
**RICHMOND NATIONAL BATTLEFIELD
PARK
MALVERN HILL AND GLENDALE UNITS
CULTURAL LANDSCAPE TREATMENTS**

**DRAFT
ENVIRONMENTAL ASSESSMENT**



DECEMBER 2003

Richmond National Battlefield Park
Malvern Hill and Glendale Units
Cultural Landscape Treatments
Draft Environmental Assessment
December 2003

National Park Service
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1.0 INTRODUCTION

This chapter explains what this document is, why it was prepared, and what it contains.

1.1 THE EA AND ITS FUNCTION

This Environmental Assessment (EA) documents the results of a study of the potential environmental impacts of actions proposed in the Richmond National Battlefield Park (RNBP). The National Park Service (NPS) is proposing several actions to improve the experience of visitors to the Malvern Hill and Glendale units of the Park. The National Park Service is responsible for the preparation of this EA, in compliance with:

- The National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) 4321 et seq.), which requires an environmental analysis for major Federal actions having the potential to affect the quality of the environment;
- Council of Environmental Quality Regulations at 40 Code of Federal Regulations (CFR) 1500-1508, which implement the requirements of NEPA;
- National Park Service Conservation Planning, Environmental Impact Analysis, and Decision Making; Director's Order (DO) #12 and Handbook.

***Purposes of an
Environmental Assessment (EA)***

- Identify, for planners, decisionmakers, and the public, potential environmental impacts of a proposed Federal action
- Determine if those impacts would be significant, thus indicating that an environmental impact statement (EIS) is needed.

Key goals of NEPA are to help Federal agency officials make well-informed decisions about agency actions and to provide a role for the general public in the decision-making process. The study and documentation mechanisms associated with NEPA seek to provide decision-makers with sound knowledge of the comparative environmental consequences of the several courses of action available to them. NEPA studies, and the documents recording their results, such as this EA, focus on providing input to the particular decisions faced by the relevant officials.

In this case, the Superintendent of Richmond National Battlefield Park will make a decision regarding a series of actions that would alter some aspects of the landscape at Malvern Hill and the Glendale components of the National Battlefield in order to return these areas to more nearly their appearance at the time of the battle. The Superintendent will make this decision in part based on the results of this EA, the overall management framework already established for Richmond National Battlefield Park, and the legislation guiding the National Park Service's actions.

Congress established Richmond National Battlefield Park in 1936 for the purpose of conserving Civil War resources in and around Richmond. Legislation also requires that NPS protect

resources and values on National Park Service properties and pass them on to future generations “unimpaired for the enjoyment of future generations” (NPS 2003).

Therefore, this EA also addresses whether the actions of the various alternative courses of action would impair resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, and (3) identified as a goal in the park’s general management plan or other Park Service planning documents

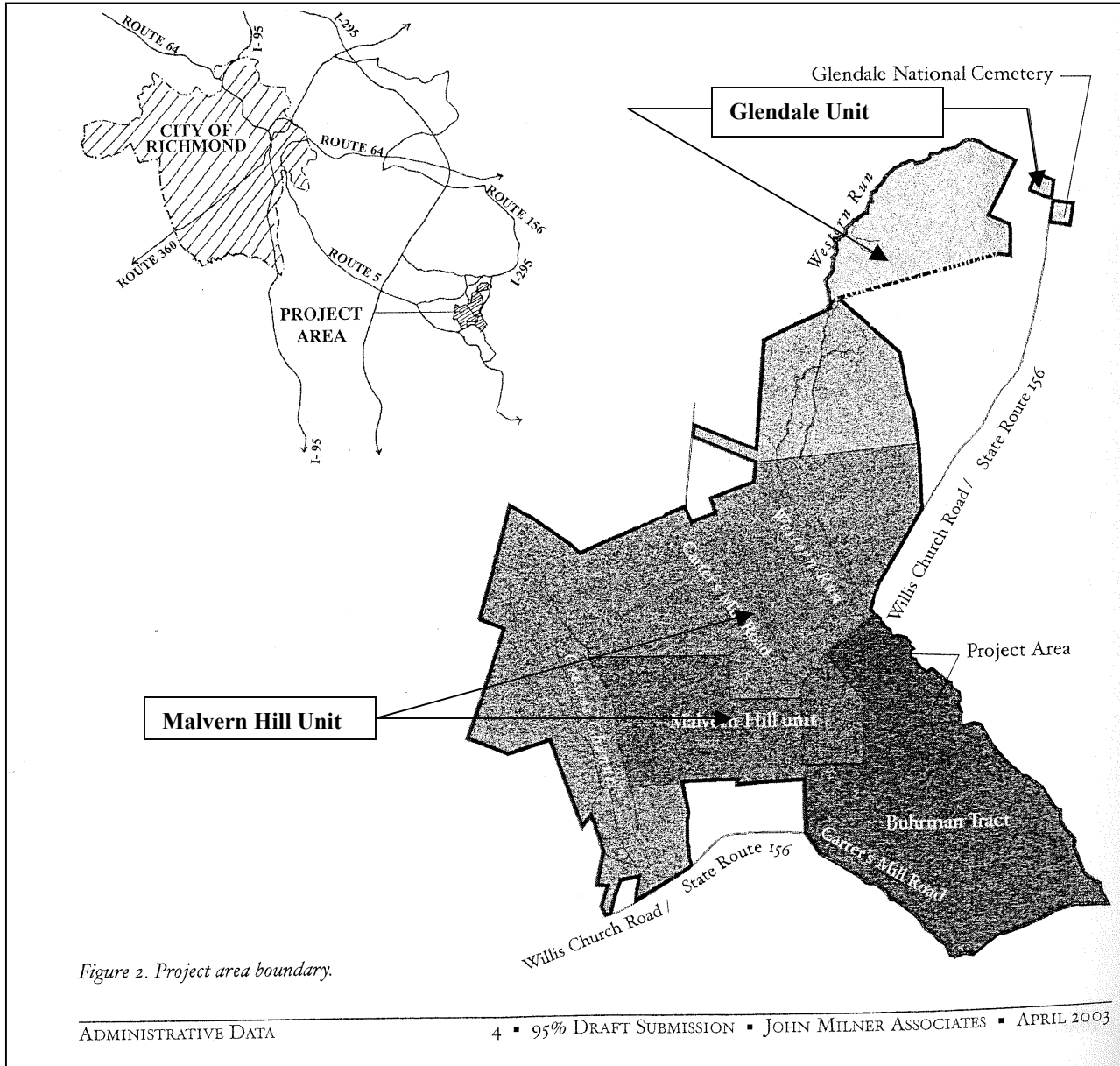
1.2 RICHMOND NATIONAL BATTLEFIELD PARK

Richmond National Battlefield Park (RNBP) is located in Henrico, Hanover, and Chesterfield Counties, Virginia. The park lies along the fall line (transition zone) between the coastal Tidewater area of the state, and the hillier Piedmont to the west. RNBP consists of a number of connected units. The Malvern Hill and Glendale units, which are the focus of the proposed action and alternatives, lie within Henrico County, approximately 12 miles east of downtown Richmond and less than one mile north of the James River, along State Route 156 (see vicinity map, Figure 1-1). These two units, and approximately 245 acres of contiguous land owned by the Civil War Preservation Trust (CWPT) comprise the project area, consisting of a total of 1,051 acres. Malvern Hill is the larger of the two units, at a little over 700 acres. Glendale consists of approximately 100 acres to the west of the Glendale National Cemetery, and another 1.53 acres adjacent to the cemetery. The Cemetery is administered by the Veterans Administration, but currently serves as a visitor contact station for RNBP.

Malvern Hill and Glendale were significant as the sites of important Civil War battles, part of the larger struggle to determine the fate of Richmond, the capital of the Confederacy. What was known as the Peninsula Campaign began in 1862, led by Union General George McClellan, with a major offensive against Richmond. After the Confederate commander General Joseph E. Johnston was seriously wounded, General Robert E. Lee assumed command. Lee tried to push the Union troops away from the city in what was called the Seven Days’ Battle. The battle of Malvern Hill, which occurred on July 1, 1862, was the last in this series of battles. It was preceded on the previous day by the battles of Glendale/Fraser’s Farm/White Oak Swamp. Union troops withdrew following the Battle of Malvern Hill.

In addition to their historic importance, the Malvern Hill and Glendale battlefields contain evidence of prehistoric occupation and settlement by American Indians, going back as far as 12,000 years before the present (BP).

Figure 1-1 Vicinity Map
Taken from NPS 2003



1.3 PURPOSE AND NEED FOR ACTION

The National Park Service’s purpose in taking the action discussed in this report is to enhance the accomplishment of RNBP’s mission. This is “to protect the Civil War Battlefield resources associated with the struggle for the capital of the Confederacy and to interpret these resources so as to foster an understanding of their larger significance” (NPS, 1996).

NPS needs to make improvements at the Malvern Hill/Glendale battlefields because at present a large part of the battlefield areas are inaccessible, interpretive information is not available, and the sites which are accessible do not provide to the visitor an appreciation or understanding of the battlefields and their significance. Battlefield areas are inaccessible because there are few places to park cars or buses, and few trails to follow, observation points to visit, or interpretive materials available. This limits the appreciation that visitors will have of the battlefields. Another major factor affecting the visitor experience is the altered appearance of the landscape. Malvern Hill/Glendale is one of the few Civil War sites that has not suffered visible encroachment by human structures. Its appearance has, however, changed since 1862, as some of the fields that had been farmed at the time of the battle have reverted to woodlands. With the climate and soils of this area, the natural vegetation of these lands is forest, and an open field, such as a farm field, will gradually revert to woods if ecological succession is allowed to proceed without human intervention, as has happened on portions of the battlefields. The presence of these woodlands obscures historic vistas, in particular at the Malvern Hill unit, and makes it difficult for visitors to understand and visualize the assault on the broad open field of that battlefield. Therefore, the visitor literally cannot see major portions of the battlefield, and cannot therefore readily appreciate why and how the fighting took place as it did. This diminishes the quality of the experience for the visitor. Fig 1-1 is a photocomposite looking north-northwest, taken from the Malvern Hill auto tour stop at the “top” of the battlefield. The wooded stands at both sides of the field were not present in 1862, so the field of battle was far wider than it appears today.

Figure 1-2 Photocomposite of the Malvern Hill Battlefield



1.4 SCOPING ISSUES AND IMPACT TOPICS

The Environmental Assessment process under NEPA requires agencies to seek outside suggestions and other input about what should be considered in the EA. This process, called “scoping” involved contacting other Federal, state and local agencies that might have an interest in the proposed action. Comments from these agencies are included in Appendix A and helped to shape the analysis as described below.

In addition, the interdisciplinary team of environmental professionals preparing the EA conducted an internal scoping effort. This team sought to identify the full spectrum of types of effects that could be expected from each component of the proposed action. The team compiled this list of potential effects in a logical diagram (Fig 1-3 A-D) showing how specific components of the action could be the cause of various effects on particular environmental resources. The diagram also shows that some of these direct effects could in turn give rise to indirect effects. This “Cause-Effect” network served as the road map for the conduct of the EA. The preliminary diagram identified the questions that needed to be answered, such as, “Will this effect actually occur, and if so, how extensive, how long lasting, how severe would it be?” By identifying the specific questions to be answered, this approach also identified what data gathering was needed: the specific information on the existing environmental resource conditions that is relevant to answering the questions (i.e. predicting and assessing the impact on that resource) was what was needed. Therefore, there was no need to gather and document background information on resources for which no reasonably foreseeable cause-effect mechanism could be identified that would lead to an effect on that resource.

Based on this scoping analysis, the team analyzed impacts on the following resources:

- Air Quality
- Archeological and Cultural Resources
- Floodplains and wetlands
- Hazardous Materials/Hazardous Waste
- Land Use
- Noise
- Public Health and Safety
- Protected (Rare/Threatened and Endangered) Species
- Socioeconomics and Environmental Justice
- Soils (including prime and unique farmland)
- Traffic
- Vegetation and Wildlife (including invasive species)
- Visitor Use/Experience and Visual Resources
- Water Resources

Fig 1-3 A Components of the Action Alternatives

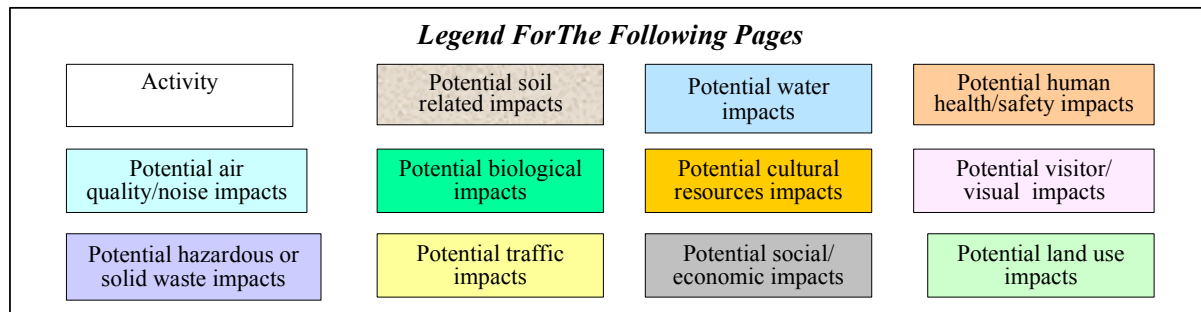
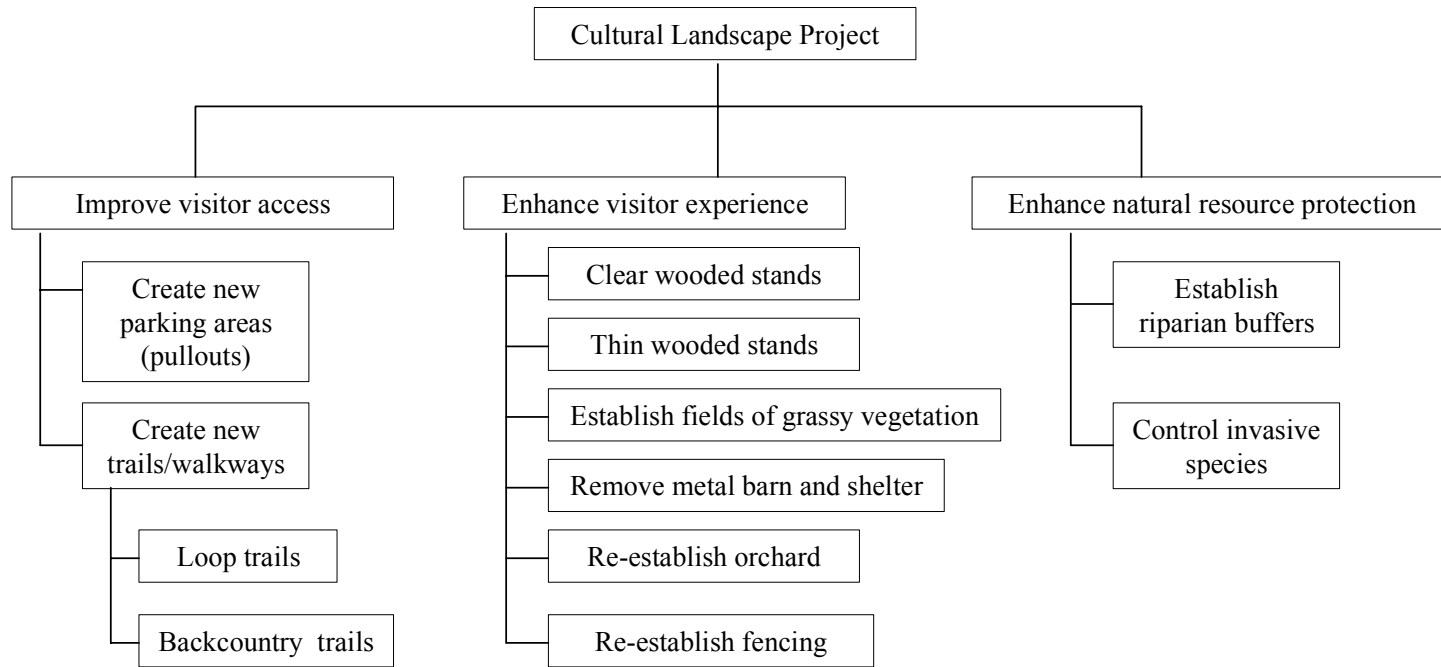


