Treatment Plan

Introduction

This treatment plan has been prepared to provide the National Park Service (NPS) with an overall vision for the cultural landscape of Vicksburg National Military Park. The plan is intended to guide and support long-term management and interpretation of the site and its resources. Comprised of treatment recommendations, guidelines, and implementation projects, the plan addresses management of four units of the Vicksburg National Military Park landscape: the main battlefield unit, Louisiana Circle, South Fort, and Navy Circle.

The treatment plan carefully considers the needs and goals for site management as identified in various meetings conducted on behalf of this project by NPS personnel and the Cultural Landscape Report (CLR) consultant team. Integral to the planning process was concurrent preparation of an Environmental Assessment (EA) by a team that included NPS Denver Service Center, Washington Administrative Service Organization (WASO), Southeast Regional Office, and park personnel, as well as consultants from Mactec Engineering and Consulting of Atlanta, Georgia. Another key factor in the development of the treatment plan was the information collected during a series of public meetings held at the park on behalf of the project.

At the time the CLR was completed, several key planning documents that typically establish a framework for treatment, such as a General Management Plan and a Long-Range Interpretive Plan, were outdated. Future development of these studies will need to be coordinated with the information included in this CLR.

Chapter Organization

This treatment plan chapter is divided into six sections as follows:

1. Park Management Goals, Issues, and Concerns. This section describes the issues raised by the park for consideration within the CLR treatment plan.

2. Treatment Alternatives Developed through the CLR/EA Planning Process. This section outlines the six treatment alternatives explored by the CLR and EA and presented to the public for review and consideration. This section also describes NPS and public responses to the alternatives.

3. The Preferred Alternative. This section identifies the preferred alternative and the process conducted to select the alternative.

4. Treatment Plan. This section presents the overarching concept for treatment associated with the preferred alternative as well as the individual recommended actions that are needed to effect the treatment concept, while addressing the park's management goals, issues, and concerns. The recommendations are organized by landscape characteristic.

5. General Management and Design Guidelines for Treatment. This section provides general treatment guidelines on how to approach resource management within the Vicksburg National Military Park landscape.

6. Implementation Projects. This section identifies and describes the various projects that will contribute to implementation of the CLR treatment plan.

Park Management Goals, Issues, and Concerns

During the CLR kick-off meeting held on January 30, 2007, at the park, NPS park and regional personnel provided the CLR consultant team with a list of management issues to be addressed in the treatment plan as follows:

- What is the appropriate landcover for the park given all of the natural and cultural resource issues under consideration by the CLR? Where should the land remain forested versus under open vegetative cover or cleared of trees, considering the imperative to interpret the battle, sustain maintenance requirements, and the risks of exposing relics and diminishing wildlife habitat?

- What is the appropriate approach to land management concerns such as the erosion of fragile loess soils and the accumulation of fuel associated with the regrowth of forest cover?

- How can the challenges related to mowing steep and highly erodible loess slopes be mitigated?

- How should the park proceed with managing invasive species, particularly privet and kudzu?

- What additional measures should the park undertake concerning wetlands protection and management?

- How should the park address issues of historic integrity and misinterpretation? For example, the orientation of the original automobile tour road was reversed in the 1960s and made into a one-way loop road, and the circa 1937 Old Administration Building near the Surrender Site is often mistaken for a Civil War-era building.

- Should missing park elements be replaced, such as the observation towers removed in the 1960s that were once a significant component of the commemorative-era landscape, or the more than 140 cast iron tablets removed during World War II?

- How should the park address management of noncontiguous park parcels as well as non-NPS ownership of parcels within or closely abutting the park boundaries?

- How can visual screening of obtrusive elements located on neighboring properties or within the viewshed of the park be achieved?

As part of the preparation of the EA component of the project, the park identified a purpose, need, objectives, and concerns statement, which provided additional guidance in the development of the CLR treatment plan. The park's statement includes the following:

> **Purpose:** The purpose of this plan is to guide landscape treatment and maintenance so that the park meets its mandate to "commemorate the campaign, siege and defense of Vicksburg, and to preserve the history of the battles and operations of the siege and defense on the ground where they were fought and were carried on . . . ." The park's authorizing legislation further includes specific actions to meet the overall purpose: "to restore the forts and the lines of fortification, the parallels and approaches of the two armies, or so much thereof as may be necessary to the purposes of the park." This plan seeks to provide a clear direction to manage the landscape in ways that commemorate the campaign, siege and defense of Vicksburg, as required by Congress, by preserving resources and enhancing visitor understanding and appreciation of the events that occurred here while providing a variety of experiences and complying with other laws and regulations.
>
> **Need:** The park needs to analyze the landscape comprehensively and determine if and what changes are needed to enhance preservation of the landscape's historic character and integrity and improve visitor understanding and experience.
>
> **Objectives**
> 1. To facilitate understanding and interpretation of the park story including:
> a. Campaign (primary)
> i. Topography/features/struggles/achievements
> ii. Confederate use of landscape/defensive plan

iii. Union use of landscape/offensive plan
iv. Proximity of river/city/fortifications
b. Context (secondary)
c. Establishment/Commemoration (secondary)
i. Helps understand why and where monuments are located
d. Civilian Conservation Corps (secondary)

2. To experience history up close:
a. Enhance the visitors' immersion in the resource
i. Encourage visitors to leave their cars to experience the park firsthand
ii. Provide interpretative experiences faithful to the park's purpose
iii. Make the park's story relevant to visitors' lives today
b. Enhance outreach and educational opportunities

3. To protect physical features and resources from degradation due to:
a. Vandalism
b. Wear and tear
c. Relic hunting
d. Erosion

4. To provide opportunities for a variety of visitor experiences while maintaining the historic character and integrity of the landscape and managing visitor use conflicts including:
a. Habitat
b. Wildlife
c. Trails/paths
d. Water resources

5. To develop sustainable ways of maintaining the landscape including:
a. Methods
b. Costs

Concerns

1. Additional measures are needed to enhance interpretation of Union and Confederate military objectives during the siege of Vicksburg to comply with the park's enabling legislation.
2. Visitors appreciate the natural landscape. However, visual interpretation and understanding of the military objectives are difficult because the current landscape now obscures lines of sight to battlefield features.
3. Visitors generally do not experience park resources up close.
4. Landscape changes would affect:
a. Wildlife habitat
b. Park aesthetics
c. Soil erosion
d. Wetlands
e. Surface water quality and temperature, and streamflow characteristics
f. Maintenance requirements
g. Visitor experience
h. Prehistoric and historic archeological resources
i. The only public forested area within urban Vicksburg
j. Viewscapes
5. Physical features and resources of the park are vandalized.
6. Soil erosion threatens military earthworks, archeological resources, and monument and landscape stability.
7. Some visitor uses are not consistent with the park mission, while others are consistent only when made secondary to the primary park mission of interpreting the battle and siege of Vicksburg.
8. Some resources and features are not accessible to visitors or maintenance crews.[293]

293. Vicksburg National Military Park, "Statement of Purpose, Need, Objectives, and Concerns," in Mactec, *Vicksburg National Military Park Environmental Assessment for Landscape Rehabilitation,* draft (Atlanta, Georgia: National Park Service, 2009).

Treatment Alternatives Developed through the CLR/EA Planning Process

Six conceptual treatment alternatives for the Vicksburg National Military Park cultural landscape were developed during a CLR/EA Workshop, held at the park on November 13–14, 2007. The conceptual alternatives were later refined and revised based on review comments received from NPS and EA project team members. A summary of the alternatives and a preliminary determination by the workshop participants of their viability is provided below. More detailed explorations of the alternatives follow.

- **Alternative A.** Maintain existing conditions and management direction (No Action). Preliminary workshop determination: Continue to consider this alternative.

- **Alternative B.** Preservation through best management practices. Interpretation is considered to be a primary means of commemoration. Preliminary workshop determination: Preservation meets resource protection needs, and visitor needs with the interpretation component. Continue to consider this alternative.

- **Alternative C.** Rehabilitate/maintain key areas of military engagement. Preliminary workshop determination: this alternative meets resource protection needs in most areas, and visitor needs with the interpretation component. Continue to consider this alternative.

- **Alternative D.** Rehabilitate/maintain the broad spectrum of military engagements. Preliminary workshop determination: this alterative meets some resource protection needs although mitigation would be required to address the concerns and problems identified in the workshop. Meets visitor needs with the interpretation component. Continue to consider this alternative.

- **Alternative E.** Restore the park landscape to its character during the Civil War siege. Preliminary workshop determination: This alternative is problematic for various reasons. First, insufficient documentation exists to restore the landscape to 1863 conditions. Second, implementation of the alternative would have severe resource implications, including potential removal of monuments, and reconstruction of missing features, such as earthworks and abatis, that would be difficult to accomplish and maintain. The significant amount of tree clearing required under this alternative may cause erosion. This alternative should not be considered further.

- **Alternative F.** Restore the park landscape to its character during the early park development period. Preliminary workshop determination: This alternative is problematic for various reasons. First, insufficient documentation exists to restore the landscape to 1917 conditions. Second, it would have severe resource implications, including the potential need to remove major monumentation components erected after 1917. Significant tree clearing would be required under this alternative and would likely lead to severe erosion. The degree of mitigation that would be necessary and the loss of many original park features suggest many potential avenues for misunderstanding by the public. This alternative should not be considered further.

Each of the treatment alternatives is associated with an overarching preservation approach, as well as a concept intended to address the park's identified purpose and need in preparing the CLR.

The alternatives comply with the *Secretary of the Interior's Standards for Historic Properties* in their overarching approaches to resource management and conservation. The Secretary of the Interior currently recognizes four appropriate treatment approaches for historic landscapes: preservation, rehabilitation, restoration, and reconstruction. "Collectively, the four treatments form the philosophical basis for responsible preservation practice and enable long-term preservation of a

landscape's historic features, qualities, and materials."[294]

The four treatment approaches are defined as follows:

- **Preservation**: the act or process of applying measures necessary to sustain the existing form, integrity, and material of a historic property. Preservation includes stabilization work, where necessary, as well as ongoing preservation maintenance and repair of historic materials and features.

- **Rehabilitation**: the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

- **Restoration**: the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by removing features from other periods in its history and reconstructing missing features from the restoration period.

- **Reconstruction**: the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

Issues Common to All Alternatives

All of the treatment alternatives considered for the Vicksburg National Military Park cultural landscape will have an impact on site resources and conditions as well as implications for maintenance, resource protection, and interpretation. While all of the alternatives are designed to help the park and the NPS best meet its mission and goals, as well as the Purpose, Need, Objectives, and Concerns statement prepared to guide this CLR, for protecting the historic Vicksburg National Military Park landscape and accomplishing its legislative mandate, each alternative involves changes to the landscape that will affect the site, the visitor, and park operations to varying degrees. Seven issues of concern are common to all of the alternatives: soil erosion control, tree clearing, turfgrass landcover, adaptive land management, best management practices, enhancing interpretation, and mitigating the potential for relic hunting. The degrees to which the alternatives successfully address these issues vary, as does the need for mitigation of potential impacts to cultural and natural resources.

The issues common to all alternatives are identified and described below; the effect that each alternative will have on the site as it relates to each issue is specified to the degree possible as part of the more detailed descriptions of each alternative that follows.

Soil Erosion Control. The loess soils that underlay the park are vulnerable to severe erosion. Erosion control has been a management challenge at the park since its inception. Areas of the park that had been cultivated and used for pasture began to erode intensively in the 1930s. The Civilian Conservation Corps conducted ambitious corrective work, regrading, stabilizing, and terracing slopes, establishing gutter and other conveyance systems, and planting forests, particularly where subsidence threatened the underlying support of significant monuments. Today, erosion continues to plague the park's maintenance staff. Wherever stormwater has the potential to run across exposed soil there is a threat of erosion. Terracing and the use of gutters continue to play an important role in erosion control within some steeply sloped areas. The park has found that maintaining a healthy stand of turfgrass, primarily Bermuda grass, is the best defense against soil erosion. However, the maintenance regime that promotes Bermuda grass requires regular mowing to keep weeds and woody growth in check. Mowing of steep slopes and ravines is not always feasible given existing budgets, staff, and the risk posed to maintenance

294. Robert R. Page, Cathy A. Gilbert, and Susan A. Dolan, *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* (Washington: National Park Service, 1998), 82.

staff in the steepest areas. In these areas, forest has been allowed to grow up. Tree roots, however, may not necessarily be the most successful at retaining the soil, and forest cover can obscure areas of erosion. The park is vigilant in correcting all evidence of erosion as soon as it is spotted. However, within forested areas erosion has the potential to go undetected. It is hoped that new materials, including plant species, may be identified in the future that will simplify the job of controlling erosion at the park. One of the most challenging issues will be controlling erosion during any landcover conversion process as the soils will be most vulnerable after one landcover has been removed and the replacement groundcover is becoming established.

Tree Clearing. The treatment alternatives presented below consider various degrees of land area to be cleared and other means for managing woodland to enhance interpretation of Civil War events.

One of the concerns that has been raised repeatedly by park staff as well as visitors and participants in recent public meetings is that woodland as it currently exists throughout much of the park obscures visual and physical relationships that were apparent during the siege and are crucial to visitor understanding of the Civil War events and associations. Two of the treatment alternatives developed for the CLR/EA include tree clearing as a site rehabilitation effort that is intended to support interpretation of the Civil War events.

One of the main issues related to tree clearing, however, is that it may lead to increased soil erosion and require additional maintenance efforts and costs. The loess soils that are associated with the park are fragile and highly susceptible to erosion. Having comprehensive vegetative cover with a good root system is crucial to preventing erosion. Soil loss can degrade archeological resources, including the remnant earthworks associated with the siege of Vicksburg. Tree clearing, particularly on sloped areas, must be followed by immediate establishment of an alternative landcover that can be maintained by the park. Regardless of soil holding capabilities, any landcover so established will is likely to have a character that is not consistent with that present at the time of the siege. Additionally, bird habitat would be lost.

There are various issues requiring additional consideration when clearing trees. For example, after cutting trunks, consideration should be paid to whether logs are to be removed, left in place to decompose, or retained to resemble Civil War obstacles such as abatis as an interpretive aid. Logs used as abatis would need to be replaced periodically as they will decompose. Soon after clearing, vegetation will begin to grow up and cover the logs, rendering interpretation challenging. The downed timber would be a fire hazard. Downed timber would also present a challenge for mechanical maintenance of ground cover. If handled properly, downed timber could be used as a stormwater control mechanism to slow and redirect water flow along the same lines of some of the park's engineered systems; without proper treatment, logs could divert run-off, possibly into channels that would cause erosion. On slopes and in bottomlands, removal of cut timber may be difficult and will have to be done carefully to avoid causing erosion.

Tree clearing would need to be undertaken using best management practices for logging. Contractors selected to conduct tree clearing work would need to follow very specific specifications to avoid damaging the land and contributing to erosion problems. Additionally, any stump removal would require on-site archeological monitoring for exposure of artifacts.

After the trees are removed, if grass is not planted and maintained, other plants that are difficult to maintain, such as saplings, woody weeds, and invasive species, will quickly colonize the site, rendering turfgrass establishment more difficult. Tree clearing will constitute a loss of wildlife and plant habitat for some existing species, and may have a negative impact on water quality due to an increase in particulate matter reaching water resources, and higher water temperatures due to the removal of the tree canopy.

Turfgrass Landcover. The park currently uses turfgrass as the primary vegetative cover within areas of visitor interest and use, where telling the story of Civil War events is most critical and possible. Turfgrass is maintained through periodic mowing. Areas of the park are mowed with more or less frequency depending on a variety of factors. For instance, areas that are of interest to visitors because they are close to the road or contain an interesting or important resource are mowed most often. The alternatives presented below generally assume that areas where tree clearing occurs will be converted to turfgrass cover, primarily Bermuda grass. Bermuda grass is the species preferred by the park for turfgrass because its root system is highly successful in holding the local loess soils. It is not currently known whether there are other species that could be used successfully within the park that would require less frequent mowing.

Mowing on steep slopes and in ravines is very challenging, and in some cases, dangerous for park maintenance staff. While alternatives to regular periodic mowing exist, each is fraught with its own challenges. Prescribed burning is one of these alternatives. Challenges to using prescribed fire include the humid conditions of the region that render the available fuel too wet to burn, the difficulty of scheduling a burn unit to coincide with appropriate conditions, and the potential for timing the burns too late in the season. Less frequent mowing can lead to rapid and excessive growth of weeds that will choke and shade out the desirable grass species that retain the soil.

Adaptive Land Management. All of the treatment alternatives presented herein involve changes in landcover that have the potential to lead to soil erosion, wildlife habitat alterations, and impacts on water resources. Given the cost of maintaining open space within the park both in staff time, equipment, and petroleum, diminishing the need for labor-intensive vegetation management is likely to become increasingly desirable. The park may choose to experiment with alternative landcover types and management strategies, particularly if implementing a treatment alternative that calls for the conversion of large areas of forest to turfgrass. It will be prudent for the park to adopt a conservative approach to implementation that includes phasing the efforts, and taking on small areas of clearing at a time. With each phase, the park should monitor the results and adapt or adjust the implementation strategy to correct any problems identified during earlier phases. A protocol for monitoring the efficacy of any treatment alternative implemented would need to be developed.

