to extrapolate CWD prevalence data collected from targeted surveillance animals in order to estimate population prevalence. Targeted surveillance is moderately labor intensive and requires educating park staff in recognition of clinical signs, training for identification and removal of appropriate samples for testing, as well as vigilance for continued observation and identification of potential CWD suspect animals. Targeted surveillance is recommended in any area and is highly advised in areas with moderate to high CWD risk or in NPS units where CWD has already been identified.
- Test and cull: A live test is available for diagnosis of CWD in white-tailed deer using a biopsy of the tissues in the tonsils. This method of selective removal allows for relatively early disease detection and may reduce transmission of CWD by minimizing infectious contacts and minimizing shedding of the prion into the environment. The technique requires capture and general anesthesia of the animal for marking/collaring, specialized training in biopsy techniques, and the ability to test large proportions of the population. These logistics make it an expensive and intensive method of managing CWD. This technique is not suitable for confirming that an individual is CWD-free. It is a good option for testing relatively small, accessible populations of deer, especially where the risk of CWD is moderate to high.
- "Hot-spot" culling: Hot-spot culling is a technique where animals potentially in contact with a confirmed CWD-positive animal are lethally removed. It has been shown that, in infected areas, there are localized regions of higher CWD prevalence within the greater metapopulation (Conner and Miller 2004). CWD is not distributed uniformly across the landscape (Miller et al. 2000, Miller and Conner 2005, Joly et al. 2006). It is hypothesized that removing animals that have been in contact with CWD positive animals will decrease local prevalence of CWD. A drawback to this method is that it inevitably removes healthy animals in addition to those that are diseased.
- Population reduction: Population reduction involves culling animals randomly within a population in an attempt to reduce animal density, and thus decrease transmission rates. In captive situations, where animal density is high, the prevalence of CWD can be substantially elevated compared to that seen in free-ranging situations. Thus, it is hypothesized that increased animal density and increased animal-to-animal contact, as well as increased environmental contamination, enhances the spread of CWD. Therefore, decreasing animal densities may decrease the transmission and incidence of the disease. However, migration patterns and social behaviors may make this an ineffective strategy if instead of spreading out across the landscape at lower densities, deer and elk stay in high density herds in tight home ranges throughout much of the year (Williams et al. 2002). Population reduction is an aggressive and invasive approach to mitigating the threat of CWD. It has immediate and potentially long-term effects on local and

regional populations of cervids and the associated ecosystem. This may be an appropriate response if animals are above population objectives or the need to know CWD prevalence with a high degree of accuracy is vital.

- Wolf predation as a stewardship tool: Recent theoretical studies have suggested that alterations to predator abundance can strongly influence disease prevalence for diseases similar to CWD. Modeling indicates that predators reduce the force of infection on wildlife hosts. With fewer predators, longevity of an infection is expected to increase and more secondary infections are expected to be produced per primary infection. Although increase in mortality rates from any type of predation could theoretically reduce transmission rates, the selective removal of vulnerable CWD-positive cervids by a coursing predator such as wolves would have the most significant impact. Wolves could influence CWD prevalence through several mechanisms, including increasing mortality rates (particularly selective removal of CWD-positive deer), redistributing deer from areas of high concentration, and removing infected carcasses from the environment. No field test of this hypothesis is currently in place because the range of CWD and wolves do not overlap.
- Depopulation: Depopulation of deer from an area is the most aggressive approach to CWD management. In addition to potentially significant environmental impacts and human dimensions issues, the feasibility of removal of all infected animals may be limited. Additionally, prions persist in the environment and may serve as a source of contamination following removal of animals (Miller et al. 2004). It is unknown how long CWD remains infective in the environment. Depopulation is likely only feasible if it can be applied on a limited geographic area delimited by barriers to deer and elk movement (e.g., lakes, geographic features). Depopulation may also be a consideration if deer are an exotic species in NPS units, which is not the case at Antietam or Monocacy National Battlefields.

STATE CHRONIC WASTING DISEASE RESPONSE AND SURVEILLANCE PLANS

In the area of Antietam and Monocacy National Battlefields the states of Maryland, Virginia, and West Virginia have developed response plans to address CWD in white-tailed deer populations. These three jurisdictions have been testing for CWD and implementing surveillance programs in recent years. In Virginia and Maryland, approximately 2,050 and 2,200 white-tailed deer, respectively, have been tested for CWD since 2002. In both of these states, there have been no confirmed positive CWD cases, as of November 1, 2006. In West Virginia, a total of 9 cases have been identified out of 1,317 samples, the first in 2005. The following details the response and surveillance plans of these states. The NPS would attempt to coordinate any CWD activities at Antietam and Monocacy National Battlefields with the states.

Maryland

In 2005, the Maryland Department of Natural Resources developed a Chronic Wasting Disease Response Plan. This plan outlines management activities intended to address the presence of CWD, help determine the magnitude and geographic extent of the infection, and attempt to eliminate or control transmission of CWD. Included in this plan are general responses to CWD such as media and public relations, response to positive CWD cases in free-ranging and captive deer in Maryland, and response to discovery of CWD within 50 miles of the Maryland border.

The Maryland plan details a systematic approach to determining the extent of CWD. If a CWD case is found, a study area would be established using a 5-mile radius around the positive case. Within 21 days, the state would begin sampling in the study area and will attempt to collect up to 300 samples over a 2- to 3-month timeframe. If additional cases are found within this study area, the area would be extended around the new case by 5 miles and sampling would continue. At the point where no additional CWD cases are found in the study area, a CWD infection zone would be established and include all the smaller study areas where CWD was detected. In this infection zone, CWD testing of all free-range hunter-killed deer would occur during the first hunting season. Within the infection zone, targeted surveillance efforts would also be intensified, and if no CWD cases are detected, the state would perform annual voluntary random CWD testing of hunter-harvested deer for the next four years, heightened emphasis on targeted surveillance in all counties adjacent to the infection zone, and opportunistic testing of non-hunter harvested deer as they are available.

If after 5 consecutive years there are no new detections of CWD in an infection zone, the area will be considered CWD free. If within the 5 years CWD is found within the infection zone, the zone will be extended by a 5-mile radius around each additional case found. Additionally, the state will implement population reduction using extended hunting seasons and bag limits, mandatory testing of hunter-killed deer, and the state will conduct epidemiological studies to determine the origin of the first CWD case. If after five years the area has more cases and cannot be considered CWD-free, the state would most likely shift to control instead of eradication of the disease.

The state also has a response plan for CWD in captive populations. This 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 described previously around the captive facility.

The state of Maryland is also looking beyond its borders and has developed a response plan for the discovery of CWD within 50 miles of the state border. This plan includes enhanced surveillance along the border near areas known to have CWD infection with a plan to collect 60 samples in an approximately 50- to 100-square mile area from deer damage permits, road kills, and hunter-harvested deer when available (MDNR 2005).

Virginia

The CWD response plan in the state of Virginia is implemented by the Department of Game and Inland Fisheries. This plan outlines management activities to determine the magnitude and geographic extent of CWD infection and to control transmission of the disease. For free-ranging populations, such as those found in NPS units, a surveillance area of a 5-mile radius is established around a CWD case, as is done in the state of Maryland. Within 60 days, the state of Virginia would collect 60 samples in this area and during the first hunting season would implement mandatory testing of all hunter-harvested free-ranging deer greater than 6 months of age. During this time, adjacent counties would intensify targeted surveillance of their deer populations for CWD. If these tests yield no new CWD cases, the state would conduct annual voluntary random CWD testing for hunter-killed deer greater than 6 months of age for the next 4 years, place a heightened emphasis on targeted surveillance within and adjacent to the surveillance area, and test non-hunter harvested deer as they become available. Similar to Maryland, areas would be considered CWD free after 5 consecutive years of no new detections.

If new cases are detected within 5 years, the Virginia response plan calls for establishment of a CWD Population Reduction Area (PRA), that would encompass a 5-mile radius around all positive CWD cases within or near the surveillance area. The primary control effort would be population reduction, which would be achieved through extending the hunting season or increasing/removing bag limits. In this area, there would be mandatory testing of hunter-killed deer. PRAs would be considered CWD free after 5 consecutive years of no new detections.

The state also has a response plan for CWD in captive populations. This 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 described previously around the captive facility.

The Virginia plan also includes response actions for discovery of CWD within 50 miles of the state border. This plan includes identifying all Virginia counties that are partially or wholly included in the 50-mile radius of the index case as high-risk areas and surveillance would be initiated per the Department of Game and Inland Fisheries surveillance plan. If necessary, the Department of Game and Inland Fisheries would implement emergency regulations including prohibition of carcass importation, deer feeding, and the designation of mandatory CWD testing surveillance areas (VDGIF 2005).