Figure 1-3 B Identification of Potential Effects

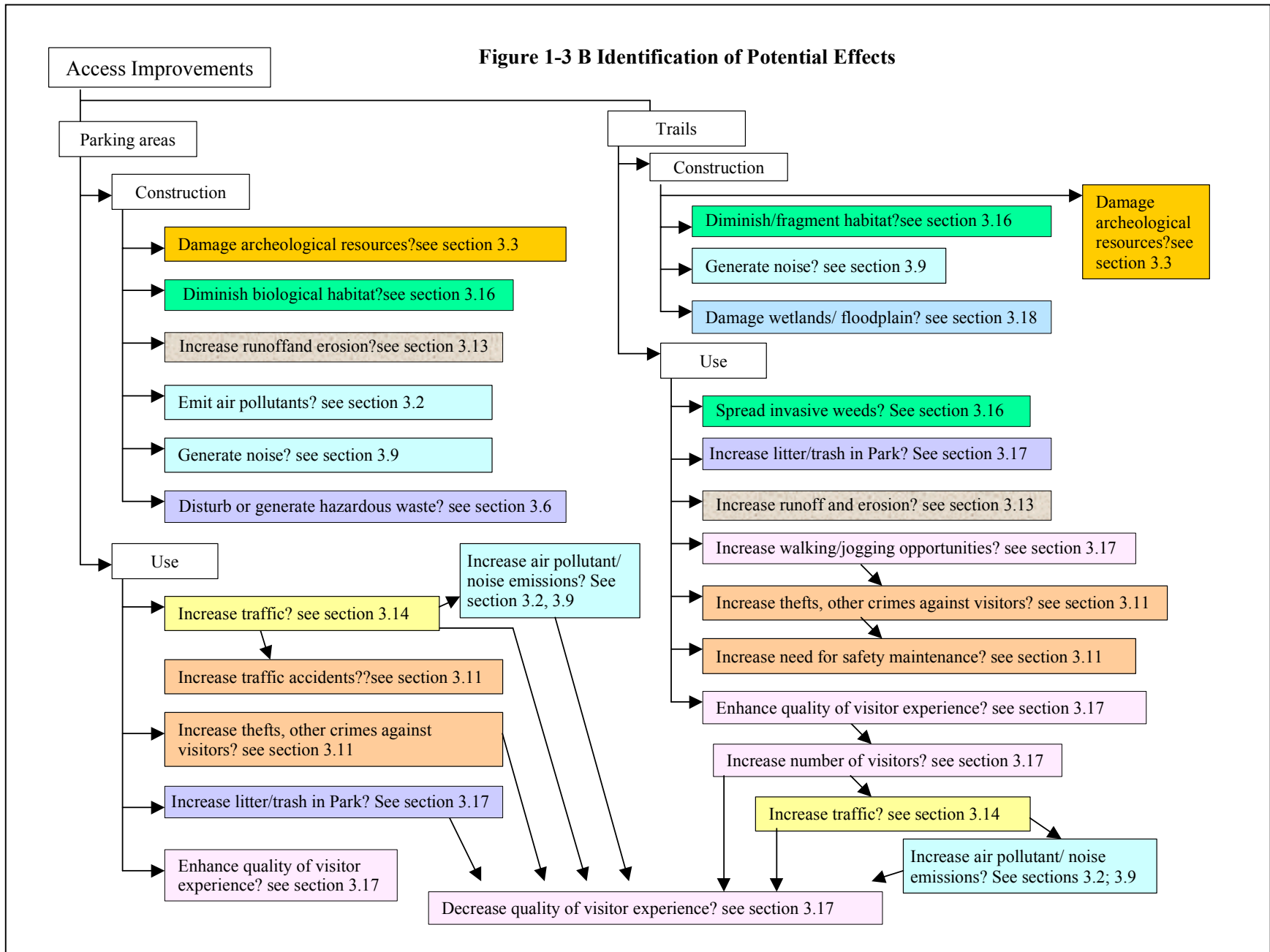


Figure 1-3 C Identification of Potential Effects

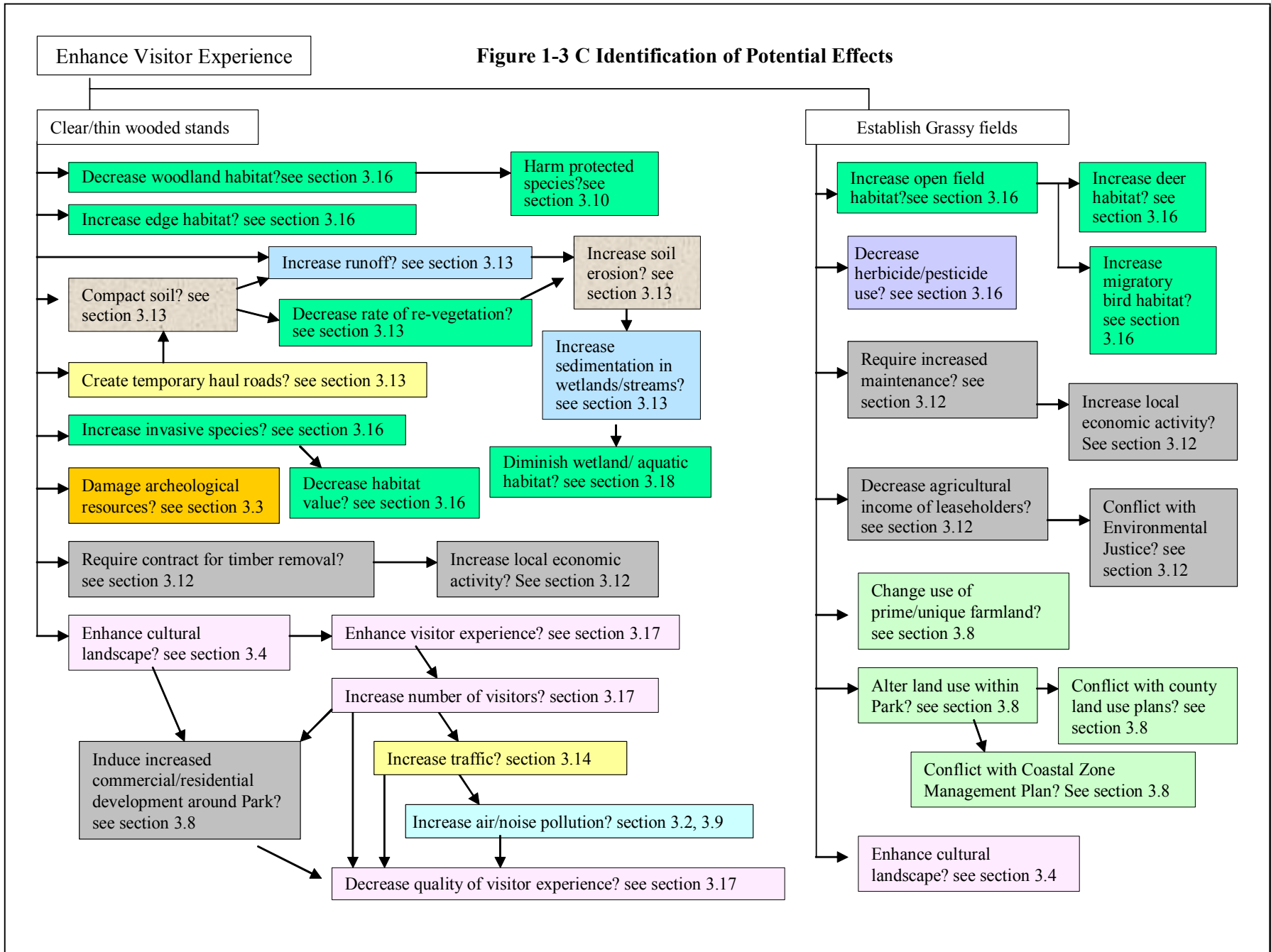
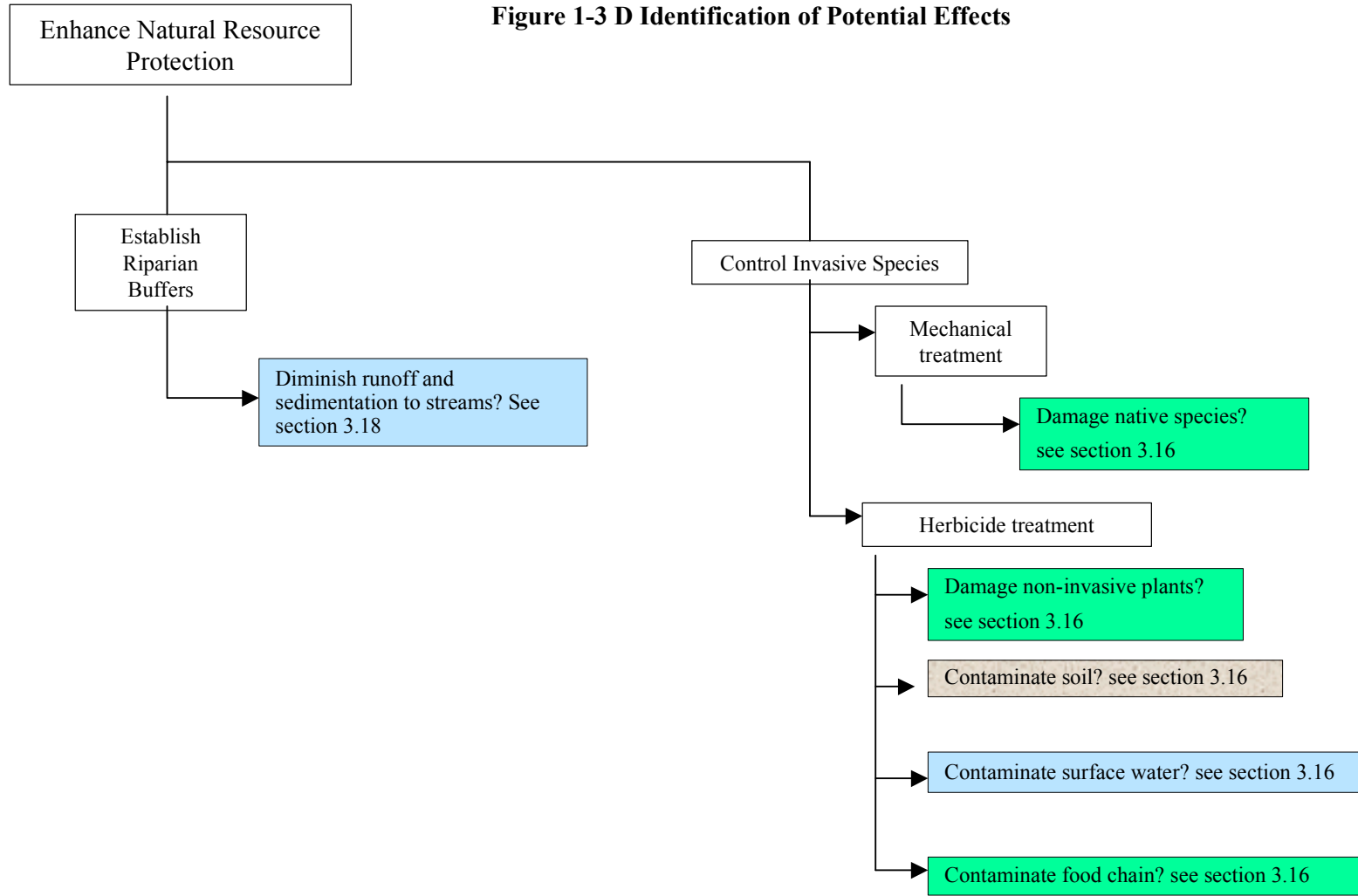


Figure 1-3 D Identification of Potential Effects



NEPA regulations emphasize the importance of adjusting the scope of each EA to the particulars of the project and its setting, and focusing on the specific potential impacts of that project. There is no need, according to the regulations, to include information on resources that would not be affected by the project. As a result, different EAs will discuss somewhat different lists of resources. Several resources that are frequently discussed in other NPS NEPA documents are not discussed in this one because the resource is not present at Malvern Hill/Glendale (NPS 1996). These resources include:

- Wild and Scenic Rivers
- Coastal Barriers
- Indian Trust Lands
- Wilderness

2.0 ALTERNATIVE COURSES OF ACTION

Given the need for improved resource protection and enhanced visitor experience, NPS has several courses of action available. This chapter describes these alternatives.

2.1 ALTERNATIVES CONSIDERED BUT NOT ANALYZED FURTHER IN THIS EA

In studying landscape treatment approaches to meet the need for enhancing the visitor's interpretive experience, NPS considered the full range of general options as identified in the Park Service's cultural resource management guidance, Director's Order #28 (NPS 1998). These approaches, Preservation, Rehabilitation, Restoration and Reconstruction, range from halting change as much as possible (Preservation), to active intervention to "rebuild" a landscape as close as possible to its historic condition (Restoration and Reconstruction).

NPS dropped Restoration and Reconstruction from consideration because there is not enough documentation and data about the details of what the historic conditions were. NPS dropped Preservation from consideration because that approach would be too restrictive overall and would preclude some of the activities that would allow enhanced visitor experience. However, some preservation components are included in the selected approach, in order to protect especially sensitive resources such as archeological materials.

NPS developed its plan based on the remaining general approach, that of Rehabilitation, which calls for some alterations to the landscape, but which also allows for a range of compatible and interpretive uses.

2.2 ALTERNATIVES CONSIDERED AND ANALYZED IN THIS EA

The descriptions and depictions of alternatives are based on the information available in the Draft Cultural Landscape Report (NPS 2003b)

Alternative 1 – Preserve Existing Conditions (No Action Alternative).

The NPS could choose to take no new action in regard to enhancing the visitor experience at Glendale and Malvern Hill. This alternative would mean that only the current policies and actions undertaken to manage the cultural landscape, other cultural and historic resources, and the natural environment would continue to be carried out. There would be no additional treatments for visitor access and interpretation. Natural patterns, such as successional replacement of former fields and agricultural lands by trees, would continue. Landscape features representing all periods of landscape history and prehistory would continue to be present. Minimal actions as required to protect natural and cultural resources would still be carried out, and deteriorated features and systems would continue to be repaired. Fig 2-1, taken from the Cultural Landscape Report (NPS 2003b) shows this alternative.

Figure 2-1 Alternative 1

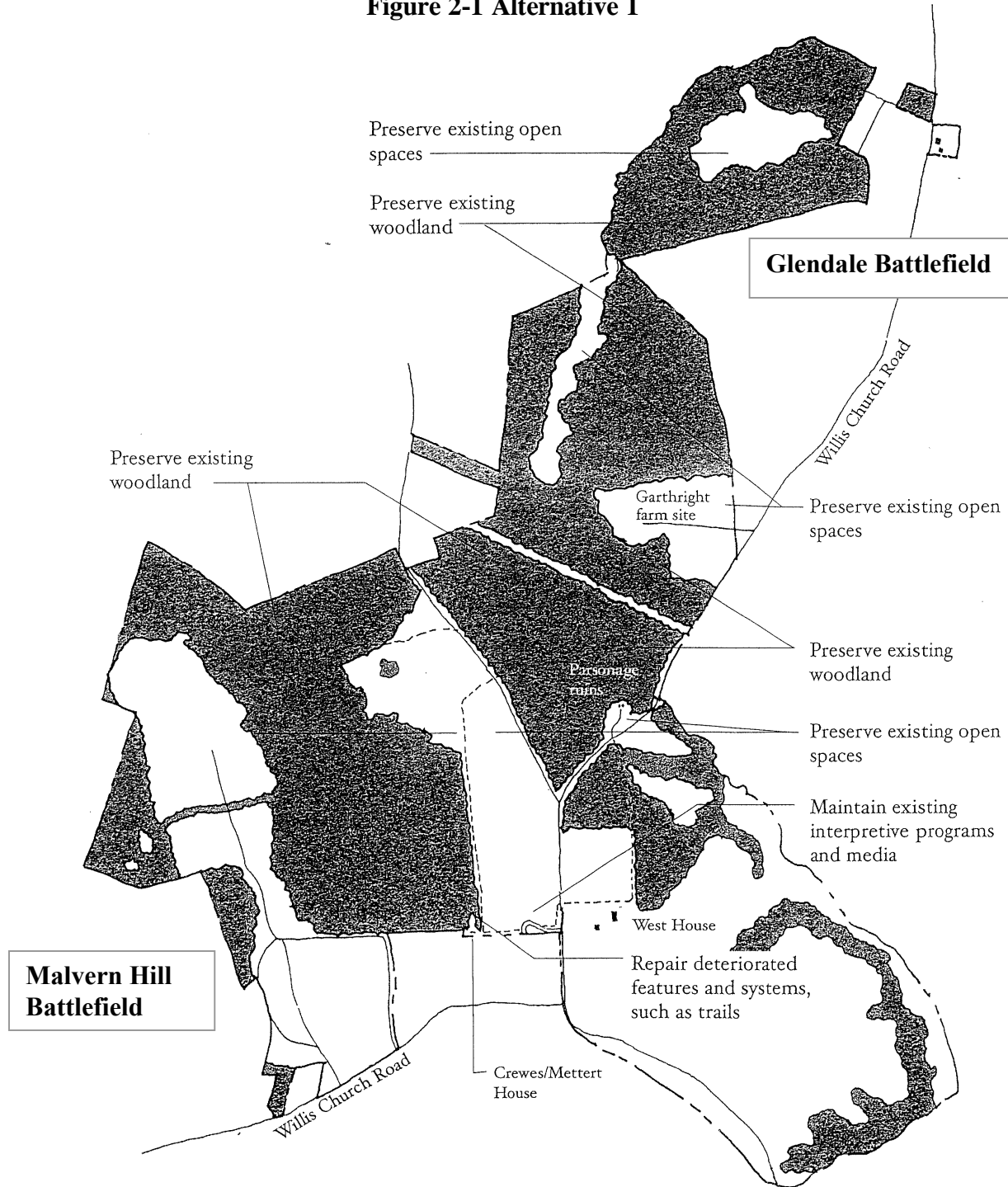


Figure 93. Alternative 1: Preserving Existing Conditions ("No Change").

Key to symbols:
 ▲ Auto tour pull-off
 ↗ Orientation of views

Alternative 2 – Battlefield as Part of a Landscape Network.

This rehabilitation alternative would focus on enhancing the current auto tour route in the project area. Interpretation and changes to the landscape would be emphasized from the vantage point of the road. This alternative would emphasize interpretation of views and viewsheds, patterns of spatial organization, land uses, and landform and topography associated with troop movements and combat tactics, in order to communicate strategies used during the historic battles. Designated vehicle pulloffs would be the site of more extensive interpretation by means of exhibits, maps, or pamphlets. Existing interpretive features would be also be used under this plan. Short spur trails would lead to special sites such as the Parsonage and Crewes/Mettert House. NPS would maintain and enhance the visitor contact facility at Glendale National Cemetery and would create vehicle pulloffs at the following places:

- north of the project area to interpret the Battle of Glendale
- at Willis Methodist Church
- at the C. Garthright farm site
- at the Parsonage ruins
- at Crewes/Mettert House
- at Crewes Channel

To approximate the historic spatial organization of the project area, NPS would retain contributing woodlands that are visible from the auto route and that contribute to interpretation. Non-contributing woodlands would be removed and replaced with warm season (native) grasses. NPS would retain woodlands on drainageways and on side slopes along streams, particularly on steep slopes with erodible soils. NPS would also retain woodland screening of areas intended for future parking areas and pulloffs; woodland buffers between open fields and developed areas not currently administered by NPS would also be maintained. Some areas that are currently open fields would be allowed to revert to forests.

NPS would allow current agricultural leases to expire and then convert lands that are currently cropped to growing warm season grasses. During the remaining years of the existing leases, NPS would encourage the planting of crops that would not obstruct the interpretive view, such as wheat, soybeans, and oats.

Figure 2-2 Alternative 2

GLENDALE AND MALVERN HILL UNITS, RICHMOND NATIONAL BATTLEFIELD PARK CLR & ARCHEOLOGICAL INVENTORY

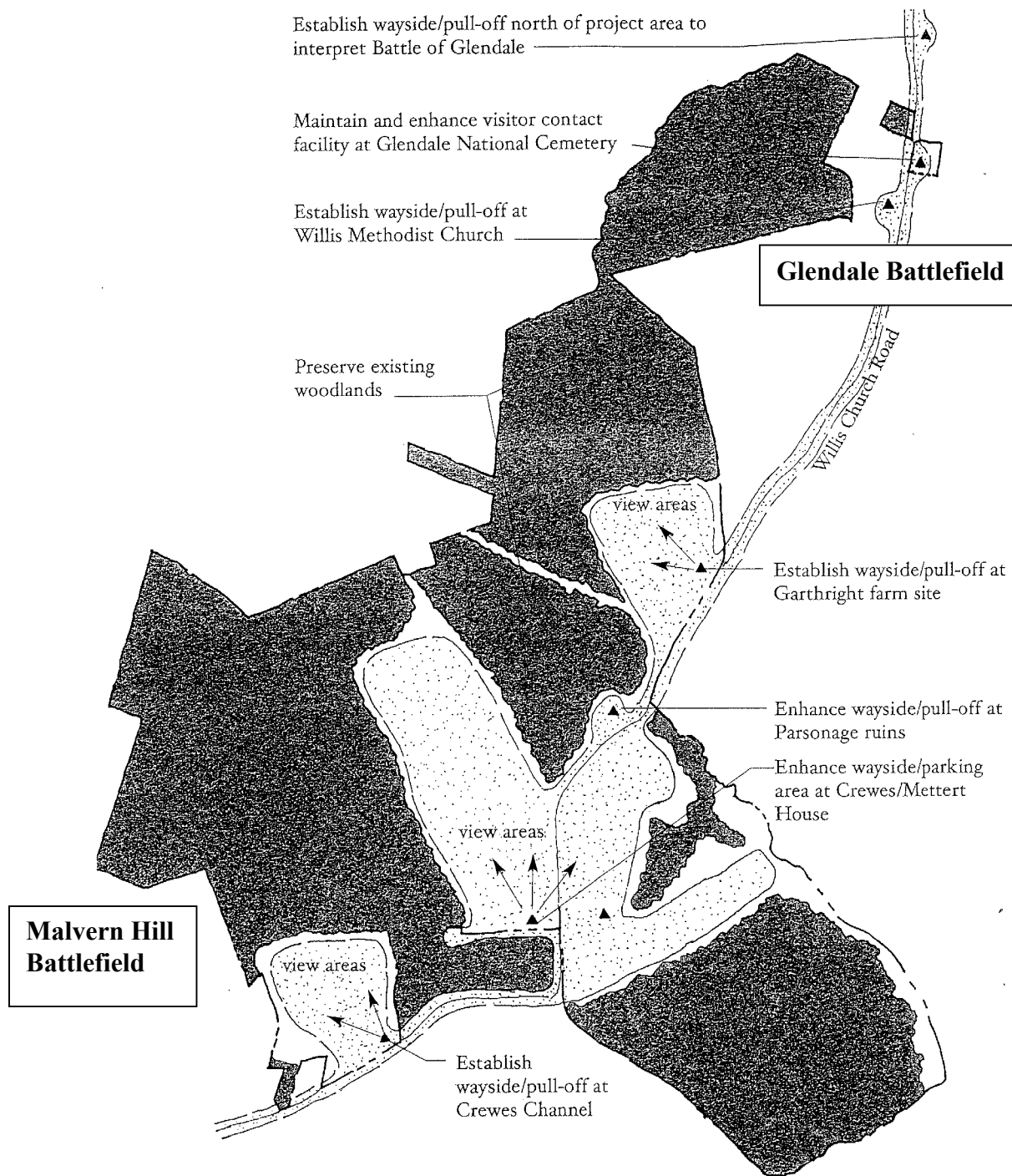


Figure 94. Alternative 2: Battlefield as Part of a Landscape Network.

Alternative 3 – Re-establish Spatial Patterns and Important Features of the 1862 Battlefield Scene.

This alternative would re-establish, to the extent possible, the character of the 1862 landscape throughout the project area. The focus would be on landcover, especially spatial organization and the composition of woodlands and open areas. To the degree feasible, historic landscape features such as former farm complexes and circulation systems would be identified; limited re-establishment of these missing landscape features would occur, depending on available evidence and funding. Re-establishment of 1862 patterns of spatial organization would also be limited by the development of site access improvements including automobile pulloffs and interpretive hiking trails. Trails would provide a variety of challenge levels and would provide access to varied battlefield sites. Fig 2-3 shows this alternative.