Best Management Practices. Best management practices (BMPs) are defined as effective, practical, or feasible (including technological, economic, and institutional considerations) conservation practices and land- and water-management measures that avoid or minimize adverse impacts to natural and cultural resources.[295] BMPs are often used to control soil loss and reduce water quality degradation caused by nutrients, animal wastes, toxics, and sediment moving from the land to surface or ground water, or to otherwise protect water quality. They can be innovative and dynamic, and provide improved environmental protection practices for landscape management procedures of many types. They may target a variety of endeavors, for instance forestry or silviculture and tree clearing, landscape installation, landscape maintenance, riparian buffer preservation, or turf management. For example, the state of Mississippi maintains best management practices for forestry as it relates to water quality protection.[296] BMPs should be reasonable, achievable, and cost effective to adopt and use.

At Vicksburg, most of the alternatives suggest that the park establish and utilize BMPs to address desired landscape change and management within the park, particularly the clearing of existing woodland areas, and the establishment of turfgrass cover. BMPs may also need to be developed for invasive alien plant control methods, riparian

295. "Twelfth Biennial Report on Great Lakes Water Quality" <www.ijc.org/php/publications/html/12br/english/report/glossary.html>, accessed August 29, 2008.
296. <www.mfc.state.ms.us/water_quality.htm>, accessed August 29, 2008.

buffer preservation, and specific types of landscape maintenance that regularly occur at the park. Consideration of innovative and dynamic BMPs is recommended.

Enhancing Interpretation. All of the treatment alternatives presented herein assume an interest on the part of the park in enhancing the interpretive program at Vicksburg National Military Park and suggest a range of means for doing so that are tied to landscape management recommendations. Improved interpretation will benefit the public in many ways, including engendering an appreciation for the site and its history and a sense of stewardship of its resources. It will also help the park to meet its stated mission and purpose. Improving interpretation at the park could take many forms. As noted above, rendering the site more visually accessible through tree clearing is one of the methods under consideration. Other options for enhancing interpretive opportunities range from developing exhibits, to increasing the role of living history, utilizing technology to aid in visualizing scenes obscured by post-Civil War changes to the landscape, and providing a tour bus with personal interpretation. Some alternatives suggest that the park implement a combination of strategies. Different combinations of the strategies presented below could be implemented depending on the park's available budget or other criteria.

Mitigating the Potential for Relic Hunting. Relic hunting is an illegal activity that can damage or destroy important historic resources. Relic hunters typically attempt to enter a protected site unnoticed and explore its potential to yield artifacts by excavating areas where combat likely occurred. Review of historical accounts and maps and metal detection suggest sites with potential for finding relics. Additional tree clearing in areas advertised as sites of important or key military engagement may invite relic hunting or unlawful excavation and exploration within the park. Sites that are near park boundaries or adjacent to roads or access points, in addition to opportunities for concealment, may be targeted by relic hunters. Tree clearing may discourage relic hunting in some areas by eliminating opportunities for concealment.

Currently, the treatment alternatives raise the issue of relic hunting as a law enforcement consideration, but do not specifically suggest physical landscape implications for mitigating the problem. The park has instituted features, such as vehicular entrance obstructions and detection devices, as means for diminishing the potential for relic hunting, and plans to implement formal park-watch programs, outside agency (city/county law enforcement) cooperative surveillance efforts, and barrier construction over time in susceptible areas.

The Treatment Alternatives Considered

The pages that follow include narrative and graphic depictions of the six treatment alternatives considered for the Vicksburg National Military Park cultural landscape as part of the CLR/EA process. The first alternative reflects current park management practices and consists of concrete actions conducted at regular, identified intervals. The other alternatives are conceptual ideas for future treatment of the historic Vicksburg landscape.

FIGURE 274. One of the kudzu management areas within Vicksburg National Military Park.

Alternative A. Maintain existing conditions and management direction (No Action)

As part of this alternative, the park would maintain its present landscape patterns and features and the management and maintenance practices that sustain them. The existing visitor center would continue to serve as the primary means for visitor contact and orientation (Fig. 101). The sixteen-mile tour road would remain the primary vehicular access route for experiencing the park's resources, and it would retain its current configuration and circulation pattern (Fig. 81 through Fig. 89). Visitors would continue to explore the park outside of their vehicles at established points of interest such as the Shirley House and Illinois State Memorial (Fig. 110). No further clearing would be undertaken and current mowing and vegetation management regimens would be continued, including specific protocols for the treatment of areas infested with invasive plants such as kudzu (Fig. 274) and repressing succession with prescribed fire (Fig. 275). Important views that are already maintained as significant interpretive sites, such as Thayer's Approach (Fig. 276) would continue to be managed for clear sight lines. Treatment would also focus on stabilization and maintenance of the current landscape and preservation of the park's Civil War and commemorative features as they exist today, including earthworks (Fig. 277), associated cannon (Fig. 278), and monuments (Fig. 279).

FIGURE 275. Prescribed fire used to repress woodland succession.

FIGURE 276. Thayer's Approach, maintained as a "backfield" area.

FIGURE 277. Earthworks in a "maintained" area.

FIGURE 278. Cannon placed on historic earthworks as interpretive aids.

FIGURE 279. The Missouri State Memorial is an example of a "maintained" area edged by a "backfield" area.

Because this alternative is comprised of existing management practices, detailed information about the periodic efforts conducted to maintain the park are described below within each landscape management area (Fig. 280):

"Unmaintained" landscape areas. Areas of the landscape that are not mowed.

- Oversee right-of-way maintenance and activity
- Monitor wildlife, habitat, erosion, vital signs, and invasive species

"Maintained" landscape areas. Areas of the landscape that are mowed at varying intervals.

Activities conducted throughout the area:

- Monitor and inspect for hazardous trees and erosion
- Correct erosion as needed
- Remove hazardous trees as needed
- Monitor wildlife, habitat, erosion, vital signs, invasive species
- Monitor, mark, and maintain a cleared zone and fire break, approximately ten feet wide, along the boundary
- Clean and maintain features (monuments, cannon and carriages, markers, tablets, statues, busts, reliefs)
- Patrol and monitor for vandalism prevention and law enforcement

Activities conducted at "points of interest" (places where visitors are invited to leave their vehicles, such as the Shirley House and tour road stops):

- Remove trash daily
- Mow bi-weekly, except for the Shirley House, Visitor Center, Cairo museum, and fee collection and information kiosks, which are mowed weekly

- Trim around features bi-weekly
- Treat fire-ant mounds weekly
- Update kiosk information quarterly
- Trim overgrowth annually
- Limb up trees where they interfere with important views annually
- Maintain/replace signs annually
- Maintain waysides and interpretive panels annually

Activities conducted in association with the sixteen-mile tour road and other roads, parking areas, and bridges:

- Remove trash daily
- Blow off debris two times per week
- Patch potholes two times per year
- Grade gravel surfaces monthly
- Maintain gates monthly
- Repair curbing annually
- Remove vegetation from bridges annually
- Maintain/replace signs annually
- Seal cracks every five years
- Stripe every five years
- Seal bridges every five years
- Maintain fee collection and information kiosks every five years
- Correct erosion as needed

Activities conducted within the "general landscape" (areas that are visible from the tour road and points of interest, and the administrative/maintenance/collections storage area):

- Remove trash daily
- Trim around features bi-weekly
- Mow every three weeks
- Treat vegetation behind the Cairo Restoration Shop to keep the drain open two times per year
- Trim overgrowth annually
- Limb up trees to provide visual access and to allow equipment and visitor access annually

Activities conducted in "backfields areas" (opening up vegetation and maintaining vegetative cover for important views):

- Bush hog/mow as possible three times per year
- Trim overgrowth to permit access for maintenance every three to five years
- Cut and treat woody vegetation in ravines and steep slope conditions every five years; leave the timber in place

Areas with unique management considerations:

- Kudzu management areas. Treat kudzu two times per year; otherwise treat as unmaintained landscape area
- Railroad Redoubt riparian buffer (twenty-five feet on each side of the stream, fifty feet total). Maintain vegetation height to less than twenty feet; otherwise treat as backfields area
- Trail (twelve miles unpaved). Initiate volunteer projects to clear trails annually; otherwise treat as unmaintained landscape
- Burn units (six units totaling sixty acres).
    - Burn every two years

- Cut big wood (8 inch diameter and smaller) two months prior to scheduled burn

Implications of the Alternative. Relationship of the alternative to the issues common to all:

- Under this alternative, no additional tree clearing will be undertaken at the park.

- Turf grass will continue to be the preferred landcover type along visitor road corridors and associated with earthworks and monuments that fall within the maintained areas of the park. There will continue to be some monuments and tablets that are located outside of maintained areas that may not be visually accessible because of tree cover and steep slopes.

- Existing interpretive programs will continue.

- The park may not be able to address the concerns raised in the Purpose, Need, Objectives, and Concerns statement prepared to guide the CLR/EA project and presented above, including:

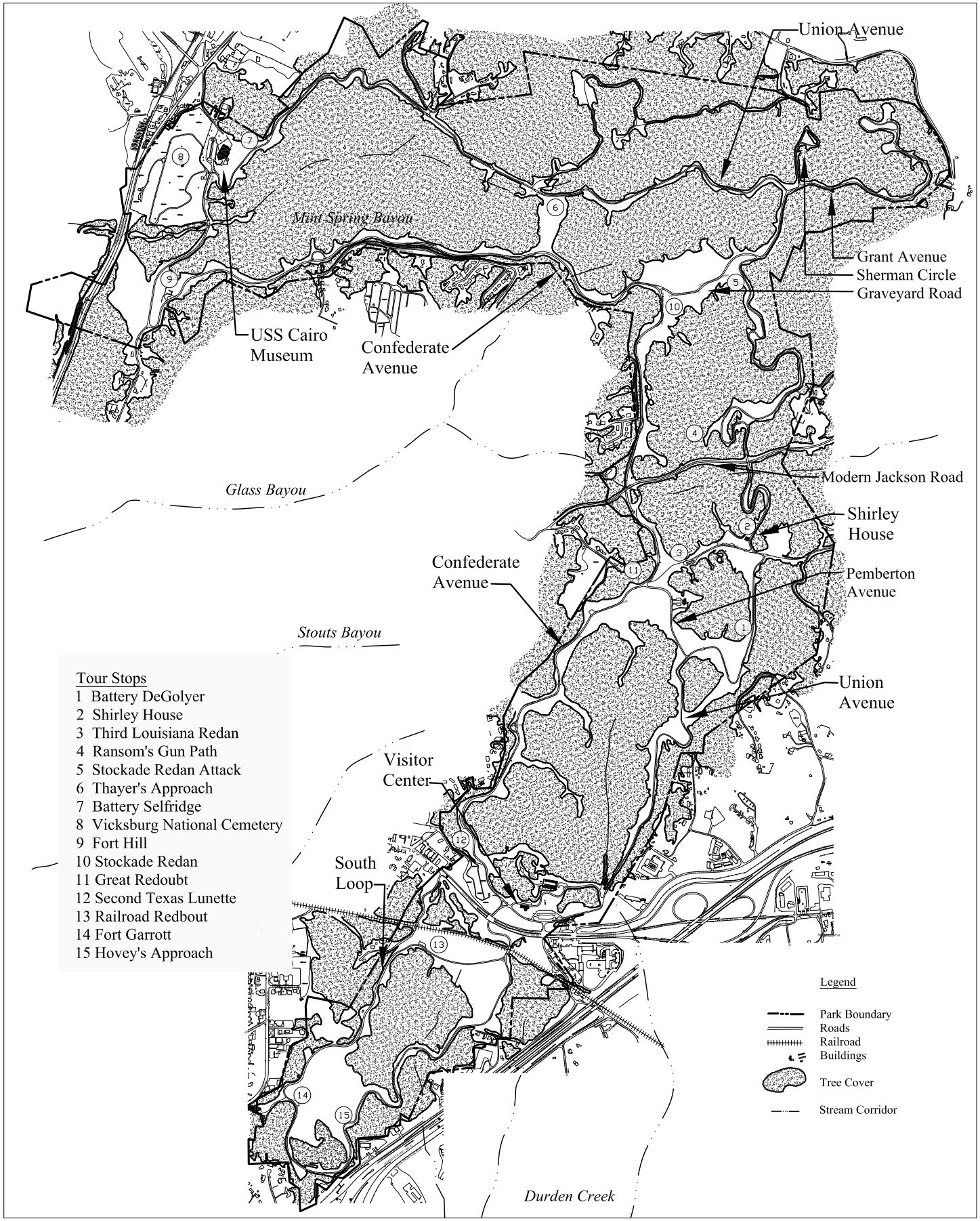
  - Additional measures are needed to enhance interpretation of Union and Confederate military objectives during the siege of Vicksburg to comply with the park's enabling legislation.

  - Visitors appreciate the natural landscape. However, visual interpretation and understanding of the military objectives are difficult because the current landscape now obscures lines of sight to battlefield features.

  - Visitors generally do not experience park resources up close.

  - Soil erosion threatens military earthworks, archeological resources, and monument and landscape stability.

  - Some resources and features are not accessible to visitors or maintenance crews.



Source: Autocad Base Map, USGS Topographic Data

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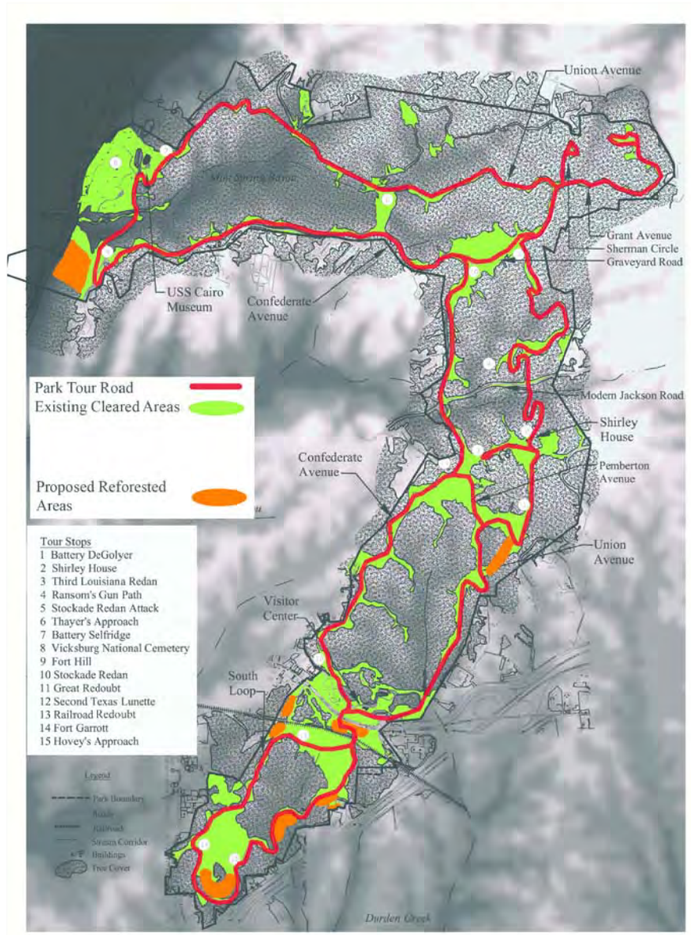
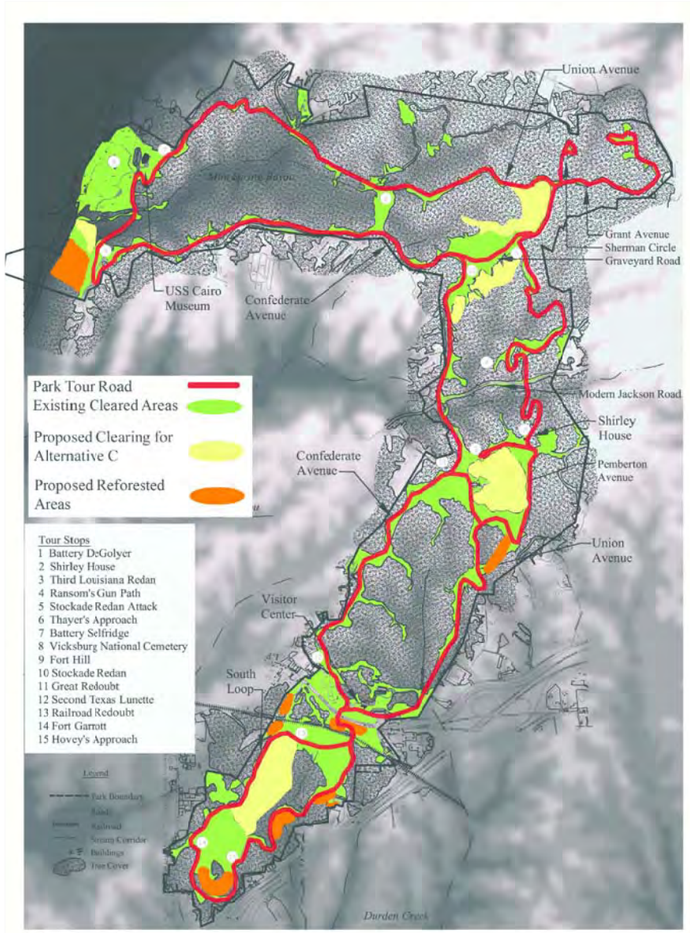
Cultural Landscape Report
Vicksburg National Military Park