The state of Virginia's surveillance plan is designed to detect CWD in separate designated geographic surveillance areas that have been stratified based on the level of risk, as assigned by the state, and the presence of CWD in West Virginia. It defines high-, medium-, and low-risk areas, and identifies specific surveillance strategies that would be used in these areas, including:

- **Random Active Surveillance:** CWD testing of clinically normal road and hunter-killed 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).

West Virginia

In September 2005, CWD was detected in a road-killed deer in Hampshire County, West Virginia. After this incident, the West Virginia Department of Natural Resources implemented an incident response plan. This plan included increasing CWD surveillance in a 5-mile radius around the positive CWD finding, the remainder of Hampshire County, adjacent counties, and statewide. In these areas, samples were taken from road-killed deer, special deer collected by Wildlife Resources Section personnel, sick deer as reported by the public, deer killed under crop damage permits, and hunter-harvested deer. This plan set out communication and coordination procedures, disease management actions, and immediate logistical needs.

Implementation of this plan has resulted in identification of eight additional CWD cases. Study of these cases indicates that they are localized and occur at a prevalence of less than 1% (9 confirmed positive

cases in approximately 1,317 tests). Additional surveillance data would be collected to further confirm this finding. Future response and surveillance plans in West Virginia include increasing collection of samples within a 5-mile radius of confirmed cases and in the rest of the state. The West Virginia plan also includes coordination with counties in Maryland and Virginia adjacent to Hampshire County, and collaboration of efforts, where appropriate.

ISSUES AND IMPACT TOPICS

Issues associated with implementing CWD detection and initial response activities at Antietam and Monocacy National Battlefields were identified by park staff during the internal scoping meeting using the NPS Environmental Screening Form. The issues identified are discussed below.

Soils

The primary issue with soils includes the potential for CWD-infected white-tailed deer to cause environmental contamination that could contribute to transmission of the disease. For example, 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). However, 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).

Air Quality

Potential sources of air quality emissions from the implementation of CWD detection and initial response activities include the use of a few vehicles to carry out the prescribed actions, as well as the potential for the use of incinerators to dispose of carcasses from CWD testing. The emissions from vehicle use would be negligible; however, the effects of incineration will be reviewed further during the preparation of the EA to determine if air quality should be considered further as an impact topic.

Water Quality/Quantity

While water quantity would not be affected by any of the CWD detection or initial response activities, more data are needed on the potential for CWD prions to enter and be transported by surface waters to determine if there could be impacts to water quality.

Vegetation

Options for CWD detection and initial response that would involve removing presumably healthy deer, or those alternatives that could result in allowing the disease to “run its course” in the deer populations of the battlefields (including the no action), could reduce the number of deer that browse in the park units. 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.

Deer

Options for CWD detection and initial response that would involve removing presumably healthy animals, or those alternatives that could result in allowing the disease to “run its course” in the deer populations of the battlefields (including the no action), would affect the white-tailed deer populations at Antietam and Monocacy. 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 it 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 (NPS 2006c).

Wildlife and Wildlife Habitat

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 or allowing the disease to “run its course”), which could indirectly 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).

Sensitive and Rare Species

While it is possible that CWD detection and response activities could affect some state-listed plant species of special concern (from trampling), it is not likely that any other sensitive, rare, or unique wildlife or fish species of special concern, or their habitat, would be affected. Consultations with the U.S. Fish and Wildlife Service and Maryland Department of Natural Resources will be conducted to identify federal and state listed species that occur at the battlefields. These lists will be reviewed during preparation of the EA in determining the potential for CWD detection and initial response activities to have adverse impacts on species of special concern.

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. As white-tailed deer were a component of that landscape, options for CWD detection and initial response that would involve removing presumably healthy deer, or allowing the disease to “run its course,” could also affect the cultural landscape at the battlefields.

Socioeconomics

White-tailed deer hunting contributes to the local economy of the areas surrounding the battlefields 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 or allowing the disease to “run its course”) 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. Also, due to the uncertainties surrounding the disease, if CWD is discovered it could also influence property values and possibly influence hunting-related tourism. Lastly, 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, or those alternatives that could result in allowing the disease to “run its course” in the deer populations of the battlefields (including the no action), could reduce the amount of deer damage on agricultural lands.

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.

Visitor Experience and Involvement of Interested Parties

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) and boat put ins (Antietam 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. In addition, coordination with the state would be required to ensure the NPS is considering their efforts in conjunction with the Maryland Department of Natural Resources Chronic Wasting Disease Response Plan (MDNR 2005)

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 surveillance activities. 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.

Long-term Management of Resources or Land/Resource Productivity

Land/resource productivity would not be affected by CWD detection and initial response activities; however, the long-term management of deer populations at Antietam and Monocacy National Battlefields could be affected if the disease is found near or within the park units. For example, the NPS would need to incorporate long-term CWD management strategies into an overall deer management program at the park units.

ISSUES ELIMINATED FROM FURTHER CONSIDERATION

Based on the review of the Environmental Screening Form at internal scoping, it was determined that the following issues could be dismissed from detailed consideration in the 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 park that would be affected by CWD detection and initial response activities.

- **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.
- **Streamflow Characteristics:** CWD detection and initial response would not occur in any area or involve actions that would potentially impact streamflow.
- **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.
- **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 significant impacts on species listed or proposed to be listed under the Endangered Species Act, or their designated critical habitat.
- **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 parks 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 park.
- **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.

- Other important environmental resources: The group did not identify any other important environmental resources that would be affected.

The analysis in the EA will determine the potential for significant impacts to natural and cultural resources that are presently unknown, and will identify if there is a direct relationship to other actions with individually insignificant, but cumulatively significant, environmental effects. While the effects on the human environment, including natural and cultural resources, from CWD or the detection and initial response activities are somewhat uncertain, this plan/EA is not expected to violate any laws or requirements imposed for the protection of the environment. In addition, this plan/EA would not set a precedent or represent a decision in principle about future actions with potentially significant environmental effects, as the NPS addresses CWD issues in the western U.S. and is developing deer management plans with a section dedicated to CWD concerns in the eastern U.S. In addition, the state of Maryland, as well as the states of Virginia and West Virginia, has CWD response plans in place.

PRELIMINARY ALTERNATIVES

Alternatives must meet objectives to a large degree, while meeting the purpose of and need for action. See Director's Order 12, 2.7; 4.5 (EIS); 5.3 (EA)

The discussion of potential alternatives during the internal scoping meeting focused on the components or potential actions that might be considered for CWD detection and initial response activities. Numerous alternative components were reviewed by the group, including options identified in "A National Park Service Manager's Reference Notebook to Understanding Chronic Wasting Disease" (NPS 2006c); this brainstorming session did not proceed into a discussion of how well the potential actions would resolve the purpose and need and meet objectives. Some ideas were considered, but may not be carried forward into the planning process. These are noted as "alternatives considered, but not carried forward." The preliminary alternatives considered separately for CWD detection and initial response, as well as those not carried forward, will be reviewed through additional public and agency scoping. After additional scoping is completed, a range of reasonable alternatives that combines options for both CWD detection and initial response will be identified for detailed analyses in the planning process.

PRELIMINARY ALTERNATIVES

EXISTING MANAGEMENT CONTINUED (NO-ACTION ALTERNATIVE)

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.

At present, because CWD was detected near Slanesville, West Virginia, less than 60 miles from both battlefields, staff are currently conducting targeted surveillance in accordance with the 2002 NPS Director's CWD Guidance Memorandum. Targeted surveillance, as defined by the NPS, would include lethal removal of deer that exhibit clinical signs consistent with CWD for testing (NPS 2006c). 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). To date, no deer exhibiting clinical signs of CWD have been observed in or near either Antietam or Monocacy National Battlefield. Targeted surveillance entails lethal removal of deer or elk which exhibit clinical signs consistent with CWD. Lethal removal of sick individuals from a population can be covered by a categorical exclusion with documentation (NPS DO-12 3.4 E(3)).

To conduct targeted surveillance, battlefield park staff have been educated about the clinical signs of CWD, and have been asked to assist natural resource staff by reporting any suspect deer. Antietam National Battlefield has also educated and solicited the assistance of neighboring landowners in looking for deer showing clinical signs of CWD. In addition, Antietam National Battlefield has developed a standard operating procedure related to CWD that is tiered off the 2002 Director's CWD Guidance Memorandum and the 2006 memorandum from the National Capital Regional Assistant Regional Director (NPS 2006d). Monocacy National Battlefield is in the process of developing such a standard operating procedure.