Figure 2-3 Alternative 3

GLENDALE AND MALVERN HILL UNITS, RICHMOND NATIONAL BATTLEFIELD PARK CLR & ARCHEOLOGICAL INVENTORY

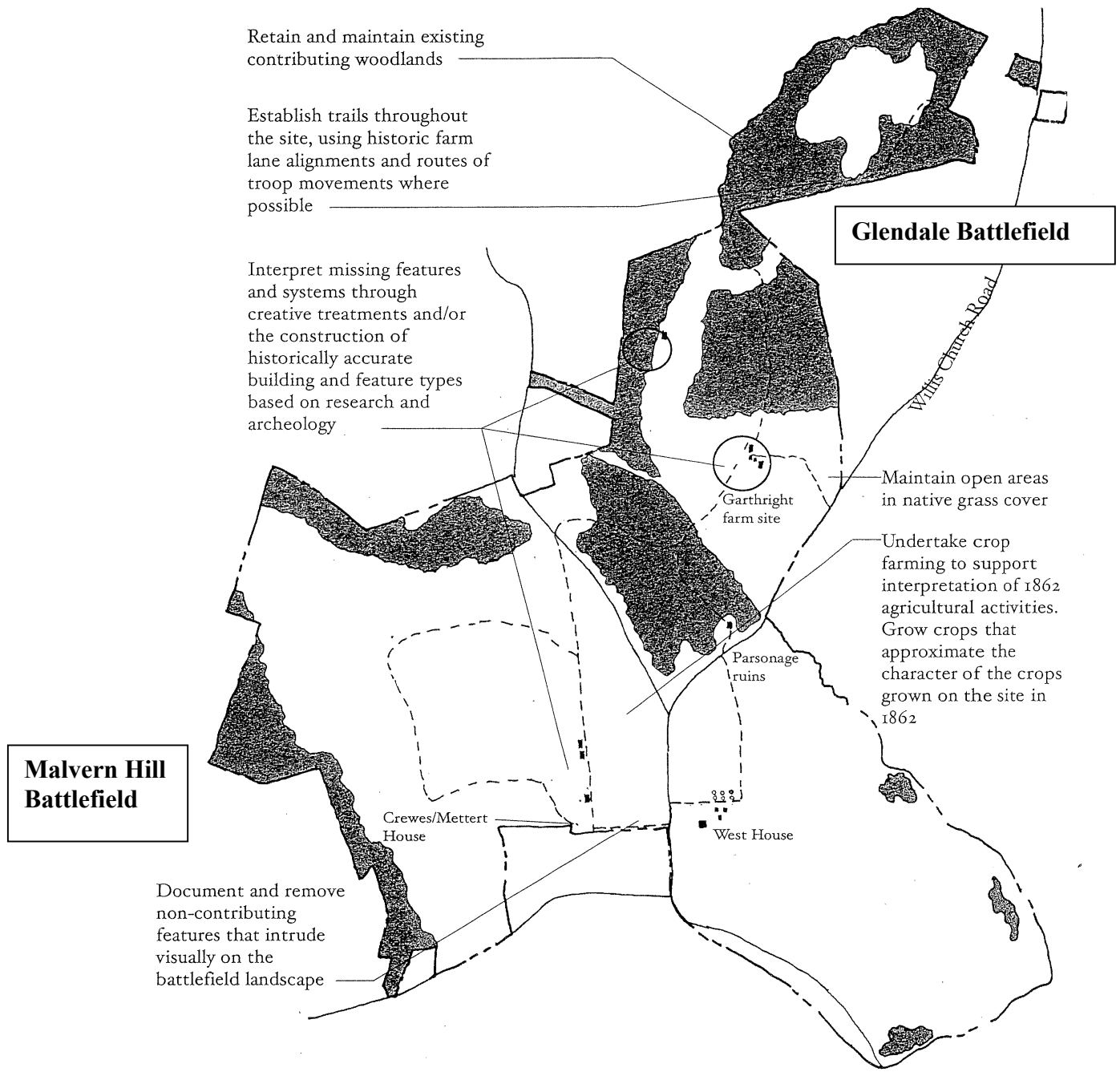


Figure 95. Alternative 3: Reestablish Spatial Patterns and Important Features of the 1862 Battlefield Landscape.

- Key to symbols:
- ▲ Auto tour pull-off
 - ↖ Orientation of views
 - Buildings and structures

Alternative 4 –Battlefield as Part of a Landscape Network that Includes an Internal Trail System for Interpretation and Recreation.

This would be a combination of some elements of Alternatives 2 and 3, and would thereby provide two interpretive options to visitors: an internal trail system and a series of auto pullouts along main roadways. Therefore, this alternative would involve three groups of actions, summarized below and depicted in Fig 2-4

- Actions to improve visitor access to the battlefield. This group of actions consists of:
 - Establishment of 7 new pullouts for visitor vehicles. Each such pullout would be less than ¼ acre, i.e. about 100 ft x 100 feet and would accommodate less than a dozen vehicles. It would be sited either to give visitors an immediate view of the battlefield, or else at a trail leading through the battlefield. The locations for these pullouts would be the same as those under Alternative 2:
 - at the edge of Fuqua field at Glendale
 - at Willis Methodist Church
 - at the Parsonage ruins
 - along Carter's Mill Road
 - at Malvern Hill Overlook
 - at West House property
 - at Crewes Channel

There would be interpretive signs at the pullouts.

- Creation of a series of about 10 miles of interpretive footpaths through and around the battlefield. Included along the trails will be bridges and raised wooden walkways over streams and wetlands.
- Actions to enhance the visitor experience by presenting a more nearly accurate battlefield appearance. This group consists of:
 - Clearing a total of about 70 acres of generally level woodland, in several separate segments.
 - Thinning, rather than clearing, another roughly 15 acres of steeply sloped woodland, to avoid destabilizing the slope.
 - Establishing warm season grasses on the cleared wooded areas and on several hundred acres currently leased for agricultural production. Agricultural leases would be allowed to expire.
 - Removing a post-Civil War metal barn near the West house and an interpretive sign structure at Malvern Hill
 - Re-establishing an orchard (perhaps apple) on about 1 acre near the West house
 - Re-establishing historic (rail) fencing pattern in several segments of about 1-200 meters along existing roadways.

- Providing interpretive materials, such as a building outline, of the slave quarters associated with the Crewes/Mettert house, if sufficient data and documentation become available.
- Actions to enhance protection of the natural resources within the Malvern Hill unit. This group consists of:
 - Establishment of riparian buffers around streams and wetlands throughout Malvern Hill/Glendale.
 - Control of invasive plant species, especially in newly cleared areas. This control will involve a combination of reseeding with desired species, mechanical removal of undesired species, and chemical control (i.e. the selective use of herbicides) when necessary.

Alternative 4 is the Park Service's preferred alternative because it would provide the greatest enhancements to the visitor experience. Therefore, this is the course of action which NPS proposes to take. As indicated earlier, this EA provides input to the Park Service's decision on whether to go ahead with this proposed action, or to choose instead another course of action.

Figure 2-4 Alternative 4

GLENDALE AND MALVERN HILL UNITS, RICHMOND NATIONAL BATTLEFIELD PARK CLR & ARCHEOLOGICAL INVENTORY

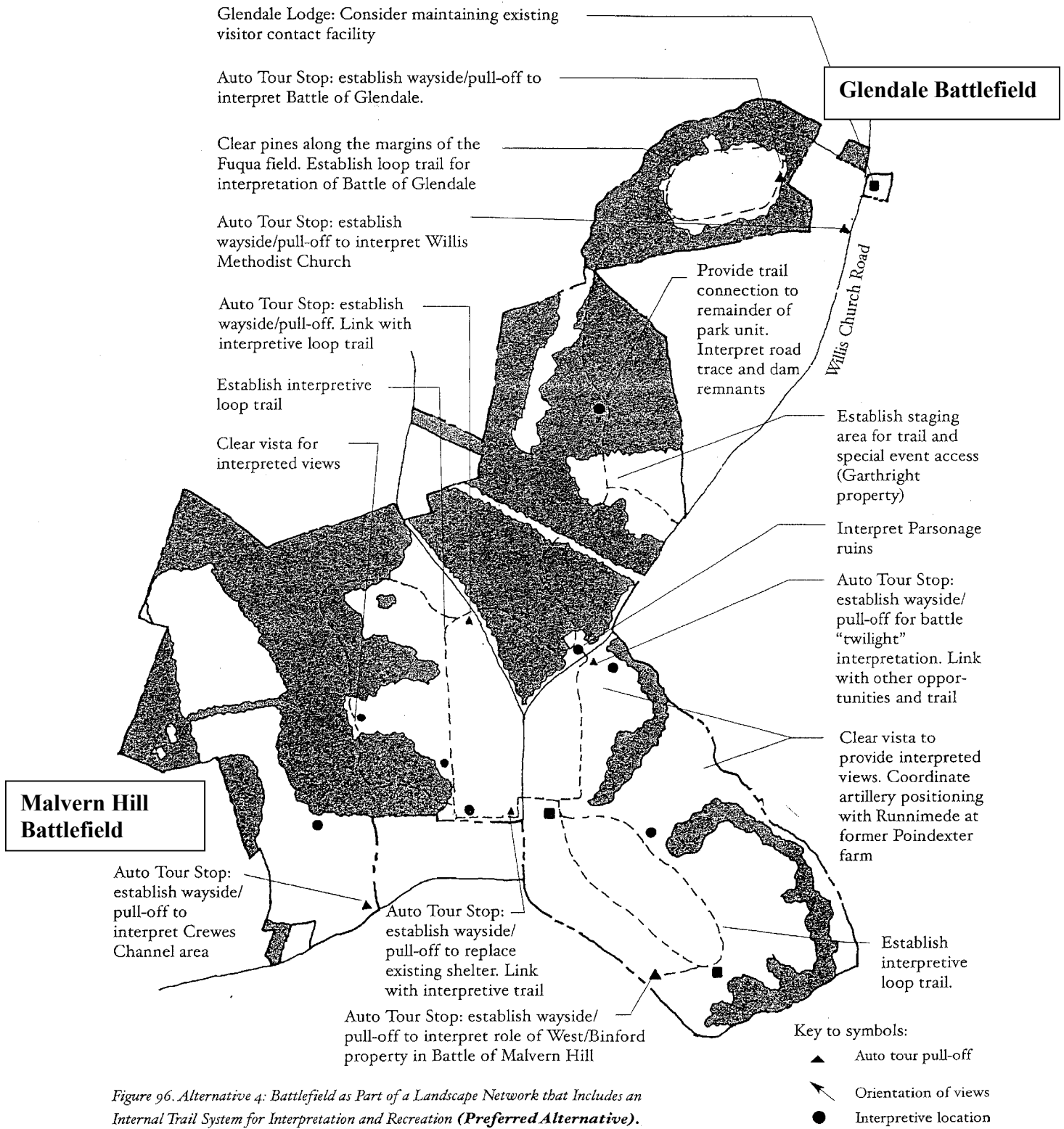
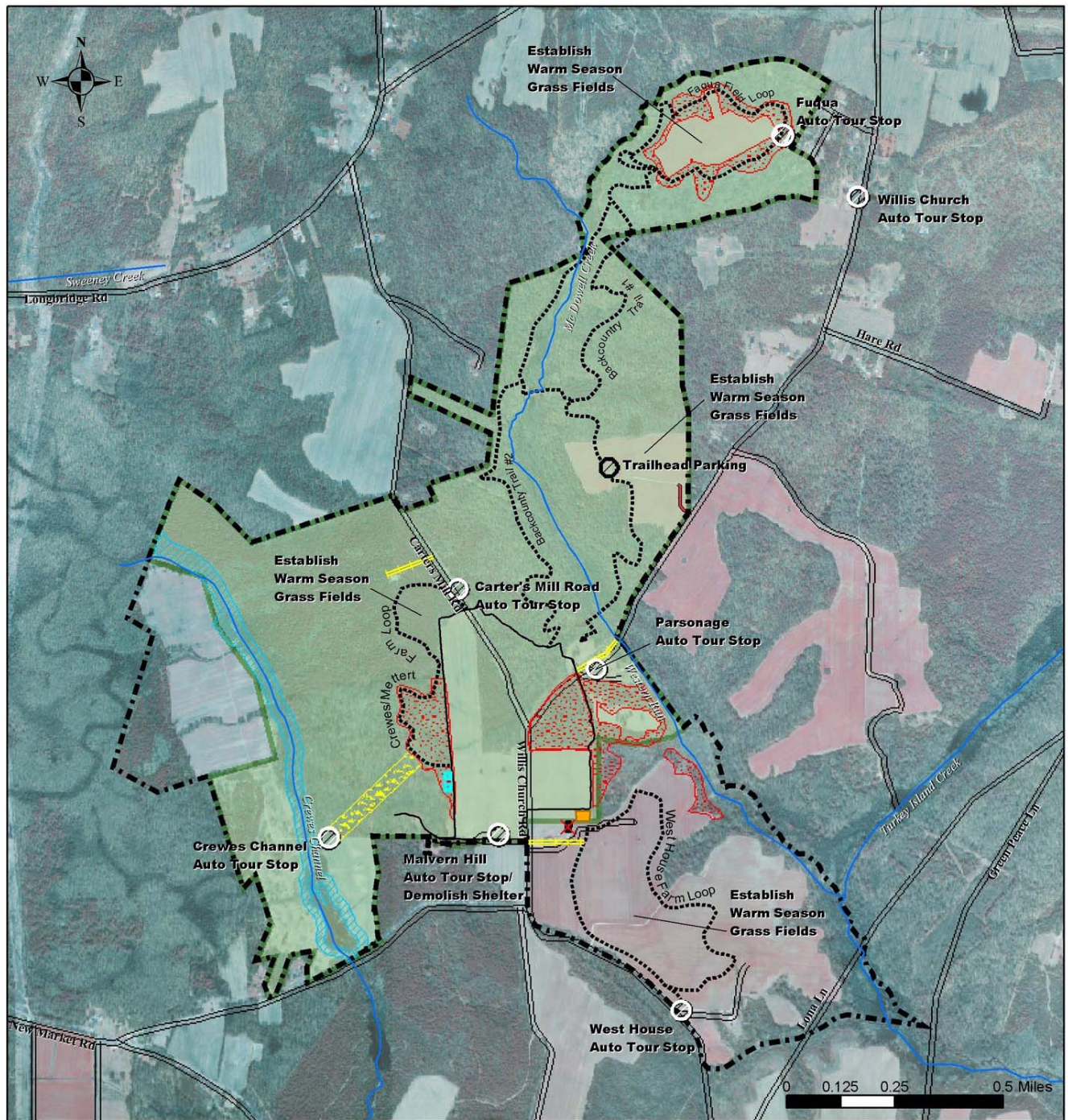


Figure 96. Alternative 4: Battlefield as Part of a Landscape Network that Includes an Internal Trail System for Interpretation and Recreation (Preferred Alternative).

Figure 2-4b Alternative 4



Legend		
Richmond National Battlefield Park (RNBP) Boundary (Glendale and Malvern Hill Units as of November 2003)	Re-establish Orchard	<p>Index Map</p> <p>RNBP Glendale and Malvern Hill Units</p> <p>Sources: USGS DOQQ, 1994; NPS, 2003; JMA, 2003</p>
Project Boundary	Re-establish Historic Fencing Patterns	
Roads	New Trails	
Preservation Treatments		
Clear Woodland to Establish 1862 Field Pattern /Remove Non-contributing Vegetation	Existing Loop Trail	
Establish Riparian Buffer	Auto Tour Stop	
Thin Woodland for View Corridor	Trailhead/ Parking Area	
Interpret Slave Quarters	Demolish Barn	
	New Entrance	

2.3 COMPARISON OF THE ALTERNATIVES’ IMPACTS

In keeping with NPS NEPA guidance, this EA analyzed the potential impacts of the Park Service’s proposed action, along with the impacts of the “No Action” alternative. Section 3.0 presents the detailed results of these analyses; Table 2-1 summarizes them.

Table 2-1 COMPARATIVE SUMMARY OF IMPACTS				
Resource Area	Alternatives			
	1. Preserve Existing Conditions (No Action)	2. Landscape Network	3. Re-establish Spatial Patterns	4. Landscape Network and Trails (Proposed Action)
Air Quality (see section 3.2)	No change to existing resource conditions	None of the action alternatives would generate any air pollutants in amounts sufficient to degrade existing air quality		
Archeological Resources (see section 3.3)		All of the action alternatives pose the potential for adverse effects on archeological resources. Alternative 2 poses the least, while alternative 3, with its extensive clearing and facility construction, poses the greatest. In any case, NPS would employ a series of active measures to avoid such effects. Upon concurrence between NPS and the State Historic Preservation Officer, these measures are expected to be effective in avoiding significant adverse effects.		
		Least risk	Greatest	Intermediate
Cultural Landscapes (see section 3.4)		As NPS intends, each of the action alternatives would have a beneficial long-term effect on the cultural landscape of the Malvern Hill/Glendale. Alternative 3 would involve the most extensive rehabilitation of the landscape, while Alternative 2 would provide very limited rehabilitation. Alternative 4 would involve an intermediate amount of rehabilitation of the cultural landscape.		
Energy (see section 3.5)		None of the action alternatives would significantly affect energy supply or demand at any scale.		

Table 2-1 COMPARATIVE SUMMARY OF IMPACTS				
Resource Area	Alternatives			
	1. Preserve Existing Conditions (No Action)	2. Landscape Network	3. Re-establish Spatial Patterns	4. Landscape Network and Trails (Proposed Action)
Hazardous Waste/Hazardous Materials (see section 3.6)		It is not reasonably foreseeable that any of the action alternatives would either generate or disturb hazardous waste that would lead to an uncontrolled release to the environment		
Hydrology and Water Quality (see section 3.7)	Potential for continued erosion and sedimentation into Crewes Channel	Under all of the action alternatives, NPS would effectively limit sedimentation into surface waters, but Alternative 3 would involve clearing steep slopes that would pose significant potential for erosion and sedimentation		
		Least risk	Greatest	Intermediate
Land Use (see section 3.8)	No change in existing conditions	No change in land use associated with any of the action alternatives would directly, indirectly or cumulatively, lead to conflict with land use plans or policies of the Park Service or surrounding jurisdictions.		
Noise (see section 3.9)		Construction and clearing activities under any of the action alternatives may cause very localized, very short duration annoyance from equipment noise to residents of a few homes and to some off-season Park visitors. Because of the short duration and limited number of people exposed to this annoyance, this adverse effect would not be significant under any of the action alternatives.		
Protected Species (see section 3.10)		None of the action alternatives are likely to adversely affect any Federally or State protected plants or animals.		

Table 2-1 COMPARATIVE SUMMARY OF IMPACTS				
Resource Area	Alternatives			
	1. Preserve Existing Conditions (No Action)	2. Landscape Network	3. Re-establish Spatial Patterns	4. Landscape Network and Trails (Proposed Action)
Public Health and Safety (see section 3.11)		None of the action alternatives pose a reasonable potential for increasing the risks to public health and safety.		
Socioeconomics/ Environmental Justice (see section 3.12)		None of the alternatives would have anything other than minor social or economic effects, nor would any adverse impacts be disproportionately borne by low-income or minority members of the community.		
Soils (see section 3.13)		The action alternatives would largely prevent soil erosion, but Alternative 3 would pose the greatest potential for soil erosion, particularly into Crewes Channel. Alternative 1 would continue exposing Crewes Channel to current erosion, while Alternative 2 would pose little increased risk of soil erosion. Alternative 4 involves a moderate increase in the risk of soil erosion over current conditions, but it also involves the creation of a new riparian buffer to protect Crewes Channel.		
		Least risk	Greatest	Intermediate
Traffic (see section 3.14)		Short term increases in traffic during construction and clearing would clearly be insignificant. Potential cumulative traffic increases if SR 156 were designated a Scenic Byway are not likely to substantially change the flow of traffic.		
Utilities (see section 3.15)		None of the alternatives would affect utilities		

Table 2-1 COMPARATIVE SUMMARY OF IMPACTS

Resource Area	Alternatives			
	1. Preserve Existing Conditions (No Action)	2. Landscape Network	3. Re-establish Spatial Patterns	4. Landscape Network and Trails (Proposed Action)
Vegetation and Wildlife (see section 3.16)	Change in forest habitat values as existing stands mature or are naturally disturbed	All of the action alternatives, with the possible exception of Alternative 2, would involve a net loss of forest habitat, including several tens of acres of mature mixed Atlantic Coastal Plain hardwood forest relatively free of invasives. Such habitat is no longer common in Virginia. An increase in grassy field habitat would only partially offset the loss of forest habitat. All of the action alternatives could increase the potential for further establishment and encroachment of invasive species. The action alternatives differ in the degree of these impacts as they differ in the areas involved. Under Alternative 2, several large sections of current fields could be allowed to revert to woodlands, possibly leading to a long-term net gain in forest habitat.		
		Least loss and risk	Greatest	Intermediate
Visitor Use and Experience (see section 3.17)	No change in existing conditions	The intent of all of the action alternatives is to enhance the visitor experience. The alternatives differ in the degree of the anticipated enhancements, with the proposed action likely to produce the greatest overall enhancement to the visitor experience. None of the action alternatives is likely to result in a substantial increase in the overall number of visitors.		
		Least enhancement	Intermediate	Most
Wetlands, Floodplains (see section 3.18)	Continued threat to Crewes Channel wetlands unprotected from sedimentation by a riparian buffer	All action alternatives pose the potential to directly or indirectly damage wetlands, but the protective measures that NPS will use can reasonably be expected to avoid these effects. Alternative 2 poses the potential for indirect effects to wetlands from upslope woodland clearing, while Alternative 3 poses the potential to damage wetlands directly during trail construction as well as indirectly from extensive woodland clearing. Alternative 4 involves both types of potential effect, but with less potential clearing involved.		

Table 2-1 COMPARATIVE SUMMARY OF IMPACTS				
	Alternatives			
Resource Area	1. Preserve Existing Conditions (No Action)	2. Landscape Network	3. Re-establish Spatial Patterns	4. Landscape Network and Trails (Proposed Action)
		Least risk	Most	Intermediate

2.4 ENVIRONMENTALLY PREFERABLE ALTERNATIVE

As a matter of policy, the National Park Service identifies the environmentally preferred alternative(s) for each of its proposed projects. This is the course of action that would best fulfill the national environmental policy goals as expressed in NEPA (Section 101 (b)), and presented in the sidebar.