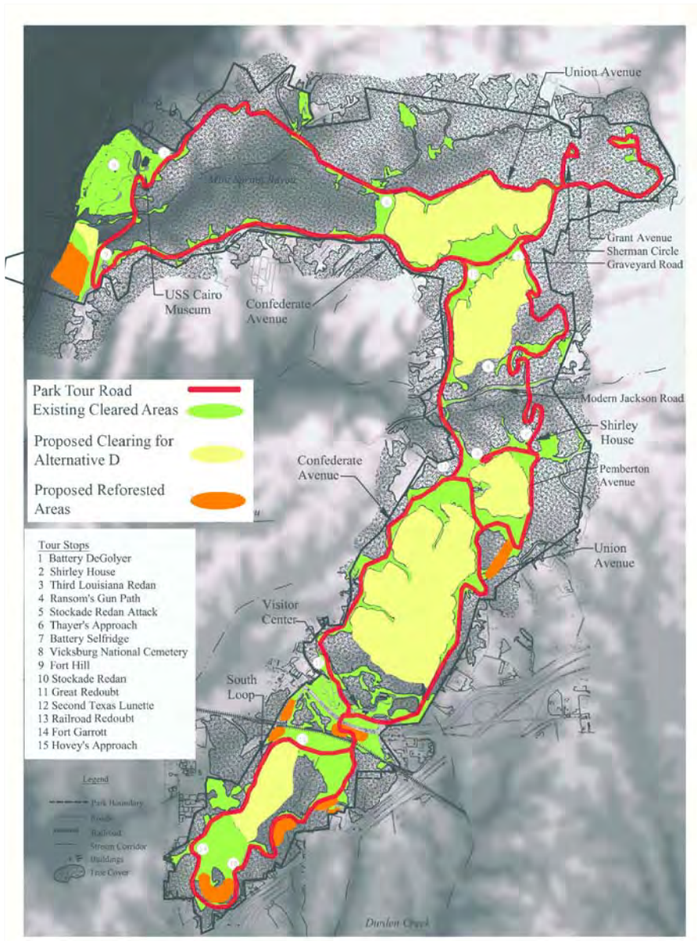
Treatment Alternative A
Existing Conditions
Figure 280



Treatment Alternative B
Preservation through Best Management Practices (BMPs)



Treatment Alternative C
Rehabilitate/Maintain Key Areas of Military Engagement



Treatment Alternative D
Rehabilitate/Maintain the Broad Spectrum of Military Engagements

Comparison View
of Treatment Alternatives B, C and D

Figure 281

Cultural Landscape Report
Vicksburg National Military Park

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Alternative B. Preservation through Best Management Practices (BMPs)[297]

This alternative (Fig. 281) involves identifying management practices for the landscape that best support preservation of vestiges of the Civil War siege as they exist today. The Best Management Practices (BMPs) support soil conservation throughout the park, but particular emphasis would be placed on retaining surviving above-ground evidence of the earthworks constructed by the opposing armies, and any surviving below-ground archeological evidence of the siege. BMPs would consider the role of vegetative cover in conserving soil, and the ecological implications of maintaining healthy plant communities, including the associated need for water resource protection, and diversity of good quality wildlife habitat (Fig. 282).

Erosion control has been a management challenge at the park since its inception due to the fragility of the underlying loess soils. Disturbed areas begin to erode immediately unless stabilized under protective cover such as vegetation with a fibrous root system. Severe erosion due to early twentieth-century agriculture was corrected in the 1930s by the Civilian Conservation Corps through extensive regrading, filling, and slope stabilization, including tree planting and sodding (Fig. 28 through Fig. 32). This alternative advocates a proactive approach to soil erosion control, and continued vigilance in taking corrective measures where necessary to ensure that erosion does not jeopardize existing landforms.

FIGURE 282. Example of erosion within the park.

As part of this alternative, the park would investigate the range of landcover types available that best protect the loess soil from erosion. Using the best scientific and empirical information available, the park would convert existing plant communities that do not provide adequate protection from erosion over time to new landcover that better mitigates the potential for erosion. New landcover would be comprised of plant communities tailored to site-specific conditions, including soil moisture and slope and solar orientation. Land cover might include a combination of continued use of turf grasses (Fig. 283) and new warm-season grass and forb fields (Fig. 284), savanna (a combination of grasses and widely spaced hardwood trees) (Fig. 285), wet meadows, or mesophytic forest. The principle characteristic of this alternative is that management of the landscape will follow the most effective and practical erosion control methods available, based on available scientific and empirical knowledge and finances, in an effort to preserve Civil War-era resources. One initial focus would be on removing invasive plant species, such as kudzu and privet, that crowd out native species with better soil-holding ability. The use of BMPs to protect the park's cultural resources could be explored as an interpretive theme within the Visitor Center and in park interpretive programs.

297. For the purposes of this project, the term *preservation* is based on the definition conveyed in *The Secretary of the Interior's Standards for the Treatment of Historic Properties* with *Guidelines for the Treatment of Cultural Landscapes*, as follows: "Preservation is the act or process of applying measures necessary to sustain the existing form, integrity, and materials of a historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project."

FIGURE 283. Turf grasses as a land cover.

FIGURE 284. Warm-season grasses used as land cover on historic earthworks; this example is from another park.

FIGURE 285. An example of the character of a savanna community; this example is from another park.

Due to the fact that the resulting landcover might alter visual and/or physical accessibility of the landscape resources used to interpret the park to the public, future interpretation of the Civil War landscape might feature advanced technology and media to illustrate conditions of the Civil War landscape that cannot be otherwise explained on the ground. New digital technologies are beginning to provide unprecedented opportunities for visual and auditory interpretive material. The potential exists to interpret and visualize the battle on-site in such a way that the visitor would be able to mediate any differences between the landscape of today and that present at the time of the siege. Such tools could facilitate interpretation without having to faithfully recreate or represent historic conditions. A variety of interpretive means ranging from static exhibits, models, and waysides, to dynamic and interactive displays on indoor and outdoor digital screens, or audiovisual presentations downloadable and transportable on hand-held devices, such as personal cell phones or GPS Rangers could be used to bridge the gap (Fig. 286). Exhibits and other interpretive aides could feature representations of missing Civil War resources such as wooden platforms, headwalls, log and stone cribs, internal circulation, magazines

FIGURE 286. A GPS Ranger.

and bombproofs, lookout towers, soldier tents, barracks, mess halls, and shebangs that comprised the elements of the fortifications and the life of the soldiers stationed there. Interpretive aides might also depict the cane brakes, cabled brush, cheveaux-de-frise, and abatis that reinforced the Confederate line of defenses faced by approaching Union soldiers (Fig. 287), or outline important sites or trajectories using mowing patterns (Fig. 288) or other minimal and removable interventions (Fig. 289). Finally, interpretive aides might also be used to tell the story of life in the region by depicting one of the farmsteads that sat on one of the ridges as the siege began or the cave-dwellings constructed by civilians during the siege. These aides would be designed solely to enhance on-site interpretation, and would be temporary and removable so as not to permanently alter the cultural landscape. In addition, they would be conceived as interpretive aids, not as reconstructions, and sited in such a way as to educate visitors without suggesting that they are themselves historic resources.

Assumptions.

- The goal of this alternative is to preserve the landscape as it currently exists as far as landform and topography are concerned. Preservation is a relatively restrictive treatment approach, which assumes that existing features are replaced in kind, and new features are not added to the landscape. These restrictions may be problematic if interpretive exhibits are proposed for areas of the park other than visitor use zones such as the Visitor Center environs.

- Soil erosion control as it relates to cultural resources and their connection to the natural terrain is the primary objective of this alternative.

- This alternative is based on the assumption that BMPs are constantly updated based on available scientific data and site manager feedback regarding performance data.

FIGURE 287. An example of an interpretive exhibit of military earthworks features now missing from the landscape, including abatis (foreground) and gabions, at another park.

FIGURE 288. Mowing patterns being utilized to outline important sites or trajectories; this example is from another park.

FIGURE 289. An example of wood posts used to outline a missing structure; this example is from another park.

- This alternative assumes a gradual implementation process and an adaptive management strategy. The approach is intended to be conservative and aimed primarily at the protection of sensitive resources.

Implications of the Alternative. The section that follows indicates the relationship of the alternative to the issues common to all:

- It is not currently clear how much, if any, tree clearing would occur under this alternative.

- To supplement any potential lack of visual accessibility to the battlefield landscape, an innovative and creative approach to interpretation is an integral part of this alternative.

- Relic hunting may or may not be affected by the implementation of this strategy depending on the future landcover type established.

- Given all of the unknowns associated with this alternative, identifying the implementation costs will rely on the establishment of numerous assumptions.

Other implications and considerations.

- This alternative, if successfully implemented, would provide the best protection for the resources that serve as a physical connection between the siege of Vicksburg and current and future generations.

- This strategy appears to best meet the 1916 NPS Organic Act mandate that all parks are subject to of conserving "the scenery and the natural and historic objects and the wild life therein," and providing "for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

- This alternative may facilitate management and maintenance practices, but it also may take years or decades to implement. Implementation may present challenges that cannot currently be met by the park depending on the BMPs that are adopted and landcover types recommended for soil conservation.

- There are conflicting opinions in the scientific community about what landcover type(s) and communities best protect loess soil from erosion. A clear and undisputed compendium of BMPs for the site may not be fully developed for some time.

- A protocol for monitoring the efficacy of any treatment approach implemented would need to be developed. Adjustments would need to be made to the approaches to address any problems identified through the adaptive management strategy.

- Annual investigation into the available alternatives for protecting loess soil from erosion through landcover management may be needed to continually apply BMPs to preserving the park's significant Civil War resources.

- In the absence of an alternate strategy and defined BMPs, every effort would need to be made to stabilize areas currently undergoing erosion by utilizing the most effective short- and long-term means for arresting the process and correcting the cause of the erosion. Methods might include placing leaf litter, straw, stone, seeded mats, excelsior netting, or geotextile over exposed soil while establishing new vegetative cover. Methods for establishing new vegetation communities might range from seeding or hydroseeding to sodding. Diverting overland flow of stormwater from areas undergoing erosion without causing erosion elsewhere may also be required.

- The park's current approach to landcover management is based on what currently works given the benefit of past experience. The park's maintenance capabilities are a critical factor in landcover management at the park. If the staff is not sufficient to maintain grass cover through regular periodic mowing, or

mowing is not feasible given the park's steep slopes, then trees are the next best option given the park's current capabilities. Tree canopies reduce the erosive energy of rain, and their root systems can slow erosion, which is why the Civilian Conservation Corps (CCC) originally planted trees. If other grass species and grass and forb communities that can be appropriately maintained are identified it would be of great value to the park. Terracing and directing water not to flow across sloped surfaces is also necessary to prevent erosion. The CCC installed extensive guttering to control the flow of surface water across slopes. Fort Hill, for example, is terraced. The efficacy of this system needs to be evaluated as part of the development of appropriate strategies for managing erosion as part of this alternative.

- The engineering of stormwater and surface water management through extensive manipulation of existing topography, such as terracing and guttering, would not necessarily be consistent with a preservation approach but may be necessary to succeed.

- Bermuda grass has a root system that holds the loess soil well; Fort Hill has been colonized by Johnson grass, an invasive alien plant, which provides very little soil protection.

- Resources leading to erosion may need to be removed to support the efficacy of this strategy. For example, the historic tour roads may exacerbate soil erosion problems, suggesting their removal or redesign.

- Under this alternative, it is possible that one resource may need to be altered to preserve another resource.

- Conflicts between historic resources associated with the primary period significance and other resources could be addressed through interpretation.

- Interpretation, including living history, can take the place of making physical changes to the landscape to meet the objectives of the enabling legislation.

- Interpretation could incorporate both traditional modes and newer technologies.

- While primary interpretation would take place at the Visitor Center and the Cairo Museum, and through rangers, volunteer guides, Podcasts, GPS, cell phone tours, etc., the park could also continue to explore innovative technologies to interpret Civil War events and associations as they evolve.

Treatment Recommendations and Implementation Guidelines. The bullet points that follow outline the actions that taken together comprise this treatment alternative.

- Convene local experts knowledgeable about land and soil management from groups such as the Nature Conservancy, Mississippi Natural Resources Conservation Service, Conservation Reserve Program, Mississippi Wildlife Fisheries and Parks, Mississippi State University, USGS, and County Agricultural Extension Agency, to identify the range of possible landcover types that should be considered for soil erosion control within the park landscape, and their associated advantages and disadvantages. Vegetation communities that might be considered include 1) warm season grass fields; 2) grass and forb meadow or prairie; 3) oak savanna; 4) native oak-hickory woodland representative of pre-settlement communities; and 5) cool-season turf grass such as Bermuda, bahia, centipede, and St. Augustine. Involve the group in developing an initial set of Best Management Practices (BMPs) for the establishment and maintenance of each recommended landcover type.

- Evaluate the advantages and disadvantages of the landcover types discussed by the group of local experts, and identify recommended landcover types to be established within different areas of the park. Evaluations should be conducted by park and regional NPS personnel, including but not limited to a natural resource specialist, archeologist,

historical landscape architect, and maintenance manager.

- Identify three ten-acre sites to be converted to a new landcover type based on the recommendations of the group of local experts. Sites should be at risk due to the fact that they are currently undergoing erosion, are deteriorating because current maintenance or management practices are not successfully mitigating erosion, or are threatened with colonization by invasive species. Consider three ten-acre sites currently involved in kudzu management as the first conversion candidates.

- Install the new landcover type(s) utilizing the BMPs identified for the site during previous planning efforts.

- Assume maintenance procedures will include weekly mowing of one-third of the new landcover, bi-annual mowing of one-third of the new landcover, and bi-annual early spring burning of one-third of the new landcover.

- Initiate monthly monitoring procedures to evaluate the efficacy of the new landcover.

- Evaluate annually the success of the converted units, and revise implementation strategies and BMPs accordingly. Document all findings, decisions, and updates to management protocols as part of this adaptive strategy.

- Initiate conversion of additional units after monitoring the results of previously-established areas for three years and applying the results of the endeavor to the methods utilized in converting the next unit. For the purposes of this study, convert three ten-acre units per three-year period.

- Expand the park's invasive alien plant species control programs by doubling current efforts to dissuade colonization by invasive species and encouraging the establishment of healthy native species. Include South Fort in the control program.

- Control or eradicate the privet along the park boundary and where it has spread. Replace privet with native trees and shrubs along the park perimeter to form a fifty- to one-hundred-foot-wide screen planting.

- Develop interpretive programs that utilize digital technology to allow visitors to understand and visualize the battlefield landscape where it is obscured by vegetative cover that protects the soil from erosion. These might include access to audiovisual and multimedia recordings as well as interactive digital information such as historic maps georeferenced to current conditions using GIS, via mobile devices such as cell phones, GPS rangers, MP3 players, car stereos and displays such as outdoor or indoor digital screens, or LCD or plasma touch screen kiosks.

- Develop a large-scale relief model of the battlefield landscape as it existed during the siege that can be experienced spatially and/or tactilely by visitors.

- Improve the living history area near the Visitor Center. Provide additional universally-accessible opportunities to engage in demonstrations, and enhance visitor comfort by providing three additional benches and shade trees in locations that have a good view of the activities.

- Develop five new removable exhibits at different locations around the park. These exhibits would feature 1) aspects of soldier life during the siege; 2) a field hospital; 3) the military engineering of the earthworks; 4) weaponry used by the opposing armies and aspects of its use including fields of fire; and 5) examples of obstacles placed by the military to deter attack on their fortifications as well as approach trenches and associated features used to attack fortified positions.

- Provide enhanced interpretation of the Civil War-era Shirley House landscape using a removable outdoor exhibit.

- Establish new interpretive information in association with the three riverfront park units to offset any changes that might occur to views and access should vegetation be rehabilitated to protect against erosion.

- Provide an interpretive wayside in a location where forest established by the CCC survives. Convey information about the 1930s efforts to stabilize slopes and mitigate soil erosion within the park, including the planting of trees, grading, and rehabilitation of some road segments and monuments.

- Increase signage along the park boundary that identifies the penalties associated with relic hunting.

- Provide as many as ten additional benches with associated shade trees near parking pull-offs and places where visitors are encouraged to get out of their cars.

Alternative C. Rehabilitate/Maintain Key Areas of Military Engagement[298]

This alternative (Fig. 281) focuses on rehabilitating Vicksburg National Military Park by making landcover changes that reveal the historic landscape of the Civil War siege in areas of key military engagement. It is intended to help the park better meet its legislative mandate to "commemorate the campaign and siege and defense of Vicksburg," and "restore the forts and the lines of fortifications, the parallels and the approaches of the two armies, or so much thereof as may be necessary to the purposes of the park." Key military engagement sites were identified through careful review of the military terrain that molded the events of May 19 through July 4, 1863, and its ability to convey the full range of events and activities that occurred. As currently envisioned, the key sites include the earthworks and artillery positions associated with the city approaches of Old Jackson Road/Battery DeGolyer/Third Louisiana Redan (Fig. 290), Railroad Redoubt/Fort Garrott (Fig. 291), and Graveyard Road (Fig. 292). Post Civil War additions to the landscape that relate to commemoration and park operations would be retained under this alternative.

This alternative assumes that BMPs, particularly regarding soil erosion control, would be used when removing tree cover in key areas. The areas proposed for conversion from forest to turfgrass or native grass cover would be evaluated prior to clearing to minimize impacts to wetlands and avoid turf establishment on slopes too challenging to mow. Judicious manipulation of existing

FIGURE 290. Battery DeGolyer on Union Avenue.

FIGURE 291. View from Railroad Redoubt.

FIGURE 292. Graveyard Road.