According to this standard operating procedure, battlefield staff would contact the Chief Ranger or Natural Resources Manager at Antietam to report clinically suspect deer (NPS 2006c). Then, 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. Only law enforcement rangers at Antietam National Battlefield 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 3” (NPS 2006c).

Opportunistic surveillance, as defined by the NPS, would include taking diagnostic samples for CWD testing from deer found dead – such as road kill – or deer lethally removed from the battlefields for other purposes (e.g., research). Per the standard operating procedure in place at Antietam National Battlefield, 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. Such sampling can be covered under NEPA using a categorical exclusion with documentation (Directors Order 12, 3.3M).

This alternative would serve as the baseline for analyzing and comparing the effects of the other alternatives.

ACTIONS COMMON TO ALL ACTION ALTERNATIVES

The following actions would be common to all alternatives:

Estimating Risk of CWD at Antietam and Monocacy National Battlefields: CWD risk factors would be analyzed to determine the appropriate CWD detection and response activities to be taken at the battlefields. Risk factors are attributes of the landscape, environment, or host animals associated with a greater probability of CWD occurring in a given region or cervid population (Samuel et al. 2003). Risk factors can generally be divided into two categories (see table 2). The first relates to the risk of being exposed to CWD, and the second addresses the risk of amplifying the disease once a population of animals has been exposed. The amplification factors are applicable to NPS units with CWD close to or within their borders as well as in proactive planning efforts, such as this one. By evaluating the risk of CWD exposure and amplification, managers can make better decisions regarding how to use their resources to identify the disease.

Opportunistic Surveillance: Opportunistic surveillance, described above, would be used as a detection method under all alternatives, as practicable. 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.

Targeted Surveillance: Targeted surveillance is an efficient means of detecting new infections (Miller et al. 2000), and would be used for detection and initial response in all alternatives, as practicable. As described above, this technique would involve Antietam and Monocacy National Battlefield staff looking for deer showing clinical signs of CWD. If observed, these deer would be reported and possibly lethally removed for testing.

TABLE 2. CWD RISK FACTORS FOR DISEASE EXPOSURE AND AMPLIFICATION

Exposure risk factors	Areas adjacent to CWD-positive wildlife
	Areas with CWD-positive farmed or captive cervids
	Areas with concentrations of farmed or captive herds
	Areas that have received translocated deer from CWD-affected regions
	Areas permitting transport of hunter-killed deer carcasses from CWD identified areas
	Areas adjacent to land on which TSE-positive animals, farmed or wild, have lived
Amplification risk factors	Areas with a history of CWD animals or CWD contaminated environments
	Areas with high deer population density
	Areas with low abundance of large predators
	Areas where free-ranging deer are artificially concentrated (baiting, feeding, water development, and other human related habitat modifications)

Source: Samuel et al. 2003

Action Threshold development: Thresholds would be developed for the implementation of certain CWD detection or initial response activities, and as part of the adaptive management program for this effort. These thresholds are likely to be linked to the results of the risk analysis to be conducted, and the distances that CWD-positive animals are from the battlefields, respectively.

In addition, thresholds for the duration of initial response activities would be established. During the internal scoping meeting, it was proposed that initial response activities be implemented for the duration of state surveillance activities conducted in light of positive CWD detections (5 years). This timeframe for initial response activities was considered reasonable by the group.

Research: NPS involvement in research related to CWD detection and response could extend to the application of new techniques at Antietam and Monocacy National Battlefields.

ALTERNATIVES FOR CWD DETECTION

In addition to targeted and opportunistic surveillance, which would be used under any alternative, these options provide a range of strategies for the NPS to consider for the detection of CWD at Antietam and Monocacy National Battlefields.

Live Test for CWD

A live test is available for diagnosis of CWD in white-tailed deer (Wild et al. 2002, Wolfe et al. 2002). CWD detection and initial response activities that involve capturing and immobilizing live animals for marking/collaring and performing tonsillar biopsies have been used in limited situations to test deer and

remove CWD-positive members of the population. The technique requires capture and general anesthesia of the animal, specialized training in biopsy techniques, and the ability to test large proportions of the population. It is a good option for testing relatively small, accessible populations of deer, and allows for relatively early disease detection (NPS 2006c).

Lethal Removal for CWD Testing

This option would involve lethally removing deer, including individuals that may be healthy, and testing for CWD. Three alternatives exist for lethal removal.

Localized Removal and Testing

It has been shown that, in infected areas, there are localized regions of higher CWD prevalence within a larger population (Conner and Miller 2004, Joly et al. 2006), and that CWD is not distributed uniformly across the landscape (Miller et al. 2000, Miller and Conner 2005, Joly et al. 2006). As a result, this technique would be used where deer potentially came in contact with a confirmed CWD-positive animal, either within or outside the battlefields, to identify other CWD cases.

Demographic Targeting and Testing

Higher CWD prevalence among males than females has been observed in white-tailed deer. In addition, differences have also been observed between age classes, where prevalence increases dramatically in older white-tailed deer, particularly in males (Gear et al. 2006). As a result, this technique would focus lethal removal and CWD testing efforts on those members of the deer populations that appear more likely to be CWD positive.

Distributed Removal and Testing

This technique would involve the random lethal removal of deer throughout Antietam and Monocacy National Battlefields for CWD testing.

ALTERNATIVES FOR INITIAL RESPONSE

In addition to targeted surveillance, which would be used under any alternative, these options provide a range of strategies for the NPS to consider should CWD be detected in or near the battlefields.

Live Test and Lethal Removal

The live test would allow battlefield managers to test deer, including presumably healthy animals, and only cull CWD-positive members of the population. This method of selective removal may reduce transmission of CWD by minimizing infectious contacts and minimizing shedding of the prion into the environment.

Lethal Removal

This option would involve lethally removing deer, including individuals that may be healthy. Any deer removed under this alternative would also be tested for CWD. Two alternatives exist for lethal removal as an initial response activity:

Localized Removal and Testing

It has been suggested that removing animals that have been in contact with CWD positive animals would decrease local prevalence of CWD. As discussed above, this technique would involve the lethal removal of deer in areas where they may have potentially come in contact with a confirmed CWD-positive animal, either within or outside the battlefields.

Population Reduction

In captive situations, where animal density is high, the prevalence of CWD can be substantially elevated compared to that seen in free-ranging situations. As a result, it has been suggested that increased animal density and increased animal-to-animal contact, as well as increased environmental contamination, enhances the spread of CWD and the potential for the disease to become established (NPS 2006c, Joly et al. 2006). Although some models have suggested that transmission of CWD is independent of density, a recent study has shown that the prevalence of CWD increases based on the abundance of deer habitat, which is a surrogate for deer density. Based on this relationship, it was hypothesized that CWD transmission may be related to deer density (Joly et al. 2006). Therefore, population reduction would involve the lethal removal of animals randomly in an attempt to reduce potential transmission of the disease (this alternative could also involve some demographic targeting as described previously). While direct evidence for a density-dependent transmission relationship is weak, this strategy could reduce the potential for the disease to spread and become established in the deer herds at the battlefields. In addition, in areas where CWD prevalence rates are high, population reduction could reduce the survival of CWD-positive animals, limiting their contacts with other deer and the potential for future environmental contamination (Joly et al. 2006).

However, it is possible that this would be an ineffective solution, as it is likely that deer from the areas surrounding Antietam and Monocacy National Battlefields would repopulate the park units in a short time. In addition, this technique could be ineffective if, instead of spreading out across the landscape at lower densities, deer stay in higher densities in tighter home ranges throughout much of the year (Williams et al. 2002). It could also have unacceptable impacts on cultural landscapes in the battlefields.

As a result, it was concluded at internal scoping that this alternative should be considered further in terms of number of deer that would need to be removed for it to be an effective initial response activity. It is possible that population reduction could be a component of an adaptive management program that would provide flexibility and give the NPS a way to work with the state of Maryland should their response to CWD ultimately include population reduction.

No Further Action Beyond Detection

This alternative for initial response would essentially allow CWD, if detected, to “run its course” in the populations of deer at the battlefields, although the NPS would continue opportunistic and targeted surveillance to monitor disease occurrence and distribution. Two mathematical models based on mule deer and general cervid demographics within the historic area of disease (northeastern Colorado and southeastern Wyoming) predict that CWD epidemics would limit cervid populations (Miller et al. 2000, Gross and Miller 2001), however, the assumptions and outcomes of the current models have been challenged (Schauber and Woolf 2003). Regardless of whether CWD has dramatic impacts on localized populations of cervids by causing large-scale declines or the disease eventually comes to an equilibrium state and stabilizes at an endemic level, the associated population reduction could reduce the potential for further transmission and spread of CWD by lowering deer densities.

ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

The following alternatives were considered during internal scoping, but were dismissed from further consideration because they did not meet the purpose and need for action, did not meet the objectives for taking action, or were not considered reasonable alternatives, as defined by Director's Order 12. These alternatives will not be analyzed in the EA.

Habitat modification

There was some discussion about modifying agricultural practices that attract deer to the battlefields, which could reduce deer densities and the potential for CWD transmission. It was suggested that crops could be changed from corn or that less grain could be left on the ground. However, it was noted that 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 is 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 Antietam and Monocacy National Battlefields, and would not be consistent with the cultural resource objective.

Elimination of White-tailed deer

Elimination of white-tailed deer is likely to have significant impacts, and implementation of this alternative would require analysis in an Environmental Impact Statement; therefore, it is outside of the scope of this Environmental Assessment. In addition, elimination of a native species 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). Finally, elimination of deer from the battlefields would not likely control the density and potential for transmission of CWD because deer would return quickly from surrounding areas.

Predator Management

The intent of reintroducing predators into Antietam and Monocacy National Battlefields would be to reduce the force of infection (rate at which susceptible deer are infected) of CWD in deer 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 or cougars. The proximity to humans is also inappropriate for reintroducing such predators. Other native animals, as well as domestic pets, could also become potential 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. Bear, another fawn predator known to occur in Maryland, have been reported within the vicinity of Antietam or Monocacy National Battlefields. However, their effects on the force of infection would be negligible.

Deer Dispersal-Hazing within the Battlefields

Based on past experience, the group agreed that hazing within the battlefields would be ineffective. It was noted that this generally just disperses problems associated with deer, and that intensive development limits the habitat available around Antietam and Monocacy National Battlefields.

Hunting

NPS regulations, 36 CFR 2.2, and 2006 NPS Management Policies 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 Service has determined that it is consistent with resource management principles (NPS 2006b). The enabling legislation of Antietam National Battlefield does not allow hunting while the enabling legislation for Monocacy National Battlefield states that hunting in the park unit is an activity punishable by fine.

CUMULATIVE IMPACT SCENARIO

The cumulative impact analysis process used by the NPS was described to the staff of Antietam and Monocacy National Battlefields at the internal scoping meeting. This four-step process was outlined as follows:

1. First begin with identifying affected resources.
2. Then, set appropriate cumulative analysis boundaries for each.
3. Third, identify past, present and reasonably foreseeable future actions within those boundaries that affect the same resource(s).
4. Then summarize the impact of these actions (y), explain how yours would contribute (x) and reveal the additive or “total” impact ($x + y$).

The Environmental Screening Form was used to identify those resources that would be affected by CWD detection and initial response activities at Antietam and Monocacy National Battlefields; these resources were grouped into the impact topics discussed earlier in this report (Step 1). Subsequently, the group identified both the spatial and temporal boundaries for each resource that would be carried through a cumulative impacts analysis (Step 2). And lastly, the group identified past, present, and reasonably foreseeable future actions (within the boundaries identified in Step 2) that could contribute to cumulative impacts on each resource. The results of this discussion are summarized below in Table 3. Ultimately, Step 4 will be completed during preparation of the EA for this project.

TABLE 3. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
Soils	Legislated Boundary of Antietam and Monocacy National Battlefields	Antietam: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years) Monocacy: 1934 (legislated creation of the battlefield) through the life of the plan (10 years)	Agriculture (inside and outside the parks) Clearcutting Construction – buildings, roads (including highway expansion), utilities, etc.	Same as past, with the exception of clearcutting Also: Active reforestation Utility Expansion	Same as current
Vegetation	Legislated Boundary of Antietam and Monocacy National Battlefields	Antietam: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years) Monocacy: 1934 (legislated creation of the battlefield) through the life of the plan (10 years)	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 parks Park operations (mowing, maintenance setbacks, etc.) Maintenance of right-of-ways Highway expansion Non-native species introduction Introduced pests (Gypsy moth, chestnut blight)	Same as past with the exception of highway expansion or clearcutting Also: Active reforestation Exotic plant management Cultural landscape management plans Orchard management	Same as past, plus: Exotic plant management Cultural landscape management plans Orchard management

TABLE 3. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
			Pest control (gypsy moth, wooly adelgid)		
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)	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 CWD Response Plan Captive Deer Facilities Maintenance of agricultural uses in the park Park operations (mowing, maintenance setbacks, etc.) Maintenance of right-of-ways Decline of potential predators Highway expansion White-tailed deer monitoring and research/other diseases	Same as past, with the exception of highway expansion Also: Change in predator composition Active reforestation	Same as past, 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

TABLE 3. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
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 Maintenance of agricultural uses in the park Park operations (mowing, maintenance setbacks, etc.) Maintenance of right-of-ways Decline of potential predators Highway expansion	Same as past, with the exception of highway expansion Also: Change in predator composition Active reforestation	Same as past, 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

TABLE 3. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
Cultural Resources (archeological sites and cultural landscapes)	Legislated Boundary of Antietam and Monocacy National Battlefields	Antietam: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years) Monocacy: 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.) Maintenance of right-of-ways 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	Same as past, with the exception of highway expansion and clearcutting Also: Active reforestation Exotic plant management Cultural landscape management plans – restoration of landscape to 1862 Orchards	Same as past, plus: Exotic plant management Cultural landscape management plans – restoration of landscape to 1862 Orchards

TABLE 3. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
Threatened and Endangered Species	This discussion was deferred until lists of federal and state listed species are obtained for the project and a more informed assessment can be made about whether or not CWD detection and initial response activities would have more than minor effects (and would therefore be considered in detail).				
Socio-economics (Neighboring land uses)	Battlefields plus 5 miles around boundaries	Antietam: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years) Monocacy: 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 past actions, plus: Widening Interstate 270 through the park Creation of national Civil War heritage area – Journey through Hollowed Ground
Health and Safety	Legislated Boundary of Antietam and Monocacy National Battlefields	Antietam: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years) Monocacy: 1934 (legislated creation of the battlefield) through the life of the plan (10 years)	Vehicle collision Disease Deer-related property damage 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

TABLE 3. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
<p>Visitor Experience and Stakeholder Involvement</p>	<p>Legislated Boundary of Antietam and Monocacy National Battlefields</p>	<p>Antietam: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years)</p> <p>Monocacy: 1934 (legislated creation of the battlefield) through the life of the plan (10 years)</p>	<p>Land acquisition</p> <p>Increased access/use of vehicles</p> <p>Development of visitor facilities</p> <p>Annual activities (e.g., living history demonstrations, artillery demonstrations)</p> <p>Increased visitation</p> <p>Interpretation/Education programs</p> <p>Recreational use of river</p> <p>Vandalism</p> <p>Antietam National Battlefield – Special interpretive events: Illumination, Salute to Independence, Memorial day and some Special Use Permits (from Core Ops Spreadsheet)</p> <p>White-tailed deer monitoring and research</p> <p>Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet)</p>	<p>Annual activities (e.g., living history demonstrations, artillery demonstrations)</p> <p>Increased visitation</p> <p>Cultural landscape management plans – restoration of landscape to 1862</p> <p>Interpretation/Education programs</p> <p>Recreational use of river</p> <p>Trail development</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>Antietam National Battlefield – Special interpretive events: Illumination, Salute to Independence, Memorial day and some Special Use Permits (from Core Ops Spreadsheet)</p> <p>Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet)</p>	<p>Annual activities (e.g., living history demonstrations, artillery demonstrations)</p> <p>Increased visitation</p> <p>Cultural landscape management plans – restoration of landscape to 1862</p> <p>Interpretation/Education programs</p> <p>Recreational use of river</p> <p>Trail development</p> <p>White-tailed deer monitoring and research</p> <p>Antietam National Battlefield – Special interpretive events: Illumination, Salute to Independence, Memorial day and some Special Use Permits (from Core Ops Spreadsheet)</p> <p>Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet)</p>