The National Environmental Policy Goals

- 1) Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- 2) Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- 3) Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- 4) Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- 5) Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life’s amenities; and
- 6) Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

In essence, the environmentally preferable alternative would be the one(s) that “causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources” (DOI, 2001).

In this case the no-action alternative (Preserve Existing Conditions) virtually by definition, neither enhances nor damages resources. The remaining alternatives all enhance cultural resources and the visitor experience while also having adverse effects on natural resources. Determining the environmentally preferable alternative therefore is a matter of identifying the greatest (cultural resource and visitor experience) benefits at the least (natural resource) cost. The EA team used a pair-wise comparison process, as described below.

No-Action Compared to Proposed Action

The Malvern Hill/Glendale is a unique cultural resource, not just because of its specific historical significance, but also because it is exceptionally free of modern encroachment. Today, a visitor to the site, especially to Malvern Hill itself, can look over the battlefield with almost nothing in view that could not have been there in July 1862. The proposed action would remove modern structures such as a metal barn, an interpretive sign/shelter, along with stands of woodland that make the battlefield appear far narrower than it actually was. The proposed action would also add a nearby orchard in roughly the same location as the one in 1862. The visitor would therefore be able to more fully appreciate the reason why the Confederates' battle tactic involved a charge uphill across broad open ground: unlike today, there were no woodlands through or behind which an advance could have been made. Other aspects of the proposed action would further enhance the visitors' appreciation of what occurred, where and why, by providing additional access, new vistas, trails and interpretive materials.

These environmental benefits would come at the cost of the loss of about 70 acres of mature, mixed hardwood forest. This type of habitat supports a diverse array of trees, other plants, birds and other wildlife. These stands also are relatively free of non-native invasive plant species. These stands, therefore are valuable, but they are not unique.

In light of these considerations the National Park Service believes that the proposed action represents a better overall achievement of the national environmental policy goals than No-Action.

Proposed Action Compared to Alternative 2, Landscape Network

Alternative 2, which emphasizes the interpretive opportunities of an enhanced auto tour and limited woodland clearing, would provide some cultural resource and visitor experience benefits, but these would be decidedly less than those offered by the proposed action.

The natural resource cost of this alternative, however, would be some loss of natural resource values. Therefore, because it offers lower benefits at almost the same cost, this alternative is not as environmentally preferable as the proposed action.

Proposed Action Compared to Alternative 3, Re-establish Spatial Patterns

Alternative 3 would seek to further enhance the cultural resource and visitor experience values with more extensive rehabilitation of the historic landscape. However, this would come at the cost of substantially greater loss of natural resource values through more extensive clearing. This alternative therefore offers a small (cultural resource/visitor experience) gain compared to the

proposed action, at a much higher (natural resource) cost. Therefore, it is not as environmentally preferable as the proposed action.

The Environmentally Preferable Alternative

Based on the reasoning presented above, NPS believes that Alternative 4, the proposed action, represents the optimum available combination of environmental benefits and costs, and best helps fulfill the national environmental policy goals.

3.0 ENVIRONMENTAL ANALYSIS

This chapter presents the results of the EA team’s analysis of potential environmental impacts, along with the information about the existing conditions that is relevant to understanding the predicted impacts. In compliance with CEQ and NPS guidance on NEPA documents, information about existing resource conditions that is not useful to the appreciation of the impacts, is not included. In conducting the analysis, the EA team used the cause-effect diagram as presented earlier in Fig 1-3 as the framework for the study. That figure contains cross-references to sections of this chapter.

3.1 IMPACT SIGNIFICANCE GUIDELINES

As indicated in Chapter 1, a key function of an EA is to determine whether a proposed action would have any significant effects, or impacts, on the environment. The CEQ’s NEPA regulations indicate that determining whether an effect is significant involves considering the “context” (the setting) and the “intensity”, or severity of the effect. For a fairly localized action such as this, the appropriate context for determining significance will vary for different resources. The severity of an effect involves several components, including the spatial extent, the magnitude, the duration, and the likelihood. Severity is also determined by:

- Potential to affect public health
- Proximity to unique cultural or ecological features
- Uncertainty or controversiality of the potential effects
- Precedent-setting potential
- Linkage to other actions that could together cause significant effects (“cumulative” impacts)
- Potential to affect culturally, historically, or scientifically significant resources
- Potential to affect species protected by the Endangered Species Act
- Potential to violate a Federal, State or local law or regulation on the environment.

Under the NEPA regulations, a specific effect may be significant even if it has both adverse and beneficial aspects and the agency believes the net result is beneficial.

Based on the consideration of these factors, the EA team formulated a set of significance guidelines, as shown in Table 3-1. The team used these to help determine whether any of the direct, indirect or cumulative environmental impacts predicted in the analysis would constitute significant adverse impacts. If the proposed action were to have significant adverse impacts, NPS would then have to conduct a more detailed analysis of impacts, and prepare an Environmental Impact Statement.

TABLE 3-1 IMPACT GUIDELINES	
Resource Area (in Alphabetical Order)	Characteristics of Significant Adverse Impacts
Air Quality	Long term pollutant emissions would be greater than or equal to 250 tons/year, and would so degrade air quality in the project area and in the immediate surrounding area that Clean Air Act standards would be violated
Archeological Resources	Disturbance of a site(s) would diminish the significance or integrity of the site(s) to the extent that its eligibility for the National Register of Historic Places is jeopardized or negated.
Cultural Landscapes	Alteration of a characteristic defining pattern(s) or feature(s) of the cultural landscape to the extent that it is no longer eligible to be listed in the NRHP.
Energy	Directly or indirectly accelerate, by more than roughly 50%, the increase in demand for non-renewable energy resources in the county.
Hazardous Materials/Hazardous Waste	Generation of new hazardous waste or disturbance of buried hazardous waste, leading to uncontrolled release of such contamination to the environment.
Hydrology and Water Quality	Chemical and physical water quality characteristics, or quantities and availability of water would be so altered as to interfere with the existing or reasonably foreseeable human uses of that water, or with the ecosystem functions which depend on that water.
Land Use	Changes in land use caused, directly or indirectly by the action, would be incompatible or inconsistent with existing land use plans of the Park or the County.
Noise	Long term introduction of persistent or recurring human-caused noise at levels likely to produce annoyance to a major proportion of visitors or nearby residents.
Pest and Invasive Species	Establishment of invasive species known to adversely affect similar ecosystems; extensive enhancement of habitat for invasive or pest species already present
Protected Species	Populations of protected species would be directly killed or their habitats so damaged that the population's continued viability is jeopardized.
Public Health and Safety	Substantially increased risk of traffic accidents, pedestrian-vehicle accidents or other hazards
Socioeconomics/ Environmental Justice	Action would cause a substantial (1%) decrease in the local community's employment or income Significant adverse impacts of the action would be disproportionately borne by low-income or minority segments of the community
Soils	Long term (more than about 5 years) change in soil structure, productivity, stability or permeability on roughly ten or more acres such that it can no longer support the existing vegetative cover.

TABLE 3-1 IMPACT GUIDELINES	
Resource Area (in Alphabetical Order)	Characteristics of Significant Adverse Impacts
Traffic	Increase in traffic on local roads sufficient to change the road's Level Of Service.
Utilities	Directly or indirectly increase demand for utilities service to such a degree that existing infrastructure would require major expansion.
Vegetation	Long term (more than about 5 years) change from a relatively scarce and valuable type of vegetative community to a relatively abundant one such that a major portion (roughly 10%) of the scarce community type in the project area and its surrounding area is lost.
Visitor Use and Experience	Most visitors would notice change and would consider it as detracting from their experience.
Visual Resources	Readily noticeable disruption of appearance of culturally significant landscapes, with anachronistic or other out-of-place elements.
Wetlands, Floodplains	The size and structure of a wetland or floodplain landform would be so altered for the long term as to interfere with the existing ecological and hydrological functioning of the feature.
Wildlife	Loss of a major portion (roughly 10%) of the habitat needed by the existing native wildlife of the project area to maintain a healthy functioning ecological system.

As discussed above, the No-Action alternative (Preserve Existing Conditions), would generally not cause any changes in any existing resource conditions. Where changes in the existing conditions are reasonably foreseeable under the No Action approach, they are discussed in the appropriate section. In many resource areas, the effects of the action alternatives would be the same or closely similar, and those sections discuss the action alternatives as a group. Where there are relevant differences in the impacts among the alternatives, they are discussed separately.

The following sections discuss potential direct, indirect and cumulative impacts along with relevant information on existing resource conditions. Where warranted, resource sections describe additional steps that would be taken to lessen adverse impacts. Each section begins with an *italicized summation* of the impact prediction.

3.2 AIR QUALITY

None of the action alternatives would generate any air pollutants in amounts sufficient to degrade existing air quality.

As shown in Figure 1-2 B and C, the potential effects on air quality could be caused by:

- Pollutant emissions from equipment used for construction or logging
- Pollutant emissions from increased visitor traffic

As with all internal combustion engines, equipment used in creating pullouts and trails, and in clearing woodlands will emit some air pollutants such as nitrogen oxides and particulate matter (soot). Even with a conservatively large estimate of 20 trucks, bulldozers, saws etc. operating continuously 8 hrs a day for two months, EPA's engine emissions factors (EPA 1998) indicate that the total amount of pollutants emitted would not exceed 2 tons for any of the regulated engine pollutants. Under the regulations for the Federal Clean Air Act, at 58 CFR 63214, Federal actions that emit less than 100 tons of these pollutants are considered to be consistent with the law's requirements to maintain clean air quality.

Fine dust stirred up by vehicles can also be a pollutant. The same 100 tons standard applies here. Given that the soil in the project area is sandy and largely coarse-grained, only a small fraction of it could become suspended as fine particulates in the air, even with extensive vehicle traffic on a bare surface. The small amount of construction and timbering traffic may therefore generate some dust plumes, but the amount, while not precisely predictable, could not conceivably approach any totals (100 tons of very fine suspended particulates) that could constitute a significant air quality impact.

Cumulative Impacts

As discussed in Section 3.17, there are no planned or proposed development or construction projects in the surrounding area that could cumulatively (additively) contribute to air quality impacts.

RNBP has recently revised its Fire Management Plan (NPS 2003a). Under that plan, NPS may use prescribed fire (controlled burns) to prevent the buildup of excessive burnable vegetation. The smoke from such prescribed fires can have short term, local effects on air quality. Therefore, NPS will coordinate any planned prescribed fires with its clearing operations to prevent cumulative air quality impacts.

3.3 ARCHEOLOGICAL RESOURCES

This section focuses on known and unknown buried artifacts and other evidence of past human activity. The next section, on Cultural Landscapes, discusses the aboveground features that make Malvern Hill/Glendale a significant cultural landscape.

All of the action alternatives pose the potential for adverse effects on archeological resources. Alternative 2 poses the least, while alternative 3, with its extensive clearing and facility construction, poses the greatest. In any case, NPS would employ a series of active measures to avoid such effects. Upon concurrence between NPS and the State Historic Preservation Officer, these measures are expected to be effective in avoiding significant adverse effects.

As Fig 1-3 B-C show, the action alternatives have the potential to damage buried archeological resources from:

- Construction of pullouts
- Construction of trails
- Clearing/thinning of wooded stands

- Subsequent erosion of previously stable overlying soil

The potential for these ground-disturbing activities to damage archeological resources exists because of the known history of the area (discussed in the next section), and because archeological surveys have identified several dozen sites, within the project area, ranging from prehistoric to the 20th Century. According to the Cultural Landscape Report (NPS, 2003) four different but interrelated surveys have identified thirty-eight archeological sites within the Glendale and Malvern Hill Units of the RBNP. Of these twenty-seven are historic and eleven are prehistoric. Twenty-one additional locations with high probability for containing pre-historic sites were also identified. There are known sites within or near areas slated for clearing or other ground-disturbing activities. The locations of these sites are not disclosed to protect these resources from potential theft, vandalism or other loss. Other sites, not yet found in the surveys conducted so far, may well exist in areas that would be disturbed, and could therefore be damaged

Therefore, NPS will use the following procedures to minimize the potential for damaging known and unknown archeological resources:

- NPS will include an archeologist and historic landscape architect in the detailed implementation planning for any ground disturbing action.
- NPS will conduct detailed archeological subsurface testing at each specific site to be disturbed under any of the actions.
- To the extent possible, all ground disturbing activities will be shifted if needed to avoid any identified resources. Segments of trails, for example, may be re-aligned. In wooded areas to be cleared, NPS may choose to leave a specific stand of trees intact where appropriate to preserve the integrity of buried archeological resources.
- During all ground disturbing activities, a qualified archeologist will be on-site to monitor the actions and will have the authority to halt the action as needed if archeological resources are encountered.
- Should unexpected resources be discovered, NPS will assess their significance before determining how to proceed. Available courses of action in such a situation would include:
 - cessation of the construction action until the site can be properly documented and excavated
 - Relocation/realignment of the action to allow the archeological materials to remain in place
- Conduct clearing operations with minimum ground disturbance by:
 - Minimizing use of heavy vehicles
 - Restricting operations to periods when soil is firm
 - Removing felled trees without dragging them
 - Cutting, not uprooting stumps
 - Stabilizing soil and minimizing erosion after clearing, such as by planting ground cover promptly, but without disturbing the bare surface extensively to do so.

Given the historical richness of the area, the construction and the clearing actions are likely to encounter archeological resources. Using the procedures described above, NPS will minimize, but is not likely to completely avoid, effects on these resources. In conjunction with this EA process, NPS is also conferring with the Virginia State Historic Preservation Office (SHPO), as required under the National Historic Preservation Act (see Appendix). It is NPS' intent to formalize an agreement with the SHPO under which NPS agrees to conduct its actions for this project in accordance with the procedures outlined above, and/or other procedures to be developed in consultation with the SHPO. In return, the SHPO would determine that the proposed actions would not be considered to have adverse effects on archeological resources.

Somewhat offsetting the potential for damage to archeological resources is the potential increase in our knowledge of the history of the area, from prehistoric to 20th Century times. However, this is not an objective of the project, and there is no certainty that any significant new findings would occur.

The several action alternatives differ in the extent of ground disturbing activity they would involve. Alternative 2, emphasizing somewhat improved vistas for an auto tour, would involve far less ground disturbance than Alternative 3's large scale clearing for more thorough rehabilitation of battlefield conditions. Alternative 4 involves an intermediate amount of ground disturbance. Although the impact prevention procedures NPS has incorporated would be used under any of the action alternatives, the less ground disturbance there is, the less risk there is of affecting archeological resources. Therefore, although none of the action alternatives are expected to result in significant adverse effects, Alternative 2 would pose the least potential for any effect, Alternative 4 somewhat more, and Alternative 3 the greatest.

3.4 CULTURAL LANDSCAPES

As NPS intends, each of the action alternatives would have a beneficial long-term effect on the cultural landscape of the Malvern Hill/Glendale units. Alternative 3 would involve the most extensive rehabilitation of the landscape, while Alternative 2 would provide very limited rehabilitation. Alternative 4 would involve an intermediate amount of rehabilitation of the cultural landscape.

As Fig 1-3 C shows, the enhancement of the cultural landscape would be the result of:

- Clearing woods from areas that were open in 1862
- Establishing grassy fields in these locations to approximate their appearance in 1862
- Converting fields currently cropped with modern crops such as soybeans, to more historically accurate grassy cover

The Malvern Hill and Glendale landscapes today still preserve considerable historic value. The landscape and associated resources of the Malvern Hill area meet the requirements for listing under the National Register of Historic Places for two reasons:

- They are associated with events that have made a significant contribution to the broad patterns of our history (National Register Criterion A); and

- They have yielded or may be likely to yield information in prehistory or history (National Register Criterion D).

The site has significance at several different time periods, outlined below, under one or both of the above criteria.

Early Settlement of Virginia

The project area appears significant under Criterion A at the state or local level, for evidence of rural settlement patterns dating to the earliest existence of Henrico County, Virginia. The period of significance coincides with the earliest dates of European settlement. The Malvern Hill and Glendale landscapes reflect rural settlement patterns established in the mid 17th century surviving to the present time. These patterns include open agricultural fields, woodlots, irrigation systems, agricultural complexes and road networks.

Historical archaeological resources within the project area appear to be nationally significant under Criterion D, for their potential to yield information about the historical period coinciding with the battles of Glendale and Malvern Hill. In particular, excavation of two slave quarters associated with the Crewes/Mettert House has yielded information about Africa-American subsistence patterns during the Civil War.

Civil War and the Battles of Glendale and Malvern Hill

The 1993 Civil War Sites Advisory Commission's Report on the Nation's Civil War Battlefields identifies Glendale and Malvern Hill as among the 384 principal battles of the Civil War. Glendale is considered a Class B battlefield, meaning it is considered to have had a direct and decisive influence on the course of a campaign, and for representing one of the principal strategic operations of the war. Malvern Hill is considered a Class A battlefield; in addition to representing one of the principal strategic operations of the war, it is also recognized as having a decisive influence on a campaign and a direct influence on the course of the war. According to the Advisory Commission, since Class A and B sites are considered to have national importance, they should be the responsibility of Federal agencies as well as state and local governments and other agencies.

Conservation and Preservation Efforts Leading up to the Establishment of Richmond National Battlefield Park

Malvern Hill is considered to be significant under National Register Criterion A at the state level, for its association with early-twentieth century Civil War battlefield and historic preservation efforts. These efforts culminated in the establishment of RNBPP. In 1932, lands donate by the Richmond Battlefields Parks Corporation became Virginia's first state park. In 1934, the land was offered to the Federal government, and was accepted into the National Park system in 1944. Malvern Hill is significant as a component of this first state park in Virginia.

Cultural Landscape

The Battles of Glendale and Malvern Hill occurred in a landscape of natural and cultural features – such as ravines, field depressions, elevated ridges and “cliffs”, open fields, cut roads, cart paths, and drainage ditches – that played a determining role in the outcome of the fighting (JMA, 2003). The vegetation at the time of the battle was diverse, and included agricultural crops, fruit trees, vegetables, and naturally occurring woodland and wetland species. Cutting of timber, clearing of land, farming, and other human activities had greatly influenced the composition and extent of forest cover. At the time of the battles, three sites in the project area were apparently maintained as open space: at the Fuqua Farm, Garthright Farm, and between the Crewes/ Mettert and West and Binford farms.

Hydrology and water resources were also important feature of the battlefield landscape. Creeks in the vicinity of Malvern Hill lie in deep ravines, often surrounded by swampy woodlands. The Western Run, a branch of Turkey Island Creek, was at the time of the battle “bordered with marshes and tangled undergrowth”, according to contemporary accounts (NPS 2003). Such watercourses and the surrounding wetlands may have influenced the course of battle.

The Malvern Hill unit is distinctive in also being free of significant modern encroachment. At most locations, a visitor viewing the battlefield does not encounter modern towers, buildings, superhighways or other elements that would detract from the historic experience. Several current features, however, do detract from the ability to provide National Park visitors with a full appreciation of the significance of these landscapes. These features include:

- Extensive woodlands that were open fields in 1862. The presence of these woods not only visually blocks visitors views of the battlefield, but also interferes with their ability to understand why the fighting took place where and how it did.
- Modern crops such as soybeans on the agricultural lands. In the summer of 1862 tall grass-like crops such as corn and wheat gave these field a different “texture” and appearance than the vine-like soybean.

Under Alternative 1, Preserve Existing Conditions, NPS would undertake minimal actions to identify and protect cultural resources within the project area. Repair of deteriorated features and systems would occur and NPS would maintain existing interpretive programs and media. The remaining open areas would be kept open. These routine actions would neither degrade nor enhance the existing cultural landscape.

Under Alternative 2, Battlefield as Part of a Landscape Network, only a small amount (about 20 acres) of woodland would be cleared, and no change would be made in the crops. Under Alternative 3, Re-Establish Spatial Patterns and Important Features of the 1862 Battlefield Landscape, over 100 acres of woodland would be converted to grassy field, as would the existing cropped fields. Alternative 4 also involves the same cropland conversion, but only involves about 70 acres of clearing.

Alternatives 3 and 4 also both call for the removal of “non-contributing” structures that detract from the experience, notably a 20th century metal barn at the West House within sight of the Malvern Hill auto tour stop, and a 1960’s era interpretive sign and shelter at that stop.

Each alternative, therefore, would accomplish some degree of rehabilitation of the cultural landscape, with Alternative 2 accomplishing the least, and Alternative 3 the most.

3.5 ENERGY

None of the action alternatives would significantly affect energy supply or demand at any scale.

The proposed would require the consumption of a small amount, perhaps a few hundred gallons, of fuel for the logging and other equipment over the period of perhaps a few months. This would be an unknown, but clearly an extremely small, fraction of the fuel routinely consumed in Henrico County.

3.6 HAZARDOUS WASTE/HAZARDOUS MATERIALS

It is not reasonably foreseeable that any of the action alternatives would either generate or disturb hazardous waste that would lead to an uncontrolled released to the environment.

As shown in Fig 1-3B, the project could conceivably affect hazardous wastes by:

- Spilling petroleum fuel during construction or clearing operations
- Spilling herbicides during application
- Uncovering buried hazardous wastes

In regard to the potential for fuel or herbicide spills, both types of operations will only be carried out with strict Spill Prevention, Control and Countermeasures Plans in place. Such SPCC plans will require, for example, minimizing the amount of fuel or herbicide brought to the field, emphasizing that refueling, refilling should only be done off-site at a facility with spill control safeguards. Should a spill occur, NPS would have in place, and would implement, a prompt procedure for containing it and removing any contaminated soil as quickly as practicable.