298. For the purposes of this project, the term *rehabilitate* is used based on the meaning conveyed in *The Secretary of the Interior's Standards for the Treatment of Historic Properties* with *Guidelines for the Treatment of Cultural Landscapes*, as follows: "Rehabilitation is the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values."

vegetation to enhance views would also be conducted as part of this alternative. Removal small numbers of trees in front of positioned cannon (Fig. 293 and Fig. 294) or the limbing up and thinning of trees along the tour road to create more transparency (Fig. 295 and Fig. 296) are examples of this approach.

New interpretive strategies and programs would be provided to support visitor understanding of the key areas revealed through tree clearing. These might involve exhibits, opportunities for Living History (Fig. 297 and Fig. 298), and augmentation of the demonstration area near the Visitor Center that currently features abatis, cheveaux-de-frise, and artillery displays (Fig. 299 and Fig. 300). Of particular interest is the reestablishment of spatial patterns associated with the 1863 battlefield landscape within view of the tour road corridor, and enhancing visual connections to and between artillery positions of the opposing armies, fields of fire, and terrain features that can be tied to the military engineering of the two lines. This approach would prioritize interventions that enhance the experience of the visitor touring the park within a vehicle, as most visitors do.

Assumptions.

- Preservation and stabilization of important natural, cultural, and historic resources is assumed under rehabilitation. Rehabilitation accommodates new uses and can make historic associations more apparent. There are many different resource types within the park, all of which are important to the history of the site. Examples of natural features that are crucial to understanding the history of the battlefield landscape include Mint Spring Bayou and the existing landform and topography. Examples of cultural features that are crucial to understanding the efforts of the veterans in establishing the park include monuments and tablets. Examples of historic features that are crucial to understanding the events of the Civil War siege include surviving earthworks.

FIGURE 293. Existing view of cannon sighted into woodland.

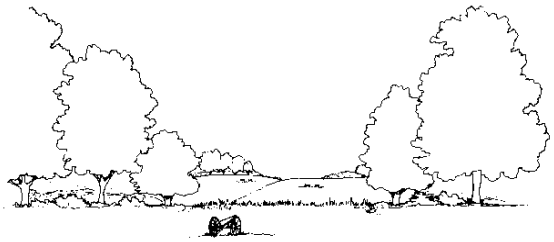


FIGURE 294. View after removing trees within the line of fire of positioned cannon.

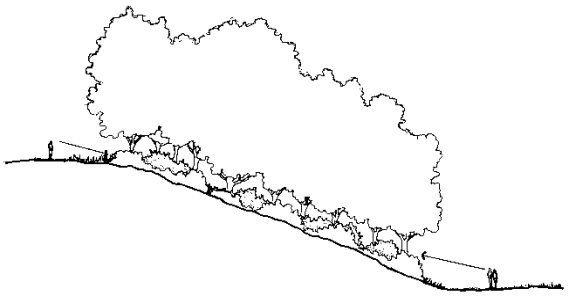


FIGURE 295. Existing sightlines through trees.

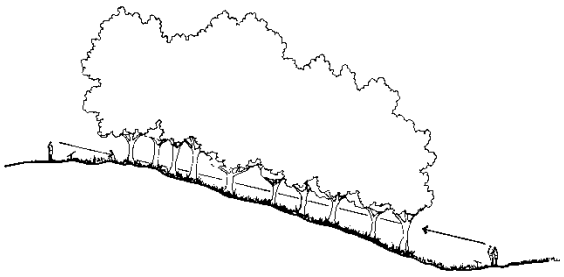


FIGURE 296. Line of sight after limbing up and thinning of trees.

FIGURE 297. Example of an earthwork exhibit and living history display from another park.

FIGURE 298. Example of a living history display from another park.

FIGURE 299. Existing living history demonstration area near the Visitor Center at Vicksburg National Military Park.

FIGURE 300. An example of a temporary living history exhibit previously used at Vicksburg National Military Park.

- Implementation of this concept will follow the guiding and applied principles for approaching preservation of battlefields presented in the NPS summary of the August 1998 and March 2001 gathering "Holding the High Ground; Principles and Strategies for Managing and Interpreting Civil War Battlefield Landscapes." Of particular note:
    - The management of battlefield landscapes shall recognize the primacy of those historic resources identified in each park's enabling legislation—those resources that are at the heart of the visitor experience and the core of the park's preservation efforts. Cultural resources on Civil War battlefields shall, therefore, be managed according to these priorities:
        - Those structures, features, landscapes, archeological resources, and viewsheds that comprised the wartime landscape
        - Commemorative expressions by veterans and subsequent generations that reflect Americans' attempts to make sense of and derive meaning from the war
        - Nationally significant post-war accretions on wartime landscapes
        - Facilities (buildings, roads, trails, or media) erected by the government or other entities to interpret, support maintenance of, or provide access to battlefield landscapes
    - Additionally, battlefield managers remain committed to preserving all significant historic resources when they do not constitute a significant degradation of the primary battlefield landscape. When post-war resources adversely affect the primary battlefield landscape, the NPS will develop solutions in close consultation with the SHPO and ACHP, in accordance with NEPA and Section 106 of the National Historic Preservation Act.

- Visitor uses shall not adversely affect the integrity of park resources or the ability of visitors to understand and appreciate the mission/stories of the park.

- This alternative assumes that interpretation and education of visitors should feature authentic connections between physical resources and military events. Taking the entire siege into consideration, this alternative emphasizes stories associated with key areas of military engagement.

- The three key areas that should be considered priorities for providing enhanced views of and access to the battlefield for their ability to meet the park's mission of telling the story of the siege and attacks are 1) Old Jackson Road/Battery DeGolyer/Third Louisiana Redan (with Old Jackson Road to Pemberton Avenue being of the highest importance); 2) Railroad Redoubt/Fort Garrott; and 3) Graveyard Road/Stockade Redan. These are assessed as follows:

  - **Area 1 – Old Jackson Road/Battery DeGolyer/Third Louisiana Redan.** The stories of Union mining and related activities, the crater, the May 22, 1863, attacks, and the Shirley House would best be told here. Of the three key areas, this would be the easiest to maintain. Implementation of this alternative would benefit from the removal of the Old Administration Building, which will be addressed further by the park in a future planning process.

  - **Area 2 – Railroad Redoubt/Fort Garrott.** The stories of how Confederate fortifications guarded key terrain such as supply lines and the May 19 and 22, 1863, attacks would best be told here. This area would be the second easiest to maintain. Natural resource challenges include gleyed soils (soil that has been saturated over a long period of time, therefore reducing the iron and manganese content) and wetland areas.

  - **Area 3 – Graveyard Road/Stockade Redan.** This is the best place to tell the story of combat, the May 19–22, 1863, attacks, the construction methods and components of Stockade Redan, and a key Union avenue of approach. This would be the most difficult of the three to maintain. Natural resource challenges include wetlands, heavy forest, and Mint Spring Bayou.

- Park land west of Thayer's Approach is the most heavily forested, are associated with water resources, and have high potential for erosion. This area is less desirable to clear and would be left in its current condition, although consideration would be paid to exposing the visual connection between the Water Battery and Fort Hill.

- Other key natural resource areas to be protected in their current condition include:

  - Mint Spring and lower falls, a designated state natural landmark south of the national cemetery.

  - Areas of exposed fossils along Mint Spring Bayou and elsewhere within the northwest corner of the park.

  - Additional wetland resources revealed through the recently prepared park wetland delineation.

Implications of the Alternative. The section that follows indicates the relationship of the alternative to the issues common to all:

- The historic record is complete enough to adequately inform landscape rehabilitation for the most significant areas of the battlefield.

- Tree clearing would be an integral part of this alternative, but the area to be cleared would be the minimal necessary to convey the most important stories about the siege as identified by park and regional personnel.

- The primary landcover likely to replace trees is currently assumed to be turfgrass or native grasses, although it may be possible in steeply sloped areas and ravines to approach landcover management in a manner similar to that used at Thayer's Approach, including less frequent mowing, burning, and the use of meadow species rather than Bermuda grass or other turf grasses requiring frequent mowing.

- Prior to implementing tree removal plans, the park would prepare a set of BMPs for the treatment and maintenance of new landcover in the three key interpretive areas where existing woodland cover is to be removed. These BMPs may suggest an alternative landcover type to turfgrass. Determination of the appropriate BMPs will require investigation into the range of vegetation types that allow for enhanced visual accessibility yet ensure retention of the existing soil profile and protect against erosion by given using the park's maintenance capabilities. The BMPs should be developed by a team of park and regional personnel with expertise in natural resources, maintenance, military history, and interpretation and potentially outside experts, and should be approved by the Superintendent. (See Implementation Projects for more information regarding BMPs.)

- Approximately twenty to twenty-five acres of the park would also be reforested to help protect the park's setting and critical viewsheds. Reforestation would involve the planting or natural re-growth of tree, shrub, and groundcover species representative of a desired future woodland composition. Species should be considered for their ability to contribute to a healthy native woodland appropriate to the cultural conditions of the site, such as mesic upland, xeric upland, or mesic to moist bottomland.

- Elsewhere, landcover modifications intended to improve visual connections to military terrain features and diminish visual obstructions would be considered. These may include a variety of modifications ranging from selective tree removal and thinning to limbing up of trees.

- The removal of trees in some steeply-sloped areas might occur cyclically rather than regularly to reduce maintenance costs.

- A protocol for monitoring the efficacy of any approach implemented should also be developed by the team. Adjustments should be made to the BMPs to address problems and issues identified through monitoring.

- Additional investigation into the alternatives for protecting loess soil from erosion through landcover management should be conducted annually and findings applied to revision of the BMPs. Investigation might include consultation with personnel involved with the management of local natural areas or large land parcels maintained in open vegetative cover that are successfully controlling erosion.

- Stump removal should occur based on site-specific conditions as follows:

    - In areas where mechanical maintenance will not occur, stumps should remain in place.

    - In areas where mowing or burning will occur, stumps should be removed.

- Enhanced monitoring of plants of special concern, birds, mammals, amphibians, reptiles, and water quality should be conducted in association with clearing or other changes in landcover. Adjustments to the treatment regime should be made if detrimental impacts are noted.

- This alternative provides an opportunity for improving interpretation and the range of recreational activities available to visitors, including:

    - Expanded interpretation of the Shirley House, to highlight evidence of the residents who lived there prior to the siege.

- Enhanced access to Mint Spring and associated waterfalls. A trail could be established to the waterfalls as a benefit to visitors. Issues to address include parking, trash collection, and coordination with ongoing stabilization efforts. As this provision does not fall within the park's legislated mandate, limited, if any, funds are available for it. The park would rely on the community to maintain the trail and collect litter.

- New trails to provide connections to interesting and important natural and cultural resources not currently accessible such as Mint Spring Bayou and the CCC camp sites. As this provision does not fall within the park's legislated mandate, limited, if any, funds are available for it. The park would rely on the community to maintain the trails and collect litter.

- The current living history program could be expanded to include special events like an "adventure camp" where visitors could experience the life of the soldier, living history, or other guided activities. A rehabilitation approach to cultural landscape management allows for the establishment of much needed visitor services such as water fountains or bottled-water vending machines and restrooms. Bicycle riding would continue to be permitted on road but not off road. Horseback riding would remain prohibited to avoid potential for erosion and safety conflicts with vehicles along the road. Rehabilitation allows the addition of new interpretive media within the battlefield landscape.

Other implications and considerations.

- Selective rehabilitation of portions of the battlefield does not provide a completely accurate depiction of the historic landscape during the battle and siege period.

Treatment Recommendations and Implementation Guidelines. The bullet points that follow outline the actions that taken together comprise this treatment alternative.

- Enhance the visual accessibility of three key areas of the battlefield landscape by removing existing forest cover and replacing it with low-growing grasses or other groundcover. Retain older native trees where they do not block important views, particularly those that afford shade along the tour road. The total area of forest cover to be converted to grass cover as part of this alternative is ninety acres.

- Also clear trees to provide a view from the artillery placed at the South Fort park unit to visualize the avenues of approach they were intended to defend.

- Conduct tree thinning, limbing, and limited removal in specified areas along the tour road to facilitate visual connections between the artillery positions of the opposing lines. Allow trees to remain that do not interfere with desired views. Thinning and limbing up of trees associated with artillery positions should only occur in areas where visitors will benefit from this action through available access afforded by the tour road or proposed new parking pull-offs and trails. One specific area to be thinned is the view of the Water Battery from Fort Hill. Assume thinning and limbing operations will occur along approximately three total miles of the tour road, although the areas likely will not be contiguous.

- Provide two new waysides to interpret the Shirley House landscape before, during, and after the siege. Continue to convey information about the shebangs that were established on the slope below the house as housing for soldiers encamped there and other military features established on the property during the siege.

- Establish interpretive waysides to provide additional information about the newly cleared areas of the park. Provide one wayside each for the Confederate and Union

perspectives within each of the three cleared areas (six total waysides).

- Provide an additional wayside within the park to interpret the role of the CCC in stabilizing parkland during the 1930s through soil erosion control and the planting of trees that now constitute many of the large forested areas of the park.

- Establish new forest cover over twenty to twenty-five acres of the park to enhance screening of incompatible views and protect steep slope areas that do not contribute to park interpretation. Reforestation should be conducted in such a way as to promote a healthy native woodland appropriate to the cultural conditions of each area considered for conversion. See the list of native tree species provided in Appendix C for plants to be considered in the reforestation effort.

- Increase ranger patrols of areas potentially utilized by relic hunters to access the park. Newly opened areas may become a target for relic hunters, and may require added protection, particularly immediately after clearing occurs.

- Establish a new trail within each of the three cleared areas. Design the trailhead and possibly a segment of each trail to be universally accessible. Due to the challenging terrain and potential for erosion, design the trails generally to follow existing topography and with a mown grass surface. Trails with mown grass surfaces will not be universally accessible. The waysides established at the accessible trailheads will provide an alternative interpretive experience for those unable to access the mown grass surfaced trails. Possible locations for these new trails include the approaches at Stockade Redan, Fort Garrott, and the assault routes of the Railroad Redoubt. Assume a total length of three miles for these new trails, and that parking pull-offs already exist to provide access to them.

- Develop a one-half-mile loop trail providing access to the Mint Spring Bayou waterfall. Assume the trail will include an accessible trailhead and possibly an additional accessible segment. Due to the terrain of the area, it is recommended that much of the trail be developed as a primitive hiking trail surfaced with hard-packed earth. Provide a parking pull-off large enough for three cars from the U.S. Business 61 side of the park south of the National Cemetery arch at a trailhead. Provide an interpretive brochure at the trailhead that describes how the park's natural conditions influenced military events.

- Provide as many as twenty additional benches, under shade trees, in places where visitors can be encouraged to get out of their cars.

The following elements were added to Alternative C during the CBA workshop:

- Convert forest in key areas to open vegetative cover utilizing BMPs, and consider vegetative cover options now and in the future for their environmental sustainability.

- Evaluate annually the success of the converted units, and revise implementation strategies and BMPs accordingly. Document all findings, decisions, and updates to management protocols as part of this adaptive strategy.

- Expand and intensify by doubling current invasive alien plant species control programs and encourage the establishment of healthy native species. Include South Fort in the control program.

- Consider using the cleared areas for additional living history programs. Provide opportunities for visitors to experience living history activities in comfort by identifying a location with views of the area that might include shade trees and benches.

- Establish three new removable exhibits within the siege landscape to facilitate visitor understanding of missing military features such as earthworks and associated

components, weaponry, obstacles, transportation and communication features, approach trenches and associated features, field hospital components, and/or soldier lifeway features. Consider locating the exhibits 1) in the vicinity of Graveyard Road to feature Confederate earthworks elements such as the stockade fence; 2) near the Shirley House to interpret Union efforts to reach the Third Louisiana Redan and shebangs, Coonskin tower, sapping, and sap rollers; and along the South Loop Road to interpret both Union and Confederate features associated with Fort Garrott and Hovey's Approach.

- Rehabilitate the Shirley House landscape to more closely approximate Civil War era conditions. Reinstate features described in association with the property such as vegetable and flower gardens, fruit trees, and walks, and identify the locations of former outbuildings and structures associated with the dwelling precinct. Continue to convey information about the shebangs that were established on the slope below the house as housing for soldiers encamped there and other military features established on the property during the siege.

- Plant or retain shade trees in association with parking areas and roadside pull-offs where visitors will be encouraged to get out of their cars.

Alternative D. Rehabilitate/Maintain the Broad Spectrum of Military Engagements

This alternative (Fig. 281) focuses on enhancing the legibility of Civil War-era resources and associations by removing tree cover that has grown up since the end of the siege and currently obscures visual and physical relationships that were important to the events that occurred at Vicksburg in 1863. Historic imagery, such as nineteenth-century lithographs of the siege landscape, would be used to guide rehabilitation and ensure compatibility with the historic character of the landscape (Fig. 301 and Fig. 302).

Tree clearing would occur in areas where military terrain analysis has indicated key battle and siege tactics of Union and Confederate commanders are evident and can be understood by visitors. Woodlands would primarily be cleared in selected areas between Union and Confederate Avenues to reveal the opposing lines of fire. This already occurs in some areas of the park (Fig. 303 through Fig. 305) but the extent of the current cleared area is insufficient and misleading and confusing to visitors. For example, in many locations, cannon face into dense stands of trees (Fig. 306). Woodlands would primarily be replaced with turf or native grasses maintained by mowing (Fig. 307). The frequency of mowing will depend in part on the severity of the cleared slopes (Fig. 308).

Interpretation would be provided to help visitors understand what happened within these cleared areas. Post Civil War additions to the landscape, including late nineteenth and early twentieth century commemorative features and park operations features that support visitor use of the park would be retained (Fig. 107 through Fig. 125). Preservation and stabilization of important natural, cultural, and historic resources is assumed under rehabilitation, and will be taken into consideration in the development of implementation plans.