TABLE 3. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
Park Management and Operations	Legislated Boundary of Antietam and Monocacy National Battlefields	<p>Antietam: 1890 (establishment of the battlefield by the War Department) through the life of the plan (10 years)</p> <p>Monocacy: 1934 (legislated creation of the battlefield) through the life of the plan (10 years)</p>	<p>Land acquisition</p> <p>Increased access/use of vehicles</p> <p>Development of visitor facilities</p> <p>Annual activities (e.g., living history demonstrations, artillery demonstrations)</p> <p>Increased visitation</p> <p>Interpretation/Education programs</p> <p>Recreational use of river</p> <p>Vandalism</p> <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 (from Core Ops Spreadsheet)</p> <p>Antietam National Battlefield – Special interpretive events: Illumination, Salute to Independence, Memorial day and some Special Use Permits (from Core Ops Spreadsheet)</p> <p>Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet)</p> <p>Antietam National Battlefield –</p>	<p>Annual activities (e.g., living history demonstrations, artillery demonstrations)</p> <p>Increased visitation</p> <p>Cultural landscape management plans – restoration of landscape to 1862</p> <p>Interpretation/Education programs</p> <p>Recreational use of river</p> <p>Trail development</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>Antietam National Battlefield – Maintaining archeological, natural history, and museum collections (from Core Ops Spreadsheet)</p> <p>Antietam National Battlefield – Special interpretive events: Illumination, Salute to Independence, Memorial day and some Special Use Permits</p>	<p>Annual activities (e.g., living history demonstrations, artillery demonstrations)</p> <p>Increased visitation</p> <p>Cultural landscape management plans – restoration of landscape to 1862</p> <p>Interpretation/Education programs</p> <p>Recreational use of river</p> <p>Trail development</p> <p>White-tailed deer monitoring and research</p> <p>Antietam National Battlefield – Maintaining archeological, natural history, and museum collections (from Core Ops Spreadsheet)</p> <p>Antietam National Battlefield – Special interpretive events: Illumination, Salute to Independence, Memorial day and some Special Use</p>

TABLE 3. CUMULATIVE ACTION SCENARIO

Impact Topic	Study Area	Temporal Boundaries	Past Actions	Current Actions	Future Actions (10 years)
			Wildland and Prescribed Fire Program (from Core Ops Spreadsheet)	(from Core Ops Spreadsheet) Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet) Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet)	Permits (from Core Ops Spreadsheet) Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet) Antietam National Battlefield – Wildland and Prescribed Fire Program (from Core Ops Spreadsheet)

AFFECTED ENVIRONMENT

DO-12 says (in accordance with the National Parks Omnibus Management Act of 1998 (NPOMA) that if information critical to decision making is lacking, then the action should be modified to eliminate that portion of the action where impacts are uncertain. In addition, NEPA and CEQ specify what must be done in the absence of information: “When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking” (Section 1502.22). The “Affected Environment” should state clearly what information is available, where conflicts exist in the data/interpretation, and what information is lacking.

See Director’s Order 12 Handbook 2.8; and Director’s Order 12 4.4 and 4.5 (unavailable information and use of technical and scientific analysis in decision making).

The following resources have been collected or will be collected on CWD management at Antietam and Monocacy National Battlefields. These documents and other references, as well as other relevant documents from the previous deer management or disease management plans for national park units in the eastern United States, will be used to prepare the Affected Environment section of the EA.

LEGISLATION

NPS Organic Act of 1916

An Act to Amend the Act of October 2, 1968, An Act to Establish a Redwood National Park in the State of California, and for other Purposes, 1978 (92 Stat. 163)

Secretary of the Interior’s Standards for the Treatment of Historic Properties

Enabling legislation for each unit

ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS AND OTHER NPS PLANNING DOCUMENTS

NPS 1979 Antietam National Battlefield Statement for Management

NPS 1983 Antietam National Battlefield Land Protection Plan.

NPS 1986 Antietam National Battlefield: An Administrative History

NPS 1992 Antietam National Battlefield General Management Plan / Final Environmental Impact Statement

NPS 1993 Monocacy National Battlefield Resource Management Plan

NPS 1995 Antietam National Battlefield Resources Management Plan

NPS 1997 Monocacy National Battlefield Strategic Plan and Annual Performance Plan

NPS 1997 Antietam National Battlefield Strategic Plan Fiscal Years 1998-2002

NPS 2006 NPS *Management Policies 2006*

NPS 2006 A National Park Service Manager's Reference Notebook to Understanding Chronic Wasting Disease, Volume 3

NPS 2006 Memorandum: To: All Superintendents, National Capital Region. From: Deputy Regional Director, National Capital Region. Subject: Monitoring for Chronic Wasting Disease

ANTIETAM AND MONOCACY NATIONAL BATTLEFIELDS RESOURCE INFORMATION

Belay, Ermias, Ryan Maddox, Elizabeth Williams, Michael Miller, Pierluigi Gambetti and Lawrence Schonberger 2004 Chronic Wasting Disease and Potential Transmission to Humans

Gross, John and Michael Miller 2001 Chronic Wasting Disease in Mule Deer: Disease Dynamics and Control

Johnson, Chad, Jody Johnson, Murray Clayton, Debbie McKenzie and Judd Aiken 2003 Prion Protein Gene Heterogeneity in Free Ranging White-tailed Deer within the Chronic Wasting Disease Affected Region of Wisconsin

Maryland Department of the Environment 2005 Wildlife and Heritage Service Chronic Wasting Disease Response Plan

NPS and Water Resource Management Plan (Antietam)

NPS 1971 Master Plan – Park and Cemetery (Antietam)

NPS 1984 Fire Management Plan (Antietam)

NPS 1998 Natural Areas Inventoried for Rare, Threatened, and Endangered Plants and Selected Animals, with Management Recommendations (Monocacy)

NPS 1996 Interpretive Plan (Monocacy)

NPS 1996 Interpretive Plan (Antietam)

NPS 1999 Environmental Assessment: Monocacy Aqueduct

NPS 2000 Baseline Water Quality Data Inventory and Analysis

NPS 2000 Cultural Landscapes Inventory (Monocacy)

NPS 2001 Monocacy Mammal Inventory

NPS 2001 Bird Inventory 1999 to 2000 (Monocacy)

NPS 2001 Antietam National Battlefield – Alternative Transportation Study

NPS 2002 Resource Management – Programs and Practices for Battlefield Conservation

NPS 2002 Environmental Assessment: Relocation of the Visitors Center (Monocacy)

NPS 2002 Inventory of *Mustela* (Weasel) (Antietam)

NPS 2004 Paleontological Resource Inventory and Monitoring, National Capital Network

O'Rourke, Katherine, Terry Spraker, Linda Hamburg, Thomas Besser, Kelly Bryaton, and Donald Knowles 2004 Polymorphisms in the prion precursor functional gene but not the pseudogene are associated with susceptibility to chronic wasting disease in white-tailed deer

Raymond, G.J, A. Bossers, L.D. Raymond, K.I O'Rourke, L.E. McHolland, P.K. Bryant III, M.W. Miller, E.S. Williams, M. Smits and B. Caughey 2000 Evidence of a molecular barrier limiting susceptibility of humans, cattle, and sheep to chronic wasting disease

USDA 2002 Plan for Assisting States, Federal Agencies, and Tribes in Managing Chronic Wasting Disease in Wild and Captive Herds

Virginia Department of Game and Inland Fisheries 2006 Chronic Wasting Disease Annual Surveillance Plan.

The park will be asked to provide the relevant documents/data for the purposes of this EA. This list is not exhaustive and will be supplemented as the development of the EA proceeds.

ENVIRONMENTAL CONSEQUENCES

Director's Order 12 has made important changes (see 4.5 (g)) in the way the National Park Service analyzes, describes, and documents (formats) its NEPA analysis.

Using the best available data, the context, duration, and intensity of impacts, including cumulative impacts, must be defined. NPS must systematically analyze the impact of each alternative in terms of its context, duration, and intensity of effect on unit resources and values, and based on this analysis determine the potential for impairment.

The parks were briefed on possible methods for impact assessment, and how park staff will be involved in setting up the criteria for impact intensity. The impact methodology, defined by Director's Order 12, sec. 4.5(G)(7)(a), describes methods used to determine impact.

- 1. Explain any assumptions.*
- 2. Define or explain how data will be interpreted.*
- 3. Describe thresholds used to measure context.*
- 4. Describe the duration and intensity of impacts.*

Impact indicators must be determined for each impact topic.

For each resource, impact thresholds help to establish the sideboards for understanding the severity and the magnitude of the impact. Example of intensity: Impact to wildlife and wildlife habitat from the implementation of CWD detection and initial response activities could be:

Negligible — There would be no observable or measurable impacts to native species, their habitats, or the natural processes sustaining them. Impacts would be short in duration and within natural fluctuations.

Minor — Impacts would be detectable, but would not be expected to be outside the natural range of variability and would not have any long-term effects on native species, their habitats, or the natural processes sustaining them. Population numbers, population structure, genetic variability, and other demographic factors for species might have small, short-term changes, but long-term characteristics would remain stable and viable. Occasional responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, or other factors affecting population levels. Key ecosystem processes might have short-term disruptions that would be within natural variation. Sufficient habitat would remain functional to maintain viability of all species. Impacts would be outside critical reproduction periods for sensitive native species.