In regard to inadvertent disturbance of buried hazardous waste during construction of pullouts or trails, this is extremely unlikely, because a records search via the Enviromapper GIS-supported database indicated no toxic releases, discharges or hazardous waste within the immediate vicinity or boundaries of the Malvern Hill and Glendale Units of the Park. Enviromapper is a comprehensive search tool that incorporates data from among other sources, EPA’s Comprehension and Liability Information System (CERCLIS). The Virginia Department of Environmental Quality GIS-supported Underground Storage Tank (UST) database revealed one instance appeared of a petroleum release in, or significantly near to, the park. This was at the Glendale National Cemetery on Feb 14, 1991. The case was closed Jan 22, 1993. There are currently no active cases documented by the UST database. Given the agricultural history of the area for the last several centuries, it is unlikely, although not impossible, that buried hazardous wastes could be encountered

during construction. In the event this does occur, a response plan as discussed above, would be in place and would be implemented.

3.7 HYDROLOGY AND WATER QUALITY

Under all of the action alternatives, NPS would effectively limit sedimentation into surface waters, but Alternative 3 would involve clearing steep slopes that would pose significant potential for erosion and sedimentation

The only potential for effect on water resources that the EA team identified was the potential for sedimentation resulting from erosion. Increased sedimentation adversely affects the stream flow patterns, the quality of water and its value as biological habitat. Therefore, to the extent that erosion would be prevented, adverse impacts to water resources would be prevented.

Section 3.13 presents a discussion of the potential for soil erosion.

Two perennially-flowing tributaries of Turkey Island Creek, Crewes Channel and Western Run drain the Malvern Hill unit. Crewes Channel drains a wetland area referred to as The Slash, which lies directly northwest of the study area. The watershed consists primarily of forest, agriculture and rural residential development areas (single family residences with at least one-acre lot sizes). Limited water quality data exist for these streams. Limited sampling of Crewes Channel and Western Run by United States Geological Survey in 2001-2002 indicated that these waters met all State water quality criteria except dissolved oxygen and pH, in Crewes channel. The low pH is likely due to natural acids draining out of the wetland, while the low dissolved oxygen may be due to naturally low flow conditions (NPS 2003c).

The areas surrounding Crewes Channel and Western Run are designated as Chesapeake Bay Preservation Areas as described under the Chesapeake Bay Preservation Act of 1988. These areas are composed of Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). Those lands, which have intrinsic water quality benefit, are designated as RPAs, such as tidal waters, tidal wetlands, perennial streams and their associated wetlands. RMAs include areas having highly erodible soils, highly permeable soils, steep slopes, nontidal wetlands not included in the RPA, base flood hazard areas, and at least the 100-foot area contiguous to the RPA.

Ground water resources have not been developed at the Glendale and Malvern Hill units. The wetland areas likely serve as ground-water discharge zones to Western Run, McDowell Creek, and Crewes Channel (NPS, 2003c).

Alternative 1 – Preserve Existing Conditions.

In regard to water resources, this alternative could result in continued erosion and sedimentation into Crewes Channel and The Slash.

Alternatives 2, 3 and 4, Woodland Clearing/Thinning/Auto Tour Stops/ Trail Establishment

Runoff from areas disturbed during woodland clearing and trail construction activities would have the potential to contribute sediment to Western Run and Crewes Channel. As part of project implementation, the NPS and their contractors would be required to develop, and submit to the State for approval, an Erosion and Sediment Control Plan prior to the onset of construction activities (VDCR, 2001). Adherence to the approved ESC plan would minimize any adverse impacts on water resources associated with erosion and sedimentation during construction to a negligible level.

In addition, use of heavy equipment during woodland clearing, pull-off construction, and trail construction could compact the soils, increasing the quantity of storm water runoff. The USEPA has established permitting requirements for construction activity storm water discharges under the National Pollutant Discharge Elimination System (NPDES) permit program. Within the Commonwealth of Virginia, VDEQ administers the Storm Water Management Program as part of the State's VPDES permit program and in accordance with the *Virginia State Water Control Law* and the *General VPDES Permit Regulation for Discharges of Storm Water from Construction Activities*. These statutes specifically set forth regulations regarding land development activities to prevent water pollution, stream channel erosion, and more frequent localized flooding.

To comply with the Virginia Storm Water Regulations, the NPS and their contractors would need to submit an application to the VDEQ for a VAR10-VPDES General Permit for Storm Water Discharges from Construction Sites. The focus of this permit is the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) to reduce the pollutants in storm water discharges to the maximum extent practicable. The construction SWPPP is similar to an ESC plan, but also includes requirements for management of waste materials and activities at the construction site. To obtain general permit coverage, the NPS must file a Registration Statement with VDEQ at least two days prior to commencement of any land disturbing activities. Prior to submittal of this statement, the NPS and their contractors would need to develop an SWPPP to be enforced at the construction site, which describes the practices and controls to be used to reduce pollutants in storm water discharges at the construction site, including erosion and sediment controls, stabilization practices, structural practices, storm water management, and other controls, and to ensure compliance with the terms and conditions of the permit.

To ensure compliance with the SWPPP, the regulations require that park personnel familiar with the construction activity, the best management practices (BMPs), and the SWPPP inspect all disturbed areas of the construction site that have not been finally stabilized at least once every 14 calendar days and within 48 hours of the end of a storm event that is 0.5 inches or greater (VDEQ, 2003). The general VPDES permit covers storm water discharges during the construction phase only. Once the site has undergone final stabilization, and all storm water discharges from the construction activity are eliminated, the permit holder must submit a Notice of Termination to the VDEQ (VDEQ, 2003). A storm water discharge permit would not be necessary for long-term operations at the site after construction is complete, and no other permitting requirements would be necessary under Alternative 2, 3, or 4.

The clearing and construction-phase erosion and sediment controls developed under the above regulations would be designed to retain sediment on-site to the maximum extent possible. Several of these controls, such as the BMPs required by *Virginia's Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC10-20 et seq.* As a first step in any land-disturbing activity, sediment basins, traps, barriers, or other measures intended to trap sediment must be installed at and around the construction site. Sediment accumulations must be removed from these structures when design capacity has been reduced by 50 percent. If sediment escapes the clearing and construction sites, off-site accumulations must be removed at a frequency sufficient to minimize off-site impacts. Where clearing/ construction vehicle access routes intersect paved roads, provisions are required to minimize the transport of sediment by vehicular tracking onto the paved surface. When sediment is transported onto a paved road surface, the road surface is required to be cleaned thoroughly at the end of each work day (VDCR, 2001; VDEQ, 2003). Implementation of these required measures would keep any erosion and sediment impacts localized to the project area. In sum, erosion, sediment, and other pollutants would be controlled during all phases of clearing and construction in accordance with State of Virginia and Federal regulations. Any adverse impacts on surface water resources would be temporary, localized, and negligible in intensity.

3.8 LAND USE

No change in land use associated with any of the action alternatives would directly, indirectly or cumulatively, lead to conflict with land use plans or policies of the Park Service, surrounding jurisdictions or the State Coastal Zone Management program.

As shown in Fig 1-3C, the potential effects analyzed in regard to land use were:

- Direct change in the land use within the Park
- Changes in surrounding land uses induced by the Park's action, perhaps acting cumulatively with other projects in the surrounding area.

Direct changes in land use would involve conversion of up to several hundred acres of forested stands and cropped fields, to grassy fields. This change of use would be compatible with the Park's 1996 General Management Plan (NPS 1996), which called for enhancing the visitor experience in the Malvern Hill and Glendale units. It would also be consistent with Virginia's Coastal Zone Management Plan (see Appendix).

The EA team investigated whether any of the alternatives could reasonably be expected to induce land use changes in the surrounding areas, such as increased residential or commercial development. If the visitor experience enhancements under consideration were to make the Park so much more attractive that the number of visitors traveling to the Park markedly increased, then attempts at recreation-related commercial development near the Park could arise. At present, the land use around the Park is agricultural and rural residential and is not likely to change in the foreseeable future because:

- visitor numbers are not likely to substantially increase as a result of any of the alternatives, as discussed below in Section 3.17.

- Henrico County plans and policies seek to maintain current land uses, as discussed below, and no major projects are planned that could stimulate changes in this land use pattern.

Henrico 2010, the current Land Use Plan for Henrico County, classifies the area surrounding the Malvern/Glendale Unit as an ‘Outlying Area’. The Henrico County Planning Department defines ‘outlying areas’ as ‘characterized predominately by agricultural uses, large tract ownership and low-density residential uses’ (Henrico 2003a). In addition, the plan states that ‘any development of these areas will likely require major infrastructure improvements such as new sewage pumping stations’.

According to the Henrico County Planning Department, there are no planned, approved, or proposed land development projects in the study area (Henrico 2003b), nor are there any major transportation projects, such as highways or rail, planned for the area. The Richmond Regional Planning District Commission’s (RPDC) *FY 2003 Major Transportation Projects* report indicates that no major transportation improvements projects in the area or in eastern Henrico County are planned within the next three years (RPDC 2003).

The land around the project area is zoned for prime agriculture and rural residential uses. The prime agriculture classification are areas identified by the Natural Resources Conservation Service as especially suitable for agriculture because of soil conditions and/or land which is currently being used for agriculture purposes. The classification generally corresponds with the A-1 Agricultural Zoning District. The Rural Residential classification refers to single family residential development areas with recommended lot sizes of one acre or greater (Henrico 2003b)

The *Henrico 2010 Plan’s* Large Tract Development Guidelines provide general recommendations for master planned communities throughout Henrico County with a particular emphasis for the undeveloped eastern portion of the county in proximity to the project area. This area of the county is not served by public utilities and expansion to the area is not planned prior to 2010. These guidelines do not prevent development, but rather provide for a Community Impact Statement and other forms of review to analyze effects on existing land uses and resources in these areas (Henrico 2003b).

The county provides additional land use oversight in the area through its Historic Resource inventory classification. The county identifies Malvern Hill National Battlefield Park and Glendale National Cemetery as historic resources. This identification does not imply additional regulations of these properties, but does regulate the compatibility of future development that may occur in proximity of these locations (Henrico 2003).

Coastal Zone Management

Because Henrico County is within Virginia’s Coastal Zone, the Federal Coastal Zone Management Act requires NPS to determine whether its proposed actions would be consistent with the State’s plans and programs for protection of the resources of its coastal zone.

All of the alternatives under consideration would be fully consistent with Virginia's Coastal Zone Management Program. Details are in the Appendix.

Cumulative Impacts

As indicated above, there are apparently no new development or transportation projects planned or proposed in the area that could pose the potential for cumulative land use changes.

3.9 NOISE

Construction and clearing activities under any of the action alternatives may cause very localized, very short duration annoyance from equipment noise to residents of a few homes and to some off-season Park visitors. Because of the short duration and limited number of people exposed to this annoyance, this adverse effect would not be significant under any of the action alternatives.

As Fig 1-3 B and C shows, changes in the noise environment could arise from:

- Equipment and vehicle noise during construction and clearing
- Increased visitor traffic

Because the land use around the Park units is primarily low-density residential and agriculture, the Park and surrounding area is generally quiet, but this noise environment is routinely punctuated by several sources of noise, such as:

- road traffic
- farm equipment
- aircraft approaching Richmond's airport, about 7 miles away.

Exact noise level data is not available, but it is likely that a Park visitor, or a nearby resident, will typically experience background noise at a level perhaps equivalent to a whisper, or about 30 dBA (See sidebar about measuring noise), with intermittent periods of noise ranging several-fold higher, depending on the listener's closeness to a road or other noise source.

Noise and Noise Measurement

The measurement of noise that could annoy humans uses a ten-fold (logarithmic) scale and units called A-weighted decibels (dBA). On this scale, a sound that is 10 dBA higher than another will seem 2 times as loud to the human ear.

Noise decreases with distance: for each doubling of open-space distance, the sound decreases by about 6dBA, not counting any further reduction of the sound by vegetation or other barriers.

Some typical noise levels:

Soft Whisper	30 dBA
Quiet Office	40
Average Home	50
Conversational Speech	66
Busy Traffic	75
Noisy Restaurant	80
Pneumatic Drill	100
Automobile Horn	120

Construction Noise

Under any of the action alternatives, there would be some short term and relatively small-scale construction activities, such as minor excavation, grading, and paving for pullouts and/or trails. This scale of activity, occurring for perhaps a few days, during the day, and during the week, at each site, would likely produce noise levels of roughly 90dBA at a distance of 50 feet (DOT 1981). The most noise sensitive construction locations would be the pullouts at Willis Church, Fuqua Farm and Crewes/Mettert House stops. These pullouts would be within about 200 feet of the church, the Western Run Farm subdivision, and the Crewes/Mettert house, respectively. For the several days' duration of the construction at each site, these buildings could be exposed to noise levels on the order of 78 dBA, (2 doublings of distance yield a noise reduction of about 12 dBA). This is roughly the equivalent of sitting in heavy traffic. Interior noise inside those homes would depend on the building's design, but would likely be at least 6 dBA lower. While there are no directly applicable Federal noise regulations, on a long-term basis, this level of noise would be considered generally unacceptable under guidelines from the Department of Housing and Urban Development (HUD 1991). However, this construction noise would be very short term. Therefore, although it could cause some annoyance to a residents of less than a dozen households for a few days, this would not be a significant impact.

Woodland Clearing Noise

Under any of the action alternatives, the most noise-sensitive clearing operations would occur at Glendale, as the early successional woodlands are cleared all around the current farm field. This operation would involve perhaps several weeks of Monday-Friday, daytime activities. At the closest, these actions would occur within about 400 feet of existing residences. Assuming power saws emitting about 100 dBA at 50 feet, this would produce frequent noise levels of roughly 82 dBA at the exterior of the buildings. Associated with this activity could be the noise of trucks hauling timber away from the site. As with the construction noise, this noise scenario could be annoying and would likely be unacceptable on a long-term basis. But these noise exposures would only occur for a short period. They would therefore potentially be a short-term annoyance, but not a significant impact.

Similarly, Park visitors at various points within the Park could "encounter" clearing operations and be exposed to the noise from these clearing operations. Visitors to the Malvern Hill auto stop, for example, could experience noise in excess of 70 dBA, depending on the location of the clearing work that day. The actual noise exposure would depend not just on distance, but also on the potential attenuation of noise by topography and vegetation. One hundred feet of dense forest, for example, can reduce noise by about 7dB, while grass can reduce noise by an additional 4 db per doubling of distance (NYDEC, 2001).

Therefore, under any of the action alternatives, some visitors could experience noise that would detract from their experience on that day. This short-term, limited effect, however, would not constitute a significant impact.

Mitigation

To decrease the potential for annoying nearby residents and detracting from Park visitors' experience, NPS would:

- conduct clearing operations during the late fall to early spring, when visitor numbers are low
- notify nearby residents in advance of pending construction and clearing operations
- notify potential visitors (such as through the Park's website) of pending clearing operations.

Increased noise from increased visitor traffic

As discussed in Section 3.17, none of the action alternatives are likely to result in substantially increased number of visitors. Therefore, noticeable increases in visitor traffic and traffic noise are not likely.

Cumulative Noise Impacts

As indicated in Section 3.8, no development or transportation projects are presently proposed or planned in the area that could contribute to cumulative noise impacts.

3.10 PROTECTED SPECIES

None of the action alternatives are likely to adversely affect any Federally or State protected plants or animals.

As Fig 1-3 C indicates, clearing or thinning woodland areas could pose the potential to harm species protected under Federal or State law. The Endangered Species Act (ESA), requires that a Federal agency consult with the United States Fish and Wildlife Service (USFWS) on any action that may affect endangered, threatened, or candidate species, or that may result in adverse modifications of critical habitat. The NPS initiated informal consultation with USFWS in a letter dated September 24, 2003, inquiring about the presence of such species or critical habitat within the project area. The USFWS responded in a letter dated October 20, 2003 that there were a number of threatened and endangered species known to occur in Henrico County, and that further consultation was needed with the two State agencies responsible for coordinating species lists. The threatened and endangered species documented by USFWS as occurring or potentially occurring in Henrico County include one bird, the bald eagle, and three plants, sensitive joint-vetch, small whorled pogonia, and swamp pink.

NPS has also consulted with the Virginia Department of Game and Inland Fisheries (VDGIF, 2003a) and the Virginia Department of Conservation and Recreation, Division of Natural Heritage (VDCR, 2003). According to the State, none of the above species, or other federally or

State-listed threatened or endangered species, are known to occur in the project area . This finding was affirmed by an independent botanist (Belden 2003) and an independent biologist (Bradshaw, 2003) who recently conducted vegetative and wildlife surveys respectively, within the Malvern Hill/Glendale units.

Although Park personnel and others have spotted bald eagles in the Park, no eagle nests have been documented within 1.5 miles from the Park (VDGIF, 2003b). Further, due to considerations of erosion control and visitor reactions, clearing operations would not be undertaken during the spring and summer eagle nesting months, so impacts would be avoided even if eagles were to nest in those stands in the next few years before they are cut.

3.11 PUBLIC HEALTH AND SAFETY

None of the action alternatives pose a reasonable potential for increasing the risks to public health and safety.

As shown in Fig 1-3 the action alternatives could affect public health and safety by:

- increasing the risk of traffic accidents
- increasing the risk of injury on walking trails
- increasing the risk of theft or other crimes against visitors

The pullouts included in Alternatives 2 and 4 would be located off 2-lane roads, such as Willis Church Rd/State Road 156. The placement of the pullouts would allow for safely turning off from or on to the public roadways. Wherever possible, they would be sited on the same side of the road as the point of interest. When this is not possible, and where, therefore, visitors will have to cross the road, the pullout will be sited to allow drivers maximum visibility toward the crossing point, and road markings will warn drivers of a pedestrian crossing. In all cases, the roads have generally light traffic, and speed limits of 40 mph. These pullouts would improve visitor safety as compared to the present condition in which visitors interested in several of the roadside points of interest must park their cars on unimproved shoulder areas and then cross the road. Wooden gates at entrances to the parking areas would prevent use of the pull-offs at night; this would avoid the risk of accidents caused by vehicles making unexpected turns at night.

Two types of trails are included in Alternatives 3 and 4: interpretive loop trails tied to pullouts, and backcountry connector trails. The interpretive loop trails would follow the RBNP Trail Management Plan (NPS 2001a) recommendations for accessibility and would comply with the Uniform Federal Accessibility Standards and the Americans with Disabilities Act Accessibility Guidelines. Relatively flat, wide and surfaced with crushed gravel, such trails pose very little risk of injury to walkers. Bicycles and other wheeled equipment would be prohibited on such trails, thus avoiding the risk of hiker/biker/skater accidents.

The backcountry trails would not be handicapped-accessible, nor would any wheeled equipment be allowed on them. These trails would be more steeply sloped, and unpaved. By designing and

maintaining these trails in accordance with the Park's Trail Management Plan, NPS would minimize the risk of personal injury.

Parking areas set back from the road, interpretive loop trails and backcountry trails all pose some potential to expose visitors to thefts and personal assaults, perhaps especially against those using the trails for exercise purposes in the early morning or evening hours. The RNBP staff includes law enforcement personnel who will provide regular oversight of the pullouts and trails.

3.12 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

None of the alternatives would have anything other than minor social or economic effects, nor would any adverse impacts be disproportionately borne by low-income or minority members of the community.

As shown in Fig 1-3C the potential socioeconomic effects could be caused by:

- loss of income to holders of agricultural leases
- short-term employment of work crew needed to remove timber
- long-term employment of additional NPS staff to maintain fields

Agricultural Leases

According to NPS (Mauch 2003), just one individual holds the lease to the several crop fields that would be converted to grass. Under all of the action alternatives, the leases would be allowed to expire, and the leaseholder would be informed of this as soon as the decision is made as to which alternative to adopt. This early notice would enable the individual to make plans to offset his loss of agricultural income from those fields. To further ease that transition, NPS will consider reducing the rent payments for the remainder of the leases.

Timber

Depending on the prevailing lumber prices at the time, NPS may have to pay a contractor to do the clearing or thinning of timber. Contractor(s) engaged to clear the wooded stands would generate short-term economic impacts by providing up to several months' employment for a work crew of perhaps a dozen personnel. This would not be a significant effect on the local economy.

Increased Maintenance

Under Alternatives 3 and 4 there would be increased maintenance. Grassy fields would have to be mowed, otherwise they could revert to woodlands. The trails included in these two alternatives would require periodic maintenance, as would the interpretive signs and other materials included in all of the action alternatives. Alternative 2 likewise would require some maintenance, but this would be at least partially offset by permitting some previously open areas to revert to woodland.

Increased maintenance requirements may be largely met with existing staff. If additional NPS staff are needed, the requirement is not likely to be more than 1 full time equivalent position, the addition of which to the local economy would clearly not be a significant effect on that economy.

Environmental Justice

Environmental Justice is the principle of seeking to avoid imposing adverse environmental effects disproportionately on the low income and minority segments of the community.