FIGURE 301. Nineteenth-century lithograph of the siege landscape, an example of a documentary source available to guide landscape rehabilitation efforts.

FIGURE 302. Another nineteenth-century lithograph of the siege landscape to consider in planning landscape rehabilitation.

FIGURE 303. Currently legible opposing lines of fire.

FIGURE 306. Cannon facing obstructed terrain.

FIGURE 304. Currently legible opposing lines of fire.

FIGURE 307. Open land cover is primarily composed of turf grasses maintained by mowing.

FIGURE 305. Currently legible opposing lines of fire.

FIGURE 308. Steeply-sloped areas pose a challenge to mowing. These would be mowed less frequently.

There are many examples of different resource types within the park, all of which are important to the history of the site. Natural resource features that are crucial to understanding the history of the battlefield landscape include Mint Spring Bayou and the park's landform and topography. Examples of cultural features that are crucial to understanding the efforts of the veterans in establishing the park include the placement of monuments and tablets. Examples of historic features that are crucial to understanding the events of the Civil War siege include surviving earthworks.

Assumptions

- This alternative assumes that the best way to "commemorate the siege and preserve the history of the battles and operations of the siege and defense on the ground where they were fought and were carried on . . ." is to reveal the landform, topography, and earthen fortifications associated with Union and Confederate lines and the landscape between them that was modified for offensive and defensive purposes.

- This alternative recognizes that some formerly cleared areas may not be feasible to clear today due to the potential for severe soil erosion.

- This alternative assumes that interpretation and education of visitors should feature authentic connections between physical resources and military events, using military terrain analysis as the basis for revealing the broadest range of stories associated with the Vicksburg landscape.

- Based on review and evaluation of the military history of the park, the most important area to be revealed through tree clearing and the reestablishment of Civil War patterns of spatial organization is the terrain between the Union and Confederate lines extending from Thayer's Approach to Fort Garrott.

- Screen plantings should be established or maintained to limit views of the Visitor Center, maintenance area, and Clay Street from cleared areas. Existing forest should remain in the area behind the Illinois Monument up to Old Jackson Road to protect the steeply sloped topography which could not be maintained through mowing, and to provide a visual screen for modern Jackson Road. Other areas that would not be cleared are located south of Fort Garrott and Grant's Circle. Screen plantings in these locations would buffer the park from Interstate 20 and would also be difficult to maintain under turfgrass cover.

- This alternative would benefit from the relocation of the tour road and the nearby tour stop out of the ditch of the Great Redoubt. This alternative would also benefit from the removal of the Old Administration Building. These actions are best considered through preparation of a General Management Plan, however, and are not pursued as part of this alternative.

- Park land to the outside edge of the tour road would not be cleared and existing vegetation would remain as a visual screen.

- Fort Hill and the landscape west and north of Thayer's Approach would not be cleared because there was little military activity in this area, and most of the park's forest and natural resources, wetlands, and Mint Spring Bayou exist within this area.

- Clearing to expose a visual connection to the Water Battery from Fort Hill is another localized effort that would support implementation of this alternative.

- Clearing of the vegetation along the perimeter of South Fort should also be conducted to provide a visual connection to the Mississippi River.

Implications of the Alternative. The section that follows indicates the relationship of the alternative to the issues common to all:

- This alternative involves extensive tree clearing. It would decrease the amount of forest habitat present in the park.
- Reducing the diversity of landcover and plant community types represented within the park may or may not have a negative impact on the current wildlife communities within the park.
- This alternative may or may not increase the potential for soil erosion.
- The riskiest aspect of landcover conversion may be tree removal followed by replacement with a new landcover when soil disturbance is a real possibility, and the vehicle for protecting the soil from stormwater may take some time to become established. Particular attention should be paid to applying soil erosion control methods during this period.
- The wetland area within the South Loop landscape would be negatively affected by additional clearing. Riparian buffers along the stream that flows below Railroad Redoubt are warranted. This alternative would lead to a significant increase in maintenance requirements and costs due to the increase in the area to be mown, storm- and surface water management issues, and the potential for increased soil erosion.
- Additional interpretation should accompany this alternative to provide visitors with a full understanding of battlefield events that benefits from the tree clearing. This may take the form of new waysides, living history programs, and trails.
- This alternative would benefit from allowing visitors to begin their tour from the Confederate perspective. It also would benefit from the establishment of additional tour stops/pull-offs, and walking trails.
- This alternative may increase the potential for vandalism and relic hunting. Implementation of this, and other alternatives, may require additional law enforcement and security efforts, an enhanced park watch program, and/or construction of features such as fences to prevent access from locales like Melborn Place.
- Relocation of the tour road near the Great Redoubt would involve major construction, alteration of the existing landform and topography, and relocating gas, electrical, and telephone utility lines. One benefit would be the eradication of a stand of non-native cane. These actions are best considered through preparation of a General Management Plan and will not be pursued as part of this alternative.
- A landcover of turfgrass does not accurately represent conditions at the time of the battle.
- Approximately twenty to twenty-five acres of the park would be reforested to help protect the park's setting and critical viewsheds. Reforestation would involve the planting or natural regrowth of tree, shrub, and groundcover species representative of a desired future woodland composition. Species should be considered for inclusion that would contribute to a healthy native woodland appropriate to the cultural conditions of the site including mesic upland, xeric upland, or mesic to moist bottomland.

Treatment Recommendations and Implementation Guidelines. The bullet points that follow outline the actions that taken together comprise this treatment alternative.

- Enhance the visual accessibility of the battlefield landscape by removing existing forest cover over approximately 350 acres, and replacing it with a low ground cover that does not interfere with visual access of the enhanced areas. Also clear trees blocking the view of the Water Battery from Fort Hill and clear trees from the margins of South Fort to reinstate historic views from the artillery

positions. Bermuda grass, native grasses and forbs, and other groundcovers should be considered for their use in newly cleared areas. The type of groundcover to be used in each area should be based on an assessment of park capabilities in terms of implementation and maintenance.

- Utilize the cleared areas for additional living history interpretation.

- Establish ten interpretive waysides to provide additional information about the newly cleared areas of the park. Depict information about both the Confederate and Union perspectives within the newly cleared areas.

- Provide two new waysides to interpret the Shirley House landscape before, during, and after the Civil War siege. Continue to convey information about the shebangs that were established on the slope below the house as housing for soldiers encamped there.

- Conduct tree thinning, limbing, and limited removal in specified areas along the tour road, where clearing is not undertaken, to facilitate visual connections between artillery positions of the opposing lines.

- Establish new forest cover over twenty to twenty-five acres of the park to enhance screening of incompatible views and protect steep slope areas that do not contribute to park interpretation. Reforestation should be conducted in such a way as to promote a healthy native woodland appropriate to the cultural conditions of each area considered for conversion. See the list of native tree species provided in Appendix C for plants to be considered in the reforestation effort.

- Increase ranger patrols in areas potentially utilized by relic hunters to access the park. Newly opened areas may become a target for relic hunters, and may require added protection, particularly immediately after clearing. Ensure that boundaries are clearly marked with signs that warn of the legal implications of relic hunting. Establish surveillance cameras in two of the most accessible areas to monitor activity along the park boundary.

- Establish five new walking trails in association with the newly cleared areas. Possible locations for these new trails include the approaches at Stockade Redan, Fort Garrott, Ransom's Path, Hovey's Approach, and the assault routes on the Railroad Redoubt. Assume a total length of five miles for these new trails, and that parking pull-offs already exist to provide access to them.

- Develop a one-mile loop trail providing access to the Mint Spring Bayou waterfall and other areas within the ravine to afford an understanding of the Confederate fortified position atop the ridge above. Assume the trailhead and possibly a segment of the trail will be accessible; however, due to the terrain it is recommended that the majority of the system be designed as a primitive hiking trail surfaced in hard-packed earth. Provide a parking pull-off large enough for five cars from the U.S. Business 61 side of the park south of the National Cemetery arch at a trailhead.. Provide an interpretive brochure at the trailhead that describes how the park's natural resources influenced the military events that occurred there.

- Provide as many as twenty-five new benches in association with new or existing shade trees in areas where visitors can be encouraged to get out of their cars and experience the park up close.

Alternative E. Restoration to the Civil War siege period (circa 1863)[299]

This alternative involves reinstating, to the greatest extent possible, the landscape that existed at the time of the siege, including its military features and landcover types. Such an approach would rely heavily on historical documentation and written descriptions such as those found in the Official Records.[300] Few photographs survive as evidence of the appearance of the landscape at the time of the siege.

Various historic photographs and lithographs exist of the Vicksburg landscape during the siege that would be used to guide restoration under this alternative. For example, two historic photographs depict the Shirley House and its environs during the Civil War; one shows of the front of the house (Fig. 11) while the other indicates the hillside east of the house where Union soldiers constructed shebangs, or sleeping dens protected from artillery fire (Fig. 184). This image, when compared with more recent photographs (Fig. 185 and Fig. 186), reveal the extent to which the landscape has changed in this particular area.

FIGURE 309. "Position of Hovey's Division of McClernand's Corps," an example of one of the sources available to guide restoration of the 1863 landscape.

FIGURE 310. "Position of Quinby's Division of McPherson's Corps," another source to support restoration efforts.

FIGURE 311. "Position of Logan's Division of McPherson's Corps," a third historic graphic depiction of the battlefield landscape.

299. For the purposes of this project, the term *restore* is used based on the meaning conveyed in *The Secretary of the Interior's Standards for the Treatment of Historic Properties* with *Guidelines for the Treatment of Cultural Landscapes*, as follows: "Restoration is the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by removing features from other periods in its history and reconstructing missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

300. *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies. Prepared under the direction of the Secretary of War, by Bvt. Lieut. Col. Robert N. Scott, Third U.S. Artillery and Published Pursuant to Act of Congress, Approved June 16, 1880* (Washington: Government Printing Office, 1880).

Other sources available to inform restoration include artistic renderings, such as the lithographs published in Civil War-era popular magazines such as *Harper's Illustrated*, or in books such as *Battles and Leaders of the Civil War*, published in the 1880s. Examples include: "Position of Hovey's Division of McClernand's Corps" (Fig. 309), "Position of Quinby's Division of McPherson's Corps" (Fig. 310), "Position of Logan's Division of McPherson's Corps" (Fig. 311), "The fight in the crater after the explosion of the Union mine under the Confederate fort on the Jackson Road, June 25, 1863" (Fig. 312), and "The siege of Vicksburg—approach of McPherson's saps to the rebel works" (Fig. 313).

True restoration, as prescribed by this alternative, would involve removal of commemorative monumentation (Fig. 314) and other resources from the battlefield that post-date 1863, including the tour road and NPS administrative facilities (Fig. 315).

Assumptions

- This alternative assumes that restoration of the park's appearance to 1863 conditions is a worthwhile goal, given that this is the date of the park's primary period of significance. This alternative addresses the comments of many individuals during public meetings held on behalf of the CLR suggesting restoration to 1863. Because landscape conditions evolved over the course of the forty-seven-day siege, the restoration would emphasize conditions present in the late spring/early summer of 1863 after the Union army had established its offensive positions and begun mining efforts to reach the Confederate defensive line.

- Under a pure restoration approach, the existing commemorative monuments would need to be removed, as well as any other features that post-date the siege, including the tour road, Visitor Center, War Department tablets, and bridges that afford visitor access and interpretation of the site.

FIGURE 312. "The fight in the crater after the explosion of the Union mine under the Confederate fort on the Jackson Road, June 25, 1863," a fourth source.

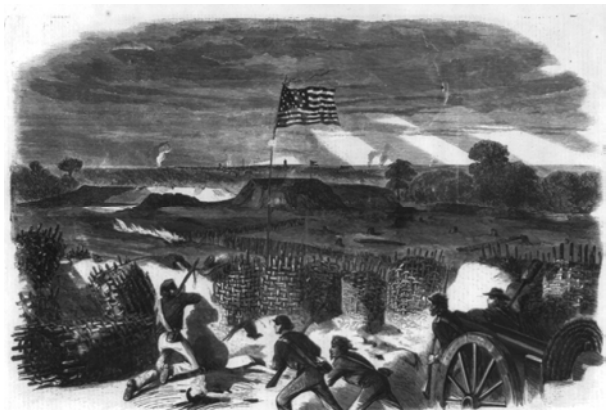


FIGURE 313. "The siege of Vicksburg—approach of McPherson's saps to the rebel works," a fifth source to support restoration.

FIGURE 314. The Michigan State Memorial, an example of a resource that would be in conflict with the restoration approach.

FIGURE 315. Old Administration Building, another example of a resource that would not be consistent with a restoration approach to landscape treatment.

Implications of the Alternative. The section that follows indicates the relationship of the alternative to the issues common to all:

- Implementation of this alternative would require extensive tree clearing. The majority of the park's existing tree cover would be removed. This alternative has a high potential for devastating erosion.
- The landscape would be easier to mow without monuments, but the ravines would be impossible to maintain.
- This alternative meets the park's purpose of interpreting the siege, as tree clearing would allow for a more accurate portrayal of the historic conditions associated with the battlefield. However, all interpretation involving the use of physical features such as waysides and exhibits would need to occur offsite.

Other implications and considerations:

- This alternative recognizes the significance of the battlefield as hallowed ground and is respectful of events that occurred here in 1863.
- Consideration would need to be given to re-acquiring the city-owned quitclaimed land to present all of the features associated with the siege. Restoration of the quitclaimed land is no longer feasible, however, given the extent of adjacent development that has occurred to the south of the park and altered the views and setting of this landscape.
- This alternative would involve the loss of monuments and other important non-siege historic resources.
- Removal of the tour roads would make visitation challenging.
- Insufficient documentation likely exists to accurately convey historic conditions.
- The Visitor Center would need to be relocated outside of the park.
- The act of removing post-siege features could impact archeological resources.

F. Restoration to the Park Development Period (circa 1899–1917)

This alternative suggests restoring the landscape to the conditions present after the park commissioners had substantially completed their initial plans for developing Vicksburg National Military Park. Veterans of the Civil War were involved in many aspects of this work. The date that appears to encompass the broadest involvement of veterans in park design and development is 1917, when the National Memorial Reunion and Peace Jubilee were held at the park. At this time, surviving veterans were reaching an advanced age.

Vicksburg National Military Park is nationally significant within the context of conservation, preservation, and commemoration as one of the first five national military parks. It is particularly significant for the role that the veterans of the battle played in marking the lines of battle and commemorating key events and associations. By 1917, most of the ideas that had been envisioned in the plans for the park at its establishment in 1899 had been realized. After this point, individuals who had experienced the Civil War were elderly and less able to participate in planning and commemoration. Restoration of the park to its character as conceived by the veterans and Park Commission would meet the mandate of the enabling legislation. Implementation of this concept would require removal of features added later that were not consistent with the original vision.

Historical documentation of early park development would be used to inform the restoration plan associated with this alternative. A series of panoramic views from the early twentieth century and a 1925 birds-eye lithograph (Appendix E) depict large areas of the park during this time. Comparisons of historic photographs with contemporary photographs taken from similar viewpoints reveal the extent of change that has occurred since 1917. Features missing from the park development period would

FIGURE 316. One of the observation towers erected in the park in the early twentieth century. No longer extant, restoration of the tower would support this treatment approach.

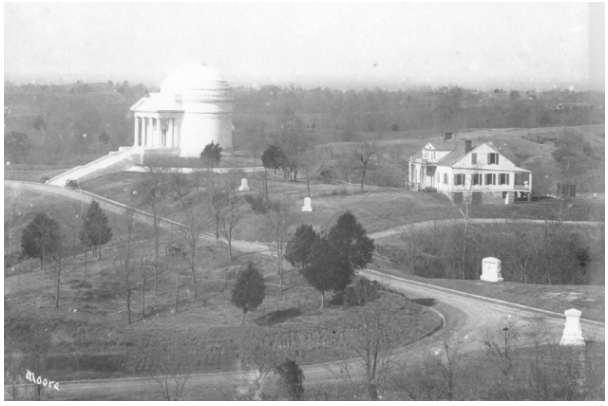


FIGURE 317. View from the top of the observation tower looking toward the Shirley House and Illinois State Memorial. This, and similar images, would support landscape restoration to the early park period.

FIGURE 318. Historic view of one of the original steel arch bridges on Union Avenue over Glass Bayou; this bridge was removed circa 1972. Consideration would be paid to restoring the bridge under this alternative.

need to be replaced. Among these are three observation towers (Fig. 316) that contributed to the interpretation of battle events by providing a bird's eye perspective (Fig. 317). Large areas of forest cover, later monuments, and changes to the tour road would have to be reconciled as well as the replacement of some original bridges (Fig. 318).

Assumptions.

- This alternative requires difficult decisions to be made about replacing missing features, such as the observation towers and life-lease properties. It is preferable that these features not be reconstructed, but they could be interpreted.
- This alternative would require removal of the Administration Building, maintenance shop, and features established by the CCC including tree plantings.
- This alternative suggests that the circle drives be restored.
- This alternative suggests that Confederate and Union Avenues, and the tour road in general, be restored to their original design and orientation.

Implications of the Alternative. The section that follows indicates the relationship of the alternative to the issues common to all:

- The majority of existing tree cover would be removed. This would lead to a high potential for soil erosion.
- Removal of trees over extensive areas would require additional maintenance efforts due to the resulting increase in turfgrass cover.
- This alternative would provide increased opportunities for interpretation, including an enhanced understanding of the siege through the reestablishment of historic patterns and open areas. No wayside exhibits that post-date the restoration period would remain, however.