Moderate — Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they could be outside the natural range of variability for short periods of time. Breeding animals of concern are present; animals are present during particularly vulnerable life stages, such as migration or juvenile stages; mortality or interference with activities necessary for survival can be expected on an occasional basis, but is not expected to threaten the continued existence of the species in the park unit. Population numbers, population structure, genetic

variability, and other demographic factors for species might have short-term changes, but would be expected to rebound to pre-impact numbers and to remain stable and viable in the long term. Frequent responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, or other factors affecting short-term population levels. Key ecosystem processes might have short-term disruptions that would be outside natural variation (but would soon return to natural conditions). Sufficient habitat would remain functional to maintain viability of all native species. Some impacts might occur during critical periods of reproduction or in key habitat for sensitive native species.

Major — Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they would be expected to be outside the natural range of variability for long periods of time or be permanent. Population numbers, population structure, genetic variability, and other demographic factors for species might have large, short-term declines, with long-term population numbers significantly depressed. Frequent responses to disturbance by some individuals would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a long-term decrease in population levels. Breeding colonies of native species might relocate to other areas of the park. Key ecosystem processes might be disrupted in the long term or permanently. Loss of habitat might affect the viability of at least some native species.

Impairment — Some of the major impacts described above might be an impairment of park resources if their severity, duration, and timing resulted in the elimination of a native species or significant population declines in a native species, or they precluded the park's ability to meet recovery objectives for listed species. In addition, major impacts to park resources and values would:

contribute to deterioration of the park's wildlife resources and values to the extent that the park's purpose could not be fulfilled as established in its enabling legislation;

affect resources key to the park's natural or cultural integrity or opportunities for enjoyment; or

affect the resource whose conservation is identified as a goal in the park's planning documents.

Results of Discussion with Parks: Preliminary discussion occurred with park staff on impact analysis. Before beginning the draft EA, methodologies and impact thresholds that are appropriate for measuring impacts to park resources will be developed and discussed with park staff.

CONSULTATION AND COORDINATION

Coordination and consultation efforts for this planning process will focus on the means or processes to be used to include the public, major interest groups, and local public entities. Park staff at both national battlefields place a high priority on meeting the intent of public involvement in the NEPA process and giving the public an opportunity to comment on proposed actions. As part of the NPS NEPA process, the purpose, need, objectives, alternatives for CWD detection and initial response, and the associated concerns were identified during the internal scoping meeting with NPS staff. Future coordination with other affected agencies and the interested public is proposed.

In addition, the park discussed developing a science team to provide input and answer questions on the technical aspects of CWD. This team would be comprised primarily of federal employees with extensive experience with CWD. State employees (e.g., wildlife veterinarians, wildlife biologists) would be asked to participate in the science team depending on the agenda for particular conference calls. The exact composition of the science team will be determined in subsequent discussions. The science team would not provide input on policy questions related to the plan, but would be asked to answer specific questions related to defining action thresholds, development of the adaptive management approach, providing technical input on alternative approaches, etc.

As part of the EA process, the park will actively involve the public. Public participation for this process would be guided by the development of a public participation plan that would include, but not be limited to the following:

- Gather input and ideas from the public on purpose, need, and objectives, as well as preliminary alternatives. Identify the interested parties and their viewpoints on CWD, its detection, and response activities.
- Gather support and be transparent while educating the public about the required compliance and planning process associated with the CWD initial detection and response plan. Be clear that this plan relates to CWD detection and initial response, and is not a deer management plan.
- Explain to the public that the NPS is being proactive about the detection of CWD by seeking additional methods to detect and implement initial response activities, and by cooperating with the state.
- Provide information to the public on the impact CWD is likely to have on Antietam and Monocacy National Battlefield resources.
- Provide timely and accurate information to the public.

To achieve these objectives, Antietam and Monocacy National Battlefields propose holding a public meeting to present the purpose, need, objectives, and preliminary alternatives. This meeting would consist of an open house format, followed by a short presentation by park staff. The open house portion of the meeting would include stations where park and project staff can answer questions and record comments. Only written comments would be accepted during the meeting. The meeting would be held in the Visitor's Center at Antietam National Battlefield and at the Gambrill House at Monocacy National Battlefield.

For both public scoping and the draft EA, a 30-day comment period is proposed. The public would be able to use the NPS Planning, Environmental and Public Comment (PEPC) website to comment on-line during public scoping and during the public comment period for the draft EA. A newsletter to update the public on project milestones, such as public scoping meetings and release of the draft EA, is also planned for this project.

The public participation plan would include a coordinated media strategy that would be developed by Antietam and Monocacy National Battlefields' public information officers. This strategy would include making sure information on the project is provided in local libraries and on the PEPC website. For example, the Internal Scoping Report would be posted on PEPC for public information. The media strategy would also include development of a media package to send to the community and other interested parties and possibly programming on public access television stations.

As part of the EA process NPS will coordinate with local and federal agencies to identify issues and/or concerns related to natural and cultural resources within Antietam and Monocacy National Battlefields. The battlefields both maintain mailing lists that would be used to identify Congressional delegates; federal, state, and local agencies; and other organizations (e.g., environmental, wildlife, cultural, academic, and hunting groups) that the NPS would coordinate with. In addition, there was some discussion that neighboring land owners or homeowner's associations should be specifically identified and informed of the plan and EA. The following individuals, groups, and agencies were identified during the internal scoping meeting to be contacted during the planning process:

CONGRESSIONAL DELEGATES

- Roscoe G. Bartlett, 6th Congressional District, Maryland
- Barbara Mikulski, U.S. Senate
- Benjamin L. Cardin, U.S. Senate

FEDERAL AGENCIES

To be developed

- USGS

DISTRICT OF COLUMBIA AND LOCAL GOVERNMENTS

To be developed

- Maryland Department of Natural Resources

ORGANIZATIONS/OTHER

- Hunting Groups (to be developed)
- Universities (University of Maryland)
- Homeowners Associations (to be developed)

- Historian Related Groups (to be developed)
- Environmental Groups (to be developed)
- Humane Society of the United States
- People for the Ethical Treatment of Animals (PETA)

LIBRARIES, NEWSPAPERS, AND OTHER MEDIA

- Washington Post
- Washington Times
- Annapolis Capital
- Baltimore Business Journal Baltimore
- Baltimore Magazine Baltimore
- Baltimore Sun Baltimore
- The Capital Annapolis
- Carroll County Times Westminster
- Cecil Whig Elkton
- Cumberland Times News Cumberland
- Daily Record Baltimore
- Daily Times Salisbury
- Frederick News-Post Frederick
- Herald-Mail Hagerstown

REFERENCES

Advisory Council on Historic Preservation (36 CFR 800)

- 2001 *Protection of Historic Properties*. Implementing Regulations for Section 106 of the *National Historic Preservation Act of 1966*, as amended.

Baker, R.H.

- 1984 Origin, Classification, and Distribution. *White-tailed Deer Ecology and Management*. Edited by L.K. Halls.

Belay, Ermias, Ryan Maddox, Elizabeth Williams, Michael Miller, Pierluigi Gambetti and Lawrence Schonberger

- 2004 Chronic Wasting Disease and Potential Transmission to Humans. *Emerging Infectious Diseases*. Vol 10. No. 6. June.

Bruce, M. E., R. G. Will, J. W. Ironside, I. McConnell, D. Drummond, A. Suttie, L. McCardle, A. Chree, J. Hope, C. Birkett, S. Cousens, H. Fraser, and C. J. Bostock

- 1997 Transmissions to mice indicate that 'new variant' CJD is caused by the BSE agent. *Nature (London)* 389:498-501.

Chronic Wasting Disease (CWD) Alliance

- 2006 Chronic Wasting Disease Alliance <http://www.cwd-info.org/> website accessed December 1, 2006.

Chronic Wasting Disease Task Force

- 2002 Plan for Assisting States, Federal Agencies, and Tribes in Managing Chronic Wasting Disease in Wild and Captive Cervids.

Collinge, J., K. C. L. Sidle, J. Meads, J. Ironside, and A. F. Hill

- 1996 Molecular analysis of prion strain variation and the aetiology of 'new variant' CJD. *Nature (London)* 383:685-690.

Conner, M. M., and M. W. Miller

- 2004 Movement patterns and spatial epidemiology of a prion disease in mule deer population units. *Ecological Applications* 14:1870-1881.

deCalesta, D. S.

- 1994 "Effect of White-tailed Deer on Songbirds within Managed Forests in Pennsylvania." *Journal of Wildlife Management* 58:711–18.

Farnsworth, M. L., L. L. Wolfe, N. T. Hobbs, K. P. Burnham, E. S. Williams, D. M. Theobald, M. M. Conner, and M. W. Miller

- 2005 Human land use influences chronic wasting disease prevalence in mule deer. *Ecological Applications* 15:119-126.