This EA indicates that none of the action alternatives would impose substantial adverse impacts on any large number of people. A small number (less than two dozen) might experience short-term nuisance impacts such as from noise, while one individual may experience loss of a portion of accustomed farm income. Existing census data cannot reveal the ethnic and socioeconomic status of these individuals. Given that Henrico County has about 28% minorities and about 6% low income, some of these affected individuals may be in these categories (US Census 2000). However, the spatial distribution of these effects is solely determined by such factors as the structure of the battlefield, the locations of existing roads, woodlands, etc. NPS could not have exercised any selectivity in where to impose these impacts based on any socioeconomic considerations. Given this, there is no evident environmental justice impact.

Cumulative Impacts

NPS has no plans for other projects that could cumulatively add to or offset the socioeconomic impacts identified here. As indicated in Section 3.8, no development or transportation projects are presently proposed or planned in the area that could contribute to cumulative socioeconomic impacts.

3.13 SOILS

The action alternatives would largely prevent soil erosion, but Alternative 3 would pose the greatest potential for soil erosion, particularly into Crewes Channel. Alternative 1 would continue exposing Crewes Channel to current erosion, while Alternative 2 would pose little increased risk of soil erosion. Alternative 4 involves a moderate increase in the risk of soil erosion over current conditions, but it also involves the creation of a new riparian buffer to protect Crewes Channel.

As Fig 1-3 shows, effects on soil could arise in several ways:

- Compaction by heavy equipment during construction or clearing
- Increased erosion from more-exposed soil surfaces
- Increased erosion from increased surface runoff
- Contamination from herbicides

As is typical in the Atlantic Coastal Plain province, the Malvern Hill and Glendale battlefields are characterized by large, relatively level terraces or plateaus bounded by steep embankments associated with the margins of waterways. Three soil associations occur in the unit (Kempsville-

Atlee-Duplin; Ochrepts and Udults-Norfolk-Caroline; and Angie-Pamunkey-Lenoir.) All are generally deep and typically well-drained. None are highly compactible or erodible. (NRCS, 2002).

Woodland Clearing

The use of heavy equipment for clearing woodlands poses the potential to compact the soil they drive over. This could lead to decreasing that soil's ability to absorb water, leading to greater runoff. This increased runoff, in turn, can lead to increased erosion of soil downslope from the runoff. Compacted soil also inhibits root growth, thus slowing the revegetation process.

Woodland clearing operations also pose the potential for exposing soil previously stabilized under forest debris. Logging equipment could also form ruts, and dragging logs could also form furrows in the soil. These could form rainwater runoff channels which could then lead to increased erosion of soil downslope. Without vegetative cover, soils could be temporarily exposed, and be more susceptible to erosion until grass is reestablished. Soil could also be exposed to erosion if new or widened roads were needed for accessing the areas to be logged.

While the soils in the unit are not especially compactible or erodible, NPS would take a series of steps to minimize the potential for soil damage. These procedures would include:

- Minimizing use of heavy vehicles
- Restricting operations to periods when soil is firm
- Removing felled trees without dragging them
- Cutting and grinding stumps, not uprooting them
- Using soil stabilization blankets, silt fences, or straw bale barriers to retard erosion from bare soil
- Stabilizing soil and minimizing erosion after clearing, such as by planting ground cover promptly, but without disturbing the bare surface extensively to do so
- Promptly removing or restoring any temporary haul roads
- Implementing any additional procedures as may be called for at the time in the Virginia Department of Forestry's Best Management Practices (VDOF 2003)

NPS could implement the clearing operations either by clear-cutting each stand, or by thinning each stand in several increments over the course of about 5 years. The thinning approach would likely further lessen the potential for soil erosion, by avoiding a sudden change from thickly forested to bare ground. While repeated passes of heavy equipment could increase the risk of soil compaction, restricting these operations to times when the soil is frozen or otherwise firm, would offset that risk.

NPS and their contractors would be required to comply with the *Virginia Erosion and Sediment Control Law, Regulations, and Certification Regulations (VESCL&R)*, the *Virginia State Water Control Law*, and the *General Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation for Discharges of Storm Water from Construction Activities* to avoid and minimize erosion and sediment runoff to Crewes Creek and Western Run during all clearing and construction activities.

As part of compliance with the VESCL&R, the NPS and their contractors would develop and implement an approved erosion and sediment control (ESC) plan during construction, and would follow (at a minimum) the VESCL&R Minimum Standards (4 Virginia Annotated Code (VAC) 50-30-40) and the guidance provided in the *Virginia Erosion and Sediment Control Handbook* published by the Virginia Department of Conservation and Recreation (VDCR, 2001). In addition, as part of the permit application under the VPDES permit program, the NPS and/or their contractor would be required to develop and implement an approved Storm Water Pollution Prevention Plan (SWPPP) to reduce pollutants in storm water discharges to the maximum extent possible (VDEQ, 2003).

In addition, since the areas around Crewes Channel, McDowell Creek, and Western Run are within designate Chesapeake Bay Preservation Areas, NPS would be required to comply with *Virginia's Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC10-20 et seq.)*. Section 9VAC10-20 states that silvicultural operations within Chesapeake Bay Preservations Areas must implement *all* necessary Forestry BMPs described in *Forestry Best Management Practices for Water Quality* (VDOF, 2002).

Pullouts

The potential for increased runoff (and resulting increased erosion of soil downslope) could also arise from an increase in paved surfaces such as at new pullouts. The pullouts would be no more than 1/4 acre in size (about 100 feet x 100 feet) and would be located on flat or nearly flat surfaces. Drainage will be included in the design of each pullout, either around its downslope edge or perhaps throughout its entire area. This could be accomplished by “paving” pullouts with paving blocks that provide drainage holes in each block, like cinder blocks laid on edge. Therefore, runoff from pullouts will not likely lead to downslope erosion.

Trails

The majority of the soils underlying the proposed trail locations are stable and not limited by flooding, water erosion, or saturated soils. A few sections of the project area contain soils on steep slopes or wet areas with limiting properties that could lead to erosion. These sections would need to be reinforced using boardwalks, bridges, water bars, or grade dips. The trail segments that would be affected by these soil limitations are described in Table 3-2.

Installing boardwalks, bridges, and runoff controls (waterbars and grade dips) in the areas described in Table 3-2 would minimize the potential soil loss from proposed trails. In addition, sediment and erosion controls, as described in the Erosion and Sediment Control plan, would be implemented to minimize soil loss and runoff during trail construction.

Table 3-2 Soil Limitations for Proposed Trails			
Trail Affected and Location	Map Symbol and Soil name	Limitation and Limiting Features	Construction Considerations
Crewes/Mettert Farm Loop; SW of Carter's Mill Road Auto tour stop.	CaD2 - Caroline very fine sandy loam, 10 to 15 percent slopes, eroded	Very limited; Water erosion	Boardwalk
Backcountry Trail #1 and #2; West side of Fuqua Field	KeD2 - Kempsville fine sandy loam, 10 to 25 percent slopes, eroded	Somewhat limited; Slope	Switchbacks, waterbars or grade dips.
Backcountry Trail #1 and #2; Where the trail intersects McDowell Creek and Western Run	Kn - Kinston and Mantachie soils	Very limited; Depth to saturated zone; Flooding	Establish Bridges and Boardwalk
Backcountry Trail #2; Near Mill dam	Mc - Mantachie-Chastain complex	Somewhat limited; Depth to saturated zone; Flooding	Bridges
Backcountry Trail #1; SE of Trailhead parking lot.	SsB - Sassafras fine sandy loam, 2 to 6 percent slopes	Somewhat limited; Too Sandy	Boardwalk
NRCS, 2002			

Herbicide Use

NPS would use herbicides to control the regrowth of woody vegetation and to prevent the establishment of non-native invasive species in cleared areas. Such use would be done in accordance with the Park's Vegetation Management Plan (NPS 1993). These procedures include: NPS would follow label specifications, and avoid applying herbicide during unfavorable weather conditions, including extended periods of rain, temperatures above 95° F, with humidity less than 30% and wind greater than 5 mph.

The procedures described above would be generally effective in preventing significant soil erosion or other damage. The overall effects, however, would differ among the several alternatives because of the varying extent of ground disturbing actions.

Alternative 1 – Preserve Existing Conditions

The no action alternative would maintain existing landscape features and systems, and minimal actions would be implemented to protect natural resources. While repair to deteriorating features would occur, establishment of a riparian buffer along Crewes Channel would not occur, resulting in the potential for minor, long-term soil loss within the riparian zone.

Alternative 2 – Battlefield as Part of a Landscape Network.

This alternative would only involve clearing about 20 acres of woodland at two sites, the areas north of West House and west of Crewes/ Mettert Fields. Pullouts would also be created, but no trails.

Alternative 3 – Re-establish Spatial Patterns and Important Features of the 1862 Battlefield Scene.

The implementation of Alternative 3 would alter the landscape, clearing over 100 acres of woodland, including the area around the Garthright Farm to McDowell Creek, all of West House Field, and Crewes/ Mettert Field to Crewes Channel. The NPS would avoid sensitive areas, such as riparian corridors; however, this alternative would involve clearing areas on steep slopes and wet soils, such as west of, and southeast of, West House. Removal of vegetation in these areas could cause sheet flows, increasing sedimentation to nearby waterways. Erosion control measures would be implemented to control sediment loss during and after woodland clearing, but there is still the potential for soil loss, gulying, and sediment runoff on steep slopes before and even after they are revegetated. Thinning such stands incrementally over several years would lessen, but not eliminate this impact.

This alternative would also involve construction of a network of trails, with their minor risks of soil erosion.

Alternative 4 – Battlefield as Part of a Landscape Network that Includes an Internal Trail System for Interpretation and Recreation.

This alternative would involve construction of pullouts and trails, and clearing of about 70 acres of woodland. It would also involve thinning a viewshed corridor down the steep slope to the west of the West house. This thinning would provide the visitor some appreciation of the difficulties of fighting up a hill, but would retain enough cover on this slope to avoid erosion and runoff that could damage the wetlands of Crewes Channel.

This alternative also calls for the establishment of riparian buffers, principally along Crewes Channel. Buffers hold soil in place, reducing the potential for sheet flows and sediment runoff. A 100-foot buffer would trap and hold sediment, which is then dispersed on the forest floor rather than traveling to stream channels. According to the Virginia Riparian Forest Buffer Panel, a 95-foot forested riparian buffer would be about 97% effective in reducing sediment runoff (VRFBP, 1998).

Prime Farmland

"Prime" and "unique" farmlands are two kinds of important farmland defined by the U.S. Department of Agriculture (USDA). Prime farmland is the land that is best suited to food, feed, forage, fiber and oilseed crops. It may be cultivated land, pasture, woodland or other land but it is not urban and built-up land or water areas. Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season and moisture supply needed to produce sustained high quality and/or high yields of a specific crop when treated and managed according to modern farming methods. (NRCS, 2003).

There are approximately 490 acres of prime farmland soils within the project area (NRCS, 2002b). There are no soil types identified as unique farmland within the project area (NPS, 1996). The conversion of wooded stands and cropped fields to grassy fields would not constitute any impact on prime farmland. The only loss of prime farmland would be at two of the auto tour pullouts, one at Glendale (Fuqua Farm) and the other at West House. In compliance with the Farmland Protection Policy Act, NPS has filed a Farmland Conversion Impact Rating (AD-1006) to the Natural Resources Conservation Service. The project can move forward if the NRCS rates the project a score of below 160. If the project exceeds a score of 160, additional alternatives would have to be considered, such as moving those auto stops to less sensitive sites.

Cumulative Effects

No other projects are proposed for the Glendale and Malvern Hill Units, nor are there apparently any development or transportation projects planned or proposed in Henrico County that could pose a credible potential for cumulative soil erosion impacts.

3.14 TRAFFIC/TRANSPORTATION

Short term increases in traffic during construction and clearing would clearly be insignificant. Potential cumulative traffic increases if SR 156 were designated a Scenic Byway are not likely to substantially change the flow of traffic.

As Fig 1-3 indicates, changes in traffic on the roads around the Park unit could stem from:

- increase in traffic during construction and woodland clearing
- increase in visitor traffic

Construction and Woodland Clearing Traffic

Under any of the action alternatives, there would be short-term increases in the number of trucks, such as logging trucks, using several of the roads adjacent to the Park. In no case would the number of vehicles (perhaps dozens a day) constitute such a substantial increase in traffic volume as to affect traffic flow.

Increased Visitor Traffic

As discussed in Section 3.17, none of the action alternatives is itself likely to increase the attractiveness of the Park so much as to substantially increase the number of visitors. If the number of visitors remains roughly the same, the amount of traffic would remain roughly the same.

Cumulative Impacts

As discussed in Section 3.8, no other projects are anticipated that would cumulatively increase traffic.

The proposed action does, however, increase the likelihood that the State DOT could designate the main northeast-southwest road through the project area, Willis Church Road/SR 156 as a Virginia Scenic Byway (NPS 2003b). This designation would then become known to the traveling public via State road maps, websites and other means. If this were to happen, the combination of the enhanced Malvern Hill and Glendale units' attractiveness, and the published designation of the SR 15 as a Scenic Byway, could induce somewhat increased numbers of visitors, and traffic. Such an increase cannot be meaningfully predicted numerically, but it is very unlikely to be so much as to affect the flow of traffic. Overall daily traffic counts for SR 156 are not available, but the amount of Park-related traffic can be estimated. The number of visitors to Malvern Hill/Glendale has been stable at roughly 20,000 people per year for the last 5 years (NPS 2000). Assuming an average of two people per vehicle, and further assuming that about half of the year's visitors come in the three summer months, then the Park visitors would account for only about 50 or 60 vehicles per day on SR 156. If, contrary to prediction, the proposed action plus the Scenic Byway designation were to result in a doubling of visitor traffic, this would still only put about 60 more vehicles on that road a day during peak months.

Virginia Scenic Byways

According to the Virginia Department of Transportation, a segment of road must substantially meet the following criteria to be considered for Scenic Byway designation:

- The route provides important scenic values and experiences.
- There is a diversity of experiences, as in transition from one landscape scene to another.
- The route links together or provides access to scenic, historic, recreational, cultural, natural and archeological elements.
- The route bypasses major roads or provides opportunity to leave high-speed routes for variety and leisure in motoring. Landscape control or management along the route is feasible.
- The route allows for additional features that will enhance the motorist's experience and improve safety.
- Local government(s) has/have initiated zoning or other land-use controls, so as to reasonably protect the aesthetic and cultural value of the highway.

Source: VDOT. 2003.

<http://www.virginiadot.org/infoservice/faq-byways.asp>

3.15 UTILITIES

None of the alternatives would affect utilities

The EA team identified no reasonably foreseeable mechanism through which the proposed action could affect utilities. No aspect of the project would involve a change in demand for utilities service. The only utility structure directly in the project area is a buried petroleum pipeline beneath a cleared right-of way easement. The proposed action involves no actions that would affect this pipeline.

3.16 VEGETATION AND WILDLIFE

The no-action alternative may result in slight shifts in forest habitat values and distribution as stands mature. All of the action alternatives would involve a net loss of forest habitat, including several tens of acres of mature mixed Atlantic Coastal Plain hardwood forest relatively free of invasives. Such habitat is no longer common in Virginia. An increase in grassy field habitat would only partially offset the loss of forest habitat. All of the action alternatives could increase the potential for further establishment and encroachment of invasive species. The action alternatives differ in the degree of these impacts as they differ in the areas involved.

As Fig 1-3 B, C and D indicate, the loss of vegetation and wildlife resources could arise from:

- Damage to wetland or stream habitats from sedimentation
- Clearing of wooded areas
- Increase in invasive species

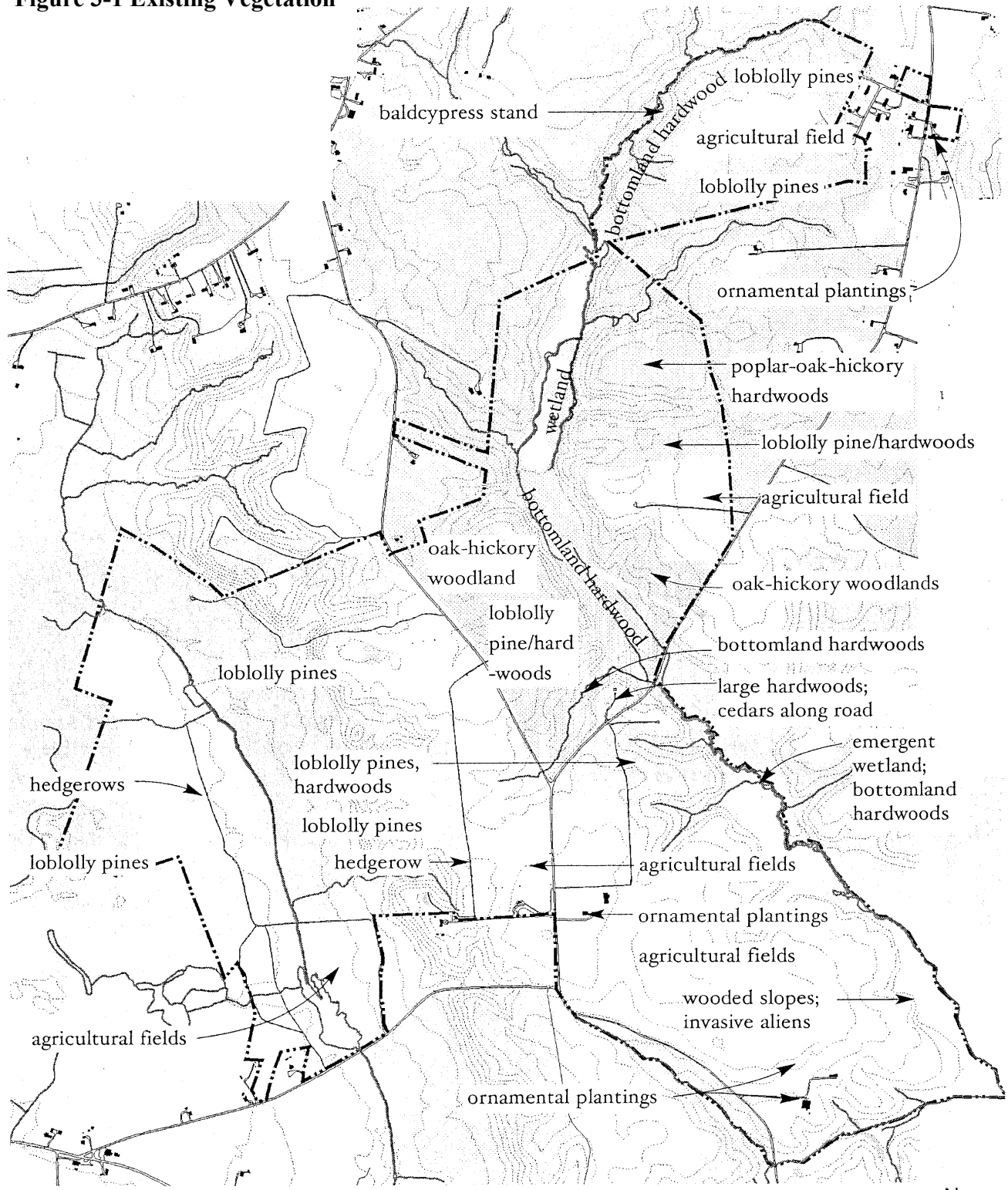
Wetland and stream habitats

As discussed in Sections 3.7 and 3.13, the potential loss of habitat value in streams and wetlands would be avoided through the erosion and sediment control measures which NPS and its contractors would implement under any of the action alternatives. Under the no-action alternative, there would continue to be a potential for erosion and sedimentation damage to the wetlands and stream habitat of Crewes Channel, which presently lacks a riparian buffer.

Clearing of wooded areas

Clearing of wooded areas would directly remove wooded habitat and replace it with grassy field habitat. The woodlands to be cleared were all apparently at least largely in crop production use in 1862. Since then, they have reverted to the mixed hardwood-conifer forest types typical of Atlantic Coastal Plain Virginia. Some stands have been at least selectively logged one or more times over the years. As a result, these stands range in age from 10 years, to about 140 years. (see Fig 3-1).

Figure 3-1 Existing Vegetation



Taken From: NPS 2003

Figure 83. Vegetation diagram.

N
↑
not to scale

In this forest type, young stands (such as the forest fringe around the Fuqua Farm at Glendale, feature largely loblolly pine, which increasingly gives way over the years to a diverse mix of hardwoods, principally oaks, sweetgum, yellow poplar (tuliptree), red maple, black walnut, hickory, American holly, beech and others. Some of these wooded stands have also been invaded by non-native species, such as privet, Japanese honeysuckle and tree of heaven (NPS 2003a, b). These and other invasive species compete with native species for light, nutrients and water, but often are not fed upon by native wildlife, so they increasingly replace native plants and diminish the wildlife habitat value of the stands.

The naturally diverse woodlands support a wide variety of wildlife species, notably white-tailed deer, raccoon, red fox, striped skunk, Virginia opossum, beaver, woodchuck, river otter and many other small mammals. There is a diverse fauna of reptiles and amphibians, including the box turtle, the copperhead snake and several species of frogs, toads and salamanders. There is also a wide variety of songbirds, as well as the wild turkey, and hunting birds such as hawks.