Other implications and considerations.

- This alternative allows the monuments and roads to remain.
- Monuments that post-date 1917 could potentially remain based on their relationship to the original plan for the park that allowed for future monumentation.
- The Shirley House would merit restoration under this alternative.
- The Memorial Arch would need to be moved to its original location or this change could be mitigated through interpretation.
- The visitor center and USS *Cairo* museum are in conflict with this alternative.
- Consideration would need to be paid to re-acquiring city-owned quitclaimed land. However, restoration of the quitclaimed land is no longer feasible given the extent of adjacent development which has altered the views and setting of this corridor.
- It would be challenging to identify sufficient historic documentation to faithfully restore the landscape to this period.

The Preferred Alternative and Treatment Plan Recommendations

Identification of a Preferred Alternative

In June 2008, CLR and EA project team members convened at the park to conduct a Choosing by Advantage (CBA) workshop intended to evaluate each of the treatment alternatives outlined above, with the exception of Alternatives E and F, which were dismissed due to the negative impacts they would have on some park resources. CBA is a decision-making process that ranks alternatives based on the advantages they provide for the park. The process results in the identification of a preferred alternative and an environmentally preferred alternative.

During the CBA workshop, Alternative C received the highest score based on advantages it provided in meeting the park's purpose, need, objectives, and concerns statement, public and stakeholder opinion, and management issues identified as the preferred and environmentally preferred alternative. As part of the CBA process, it is possible to improve the preferred alternative by incorporating elements from other alternatives not selected. During the workshop, participants identified additional elements to be added to Alternative C as part of the CLR. The treatment plan below conveys the improved alternative as developed in the workshop, the additional detail appropriate to the level of investigation provided by a CLR.

The recommended treatment approach presented in Alternative C is rehabilitation. Rehabilitation affords the park the opportunity to meet the current and projected future interpretive, functional, and management goals outlined in the park's list of issues and goals. Because rehabilitation is defined as the act or process of making possible a compatible use for a property, this approach allows for protection of the site's historic character and resources while carefully addressing the needs for limited enhancement of interpretive opportunities and circulation routes, ecological maintenance and restoration, and the improvement of visitor amenities.

Under rehabilitation, stabilization, protection, and preservation of historic and natural resources are actions that must occur to allow for the limited accommodation of new uses. As part of the treatment recommendations, those resources and systems within the park that are to be the focus of stabilization, protection, and preservation are noted, as are those aspects or areas of the landscape that are particularly sensitive to change and disturbance. Sensitive habitats and biotic resources, as well as sites of known and potential archeological resources, for example, should be treated with great care. In general, the CLR recommends preservation of archeological resources unless a compelling research question or informational need justifies disturbance or excavation, or mitigation to accommodate unavoidable change is necessary.

Secretary of the Interior's Standards for Rehabilitation

For each treatment approach, the Secretary of the Interior espouses specific standards to guide future management. Ten basic principles comprise the standards for rehabilitation. These are intended to help preserve the distinctive character of a site while allowing for reasonable change to meet new needs. The standards (36 CFR Part 67) apply to historic properties of all periods, locations, sizes, conditions, and uses. These standards create a baseline of guidance to which intended changes to the historic landscape must be compared. These standards are neither technical nor prescriptive, but promote responsible rehabilitation practices as follows:

1. A property will be used as it was historically, or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features,

spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Treatment Plan

Introduction

This treatment plan for Vicksburg National Military Park provides a vision for the long-term management of the park as a whole, as well as site-specific guidance for individual resources. It is intended to convey an overarching concept for treatment that meets the NPS issues, goals, and concerns identified as part of this project. The concept is derived from the preferred alternative (Alternative C) developed as part of the EA described above —Rehabilitate/Maintain Key Areas of Military Engagement—with some additional elements added from the CBA workshop. The treatment plan that follows, comprised of recommendations, general management and design guidelines, and implementation projects, convey the specifics of how to achieve the vision.

The park has identified the need to more closely approximate historic patterns of open landcover within areas of key military engagement while continuing to protect and enhance natural and cultural resource values. The park also wishes to provide enhanced interpretation through improved visual connections to and between battlefield resources, and the provision of additional signage, waysides, exhibits, and personal interpretation opportunities. To assist the park in these goals, the CLR treatment plan concept is as follows.

The overarching concept for cultural landscape treatment at Vicksburg National Military Park is to better convey the story of the battles and the siege leading to the surrender of the Confederate forces, and the establishment of a park on this important ground, by reinstating historic conditions in carefully chosen locations and establishing aids to interpreting missing landscape features. Contemporary park access and interpretation needs are accommodated in the least intrusive manner possible, and landscape management is guided by the principles of sustainability to diminish the financial and environmental costs associated with maintenance and management.

Vegetation and natural resource management, interpretation, and consideration of the overall visitor experience are of the highest-priority based on the park's purpose and needs statement for the CLR. The recommended approach to vegetation management, including selective tree clearing, supports a crucial interpretive goal at the park: enhancement of visual accessibility. Removal of specific non-contributing woodland areas, control of invasive plant species, and restoration of the historic character of areas of key military engagements will help visitors better understand the events of the siege. The plan considers the highly-erodible nature of the park's loess soils in the approach to converting woodland to a more open vegetative cover, and includes numerous mitigation strategies for protecting existing landform and topography.

In addition to vegetation management, the treatment plan recommends the development of new exhibits and interpretive features that connect the visitor to key physical resources and the historic use of the landscape. The park is currently in the process of developing a long-range interpretive plan, which will establish the specific goals and vehicles for park interpretive programs. The treatment plan provides numerous ideas for consideration within the LRIP due to the link between landscape management and interpretation. In particular, the treatment plan suggests assisting visitors with understanding the extent and character of the numerous military landscape features that are no longer present within the park such as abatis, cheveaux-de-frise, fascines, gabions, headlogs, gun platforms, military roads, pickets, rifle pits, approach tunnels, and scaling ladders, etc.

Interpretation of the work of the veterans, park commissioners, and later the CCC to protect, preserve, and manage this significant historic landscape is recommended herein. The treatment plan suggests that information about these endeavors be presented to the public to instill a sense of stewardship and appreciation of this fragile site, and to inspire the public to incorporate a similar ethic into their daily lives. At a minimum, it will be important to help visitors to distinguish

between existing layers of history that frequently occupy the same site, for example earthworks, commemorative markers, and tablets.

The pages that follow convey a series of action items—treatment recommendations—that are organized by the landscape characteristics used to describe the park's existing conditions in chapter three. These are followed by a set of principles—General Management and Design Guidelines—that indicate how the actions items should be implemented. The final section is a series of implementation projects that suggest a process to be followed when undertaking the key recommendations conveyed below. Implementation projects are referenced with their associated recommendations.

Treatment Recommendations by Landscape Characteristic

Spatial Organization.

- Retain and maintain the patterns of spatial organization that survive from the primary period of significance (1863 Civil War siege). These include evidence of the system of earthworks, batteries, rifle pits, and pickets established by the Confederate army on the bluffs encircling the city of Vicksburg and overlooking the Mississippi River to maintain control of the river; and the positioning of Union troops around the Confederate defensive system on elevated landforms and at potential avenues of approach, particularly Old Jackson Road, Graveyard Road, and the rail line near Railroad Redoubt.

- Retain and maintain the patterns of spatial organization that survive from the secondary period of significance (commemoration of the siege). These include the tour road system and monuments that edge the road and are associated with many of the surviving earthwork features.

- Retain and maintain the open character of the maintained areas of the park, which include the tour road margins, points of interest, and key resources within view of points of interest. Increase the extent of the area maintained in open landcover by 1) converting forest cover to open space within three areas of key military engagements as an interpretive aid for visitors; 2) clearing views of the Water Battery from Fort Hill; 3) undertaking limited clearing and thinning to afford views from artillery positions along the tour road that can be seen or easily approached by visitors; and 4) reestablishing views from South Fort to the river and riverside and road approaches it defended.

- Ensure that a vegetative screen or visual buffer exists along all park boundaries where views of incompatible adjacent development are afforded (See Implementation Project No. 5).

- Consider exploring the historic patterns of spatial organization of the military landscape that are no longer apparent in the interpretive information provided to visitors. Examples of missing features that structured the military landscape include military roads, abatis, fascines, cheveaux-de-frise, headlogs, gun platforms, rifle pits, batteries, approach tunnels, and scaling ladders (See Implementation Project No. 7).

- Consider exploring the historic patterns of spatial organization derived from local farmsteads present prior to and after the siege in the interpretive information provided to visitors.

- Consider exploring the missing historic patterns of spatial organization associated with the commemorative period, such as circle drives around monuments and observation towers in interpretive information provided to visitors.

Landform and Topography and Topographic Modifications.

- Retain and maintain landform and topography features and topographic modifications that survive from the primary period of significance. These include the 1) loess bluffs

formed after retreat of the last glaciers; 2) dissected landforms and ravines formed from overland flow of stormwater and groundwater sourced springs and seeps; 3) prominent ridgelines encircling the city with east-west trending ridges; 4) grading conducted during the Civil War by the Confederates to establish fortifications, batteries, rifle pits, trenches, glacis, and fields of fire; 5) grading conducted by the Union army to establish fieldworks and construct trenches and mines to approach and damage the Confederate fortifications.

- Retain and maintain landform and topography and topographic modifications that survive from the secondary period of significance. These include the grading conducted to establish the tour road and monument sites, and erosion control measures conducted by the CCC at various locations within the park.

- Stabilize and repair any landform, topography, or topographic modification features that survive from the periods of significance but are in fair to poor condition due to erosion, slumping, or visitor access.

Land Uses and Activities.

- Continue to allow military land uses and activities such as staff rides and military training exercises that perpetuate a historic land use associated with both periods of significance.

- Retain and maintain the land uses and activities that survive from the secondary period of significance including commemorative, administrative, maintenance, interpretive/museum/educational, visitor services, recreation, and cemetery.

- Convey, through interpretation, the residential and agricultural land uses that were associated with the site during the periods of significance but are no longer in evidence today.

- Monitor local zoning and planning committees for nearby adjacent development and land use changes that may adversely impact the character and cultural resources of the area around the park. Participate in the early stages of any development plans to protect park values.

Natural Systems and Features, and Responses to Natural Resources.

- Remove trees from ninety acres of non-contributing forest stands in association within three specified areas of key military engagements, taking into consideration natural resource values such as potential impacts on water quality or the possibility of soil erosion. Additionally, clear non-contributing woodland from South Fort and the Water Battery site, and undertake thinning and limbing, or limited clearing, to enhance views between the lines along the tour road. Utilize the best management practices (BMPs) established for the project when removing trees, and avoid, minimize, and mitigate impacts to wetlands (see Implementation Projects Nos. 2, 3, and 4).

- Retain and maintain all natural systems and features known to survive from both periods of significance, including 1) Mint Spring Bayou and its associated waterfalls, ravine, and bottomlands landform; 2) Glass Bayou and its associated ravine landform; 3) Durden Creek and its associated ravine landform; 4) existing wet meadows, vernal pools, and riparian areas; 5) springs and seeps; and 6) limestone geology.

- Retain and maintain evidence of the responses to natural resources that survive from the primary period of significance, including 1) the siting of Graveyard, Old Jackson, and Baldwin Ferry Roads along east-west trending ridgelines; 2) the siting of the Shirley House on a ridgeline with access to a good spring; 3) the siting of the Confederate earthworks on elevated terrain for military advantage; 4) the placement of Confederate defensive structures, rifle pits, and batteries to defend likely avenues of approach such as roads and rail lines traversing ridgelines, and the river; 5) the Union siting of earthworks on elevated

terrain for military advantage; and 6) military occupation of high points for observation and lookout positions. Consider interpreting these responses.

- Retain and maintain evidence of the responses to natural resources that survive from the secondary period of significance, including 1) bridges and culverts established to cross ravines and wet areas in support of park development; 2) drain structures, curbs, and paved channels established to convey stormwater away from erodible soils; 3) portions of the mixed mesophytic forest partially derived from CCC-planting efforts to protect against erosion in areas not currently proposed for clearing; and 4) soil erosion control efforts conducted by the CCC, including importation of soil, regrading, and sodding. Consider interpreting these responses.

- Stabilize or repair contributing natural resources that are in fair to poor condition, including aspects of various park water resources, eroding loess bluffs and ridges, and forested areas infested with invasive plants.

- Stabilize or repair contributing responses to natural resources that are in fair to poor condition, including 1) aspects of the tour road system and some of the bridges; 2) the Shirley House and associated spring; 3) evidence of Confederate and Union earthworks sited to take advantage of topographic conditions, and 4) some of the drain structures used in association with terracing and along road corridors.

- Establish or retain a riparian buffer along the margins of Mint Spring Bayou, Durden Creek, Stouts Bayou, Glass Bayou, and all springs and wetlands. Control or remove invasive plant species within riparian buffers. Plant native species of trees, shrubs, and herbaceous grasses and forbs as needed to ensure that a continuous riparian buffer exists in association with all water resources (see list of native plants found within the park provided in Appendix C for options) (see Implementation Project No. 2). Where view corridors are desirable for interpretation, limb up existing trees, and/or remove smaller trees and shrubs to allow for specific viewing opportunities (see Implementation Project No. 3).

- Educate visitors about the sensitive nature of local plant communities and water resources.

- Limit pedestrian access to wetlands.

- Minimize soil disturbance and grading when introducing new site developments such as parking, paths, or trails.

Circulation.

- Retain and maintain the circulation features that are known to survive from the primary period of significance. These include the Kansas City Southern Railroad line, Graveyard Road, and Old Jackson Road. Monitor city protection of the historic roads located beyond current park boundaries, including Baldwin Ferry Road, Halls Ferry Road, and Warrenton Road (Washington Street).

- Retain and maintain the circulation features that survive from the secondary period of significance including Confederate and Union Avenues, Pemberton Avenue, Connecting Avenue, Sherman Avenue, Sherman Circle, Grant Avenue, Grant's Circle, and Pemberton Circle. Monitor city protection of the historic roads located beyond current park boundaries, including South Confederate Avenue, Clay Street, Wisconsin Avenue, Iowa Avenue, Indiana Avenue, and North Frontage Road.

- Consider allowing visitors to begin their journey along Confederate Avenue, either by reversing the current tour road direction or reinstating the historic two-way road system.

- Establish a new trail within each of the three cleared areas. Design the trailhead and possibly a segment of each trail to be universally accessible. Due the challenging terrain and potential for erosion, design the

trails generally to follow existing topography and with a mown grass surface. Trails with mown grass surfaces will not be universally accessible. The waysides established at the accessible trailheads will provide an alternative interpretive experience for those unable to access the mown grass surfaced trails. Possible locations for these new paths include the approaches at Stockade Redan, Fort Garrott, and the assault routes of the Railroad Redoubt. Provide parking pull-offs that connect to the new paths. (See Implementation Project No. 6.)

- Develop a loop trail that provides access to the Mint Spring Bayou waterfall. Design the trailhead and possibly a segment of the trail to be universally accessible. Due to the challenging terrain, design the majority of the trail as a primitive hiking trail and surface it with hard-packed earth protected with a layer of mulch or leaf litter. Provide a parking pull-off large enough to accommodate three cars from the U.S. Business 61 side of the park south of the National Cemetery arch at a trailhead. Provide an interpretive brochure at the trailhead that describes how the park's natural conditions influenced military events (see Implementation Project No. 6).

- Repair or stabilize contributing circulation features identified as being in fair to poor condition including historic Jackson Road, Graveyard Road, Union Avenue, and Confederate Avenue. Recommend that the city repair or stabilize historic roads in fair to poor condition located outside of the park including Baldwin Ferry Road, Hall's Ferry Road, and Warrenton Road (Washington Street).

- Consider means for better integrating the historic Jackson Road trace into the visitor experience and park interpretive program.

- Post regulatory signage to guide bicycle uses within the park, including rules of conduct. Prevent bicycles from traveling on park trails.

- Establish designated bicycle parking with bike racks at points of interest, interpretive waysides, and trailheads. Prevent bicycles from traveling on park trails and require that riders dismount and/or lock bikes in designated areas when approaching historic features that could be damaged by tire tracks, or by leaning bicycles against surfaces.

- Plant or retain shade trees in association with parking areas and roadside pull-offs where visitors will be encouraged to get out of their cars.

Vegetation.

- Prepare a vegetation management plan that considers appropriate approaches for treating all park plant communities.

- Utilize BMPs for vegetation management, including tree clearing, establishment of riparian buffers, establishing screen plantings, maintaining turf grass, invasive plant control, and enhancing the health of native communities (See Implementation Projects No. 2 through No. 4).

- Protect areas of rare or unique habitat within the park from visitor access, and changes in landcover or vegetation that might negatively impact rare or unique habitat.

- Expand and intensify invasive plant control programs and encourage the establishment of healthy native species. Include South Fort in the control program.

- Continue using prescribed fire to manage vegetation on excessively steep slopes and in invasive plant control areas. Attempt to burn annually or as frequently as fuel loads and/or park resources permit, guided by a fire management plan.

- Retain and maintain cultural vegetation features surviving from the secondary period of significance including turfgrass along key visitor use areas, and CCC-generated forest where clearing is not slated to occur.

- Establish or enhance existing screen buffers along park boundaries featuring primarily native plant material from the list provided in Appendix C (see Implementation Project No. 5).