Gear, Daniel A., Samuel, M.D., Langenberg, J.A., and Keane, D.

- 2006 Demographic Patterns and Harvest Vulnerability of Chronic Wasting Disease Infected White-tailed Deer in Wisconsin. *Journal of Wildlife Management* 70(s): 546-553.

Gross, J. E., and M. W. Miller

- 2001 Chronic wasting disease in mule deer: disease dynamics and control. *Journal of Wildlife Management* 65:205-215.

Johnson, Chad, Jody Johnson, Murray Clayton, Debbie McKenzie, and Judd Aiken

- 2003 Prion Protein Gene Heterogeneity in Free-Ranging White-Tailed Deer within the Chronic Wasting Disease Affected Region of Wisconsin. *Journal of Wildlife Diseases* 32(3).

Johnson, C.J., Phillips, K.E., Schramm, P.T., McKenzie, D., Aiken, J., and Pedersen, J.

- 2006 Prions Adhere to Soil Minerals and Remain Infections. *PLoS Pathog* 2(4):e32. DOI 10.1371/journal.ppat.0020032.

Joly, D.O., Samuel, M.D., Langenberg, J.A., Blanchong, J.A., Batha, C.A., Rolley, R.E., Keane, D.P., and Ribic, C.A.

- 2006 Spatial epidemiology of chronic wasting disease in Wisconsin white-tailed deer. *Journal of Wildlife Disease*, 42(3), 2006, pp. 578-588.

Lopez R. R., N. J. Silvy, J. D. Sebesta, S. D. Higgs, M. W. Salazar

- 1998 "A Portable Drop Net for Capturing Urban Deer." In 1998 *Proceedings of the Annual Conference of Southeast Association of Fish and Wildlife Agencies* 52:206–9.

Kleppe v. New Mexico, 426 US 529, 540 (1976)

Maryland Department of Natural Resources

- 1998 "Charting the Course for Deer Management in Maryland" A management plan for white-tailed deer in Maryland. Available at: <<http://www.dnr.state.md.us/wildlife/contents.html>>.
- 2005 Wildlife and Heritage Service Chronic Wasting Disease Response Plan. Maryland Department of Natural Resources.

Mathiason, C.K. Powers, J.G., Dahmes, S.J., Osborn, D.A., Miller, K.V., Warren, R.J., Mason, G.L., Hays, S.A., Hayes-Klug, J., Seelig, D.M., Wild, M.A., Wolfe, L.L., Spraker, T.R., Miller, M.W., Sigurdson, C.J., Telling, G.C. Hoover, E.A.

- 2006 Infection Prions in the Saliva and Blood of Deer with Chronic Wasting Disease. *Science* 314: 133-135

McCabe, R. E. and T. R. McCabe

- 1984 Of slings and arrows: an historical retrospection. White-tailed Deer Ecology and Management. Edited by L. K. Halls.

McShea, W. J.

- 2000 "The influence of Acorn Crops on Annual Variation in Rodent and Bird Populations." *Ecology* 81:228-38.

McShea, W. J., and J. H. Rappole

- 2000 "Managing the Abundance and Diversity of Breeding Birds Populations through Manipulation of Deer Populations." *Conservation Biology* 14.

Miller, M. W., and M. A. Wild

- 2004 Epidemiology of chronic wasting disease in captive white-tailed and mule deer. *Journal of Wildlife Diseases* 40:320-327.

Miller, M. W., and E. S. Williams

- 2003 Prion disease: horizontal prion transmission in mule deer. *Nature* 425:35-36.

Miller, M. W., M. A. Wild, and E. S. Williams

- 1998 Epidemiology of chronic wasting disease in captive Rocky Mountain elk. *Journal of Wildlife Diseases* 34:532-538.

Miller, M. W., and M. M. Conner

REFERENCES

- 2005 Epidemiology of chronic wasting disease in free-ranging mule deer: spatial, temporal, and demographic influences on observed prevalence rates. *Journal of Wildlife Diseases* 41:275-290.

Miller, M. W., E. S. Williams, C. W. McCarty, T. R. Spraker, T. J. Kreeger, C. T. Larsen, and E. T. Thorne.

- 2000 Epizootiology of chronic wasting disease in free-ranging cervids in Colorado and Wyoming. *Journal of Wildlife Diseases* 36:676-690.

Miller, M. W., E. S. Williams, N. T. Hobbs, and L. L. Wolfe

- 2004 Environmental sources of prion transmission in mule deer. *Emerging Infectious Diseases* 10:1003-1006.

National Park Service, U.S. Department of the Interior (NPS)

- 1983a Antietam National Battlefield Land Protection Plan. National Park Service.

- 1983b Monocacy National Battlefield Land Protection Plan. National Park Service

- 1992 Antietam National Battlefield General Management Plan / Final Environmental Impact Statement. National Park Service. Washington, D.C.

- 1993 Monocacy National Battlefield Resource Management Plan.

- 1995a Antietam National Battlefield Resources Management Plan.

- 1995b Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR 68).

- 2001 Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making

- 2002a Monocacy National Battlefield Cultural Landscapes Inventory

- 2002b Director's CWD Guidance Memorandum. Washington, D.C.

- 2006a Monocacy National Battlefield Draft General Management Plan/Environmental Assessment. National Park Service.

- 2006b *NPS Management Policies 2006*. U.S. Department of the Interior, National Park Service. Washington, D.C.

2006c A National Park Service Manager's Reference Notebook to Understanding Chronic Wasting Disease. Version 3. National Park Service Biological Resource Management Division. Fort Collins, Colorado.

2006d National Capital Region Memorandum: Monitoring for Chronic Wasting Disease

2006e Standard Operating Procedure: Surveillance for Chronic Wasting Disease

2006 f Antietam National Battlefield Memorandum: Deer Movement Study

New Mexico State Game Commission v. Steward L. Udall. 410 F.2d 1197, 1969.

O'Rourke, Terry Spraker, Linda Hamburg, Thomas Besser, Kelly Brayton, and Donald Knowles

2004 Polymorphisms in the Prion Precursor Functional Gene but not the Pseudogene are Associated with Susceptibility to Chronic Wasting Disease in White-tailed deer. *Journal of General Virology*. 85.

Porter, W. F.

1991 "White-tailed Deer in Eastern Ecosystems: Implications for Management and Research in National Parks." Natural Resources Report NPS/NRSUNY/NRR-91/05. Washington, D.C.

Prusiner, S. B.

1982 Research on scrapie. *Lancet* 2:494-495.

1991 Molecular biology of Prion diseases. *Science (Washington)* 252:1515-1522.

1997 Prion diseases and the BSE crisis. *Science (Washington)* 278:245-251.

Race, R. E., A. Raines, T. G. M. Baron, M. W. Miller, A. Jenny, and E. S. Williams

2002 Comparison of abnormal prion protein glycoform patterns from transmissible spongiform encephalopathy agent-infected deer, elk, sheep, and cattle. *Journal of Virology* 76:12365-12368.

Raymond, G.J, A. Bossers, L.D. Raymond, K.I. O'Rourke, L.E. McHolland, P.K. Bryant III, M.W. Miller, E.S. Williams, M. Smits, and B. Baughey

2000 Evidence of a Molecular Barrier Limiting Susceptibility of Humans, Cattle, and Sheep to Chronic Wasting Disease. *The EMBO Journal*. Vol 19. No 17.

Salman, M. D

2003 Chronic wasting disease in deer and elk: scientific facts and findings. *Journal of Veterinary Medical Science* 65:761-768.

Samuel, M. D., D. O. Joly, M. A. Wild, S. D. Wright, D. L. Otis, R. W. Werge, and M. W. Miller

REFERENCES

- 2003 Surveillance strategies for detecting chronic wasting disease in free-ranging deer and elk. National Wildlife Health Center, United States Geological Survey, Madison, Wisconsin, USA. 41pp.

Schauber, E. M., and A. Woolf

- 2003 Chronic wasting disease in deer and elk: a critique of current models and their application. *Wildlife Society Bulletin* 31:610-616.

Schramm, P.T., Johnson, C.J., Mathews, N.E., McKenzie, D., Aiken, J.M., Pedersen, J.A.

- 2006 Potential Role of Soil in the Transmission of Prion Disease. *Reviews in Mineralogy and Geochemistry* 64:135-152.

Spraker, T. R., M. W. Miller, E. S. Williams, D. M. Getzy, W. J. Adrian, G. G. Schoonveld, R. A. Spowart, K. I. O'Rourke, J. M. Miller, and P. A. Merz.

- 1997 Spongiform encephalopathy in free-ranging mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*) and rocky mountain elk (*Cervus elaphus nelsoni*) in northcentral Colorado. *Journal of Wildlife Diseases* 33:1-6.