Clearing any of these stands, under any of the action alternatives, would cause a direct loss of these diverse vegetation and wildlife resources. Replacing them with grassy fields would provide substitute habitat for species tolerant of a wide variety of habitats (such as white tailed deer), but would represent a net loss of habitat for species, such as many songbirds, which depend specifically on forest habitats of particular types.

Although they are diverse and provide habitat for a wide variety of species, most of the stands that could be cut are typical woodland types that are common in the RBNP, in Henrico County and throughout the Atlantic Coastal Plain. Their loss, therefore, would represent an incremental loss of healthy, yet common habitat. One stand, however, is distinctive, the woodlands on the escarpment to the east of Crewes Channel. This stand has not apparently been cut since it began reverting to woodland shortly after the Civil War. It is therefore one of the older forest stands in the area, and provides valuable bird and wildlife habitat in old dead trees (snags), fallen logs and other structural elements. This stand is further distinctive because it is also relatively free of invasive plants. (Belden 2003; Patterson 2003). This is rare in the Coastal Plain or the Piedmont of Virginia. Clearing this stand, therefore, would cause a greater loss of vegetation and habitat value than it would in other stands of similar size.

To lessen the visual effect for visitors, NPS is considering conducting the clearing operations as several increments of thinning in each stand over about 5 years. These rounds would temporarily increase the amount of habitat transitional between forest and field. This would favor some birds and mammals, such as the deer, while causing a gradual loss of habitat for interior forest species. The long-term effect, a loss of forest habitat, would be the same.

The potential loss of vegetation and habitat values could diminish, but would not likely jeopardize the continued presence of any plant or animal species on the unit (Bradshaw 2003).

Increased Open Field Habitat

The new grassy field habitats would provide increased habitat for some species including migratory birds such as geese. Malvern Hill/Glendale is under an important migratory bird

flyway, so the addition of suitable habitat may result in an increase in the use of the unit by geese and other species.

Invasive Species

Invasive plant species could get established in any cleared or thinned area. Such species can outcompete native plants, pushing them out and diminishing the wildlife habitat value. NPS will take active steps to prevent this. In accordance with the Park's Vegetation Management Plan, (NPS 1993), Park personnel will use a variety of techniques to prevent invasives from getting established on newly cleared fields. These steps include prompt reseeding with the desired native grass species, mechanical removal of weeds, and treatment with herbicides. That plan, and Federal laws and regulations such as the Federal Insecticide and Fungicide Registration Act, regulate the use of herbicides to ensure that these chemicals do not contaminate soil or water nor accumulate to toxic levels in the food chain. The combination of mechanical and limited chemical controls will balance the objectives of preventing establishment and spread of invasives against the potential that these control mechanisms will harm native species more than the presence of the invasives would.

The proposed thinning of a viewshed corridor on the slope east of Crewes Channel could pose a particular risk of allowing the establishment of invasive species in one of the oldest forest stands on the unit, and which is still unusually free of invasives (Belden 2003; Patterson 2003).

These measures to control invasives are likely to be partly successful. At least eight non-native plant species are currently established at Richmond National Battlefield at troublesome levels. It is not certain that the newly cleared fields can be kept free of plants such as garlic mustard, Johnson grass and Japanese stilt grass. According to the Park's vegetation management plan, (NPS 1993) the Japanese stilt grass in particular is too difficult to eradicate once it is established, without harming the environment more than the stilt grass does.

The conversion of presently cropped farm fields to more historically accurate grass cover could also expose those fields to invasive species, which are presently controlled through the use of mechanical and chemical (herbicide) means. NPS may have to maintain similar control levels.

The establishment of backcountry and interpretive trails could also facilitate the spread of invasive species: seeds clinging to visitors' clothing, or to wildlife using the new corridors, could be spread to, and become established in, interior forest areas where they might not otherwise reach. To guard against this, NPS would include monitoring the trailside vegetation as part of its trash and safety maintenance procedures for the new trails.

These effects, the loss of woodland habitat, the increase in field habitat, and the potential increase in invasive species, are largely dependent on the areas involved. Therefore, Alternative 2, involving the least amount of woodland clearing, would incur the least degree of these impacts. Alternative 3, involving the potential clearing of well over 100 acres of woodland, and the conversion of about 100 acres of cropland to grassy field, would incur the greatest loss of woodland, the greatest gain in grassy habitat, and the greatest risk of further increases in invasives. Alternative 4 represents an intermediate level of these impacts.

The No-Action Alternative

As with other resources addressed in this EA, the No-Action alternative, i.e. the continuation of NPS' present policies and actions to preserve existing conditions, would, for the most part, accomplish exactly that. Biological habitats, however, are dynamic and will change even in the absence of human activities. Young forested stands, such as the loblolly pine dominated forest fringe around Fuqua farm, will naturally succeed over the coming decades to a more mixed stand with greater proportions of hardwoods such as the various oaks, sweetgum, tuliptree and others. This natural process will represent a modest change in the value of the woodland habitat. In the absence of natural disturbances, the woodlands of the unit would likely eventually mature into the diverse mixed hardwood type as seen on the escarpment east of Crewes Channel. However, fire, ice- and windstorms, drought, insect infestations are all natural disturbance processes that can substantially alter this natural progression to a "stable" forest condition. In the long term, therefore, the mix of old and young forest stands on the unit may transition to a higher proportion of mature growth, but it may also retain a patchwork pattern similar to that existing today, even if young stands reach maturity, and older stands are set back to a younger condition by natural disturbance.

Cumulative Impacts

There are no other planned or proposed actions on or near the Park, which could foreseeably have a cumulative effect on habitat loss. The ongoing spread of invasive species, however, is a continuing problem for NPS. To the extent that each of the action alternatives could provide further opportunities for the spread of invasives, this would be a cumulative adverse impact. Control measures by NPS could keep these impacts from being significant.

3.17 VISITOR USE AND EXPERIENCE

The intent of all of the action alternatives is to enhance the visitor experience. The alternatives differ in the degree of the anticipated enhancements, with the proposed action likely to produce the greatest overall enhancement to the visitor experience. None of the action alternatives is likely to result in a substantial increase in the overall number of visitors. Therefore, no adverse effects on the visitor experience such as from crowding, would occur under any of the action alternatives.

As Fig 1-3 B and C show, both potential beneficial and adverse effects on visitor use and experience were investigated. These included:

- Enhanced visitor interpretive experience from enhancement of the cultural landscape
- Enhanced visitor interpretive experience from additional interpretive materials
- Enhanced visitor interpretive experience from increased access to the battlefields
- Enhanced recreational opportunities
- Diminished visitor experience from crowding
- Diminished visitor experience from litter on the landscape
- Diminished visitor experience from the sudden change in landscape appearance

Alternative 2 Landscape Network

The types of landscape improvements included under Alternative 2 would enhance the auto-touring experience. Visitors following the auto tour route would find not only new interpretive signs and other materials, but also would see selected key portions of the battlefield rehabilitated more nearly to their 1862 open conditions, and would thereby be able to understand and appreciate the dynamics of the battle more fully than is typically possible at those locations today. (Refer to Fig 2-2).

This improved visitor experience, however, is not likely to significantly increase the number of visitors (Mauch 2003). After similar landscape rehabilitations at Spotsylvania National Military Park and Gettysburg National Military Park, the number of visitors has not significantly increased (Ruth 2003).

Alternative 3 Re-establish Spatial Patterns

The increased opening-up of the landscape under this alternative would further enhance the visitors' understanding and appreciation of the battle. The new network of trails would also contribute to this enhancement; the trails would also increase visitor circulation throughout the Park, potentially resulting in a less crowded environment by dispersing visitors throughout the site rather than concentrating interpretation at just a few central locations. The trails would also provide a new resource for visitors seeking walking or jogging recreation. Still, NPS does not expect this improved experience for visitors to lead to significant increases in the number of visitors.

There is also the potential to "shock" regular Battlefield visitors who would see a significantly different landscape from one year to the next, if the clearing were implemented as clearcuts rather than incremental thinning. To the extent that a sizable number of the Park's 20,000 visitors a year are essentially annual regular visitors, they would indeed see major visual changes, as intended. Assuming that such visitors have a strong interest in Civil War history, it is reasonable to assume that they would not only understand the change, but would welcome it. Therefore, the clearcut approach is not likely to generate adverse visual impacts for visitors.

As with any trail, litter in trailhead parking areas or along the trail can diminish the quality of the visitor experience. At Malvern Hill, the anticipated number of visitors is not likely to exceed the NPS' capability to maintain a reasonably litter-free landscape.

Alternative 4 Landscape Network and Trails

By providing both enhanced auto-tour, and trail interpretive and general recreation opportunities, in a landscape largely rehabilitated to 1862-type conditions, this alternative would likely provide the greatest suite of enhancements of the visitor experience. Again, however, the total number of visitors is not likely to increase substantially above the roughly 20,000 annual figure of recent years. If this prediction were inaccurate, and if visitation even doubled, these increased numbers would not create crowding that would detract from the visitor experience: if 50% of all visitors come during the three summer months, then there is an average of roughly

120 people visiting the Park each day during peak season. If this alternative were to add another 120 people to the Park per day, with the increased number of locations to visit (pullouts, trails), the typical visitor is not likely to experience any more interaction with other visitors than they do now.

3.18 WETLANDS, FLOODPLAINS

All action alternatives pose the potential to directly or indirectly damage wetlands, but the protective measures that NPS will use can reasonably be expected to avoid these effects. Alternative 2 poses the potential for indirect effects to wetlands from upslope woodland clearing, while Alternative 3 poses the potential to damage wetlands directly during trail construction as well as indirectly from extensive woodland clearing. Alternative 4 involves both types of potential effect, but with less potential clearing involved.

As Fig 1-3 B, C and D show, the potential effects on wetlands and floodplains that the team investigated are:

- Damage to wetlands from trail construction through them
- Damage to wetlands from woodland clearing

Malvern Hill and Glendale units contain approximately 92 acres of wetlands. Approximately 30 acres of wetland are associated with the Crewes Channel and approximately 62 acres area associated with the McDowell Creek/Western Run watershed. Wetland areas in the Park provide numerous functions, including vegetation and wildlife habitat, drainage ways for hydrologic systems, and physical and chemical improvements of local waterways. Moreover, they are interpreted as historic conditions that strongly affected troop movements and battle outcomes (NPS, 2003b). A park-wide wetland delineation by the USGS National Wetland Research Center is in progress, but data are not yet available. National Wetlands Inventory maps (1:24000) and “Form and Function of Forested Wetlands, Richmond National Battlefield Park” (Johnson et al 1994) provide maps and descriptions of park wetlands based on vegetative plot data

The wetlands associated with both Crewes Channel and Western Run are mostly dominated by broad leaved trees and shrubs and are seasonally flooded, meaning that surface water is present for extended periods during the growing season, but can be absent by the end of the summer. Crewes Channel is dammed just north of SR 156 and forms a pond with a wetland fringe of emergent marsh vegetation. Portions of the wetlands adjacent to Western Run are in the 100-year floodplain.

Trail Construction

Portions of the backcountry trail proposed under Alternatives 3 and 4 would be constructed in the wetlands associated with Western Run. Wooden walkways on pilings will be needed. Such walkways could damage wetlands during construction if heavy equipment were to create ruts in the wetland that altered the natural water flow pattern. After construction, the walkways

themselves could further alter the natural hydrology by impeding the flow of water. NPS will avoid these impacts by:

- Avoiding or minimizing the use of heavy equipment for walkway construction
- Adhering to the best management practices to be specified in the Erosion and Sediment Control Plan as discussed in Sec 3.7 and 3.13
- Constructing walkways when ground is firm
- Constructing walkways from upland bank to upland bank, i.e. somewhat elevated from the wetland
- Monitoring the completed walkways and periodically clearing out debris

As the trail design is developed, NPS will confer with the Army Corps of Engineers and the State as needed to determine if a wetland construction permit is needed.

Woodland Clearing

Clearing operations could damage wetlands directly, if forested wetland were to be cleared, and indirectly, from increased erosion, runoff and sedimentation from cleared areas. NPS will minimize these effects by:

- Using the erosion and sedimentation control measures as previously discussed in Sec 3.7 and 3.13
- Avoiding clearing forested wetlands to the extent possible while achieving the objective of opening battlefield vistas.

A narrow (roughly 100 feet) streamside wetland near the Parsonage is the only wetland identified thus far in areas proposed for clearing. NPS may choose to thin this area rather than clear it. If NPS determines that clearing is warranted by the battlefield rehabilitation objective, then the forested stand could be replaced by appropriate grassy wetland vegetation and a riparian buffer strip. If either clearing or thinning is to be done, NPS would protect the wetland from equipment damage during the cutting operations with precautions similar to those discussed above, such as minimizing the use of heavy equipment in the wetland itself, and conducting operations when the ground is as firm as possible.

3.19 SHORT TERM RESOURCE USES AND LONG TERM PRODUCTIVITY

None of the action alternatives would involve short-term consumption of resources at the cost of loss of long-term productivity. There would be a consumption of timber from cleared woodlands, and a cessation of crop production on present agriculture leasehold fields, but the replacement of both the woodlands and the cropped fields with grassy fields would fully maintain the long term productive capability of these lands. In the future, they could be readily returned either to crop production, or allowed to revert once again to woodlands.

3.20 IRREVERSIBLE OR IRRETRIEVABLE RESOURCE COMMITMENTS

For the reasons cited in the previous section, none of the alternatives represent resource commitments that could not be reversed over time. The action alternatives do involve the one-time “consumption” of up to several hundred acres of timber as a consequence of clearing the land to rehabilitate the historic landscape appearance.

3.21 IMPAIRMENT

NPS’s Organic Act states that park resources must be passed on to future generations “unimpaired”. Impairment occurs when an impact degrades or harms the integrity of park resources or values, including opportunities that would otherwise normally be available for the enjoyment of those resources or values had the impact not occurred (NPS 2001b). None of the alternatives would result in the impairment of RNBPA resources.

4.0 COORDINATION AND CONSULTATION

The EA team conducted external scoping by contacting relevant Federal, State and local government agencies and organizations and soliciting their inputs. The scoping letter the EA team sent is presented in Appendix A, along with responses from the agencies contacted.

Coordination with USDA and the County in regard to Prime Farmlands is ongoing.

Consultation with the State Historic Preservation Office is ongoing. See Assessment of Effect in the Appendix

Coordination with the State of Virginia in regard to Coastal Zone Management is ongoing. See Consistency Determination in Appendix

5.0 REFERENCES

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APPENDIX

Scoping, Coordination, Consultation

W. Tayloe Murphy, Jr.
Secretary of Natural
Resources



Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street
Richmond, Virginia 23219-2010
Telephone (804) 786-7951 FAX (804) 371-2674 TDD (804) 786-2121

James I. Mangi
Mangi Environmental Group, Inc.
7915 Jones Branch Drive
McLean, Virginia 22102

October 20, 2003

Re: Richmond NBP, Malvern Hill Improvements Project

Dear Mr. Mangi:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Database System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Biotics documents the presence of natural heritage resources in the project vicinity. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks additional natural heritage resources. New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of \$60.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, Department of Conservation and Recreation, 203 Governor Street, Suite 414, Richmond, VA 23219, ATTN: Cashier. Payment is due within thirty days of the invoice date.

Should you have any questions or concerns, feel free to contact me at 804-786-8377. Thank you for the opportunity to comment on this project.

An Agency of the Natural Resources Secretariat



ROBERT C. THOMPSON, P.E.
DIRECTOR OF PUBLIC WORKS
COUNTY ENGINEER
(804) 501-4393

COMMONWEALTH OF VIRGINIA
COUNTY OF HENRICO

October 17, 2003

Mr. James I. Mangi, PhD
The Mangi Environmental Group, Inc.
7915 Jones Branch Drive
McLean, VA 22102

RE: Richmond National Battlefield Park

Dear Mr. Mangi:

The Henrico County Department of Public Works has reviewed the materials submitted by The Mangi Environmental Group, Inc. for an Environmental Assessment of the above-referenced project. Thank you for the opportunity to review and comment on this project.

An Erosion and Sediment Control Plan must be submitted to the County for any proposed land disturbance over 2,500 square feet (i.e., clearing of 100 acres, riparian buffer establishment, ten miles of footpaths, and seven new vehicle pullouts). The Erosion and Sediment Control Plan must address all normal Ordinance requirements including, but not limited to:

1. A County standard Environmental Site Assessment plan sheet must be provided (see attached).
2. All land disturbing activities must be clearly indicated on the plan. The plan should distinguish between areas to be cleared, areas to be grubbed, areas where any exposed soil will be created, etc.
3. The plan must include all appropriate erosion control measures as dictated by State Law, County Ordinance, and County policy.
4. All jurisdictional wetlands and waters of the U.S., and any disturbance in those areas must be clearly indicated. Any applicable Corps of Engineers or DEQ permits must be forwarded to this office.
5. All Chesapeake Bay Preservation Areas must be indicated.

Crewes Channel and Western Run are Chesapeake Bay Preservation Areas. While the County encourages the establishment of riparian buffers along Crewes Channel, there are minimum standards for such establishment. Thinning of the Resource Protection Area (RPA) for viewshed purposes and the establishment of trails are allowed in a RPA. However, the County requires plans for work within the RPA to ensure the activities are being conducted in compliance with the Zoning Ordinance.

If you have any questions regarding this correspondence, please call Ms. Lane Carr at (804) 261-8359.

Sincerely,

A handwritten signature in black ink that reads "Jeff Perry".

Jeff Perry
Environmental Management Engineer

pc: Lane Carr/Environmental Division

enclosure

P.O. BOX 27032 / RICHMOND, VIRGINIA 23273-7032
FAX (804) 501-7470



COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Department of Game and Inland Fisheries

William L. Woodfin, Jr.
Director

October 16, 2003

James I. Mangi, PhD
President
The Mangi Environmental Group, Inc.
7915 Jones Branch Drive
McLean, Virginia 22102

RE: ESSLOG #19099, Richmond National Battlefield Park – Malvern Hill Unit Improvements,
Henrico County, VA

Dear Dr. Mangi:

This letter is in response to your request for information related to the presence of threatened or endangered species in the vicinity of the above referenced project.

1. Southwestern most portion of the project area, at the southernmost portion of the Crewes Channel riparian buffer, (lat./long.: 37,24,32 77,15,26):
The *federal threatened/state threatened* bald eagle (*Haliaeetus leucocephalus*) has been documented at approximately 1.5 miles south and 2 miles west of this portion of the project area. Also, data provided by the Virginia Department of Agriculture and Consumer Services (VDACS) indicate that the *federal threatened* sensitive joint-vetch (*Aeschynomene virginica*) has been documented approximately 1.5 miles from this portion of the project area. As well, this portion of the project is adjacent to a tributary (Crewes Channel) to Turkey Island Creek, which has been designated as a confirmed Anadromous Fish Use Area due to the documentation of striped bass. Also, Turkey Island Creek is a tributary to a portion of the James River, which has been designated as a confirmed Anadromous Fish Use Area known as James River 1. The following anadromous and semi-anadromous species have been documented: alewife, striped bass, blueback herring, yellow perch, American shad, and hickory shad. Therefore, the applicant should coordinate with Keith Tignor, VDACS, Office of Plant Protection at (804) 786-3515, the U.S. Fish and Wildlife Service, and this Department regarding potential impacts to these species and resources. Contact information for the U.S. Fish and Wildlife Service is as follows: Karen Mayne, 6669 Short Lane; Gloucester, VA 23061, (804) 693-6694 (phone), and (804) 693-9032 (fax). To contact this Department call Brian Moyer at (804) 367-6913.
2. Southeastern most point, at West House auto tour stop, (lat./long.: 37,24,24 77,14,30):
The *federal threatened/state threatened* bald eagle (*Haliaeetus leucocephalus*) has been documented at approximately 1.5 miles south of this portion of the project area. Also, data provided by the Virginia Department of Agriculture and Consumer Services

4010 WEST BROAD STREET, P.O. BOX 11104, RICHMOND, VA 23230-1104
(804) 367-1000 (V/TDD) Equal Opportunity Employment, Programs and Facilities FAX (804) 367-9147

James I. Mangi, PhD
ESSLog #19099
10/16/2003
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(VDACS) indicate that the *federal threatened* sensitive joint-vetch (*Aeschynomene virginica*) has been documented approximately 1.5 miles from this portion of the project area. As well, this portion of the project is approximately 0.5 mile from Turkey Island Creek, which has been designated as a confirmed Anadromous Fish Use Area due to the documentation of striped bass. Also, Turkey Island Creek is a tributary to a portion of the James River, which has been designated as a confirmed Anadromous Fish Use Area known as James River 1. The following anadromous and semi-anadromous species have been documented: alewife, striped bass, blueback herring, yellow perch, American shad, and hickory shad. Therefore, the applicant should coordinate with Keith Tignor, VDACS, Office of Plant Protection at (804) 786-3515, the U.S. Fish and Wildlife Service, and this Department regarding potential impacts to these species and resources. Contact information for the U.S. Fish and Wildlife Service is as follows: Karen Mayne, 6669 Short Lane; Gloucester, VA 23061, (804) 693-6694 (phone), and (804) 693-9032 (fax). To contact this Department call Brian Moyer at (804) 367-6913.