- Assess the condition of trees within areas of visitor use in consultation with a certified arborist. Determine whether they pose any threat or hazard to individuals, buildings, or monuments. Remove hazardous plants and those that may threaten the stability of monuments or buildings.

- Enhance the visual accessibility of three key areas of the battlefield landscape by removing ninety acres of existing forest cover and replacing it with low-growing groundcover. Clear trees to provide a view from the artillery placed at the South Fort unit of the park to visualize the avenues of approach defended. Clear trees to allow for views of the Water Batteries from Fort Hill. (See Implementation Project No. 3.)

- Conduct the tree clearing in stages, undertaking a series of manageable and discrete areas over time. Retain older native trees where they do not block important views, particularly those that afford shade along the tour road. Ensure that BMPs for forest clearing, including soil erosion and run-off control and safe and effective tree removal principles, are followed (see Implementation Projects Nos. 2 through 4).

- Evaluate the success of each converted area annually over the course of one to three years before beginning conversion of additional areas. Refine the implementation strategies and BMPs accordingly. Document all findings, decisions, and updates to management protocols as part of this adaptive strategy. Consider various options for new landcover to replace the removed trees. Consider sustainability and the ability of the species to control against erosion, be easily established, and associated maintenance requirements and costs. Options may include oak savanna, warm-season grass fields, wet meadow, Bermuda grass, centipede grass, St. Augustine grass, or other ground covers. Consider using prescribed fire as a management tool (see Implementation Project No. 4).

- Conduct tree thinning, limbing, and limited removal in specified areas along the tour road to facilitate visual connections between the artillery positions of the opposing lines. Thinning and limbing up of trees associated with artillery positions should only occur in areas where visitors will benefit from this action because the tour road, a parking pull-off, or a trail will afford visual access. Clear and thin as little vegetation as possible to achieve the desired viewshed opening. Allow trees to remain that do not interfere with desired views (see Implementation Project No. 3).

- Consider establishing a new exhibit in association with the Shirley House that features the plants described in historic accounts of the landscape to interpret civilian life at the time of the siege. Exhibits and other treatments associated with the Shirley House should be based on preparation of a Cultural Landscape Report for the property

- Establish new forest cover over approximately twenty to twenty-five acres of the park to enhance screening of incompatible views and protect steep slope areas that do not contribute to park interpretation. Reforestation should be conducted in such a way as to promote a healthy native woodland appropriate to the cultural conditions of each area undergoing the conversion. See the list of native tree species provided in Appendix C for the species to be considered for the reforestation effort (see Implementation Project No. 5).

- Consider preparing Cultural Landscape Reports for the Shirley House, Vicksburg National Cemetery, and Pemberton's Headquarters to support further rehabilitation efforts at the park.

Buildings and Structures.

- Retain and maintain the Shirley House which survives from the primary period of significance.

- Retain and maintain the remnant structures that survive from the primary period of significance, including the 1) Confederate fortifications: Fort Hill, Second Texas Lunette, Great Redoubt, Third Louisiana Redan, Green's Redan, Stockade Redan, Twenty-seventh Louisiana Lunette, Fort Garrott, Railroad Redoubt, Water Battery, South Fort, Battery Barnes; and 2) Union positions at Battery Benton, Battery Selfridge, and Battery DeGolyer.

- Retain and maintain buildings that survive from the commemorative period of the park's significance including the Old Administration Building and the maintenance complex.

- Retain and maintain the structures that survive from the secondary period of significance, including the 1) the Memorial Arch; 2) Surrender Interview Site monument; 3) Union Navy Memorial; 4) tunnel near Thayer's Approach; 5) Melan Arch bridges; 6) Maloney Circle bridge; and 8) state monuments: Massachusetts, New Hampshire, Pennsylvania, Iowa, Illinois, Minnesota, Virginia, Rhode Island, Mississippi, Wisconsin, Maryland, Michigan, Missouri, New York, Louisiana, West Virginia, North Carolina, Indiana, South Carolina, Alabama, Arkansas, and Florida. Also retain and maintain state monuments that post-date the commemorative period of significance.

- Repair or stabilize contributing buildings in fair to poor condition. These include the Shirley House, the Old Administration Building, and aspects of the maintenance complex.

- Repair or stabilize contributing structures in fair to poor condition. These include the 1) Second Texas Lunette; 2) Third Louisiana Redan; 3) Green's Redan; 4) Stockade Redan; 5) Twenty-seventh Louisiana Lunette; 6) South Fort; 7) Water Battery; 8) other batteries and rifle pits; 9) Battery Selfridge; 10) Battery DeGolyer; 11) Battery Benton; and the 12) tunnel near Thayer's Approach.

- Provide additional interpretation of the form, function, and spatial organization of the missing buildings and structures present during May through July 1863. Focus particularly on historic graphics such as photographs and drawings, and physical descriptions conveyed in the Official Records, or soldiers' journal or diary entries.

Views.

- Maintain existing, or establish new, vegetative buffers along the park's boundary to screen views of nearby incompatible development. Buffers should be comprised of a layered, informal, but relatively dense planting of native evergreen and deciduous trees and shrubs. Maintain open sight lines beyond the park boundary where interpretation is desirable and views are compatible with the historic scene.

- Mitigate the appearance of mid- to late-twentieth-century residences located along park boundaries.

- Maintain vegetative screens to limit views of the Visitor Center and its associated parking lot from visitor use areas.

- Remove and thin trees along the Confederate and Union Avenues to establish views that interpret artillery fire and troop movement. Re-evaluate the need for interpretive views if the amount of vegetation in need of removal is large and proves to be a financial burden or ecologically unsound.

Small-scale Features.

- Retain and maintain all small-scale features that survive from the secondary period of significance. These include the various monuments, statues, iron and bronze tablets and position markers, busts and reliefs, equestrian statues, emplaced cannon, culvert and drainage structures, retaining walls, Shirley House gravestones, and War Department boundary markers established by the end of the period of significance.

- Replace the more than140 tablets that were removed from the park during a World War II metal drive.

- Repair or stabilize contributing small-scale features identified in fair to poor condition including individual iron and bronze tablets and position markers, battlefield markers, statues, busts and reliefs, equestrian statues, emplaced cannon, culverts and drainage structures, retaining walls, and boundary markers.

- Keep signage minimal and unified in style.

- Provide additional benches along the tour road, particularly where visitors can be encouraged to get out of their cars. Consider using existing trees or planting new trees in association with the placement of benches to provide shade for visitors.

- Install the least-intrusive site furnishings—benches, directional and regulatory signage, and bollards—possible when accommodating anticipated visitor needs.

- Design a consistent design palette for park site furnishings to unify the character of the landscape (see Implementation Project No. 8).

- Ensure that new site furnishings are compatible with the natural and historic character of the site but cannot be confused with historic features. Select furnishings that are simple in design and either dark or earth-toned in color. Avoid features that are brightly colored, overly ornate, or contain reflective or glossy surfaces.

Interpretation.

- Prepare a long-range interpretive plan for the park that incorporates the physical history information available in the CLR and guides landscape management relating to interpretation supported by implementation of the recommendations included herein.

- Reveal missing features of the military landscape using interpretive elements such as waysides, exhibits, models, pamphlets, clearing and thinning, mowing patterns, and technology-based electronic and virtual exhibits (see Implementation Project No. 7).

- Establish new interpretive nodes at the three areas of key engagement that incorporate non-historic woodland clearing, trails, parking, shade trees, and interpretive information conveyance systems.

- Establish interpretive waysides to provide additional information about the newly cleared areas of the park. Provide waysides for the Confederate and Union perspectives within each of the three cleared areas (six total waysides).

- Provide new interpretive trail connections and interpretive materials and opportunities in association with the three proposed areas of key engagement.

- Consider using the newly cleared areas for additional living history programs. Provide opportunities for visitors to experience these living history activities by identifying a location with view of the area that might include shade trees and benches.

- Consider establishing new temporary exhibits within the siege landscape to facilitate visitor understanding of missing military resources such as earthworks and associated components, weaponry, obstacles, transportation and communication features,

approach trenches and associated features, field hospital components, and soldier lifeway exhibits (see Implementation Project No. 7).

- Rehabilitate the Shirley House landscape to more closely approximate Civil War era conditions. Prior to rehabilitation, prepare a Cultural Landscape Report for the property to guide design and implementation of this recommendation. Consider reinstating features described in historic accounts of the property such as vegetable and flower gardens, fruit trees, and walks. Identify the locations of former outbuildings and structures associated with the dwelling precinct. Continue to convey information about the shebangs that were established on the slope below the house as housing for soldiers encamped there, and other military features established on the property during the siege.

- Consider providing information to visitors about important links between the forts along the river, the quitclaim parcels, the current main battlefield unit of the park, and Maloney Circle.

- Consider exploring the historic patterns of spatial organization derived from local farmsteads present prior to and after the siege in interpretive information provided to visitors.

- Provide an additional wayside within the park to interpret the role of the CCC in stabilizing parkland in the 1930s through soil erosion control and the planting of trees that now constitute many of the large forested areas of the park.

- Ensure that visitors are provided information about South Confederate Avenue and the monument- and tablet-lined road corridors south of the existing park that lead to Louisiana Circle, South Fort, and Navy Circle that were formerly included within park land. Convey the history of the park quitclaiming the land to the city of Vicksburg. Recommend that visitors travel the historic route and stop at the forts along the river.

- Consider including alternative interpretive materials for physically-impaired persons unable to experience the entire site.

- Consider offering interpretive materials for the visually-impaired. Include Braille on waysides, offer audio-tapes, and/or install a "touchable" model of the site. The touchable model should be a bronze relief of the landscape as it appeared at the time of the siege that allows visitors to understand the site in its entirety and experience the various missing features.

Archeological Resources.

- Conduct an overview and assessment survey of the park's archeological resources. Undertake remote sensing studies using ground-penetrating radar and metal detection to aid in the location of additional archeological resources. Use the findings of the assessment to protect, stabilize, and maintain known and potential archeological resources and design future archeological investigations.

- Consider measures to enhance the security of archeological resources, including the placement of signage, enhancing ranger patrols, and establishing a community watch group. In particular, discourage relic hunting within the park. Signage should indicate that disturbing the ground and removing artifacts is illegal. Increase ranger patrols of areas potentially targeted by relic hunters. Newly opened areas may become a target for relic hunters, and may require added protection, particularly immediately after clearing occurs.

- Protect archeological sites from disturbance except for investigations necessary to address important research questions and to consider proposed new additions such as trails and interpretive exhibits, and vegetation management treatments. Avoid ground disturbance associated with archeological excavation unless conducted in support of collecting essential information.

- Prepare a ground disturbance policy to be implemented by park personnel and all others who will be physically interacting with the site. Ensure that the ground disturbance policy includes guidelines regarding what constitutes ground disturbing activities and other pertinent information that site managers and cultural resource staff deem necessary for staff maintaining the site to understand.

- Engage an archeologist to conduct on-site investigations to determine any potential impact on cultural resources prior to construction of new trails and paths or exhibits.

- Document all known and potential archeological resources prior to undertaking any ground-disturbing activities. Engage a qualified archeologist to monitor any ground-disturbing activities.

- Incorporate archeology into long-term plans for protection, maintenance, and interpretation of the site.

- Avoid regrading or filling any historically significant earthen form.

- Avoid establishing trails in areas associated with known sensitive archeological resources.

- Monitor water resource margins for erosion and associated emerging archeological resources.

General Management and Design Guidelines for Treatment

The following section provides general guidelines for the treatment of the Vicksburg National Military Park landscape intended to support all treatment recommendations and alternatives developed as part of this CLR. These guidelines relate to a philosophy of cultural landscape treatment based on *The Secretary of the Interior's Standards for the Treatment of Historic Properties* with *Guidelines for the Treatment of Cultural Landscapes*, and a comprehensive view of the park as a whole. The following guidelines should be used when planning for any and all landscape changes, and should be considered in connection with each of the proposed landscape treatment recommendations included in this report.

Land Use

- Avoid land use activities, permanent or temporary, which threaten or impair known or potential archeological resources.

- Monitor and regulate use of the landscape to minimize immediate and long-term damage to cultural resources.

- Consider equally both natural and cultural features in treatment and land-use decisions.

Buildings and Structures

- Consider and recognize the interpretive value of unobtrusive, non-contributing buildings and structures.

- Consider the removal of non-contributing structures that are intrusive to the historic landscape.

- Avoid conjectural reconstruction of missing historic buildings and structures.

Circulation

- Minimize the visual impacts of vehicles and vehicular access systems. Consider the impact of any proposed circulation systems on views from primary visitor use areas. Consider noise and the other impacts that proposed new roads and parking areas will have on the visitor experience and historic resources.

- Encourage pedestrian circulation throughout the park as an alternative to vehicular access.

- Minimize the visual impacts of pedestrian access systems.

- Provide a range of pedestrian trail circuit lengths and accessibility/difficulty levels to serve a wide variety of visitors.

- Incorporate historic circulation routes whenever possible into pedestrian trail systems.

- Construct new trail segments in as minimal a fashion as possible to access points of interest or complete loop trails.

- Ensure proper drainage along trails. Establishment of trails that are too narrow, uneven, or poorly drained can result in trampling of vegetation, soil compaction, erosion, and damage to the surrounding ecosystem, and may become hazardous to visitors.

Guidelines for Adapting Historic Road Traces as Trails.

- Use only low-tire-pressure vehicles when working along historic road traces.

- Design new trails that follow or traverse historic road traces in such a way as to avoid cutting into the ground in order to preserve archeological resources. Utilize fill sections rather than cutting into the existing grade wherever possible to achieve positive drainage and address drainage and erosion control needs.

- Incorporate local materials, such as stone and wood, into trail-related structures including water bars, stepping stones, signage, fences, steps, treads, stream crossings, stone boxes or treadways crossing marshy areas, retaining walls, trail markers, and shelters. Design these features to be clearly a product of their time.

Guidelines for New Trails.

- Consider the range of possible trail types carefully before implementing a new trail system. The range of trail options to consider are as follows:

    - No trail: In areas with sensitive natural or archeological resources, it may be best to avoid trail development altogether. Avoid placing trails near sensitive resources that could be damaged by people.

    - Primitive hiking trail: Consider for areas that are relatively sensitive. Primitive hiking trails include only limited development and are anticipated to experience low-impact use and a relatively small number of pedestrian users.

    - Pedestrian trail: Consider for areas where only low-impact use, such as hiking or jogging, is anticipated. Establishment of this type of trail typically results in some level of disturbance, based upon the fact that construction equipment is required.

    - Unpaved multi-use trail: Consider this type of trail for moderate use areas to accommodate pedestrians and bicyclists, but site it to avoid impacts to historic resources. This trail type requires moderate site disturbance in the form of grading and surfacing. An unpaved multi-use trail can be made accessible in conformance with Americans with Disabilities Act (ADA) standards.

    - Paved multi-use trail: Consider this type of trail for high use areas and for the primary visitor interpretive experience. It should not be used, however, when following

historic road traces or corridors due to the relatively high level of disturbance involved in its construction.

Guidelines for Trail Construction by Type.

Primitive hiking trail guidelines.

- Design primitive hiking trails as minimal, well-drained, three- to four-foot-wide earthen- or grass-surfaced treadways.
- Design primitive hiking trails as spurs leading from more developed or major trails. Limit primitive hiking trailhead development to minimal signage at intersections with larger trails.
- Design primitive hiking trail alignments to require minimal grading and erosion control methods that can be effected by hand. Avoid trail runs that are steeper than 15 percent. Erosion control methods should be utilized primarily to correct poor drainage and prevent damage to the trail surface by stormwater.
- Utilize stepping stones, stone boxes, or a treadway of large stones on trails that pass through wet areas to allow drainage and water to move freely and prevent erosion and compaction. Ensure that stones are level and do not present a trip hazard for pedestrians. In remote areas, locally collected or quarried stepping stones are preferable to a wooden boardwalk that might be used on a heavily traveled and highly accessible trail.

Pedestrian trail guidelines.

- Incorporate only a minimal trailhead and signage into the design of this type of trail. Signage should be limited to trailheads and intersections with larger trails.
- Consider making sections near trailheads barrier-free to allow some measure of universal accessibility, where feasible.
- Utilize earthen, shredded bark mulch, or crushed stone surfacing.
- Avoid trail runs that are steeper than 10 percent grade. Maintain cross-slopes at 2 percent or less.
- Utilize low-profile boardwalks when crossing wet areas.

Unpaved multi-use trail.

- Design trails of this type with a minimum ten-foot-wide firm surface with three-foot-wide soft shoulders on either side to allow passing. Surface these trails with crushed aggregate or gravel fines, with shoulders of grass or shredded bark mulch. To meet ADA requirements for universal-accessibility, crushed aggregate trails will need to incorporate a chemical binding agent to ensure an adequate degree of firmness.
- Incorporate signage at trailheads, and as needed for orientation and to post regulations and warnings.

Paved multi-use trail.

- Consider using warm-colored surface materials such as colorized concrete or asphalt, or a stabilized crushed-stone surface fabricated from warm-colored brownstone.

Universally-accessible trail guidelines.

- Design universally-accessible trails to have a firm surface.
- Avoid trail runs longer than 200 feet that are steeper than a 5 percent grade. Maintain cross-slopes at 2 percent or less.
- Follow the guidance available in the trail accessibility pages on the American Trails website at http://www.americantrails.org/resources/accessible/index.html.

Rare, Threatened, and Endangered Plant and Animal Species

- Avoid altering the habitats of rare, threatened, or endangered species or species of special concern. Evaluate the potential impact to wildlife habitat prior to undertaking any construction or vegetation removal project.