United States v. Moore, 640 F. Supp. 164, 166 (S.D. W. Va. 1986).

U.S. Department of Agriculture

- 2000 *Pre-Decisional Environmental Assessment, Deer Damage Management in the Commonwealth of Virginia.*

- 2003 *Environmental Assessment, White-tailed Deer Damage Management in Pennsylvania.*

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

- 1992 *Migratory Bird Treaty Act of 1918.* In Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service. Available at <http://laws.fws.gov/lawsdigest/migtrea.html>.

- 2002 A Guide to the Laws and Treaties of the United States for Protecting Migratory Birds; revised May 12, 2002. Available at <http://migratorybirds.fws.gov/intrnltr/treatlaw.html>.

Virginia Department of Game and Inland Fisheries (VDGIF)

- 2005 Chronic Wasting Disease Response Plan

West Virginia University Extension Service

- 1985 "Deer and Agriculture in West Virginia." West Virginia University Extension Service Publication Number 806.

Wild, M. A., T. R. Spraker, C. J. Sigurdson, K. I. O'Rourke, and M. W. Miller

- 2002 Preclinical diagnosis of chronic wasting disease in captive mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*) using tonsillar biopsy. *Journal of General Virology* 83:2629-2634.

Wilesmith, J. W., G. A. H. Wells, M. P. Cranwell, and A. M. Ryan

- 1988 Bovine spongiform encephalopathy: epidemiological studies. *Veterinary Record* 123:638-644.

Williams, E. S., M. W. Miller, T. J. Kreeger, R. H. Kahn, and E. T. Thorne

- 2002 Chronic wasting disease of deer and elk: a review with recommendations for management. *Journal of Wildlife Management* 66:551-563.

Williams, E. S., and M. W. Miller

- 2002 Chronic wasting disease in deer and elk in North America. *Revue Scientifique et Technique - Office International des Epizooties* 21:305-316.
- 2003 Transmissible spongiform encephalopathies in non-domestic animals: origin, transmission and risk factors. *Revue Scientifique et Technique - Office International des Epizooties* 22:145-156.

Williams, E. S., and S. Young

- 1980 Chronic wasting disease of captive mule deer: a spongiform encephalopathy. *Journal of Wildlife Diseases* 16:89-98.
- 1992 Spongiform encephalopathies in Cervidae. *Revue Scientifique et Technique - Office International des Epizooties* 11:551-567.
- 1993 Neuropathology of chronic wasting disease of mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus nelsoni*). *Veterinary Pathology* 30:36-45.

Wolfe, L. L., M. M. Conner, T. H. Baker, V. J. Dreitz, K. P. Burnham, E. S. Williams, N. T. Hobbs, and M. W. Miller

- 2002 Evaluation of antemortem sampling to estimate chronic wasting disease prevalence in free-ranging mule deer. *Journal of Wildlife Management* 66:564-573.

**APPENDIX A: NATIONAL PARK SERVICE CHRONIC
WASTING DISEASE MEMORANDUMS**

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:

- 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 US 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 <1 percent with a 99 percent 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 (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

NATIONAL PARK SERVICE

ANTIETAM NATIONAL BATTLEFIELD

I. Title: Standard Operating Procedure; Surveillance for Chronic Wasting Disease (CWD)

II. Date of Approval: April 14, 2006

III. Approved: -signed- J.W. Howard

John W. Howard

Superintendent

IV. Revision Requirement: Every three years

V. Purpose

To establish a park level standard operating procedure (SOP) to implement the guidance provided in the NPS Director's July 26, 2002 memo *National Park Service Response to Chronic Wasting Disease of Deer and Elk* (NPS 2002) and the NCR Deputy Regional Director's February 10, 2006 memo *Monitoring for Chronic Wasting Disease* (NPS 2006b).

The 2002 memo requests parks and regions to implement the following:

- Parks in close proximity (60 miles) to areas where CWD has been detected should initiate a 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. This is referred to as *Opportunistic Surveillance* in the January 3, 2006 version of *A National Park Service Manager's Reference Notebook to Understanding Chronic Wasting Disease* (NPS 2006a). For environmental compliance, sampling of dead animal tissue is a categorical exclusion under RM-12, 3.3 M (day-to-day resource management) (NPS 2006b).
- Cooperate and coordinate with state wildlife and agricultural agencies regarding proposed prevention, surveillance, research, and control actions for CWD.
- Immediate action should be taken, on a limited scale, to address imminent threats such as 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. This is referred to as *Targeted Surveillance* in the *Reference Notebook* (NPS 2006a). For environmental compliance, targeted surveillance of live animals exhibiting clinical signs of CWD is a categorical exclusion under RM-12, 3.4 E (3) (removal of individual members of a non-threatened/endangered species) (NPS 2006a).

VI. Background

Chronic Wasting Disease (CWD) is a naturally occurring prion disease, which poses a threat to the health of deer and elk populations in areas where it already occurs as a self maintaining disease and potentially to native deer and elk species throughout their North American ranges.

CWD causes brain lesions in cervids (i.e., deer, moose and elk) that result in progressive weight loss, behavioral changes and eventually death. Animals with CWD infections are generally infected for 20-30

months before they show obvious clinical signs, but incubation may be somewhat shorter (16 months) or considerably longer (60+ months) in individual cases. Details of transmissions have not yet been determined and there is **currently no evidence that CWD is transmissible to humans or domestic livestock**. It is, however, clearly infectious among deer and elk and may have the potential to affect populations of all members of the cervidae family.

VII. Surveillance Methods

This Standard Operating Procedure (SOP) addresses the surveillance that will occur at Antietam National Battlefield. For our purposes here at the battlefield, we are concerned with the potential presence of the disease in white-tailed deer that traverse the park and cooperating with the State of Maryland on their monitoring program. There are two types of surveillance that may occur—opportunistic or targeted.

Opportunistic surveillance involves taking diagnostic samples for CWD testing from deer found dead or harvested within an NPS unit. Cause of death may be hunting, culling, predators, disease, trauma (hit by car), or undetermined. Opportunistic sampling has little, if any, negative impact on current populations. Opportunistic surveillance is an excellent way to begin surveying for presence of CWD without changing management of the host resource. This is a good first step option for NPS units where CWD is a moderate risk but where it has not yet been encountered. (NPS 2006b)

Targeted surveillance entails lethal removal of deer which exhibit clinical signs consistent with CWD. Behaviors or signs that a deer may be exhibiting with CWD, where targeted surveillance would be an option, are the following:

- Deer appears emaciated.
- Moves in a set pattern (walking in circles or back and forth repetitively)
- Carries head and ears in a lowered position
- May exhibit drooling, stumbling or subtle trembling and a wide legged stance

Upon taking a report, it will be at the discretion of the Chief Ranger or Natural Resources Manager as to whether or not a deer will be put down that is believed to be showing symptoms. Only a Law Enforcement ranger will cull a deer by using their side arm or weapon at their disposal.

VIII. Reporting

Everyone's participation at the park is critical for the surveillance effort, especially those who work in the field. If an employee observes a suspect deer, which they believe is exhibiting clinical signs consistent with CWD, they are to first take note as to its location and any behavior or signs that it is exhibiting. The employee then promptly calls either the Chief Ranger or Natural Resources Manager to determine whether or not the animal should be put down. If that determination is made, a Law Enforcement Ranger will put the animal down, the carcass will then be prepared by the Natural Resources Staff to be sent to a location and tested for CWD.

If an employee observes a dead deer on the battlefield or along tour roads, this information will be passed along to the Natural Resources Staff, as is usually done for vehicle caused wildlife fatality data. Then a determination will be made by either the Chief Ranger or Natural Resources Manager whether or not the carcass should be sent for testing as part of Opportunistic Sampling.

Procedures for shooting, sample collection, handling, cleanup and storage will be provided by the Chief Ranger or Natural Resources Manager and will be based on information provided in the *NPS Reference Notebook* (2006a) and the January 12, 2006 CWD Workshop held at Manassas National Battlefield.

IX. References

National Park Service. 2006a. A National Park Service Manager's Reference Notebook to Understanding Chronic Wasting Disease. Biological Resource Management Division. Fort Collins, CO.

National Park Service. 2006b. Memorandum to Superintendents, NCR from Deputy Regional Director, NCR ; Subject: Monitoring for Chronic Wasting Disease.

National Park Service. 2002. Memorandum to Regional Directors from Director; Subject: National Park Service Response to Chronic Wasting Disease of Deer and Elk.

Prepared By: Joseph Calzarette, Natural Resources Manager, Division of Natural Resources & Protection

Reviewed By: Ed Wenschhof, Chief Ranger, Division of Natural Resources & Protection