3. Southwestern portions of project, including most of Crewes Channel and the western portion of Detail A:

Bald eagle and sensitive joint-vetch documentations are approximately 1.75 miles from this portion of the site. Additionally, a block survey of an area encompassing this portion of the project documented the following *state special concern* species during the breeding season: barn owl (*Tyto alba*), great egret (*Ardea alba*), northern harrier (*Circus cyaneus*), and dickcissel (*Spiza americana*). But, the classification of *state special concern* is not a legal designation and does not require further coordination.

Information about fish and wildlife species was generated from our agency's computerized Fish and Wildlife Information System, which describes animals that are known or may occur in a particular geographic area. Field surveys may be necessary to determine the presence or absence of some of these species on or near the proposed area. Also, additional sensitive animal species may be present, but their presence has not been documented in our information system.

Endangered plants and insects are under the jurisdiction of the Virginia Department of Agriculture and Consumer Services, Bureau of Plant Protection. Questions concerning sensitive plant and insect species occurring at the project site should be directed to Keith Tignor at (804) 786-8261.

There is a processing charge of \$75.00 for our response. Please remit a check, made payable to **TREASURER OF VIRGINIA**, within 30 days to MaryBeth Murr at the address listed on the first page. Include a copy of this letter with your payment to ensure that your account is properly credited.

James I. Mangi, PhD
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This letter summarizes the likelihood of the occurrence of endangered or threatened animal species at the project site. If you have additional questions in this regard, please contact me at (804) 367-1185. Please note that this response does not address any other environmental concerns; these issues are analyzed by our Environmental Services Section, in conjunction with interagency review of applications for state and federal permits. If you have any questions in this regard, please contact Brian Moyer at (804) 367-6913.

Please note that the data used to develop this response are continually updated. Therefore, if significant changes are made to your project or if the project has not begun within 6 months of receiving this letter, then the applicant should request a new review of our data.

The Fish and Wildlife Information Service, the system of databases used to provide the information in this letter, can now be accessed via the Internet! The Service currently provides access to current and comprehensive information about all of Virginia's fish and wildlife resources, including those listed as threatened, endangered, or special concern; colonial birds; waterfowl; trout streams; and all wildlife. Users can choose a geographic location and generate a report of species known or likely to occur around that point. From our main web page, at www.dgif.state.va.us, choose the hyperlink to "Wildlife", then "Wildlife Information & Mapping Services" and then "Wildlife Information Online Service". For more information, please contact Amy Martin, Online Service Coordinator, at (804) 367-2211.

Thank you for your interest in the wildlife resources of Virginia.

Sincerely,



Susan H. Watson
Research Specialist Senior

cc: R.T. Fernald, VDGIF
E. Davis, USFWS
K. Tignor, VDACS



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061



October 20, 2003

Mr. James I. Mangi
The Mangi Environmental Group, Inc.
7915 Jones Branch Drive
McLean, Virginia 22102

Re: Project #3106

Greetings:

The U.S. Fish and Wildlife Service (Service) has received your request to review the attached project for potential impacts to federally listed or proposed endangered and threatened species and designated critical habitat in Virginia pursuant to the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). Attached is a list of species with Federal status and species of concern that have been documented or may occur in the county where your project is located. This list was prepared by this office and is based on information obtained from previous surveys for rare and endangered species.

In order to ensure coordination with the State agencies, we consistently recommend that individuals contact the Virginia Department of Conservation and Recreation, Division of Natural Heritage **and** the Virginia Department of Game and Inland Fisheries, since each agency maintains a different database and has differing expertise and/or regulatory responsibility. You can contact these agencies at the following addresses:

Virginia Department of Game and Inland Fisheries
Environmental Services Section
P.O. Box 11104
Richmond, VA 23230
(804) 367-1000

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 2nd Floor
Richmond, VA 23219
(804) 786-7951

Mr. James I. Mangi

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If either of these agencies determines that your project may impact a federally listed, proposed, or candidate species OR federally designated critical habitat, please contact this office and provide a copy of the response letter from each agency and the above referenced project number; otherwise, further contact with this office is not necessary.

If you have any questions or need further assistance, please contact Ms. Jolie Harrison at (804) 693-6694, extension 208.

Sincerely,



Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

HENRICO COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>
<u>BIRDS</u>		
<i>Haliaeetus leucocephalus</i> ¹	Bald eagle	LT
<u>VASCULAR PLANTS</u>		
<i>Aeschynomene virginica</i> ²	Sensitive joint-vetch	LT
<i>Helonias bullata</i> ⁴	Swamp pink	LT
<i>Isotria medeoloides</i> ³	Small whorled pogonia	LT

Species of Concern

<u>INVERTEBRATES</u>		
<i>Fusconaia masoni</i>	Atlantic pigtoe	G2
<u>VASCULAR PLANTS</u>		
<i>Chamaecrista fasciculata</i> var. <i>macrosperma</i> ¹	Marsh senna	G5T2
<i>Juncus caesariensis</i>	New Jersey rush	G2
<i>Trillium pusillum</i> var. <i>virginianum</i>	Virginia least trillium	G3T2

¹Nesting occurs in this county; concentrated shoreline use has been documented on the James River.

²This species has been documented in an adjacent county and may occur in this county.

³This species has been documented in an adjacent county and may occur in this county east of I-95.

⁴This species has been documented in this county east of I-95.

November 12, 2002

Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

KEY

LE - federally listed endangered.

LT - federally listed threatened.

PE - federally proposed endangered.

PT - federally proposed threatened.

EX - believed to be extirpated in Virginia.

LE(S/A) - federally listed endangered due to similarity of appearance to a federally listed species.

LT(S/A) - federally listed threatened due to similarity of appearance to a federally listed species.

C - candidate species; the U.S. Fish and Wildlife Service has enough information to list the species as threatened or endangered, but this action is precluded by other listing activities.

SOC - species of concern; those species that have been identified as potentially imperiled or vulnerable throughout their range or a portion of their range. These species are not protected under the Endangered Species Act.

G - global rank; the species rarity throughout its total range.

G1 - extremely rare and critically imperiled with 5 or fewer occurrences or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.

G2 - very rare and imperiled with 6 to 20 occurrences or few remaining individuals; or because of some factor(s) making it vulnerable to extinction.

G3 - either very rare and local throughout its range or found locally (abundantly at some of its locations) in a restricted range; or vulnerable to extinction because of other factors. Usually fewer than 100 occurrences are documented.

G_T_ - signifies the rank of a subspecies or variety. For example, a G3T1 would apply to a subspecies of a species that is very rare and local throughout its range or found locally in a restricted range (G3) but the subspecies warrants a rank of T1, critically imperiled.

G_Q - The taxon has a questionable taxonomic assignment.

**RICHMOND NATIONAL BATTLEFIELD PARK
MALVERN HILL/GLENDALE CULTURAL LANDSCAPE TREATMENTS
ASSESSMENT OF EFFECT**

This Assessment of Effect accompanies an Environmental Assessment on the actions proposed by the National Park Service concerning rehabilitation of the Malvern Hill and Glendale battlefields. That EA is intended to facilitate compliance with both NEPA and NHPA in an integrated manner. This Assessment of Effect, however, provides some additional specialized information not included in the EA.

Proposed Action

The Cultural Landscape Report and Archeological Inventory prepared for the Glendale and Malvern Hill Units of the Richmond National Battlefield (NPS 2003) calls for the Rehabilitation of the cultural landscape as an aid in interpreting the events of June 30-July 1 1862 as well as providing “enhanced interpretation” of the site for the visitor. The Treatment Plan (Chapter 6) calls for a “research based cultural landscape scene recreation” including the removal of non-contributing landscape elements (structures, vegetative cover) and the establishment of a park-wide trail system through the Glendale and Malvern Hill Units sites. The Environmental Assessment provides detailed descriptions of the proposed actions.

Area of Potential Effect

The Glendale and Malvern Hill Units are part of the Richmond National Battlefield Park located south and east of Richmond, Virginia in Henrico County. The Malvern Hill and Glendale Units of RBNP contains historic buildings and structures, cultural landscapes and archeological resources, both historic and prehistoric. The landscape and associated resources of the Malvern Hill area have been found to be significant under two of the four criteria for properties listed under the National Register of Historic Places: A) Be associated with events that have made a significant contribution to the broad patterns of our history; and D) Have yielded or may be likely to yield information in prehistory or history. The site has significance at several different time periods, outlined below, under one or both of the above criteria.

National Significance of Glendale and Malvern Hill Battlefields

The 1993 Civil War Sites Advisory Commission’s *Report on the Nation’s Civil War Battlefields* identifies Glendale and Malvern Hill as among the 384 principal battles of the Civil War. Glendale is considered a Class B battlefield, meaning it is considered to have had a direct and decisive influence on the course of a campaign, and for representing one of the principal strategic operations of the war. Malvern Hill is considered a Class A battlefield; in addition to representing one of the principal strategic operations of the war, it is also recognized as having a decisive influence on a campaign and a direct influence on the course of the war. According to the Advisory Commission, since Class A and B sites are considered to have national importance, they should be the responsibility of Federal agencies as well as state and local governments and other agencies.

Early Settlement of Virginia

The project area also appears significant under Criterion A at the state or local level, for evidence of rural settlement patterns dating to the earliest existence of Henrico County, Virginia. The period of significance coincides with the earliest dates of European settlement. The Malvern Hill and Glendale landscapes reflect settlement patterns established in the mid 17th century and carried through to some degree to the present time. These patterns include open agricultural fields, woodlots, irrigation systems, agricultural complexes and road networks.

Historical archaeological resources within the project area appear to be nationally significant under Criterion D, for their potential to yield information about the historical period coinciding with the battles of Glendale and Malvern Hill. In particular, excavation of two slave quarters associated with the Crewes/Mettert House has yielded information about Africa-American subsistence patterns during the Civil War.

Civil War Actions at the Glendale and Malvern Hill Battlefield Sites

During the spring and early summer of 1862, Union troops under General George B. McClellan attempted to capture Richmond, the capital of the Confederacy. This campaign was considered by McClellan to be extremely important as a means to bring the war to an early close. An initial strategy of attacking Richmond from the west having failed, McClelland then directed the Army of the Potomac to attack from the east, in the peninsula of land between the York and the James Rivers. McClellan's Peninsula Campaign was met by Confederate troops under General Robert E. Lee. In the Seven Days' Battles that resulted, Union troops were forced to retreat. There were enormous casualties on both sides. While McClellan's campaign had failed, Lee also had failed to meet his objective of forcing surrender from the Union troops. After this series of battles, both sides recognized that the war would be long and bloody.

By the time of the Battle of Glendale on June 30, 1862, McClellan had decided to retreat to the James River, while Lee was determined to trap and destroy the Federal troops. The battle itself ended in a bloody stalemate. The following day, at Malvern Hill, McClellan's entire army was situated on a high plateau overlooking the fields of the Crewes/ Mettert and West farms. The plateau from which the Union troops defended their position was one of the highest spots in eastern Virginia, at 130 feet above sea level.

Strategically, the configuration of Malvern Hill was more important than its height. The flanks of the plateau were covered with ravines, streams, swamps, and dense brush. The Confederate troops would have to conduct their assault up more than half a mile of gently rising ground, covered with crops and fringed with dense woodland. The center of the slope was a wheat field with the grain bundled into shocks; an area from which bullets would easily ricochet. When the Confederate troops attacked, they were met with devastating artillery fire. After a ferocious battle with very high casualties, the Confederate troops were defeated. Nevertheless, McClellan did not follow up this victory, and the Army of the Potomac continued its retreat to Harrison's Landing on the James River.

Conservation and Preservation Efforts Leading up to the Establishment of Richmond National Battlefield Park

Malvern Hill is considered to be significant under National Register Criterion A at the state level, for its association with early-twentieth century Civil War battlefield and historic preservation efforts. These efforts culminated in the establishment of RBNBP. In 1932, lands donated by the Richmond Battlefields Parks Corporation became Virginia's first state park. In 1934, the land was offered to the Federal government, and was accepted into the National Park system in 1944. Malvern Hill is significant as a component of this first state park in Virginia.

Cultural Landscape

The Battles of Glendale and Malvern Hill occurred in a landscape of natural and cultural features – such as ravines, field depressions, elevated ridges and “cliffs”, open fields, cut roads, cart paths, and drainage ditches – that played a determining role in the outcome of the fighting (JMA, 2003). The vegetation at the time of the battle was diverse, and included agricultural crops, fruit trees, vegetables, and naturally occurring woodland and wetland species. Cutting of timber, clearing of land, farming, and other human activities had greatly influenced the composition and extent of forest cover. At the time of the battles, three sites in the project area were apparently maintained as open space: at the Fuqua Farm, Garthright Farm, and between the Crewes/ Mettert and West and Binford farms.

Hydrology and water resources were also important features of the battlefield landscape. Creeks in the vicinity of Malvern Hill lie in deep ravines, often surrounded by swampy woodlands. The Western Run, a branch of Turkey Island Creek, was at the time of the battle “bordered with marshes and tangled undergrowth”, according to contemporary accounts (JMA, 2003). Such watercourses and the surrounding wetlands would have presented an impediment to attacking troops.

Buildings and Structures

The Cultural Landscape Report (NPS 2003) identifies nine buildings and/or structures within or immediately adjacent to the park boundaries. These include one building listed on the National Register (Glendale National Cemetery Lodge).

West House- 19th century dwelling located on the Buhrmann Tract across State Route 156 from the Malvern Hill Unit entrance.

Glendale National Cemetery Lodge (adjacent)- Constructed in 1874 from a design by Quartermaster General Montgomery C. Meigs, this building is outside of the project area but associated with the park.

Barn, near the West House

2 Silos on the Buhrmann property to the south along Carter's Mill Road- marks the remnants of a farmstead near the West House

Interpretive shelter at Malvern Hill Unit parking lot.- built as part of the National Park Service's Mission 66 program overlooks an open field, the location of most hotly contested portion of the Battle of Malvern Hill.

Concrete Bridge across Western Run (Willis Church Road)- dates from the 1940's.

Parsonage Ruins- two brick chimneys stand next to one another, the only remnants of the former structure destroyed by fire in 1988.

Freeman Markers- located at the entrance to the Malvern Hill Unit, along a trail north of the Crewes/ Mettert House, and along 156 at the entrance to the parsonage ruins. These cast-iron inscription tablets stand three feet high and measure four feet wide.

Structures located at the Glendale National Cemetery- include two utility buildings, an artillery monument and the stone perimeter wall.

Archeological Sites

According to the CLR (JMA, 2003) four different but interrelated surveys have identified thirty-eight archeological sites within the Glendale and Malvern Hill Units of the RBNP. Of these twenty-seven are historic and eleven are prehistoric. Twenty-one additional locations with high probability for containing pre-historic sites were also identified.

Effect on Historic Properties Listed with or Eligible for Listing on the National Register of Historic Places of the Proposed Action

Woodland Clearing

Archeological sites that may be affected by woodland clearing or thinning or the during the construction of interpretive trails and/or waysides include:

Fuqua Farm- 0025.2- The Fuqua farmhouse site merits further archeological investigation before it is interpreted to visitors. It is located in an area of thick vegetation that may be included in clearing activities.

Fuqua Farm- 0034: A low density lithic scatter may be disturbed during tree removal or thinning.

Crewes/ Mettert farm: 0024.1- The slave quarters site is located at the eastern edge of a woodland to be removed. An archeologist should comment on the potential impacts to the site and recommend precautionary steps or methods to protect the site.

Crewes/ Mettert farm: 0031- This prehistoric site may be impacted by nearby tree clearing.

Crewes/ Mettert Farm: The woods west of the existing farm fields may contain archeological sites like those identified as the Crewes/ Mettert slave cabins. Discoveries at the slave cabins suggest that this area should be classified as a high probability area, and that it should be examined carefully prior to clearing any non-contributing woodland in the area.

West House- This site has been identified as an Area of High Prehistoric Site Potential (JMA, 2003). Three such areas were identified within woodlands recommended for thinning for viewsheds. Prior to any clearing of woodland, an archeologist should study the site for potential impacts of this task upon the sites.

Adverse Effects on Historic Properties

Surveys by NPS contractor JMA have identified several buildings and structures, cultural landscapes and archeological sites (both prehistoric and historic) at the Glendale and Malvern Hill Units of the Richmond National Battlefield Park. Implementation of the proposed landscape treatment plan will not adversely affect such resources. Each phase of the implementation of the Treatment Plan will be coordinated with archeology and preservation goals for the site. Archeological surveys conducted in advance of all ground disturbing activities, and on-site archeological monitoring during such activities, will help ensure that historic or archeological resources are not adversely affected.

Resolution of Adverse Effects

Implementation of the Preservation Treatment Plan calls for woodland clearing and the removal of non-contributing landscape elements. Both the clear-cutting method as well as a gradual thinning method of tree removal has potential to impact cultural resources on the site. Clear-Cutting can seriously disturb archeological sites, especially if the ground is wet and may require extensive data recovery of significant archeological sites. Thinning and gradual removal of overstory vegetation should lower the cost of compliance with cultural resource legislation. For both methods mitigation strategies may include recording and data recovery for historic structures and resources.

The General Management and Design Guidelines Treatment Plan includes forest management practices designed to minimize threats to cultural resources, such as archeological sites. The Plan also calls for pre-timber harvest planning among a multidisciplinary team to include an archeologist and a historic landscape architect.

Reference

(NPS 2003) National Park Service, Richmond National Battlefield Park. Glendale and Malvern Hill Units, Cultural Landscape Report & Archeological Inventory. Sep 2003.

FEDERAL CONSISTENCY DETERMINATION

Under the Coastal Zone Management Act Section 307 (c) and 15 CFR Part 930, sub-part C, Federal government actions within the Coastal Zone must be consistent with state and local regulations. The NPS has determined that the proposed action would have minimal effects on the coastal zone or coastal zone resources and uses. The potential for direct and indirect effects is summarized below for each of the enforceable regulatory programs of Virginia's Coastal Resources Management.

Fisheries Management – There are two perennial streams within the project area. Clearing land near the Crewes Channel area has the potential to increase soil erosion. Increased sedimentation could possibly impact aquatic species over the short term. As part of project implementation, the NPS and their contractors would be required to develop, and submit to the State for approval, an Erosion and Sediment Control Plan prior to the onset of clearing and construction activities (VDCR, 2001). Adherence to the approved ESC plan would minimize any adverse impacts on water resources associated with erosion and sedimentation, and hence on fisheries, to a negligible level.

Subaqueous Land Management - As with fisheries management, adherence to the approved ESC plan would ensure that there would be no impacts of any consequence to subaqueous lands.

Wetlands Management – There are several wetlands within or contiguous to the project area. Care will be taken to minimize impacts from actions that could affect wetlands, such as construction of trails and clearing of trees. There will be minimal use of heavy equipment during construction of walkways over wetlands. Construction will be from upland bank to upland bank, and will be undertaken when ground is firm. The Park will consult with the Corps of Engineers to determine if a wetland construction permit is needed.

A narrow (roughly 100 feet) streamside wetland is the only wetland identified thus far in areas proposed for clearing. NPS may choose to thin this area rather than clear it. If NPS determines that clearing is warranted by battlefield rehabilitation objectives, then the forested stand could be replaced by appropriate grassy wetland vegetation and a riparian buffer strip. Development of and adherence to the approved ESC plan will ensure that minimal impacts to wetlands occur as a result of erosion and sedimentation due to clearing and construction.

Dunes Management – The project is located in an upland area and does not contain coastal dunes; therefore there would be no impact to coastal dunes.

Non-point Source Pollution Control – Adherence to the approved ESC plan would minimize any non-point source impacts associated with erosion and sedimentation.

Point source Pollution Control – The project would not introduce any point sources that would require regulation.

Shoreline Sanitation – No septic systems are located or proposed within the project area; therefore there would be no impact to shoreline sanitation

Air Pollution Control – The proposed action would have negligible and/or short-term impacts on air quality. The small increase in emissions from forestry equipment and from possible increased visitation to the project area following rehabilitation activities would not generate any air pollutants in quantities sufficient to degrade existing air quality.

Coastal Lands Management – Areas surrounding the two perennial streams in the project area are designated as Chesapeake Bay Preservation Areas. NPS will abide by state and local (Henrico County) regulations regarding coastal lands management, including development of an approved Erosion and Sediment Control Plan.

Based upon the above information, data, and analysis, the NPS finds that the proposed action of landscape rehabilitation in RNBP is consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Resources Management Program.

Pursuant to 15 CFR 930.41, the Virginia Coastal Resources Management Program has 60 days from the receipt of this letter in which to concur with or object to this Consistency Determination, or to request an extension under 15CFR 930.41(b). Virginia's concurrence will be presumed if the National Park Service does not receive its response by the 60th day from the State's receipt of this determination. The State's response should be sent to:

Mike Johnson
National Park Service
Richmond National Battlefield Park
3215 East Broad Street
Richmond, VA 23223