Sustainability

- Institute cultural and natural resource treatment and maintenance methods that are environmentally and culturally sensitive and sustainable over the long term.

- Minimize areas of woodland disturbance, earth grading and compaction, and drainage pattern alteration.

- Promote biodiversity by protecting and planting native plant species.

- Use mitigating devices, such as retaining walls, closed drainage systems, and large areas of cut and fill, sparingly. Implement the least-intrusive measures and those involving stabilization first, and subsequently proceed to the most invasive as necessary. Limit major new interventions to areas that have previously been disturbed.

- Emphasize landform-based solutions, such as grading, over hardscape solutions, such as retaining walls.

- Take into consideration life-cycle costing of materials to assess their long-term wearing capacity and maintenance costs. Consider materials that are non-toxic, durable, long-lived, and low-maintenance.

Topography

- Minimize soil disturbance and grading.

- Preserve existing landforms and natural drainage patterns to the greatest extent possible.

- Avoid attempts to reconstruct or restore historic grades unless supported by clear documentary evidence showing how they appeared at a specific period or as intended by its original constructed design, as set out by the Secretary of the Interior's "Standards for the Treatment of Historic Properties."

Landcover Management

- Develop and follow BMPs, integrated pest management strategies, and soil and erosion control measures in all maintenance and management practices in order to minimize water pollution and degradation of natural systems.

- Establish vegetative cover, preferably composed of native species, on all slopes greater than 10 percent for erosion control. Consider planting species that are appropriate to the soil conditions, such as using wet-site species in perennially wet areas.

Forest Management

- Remove, when necessary, existing trees using a method that minimizes the potential impacts on known and potential archeological resources. Undertake tree removal from areas with known or potential archeological resources under the guidance of an archeologist.

- Retain, where appropriate, existing woodlands; allow successional areas to mature; and establish new buffers along appropriate sections of the park boundary when protection of viewsheds is required. Buffers should consist of mixed species woodland with understory plants. Promote varied plant composition, and consider locally native woodland species for screen and buffer plantings.

- Remove invasive alien species using ecologically sound removal techniques.

- Maintain woodlands by thinning periodically to improve stand health and increase wildlife habitat.

- Remove dead trees and shrubs, and those identified as potentially hazardous to individuals or resources because of their health or condition.

Water Resources Management

- Retain and maintain all existing water resources, including springs and seeps.

- Monitor water resources for invasive alien plant species. Remove invasive alien species identified during water resource monitoring activities using ecologically sound removal techniques.

- Maintain riparian buffers in association with all water resources.

New Design and Construction

- Consider adding new features to support interpretive, management, and visitor access functions at the park in such a way as to avoid altering existing features or adversely affecting the landscape's existing character. Features that facilitate access and interpretation should be designed in such a way as to minimize adverse impacts on the character and features of the landscape. Larger facilities should be designed to be as unobtrusive as possible while allowing for accessibility and safety. Limit the construction of new facilities to those that are absolutely necessary. Consider the use of temporary structures that do not require subgrade foundations.

- To the extent possible, accommodate new uses in existing buildings on the site.

- Site any proposed new buildings and structures out of primary and character-defining viewsheds. New buildings and structures should be situated to lie lightly on the land, minimizing soil disturbance, particularly cut and fill. Minimize the footprints of new buildings and structures by optimizing use and flexibility of both indoor and outdoor spaces. Consider designing low buildings situated below the brows of ridgelines or within valleys. The design of a cluster of smaller buildings is preferable to the establishment of one larger building. Groups of smaller buildings should be clustered tightly together. Also situate new structures relatively close to existing road corridors to avoid the establishment of new roads. Design new buildings and structures to be compatible with local traditions in terms of scale, massing, roof form, and details, and construct them from locally-available and indigenous materials. Sustainability should be considered in the choice of materials and energy use; consider incorporating passive solar energy conservation strategies into the design of new buildings and structures. Also consider the local climate in the siting and design of buildings, taking into consideration solar orientation, heat gain, shading, prevailing winds, and seasonal average temperatures.

- Avoid adding new features or altering existing features in ways that adversely affect the landscape's historic character. Introduce features to facilitate access and interpretation in ways that minimize any adverse impacts.

- Design and site new additions or alterations to the landscape in such a way that they do not destroy historic materials, features, and spatial relationships that characterize the cultural landscape. New construction should be limited to those alterations and additions that are necessary for visitor access, interpretation, and management. This might include vehicular, pedestrian, and interpretive systems such as trails and paths, minimal automobile parking areas, and unobtrusive and minimal wayside, informational, identity, and regulatory sign systems. The new or altered features should be as unobtrusive as possible while allowing for accessibility and safety.

- Limit the use of destructive techniques, such as archeological excavation, to providing

sufficient information in support of research, interpretation, and management goals.

- Evaluate all proposed new uses in consultation with an historical landscape architect and other cultural and natural resource specialists.
- Undertake sufficient study and recordation of landscape features requiring modification, repair, or replacement before work is performed to protect research and interpretive values.
- Retain and maintain historic materials, features, finishes, construction techniques, spaces, and spatial relationships.
- Avoid as possible landscape changes that create a false sense of historical development, including the addition of conjectural, typical, or representative features. Consider the addition of typical features in cases where restoration is not possible but make clear that they are not historic resources via interpretation.
- Retain and maintain changes to the cultural landscape that have acquired historic significance in their own right.
- Repair, rather than replace, deteriorated historic features. Replacement of severely deteriorated features should be based on archeological, documentary, or physical evidence. Such new features should also be based on archeological, documentary, or physical evidence; the new feature should match the old in design, color, texture, and, where possible, materials.
- Avoid the use of chemical or physical treatments that cause damage to cultural resources and natural systems. Undertake the surface cleaning of structures using the gentlest means possible.
- Protect and preserve archeological resources in place. If such resources must be disturbed, undertake mitigation measures such as recovery, curation, and documentation.
- Design all new additions and alterations to be a product of their time, and compatible with the historic resources in materials, size, scale and proportion, and massing. Differentiate new work from existing historic resources.
- Design and site new additions and alterations to the landscape in such a way that, if removed in the future, the essential form and integrity of the cultural landscape would be unimpaired.
- Minimize disturbance associated with the installation of visitor access facilities and systems that cross or abut wetlands to preserve existing landforms, and plant and animal life.
- Design new features, systems, and programs to be as accessible as possible.
- Establish new waysides in the least intrusive manner possible to fulfill proposed interpretive goals.

Adjacent Lands and Visual Quality

- Monitor and participate in regional and local planning activities in order to protect the park's setting and adjacent resources.
- Develop and maintain working relationships with adjacent property owners. Work with neighbors and community groups to develop a program of monitoring unauthorized access and destruction of resources.
- Educate adjacent property owners regarding resources located on their lands. Work with these owners to develop programs for the protection of these resources.
- Develop or maintain visual buffers along property lines abutting development. The clearing of woodlands on adjacent properties or properties within the park's viewshed are activities that could potentially threaten the visual quality of the project area. Monitor adjacent planning and development activities, and develop working relationships with adjacent landowners to yield information that

may determine the need to establish additional buffers due to proposed development.

- Utilize screening methods, such as native vegetation, that blend with the surrounding character of the site and do not become a secondary visual intrusion.

- Minimize development impacts on the park by working with developers during the planning process, suggesting setbacks and the least intrusive siting and character for improvements and new structures.

Access to Resources

- Limit, monitor, and control unauthorized access to the park.

- Limit, monitor, and control access to areas that are vulnerable to damage from human access or use.

- Develop an interpretive program that addresses cultural resources, natural systems, and their interrelationships.

- Minimize the visual and physical impacts of interpretive and visitor access facilities on cultural resources and natural systems. Develop the least intrusive interpretive and visitor access improvements possible.

- Erect the minimal number of signs possible for identity, directional, interpretive, and regulatory needs.

- Develop interpretive programs and media to be as accessible as possible for the widest range of visitors.

Role of Preservation Specialists

- Undertake all treatment projects under the direction of cultural and natural resource specialists, including historical landscape architects, historical architects, archeologists, natural resource managers, and qualified technicians and artisans.

Documentation

- Document, through drawings, photographs, and notes, all changes and treatments. Maintain records of treatments and preserve documentation according to professional archival standards.

Implementation Projects

This section describes the means for implementing many of the recommendations conveyed above. Identified below are eight implementation projects intended to support the park's ability to undertake work on the treatment plan, and secure funding. As such, they are presented in accordance with the format of NPS Project Management Information System (PMIS) funding requests. The projects are presented in a consistent format that describes the concept, identifies the considerations that must be addressed in planning for implementation, the location of the project, the additional studies that might need to precede implementation efforts, and the step-by-step process for implementation.

The implementation projects developed for this CLR are as follows:

1. Best Management Practices for Riparian Buffer Establishment; Tree Removal; New Landcover Establishment; and Invasive Plant Species Control
2. Enhance Wetland Protection by Establishing or Maintaining Riparian Buffers
3. Clear and Thin Non-Contributing Woodland using Best Management Practices
4. Establish New Landcover where Woodland is Cleared Using Best Management Practices
5. Establish or Maintain Vegetative Screen Buffers to Protect the Park's Setting and Feeling
6. Establish New Interpretive Trails
7. Enhance Interpretation within the Park Emphasizing the Cultural Landscape
8. Establish Design Guidelines for Contemporary Park Features

1. Best Management Practices for Riparian Buffer Establishment; Tree Removal; New Landcover Establishment; and Invasive Plant Species Control

Description. The CLR treatment plan recommends that the park adopt Best Management Practices (BMPs) to guide many of the actions and long-term management protocols for park resources, particularly those involving environmental features such as wetlands, soil, and vegetation. For the purposes of this report, BMP information relating to four topics has been collected for use by the park as they move forward with implementation of recommended projects. It is anticipated that the park will need to tailor current and available BMP information to the individual projects at hand, so this section will serve as a general guide rather than a specific list of actions. As part of the development and refinement of these BMPs, consideration should be given to maintenance practices required prior to and during maintenance activities.

Best Management Practices for Riparian Buffer Establishment.

See Implementation Project 2.

Best Management Practices for Tree Removal.

The most current BMPs, prepared in September 2008 by the Mississippi Forestry Commission are titled *Mississippi's BMPs: Best Management Practices for Forestry in Mississippi*, available online at www.mfc.state.ms.us.

Best Management Practices for New Landcover Establishment.

- Re-vegetate all disturbed soil in a manner that optimizes plant establishment for that specific site, unless ongoing disturbance at the site will prevent establishment of invasive species.
- Use local seeding guidelines and appropriate mixes, but realize that many species previously recommended for this purpose are now presenting invasive problems. Use native material where appropriate and available. Re-vegetation may include planting, seeding, fertilization, and mulching.
- Monitor and evaluate the success of revegetation in relation to the project plan.
- When re-vegetating areas that were previously dominated by invasive plants, try to achieve at least 90 percent control of the invasive before attempting restoration.

For more information, see "Invasive Plant Responses to Silvicultural Practices in the South" by C. W. Evans, D. J. Moorehead, C. T. Bargeron, and G. K. Douce (Tifton, Georgia: The University of Georgia, 2006).

Best Management Practices for Invasive Plant Species Control.

- Before starting any ground-disturbing activities, inventory invasive plant infestations both on-site and in the adjacent area.
- Begin activities in uninfested areas before operating in infested areas.
- Use uninfested areas for staging, parking, and cleaning equipment. Avoid or minimize all types of travel through infested areas, or restrict to those periods when spread of seed or propagules are least likely.
- When possible, to suppress growth of invasive plants and prevent their establishment, retain relatively closed canopies.
- Minimize soil disturbance and retain desirable vegetation in and around the area to the maximum extent possible.
- Monitor infested areas for at least three growing seasons following completion of activities. Provide for follow-up treatments based on inspection results.
- Do not blade roads or pull ditches where new invaders are found.

- When it is necessary to conduct soil work in infested roadsides and ditches, schedule the activity when seeds and propagules are least likely to be viable and to be spread.

- Quarantine soil from infested areas to prevent off-site spread.

- Invasive plants can be introduced and spread by moving infested equipment, sand, gravel, borrow, fill, and other off-site material. Inspect material sources at site of origin to ensure that they are free of invasive plant material before use and transport.

For more information, see Mactec, "Vicksburg National Military Park Environmental Assessment for Landscape Rehabilitation" (Atlanta, Georgia: National Park Service, 2009); <www.uaf.edu/ces/aiswg/word-documents/FS_NPS_InvasiveSpeciesBMPsFinal.doc>; and C. W. Evans, D. J. Moorehead, C. T. Bargeron, and G. K. Douce, "Invasive Plant Responses to Silvicultural Practices in the South" (Tifton, Georgia: The University of Georgia, The Bugwood Network, 2006), available on-line at <www.bugwood.org>.

2. Enhance Wetland Protection by Establishing or Maintaining Riparian Buffers

Description. Any future change in land management at Vicksburg National Military Park will need to include efforts to avoid, minimize, and mitigate all potential impacts to wetlands. One of the critical factors affecting wetlands and water quality is overland flow of stormwater. Riparian buffers are one of the tools available to the park to protect wetlands and water quality from erosion, sedimentation, and influxes of pollutants (Fig. 319).

Riparian buffers are bands of vegetation that edge watercourses to either side between the flood zone and the edge of the water—typically a strip of large trees, another of medium-sized trees and shrubs, and a third strip of grasses—designed to filter sediments and pollutants from stormwater flowing overland before it reaches the water course. Riparian buffers also stabilize streambanks, hold and release water, and contribute to aquifer recharge. Riparian buffers are developed with a plant composition and depth designed to address site-specific soil and slope conditions. Riparian buffer vegetative composition can vary greatly, but many of the trees, shrubs, and fibrous-rooted grasses native to the region can be used successfully to create effective buffers. Natural resource managers familiar with the park and region can help select plants that are appropriate for the buffer. Riparian buffer establishment and/or conservation should be considered an integral part of all park landscape management planning and implementation strategies.

Considerations. The condition of existing vegetation communities along stream and river corridors need to be evaluated for their value as a riparian buffer. For example, there may be gaps in existing woodlands along stream margins that need to be filled. Riparian buffers can be established by allowing guided natural woodland succession rather than planting. Interventions will likely be necessary where invasive plant species are a threat to native riparian vegetation, and where watercourses have unstable hydrologic conditions due to upstream disruptions caused by construction, industry, or road or residential development.

For sites where a riparian buffer is recommended, but tree cover interferes with important views, it may be possible to establish and maintain an alternative buffer type. Alternative buffers might include vegetation that can be maintained at a lower height, such as native grasses, sedges, and forbs with a strong fibrous root system capable of stabilizing the soil, interplanted with a limited number of trees and shrubs. It may also be possible to thin existing tree stands or remove individual trees and large shrubs in limited areas to accommodate site-specific interpretive objectives.

Location. Riparian buffers should be considered for all perennial and intermittent watercourses, springs, and wetlands.

Additional Studies Recommended.

- Develop a set of best management practices (BMPs) for riparian buffer implementation and management. Refer to the most recent version of Director's Order 77 for guidance in developing BMPs.

- Prepare a plan that identifies all areas requiring a buffer and delineates the proposed dimension for each buffer. Delineate proposed buffer boundaries for all perennial water bodies and wetlands using global positioning systems (GPS). Buffer dimensions and composition will take into consideration topography, vegetative cover, and soil type. The locations of the proposed buffers should be field verified, and any deficiencies in the existing riparian forest should be noted and addressed in the plan. The plan should identify a list of desirable native species for inclusion in the buffer planting. The site specific selection of species should be tied to cultural conditions. Ecologists and plant specialists should be involved in determining the recommended species compositions, densities, and the appropriate season for planting. Seed scarification, dormancy, and the potential for colonization by invasive

species are often dependent on seasonal issues. Planting schemes should be based upon a detailed evaluation of the following elements:

- Soil type(s)
- Slope of buffer zone
- Stability of soil organic layer
- Vegetation type(s) and communities
- Hydrology
- Type and condition of adjacent waterway
- Land use history
- Location of cultural and archeological features

Project Implementation Process.

Existing Riparian Buffers.

1. Retain existing vegetation that is consistent with the desired riparian buffer in composition.

2. Rehabilitate buffers using BMPs for forestry if the buffer is not stable due to vegetation that is in poor health, the existing buffer is too narrow, or invasive plants are present.

3. Invasive plants should be removed.

4. Plant native vegetation as needed to rehabilitate the existing buffer, and implement maintenance and management practices that support the establishment of additional buffer area if its width or density must be increased (see new riparian buffer section below).

5. Establish a program to perform cyclical maintenance and monitoring to ensure the continued effectiveness and health of the existing vegetative composition.

6. Provide educational and/or interpretive information to park employees and visitors on the value of riparian buffers and the goals of buffer conservation projects. Consider using waysides, signage, or other means to interpret buffers.

New Riparian Buffers.

1. Establish a riparian buffer strip to the designed dimension to either side of watercourses and wetlands where buffers do not exist, or in places where existing buffers do not comply with NPS management objectives. Begin by identifying potential buffer locations and delineating minimum buffer boundaries. Involve park staff, including natural resource specialists, in the process.

2. Prepare the site for buffer establishment by removing exotic and invasive vegetation and protecting sensitive natural or cultural resources.

3. Plant appropriate native vegetation, as identified in the plan. Follow established procedures for forest restoration, planting a combination of native trees, shrubs, and herbaceous plants, such as grasses and forbs, within the new riparian buffer zone.

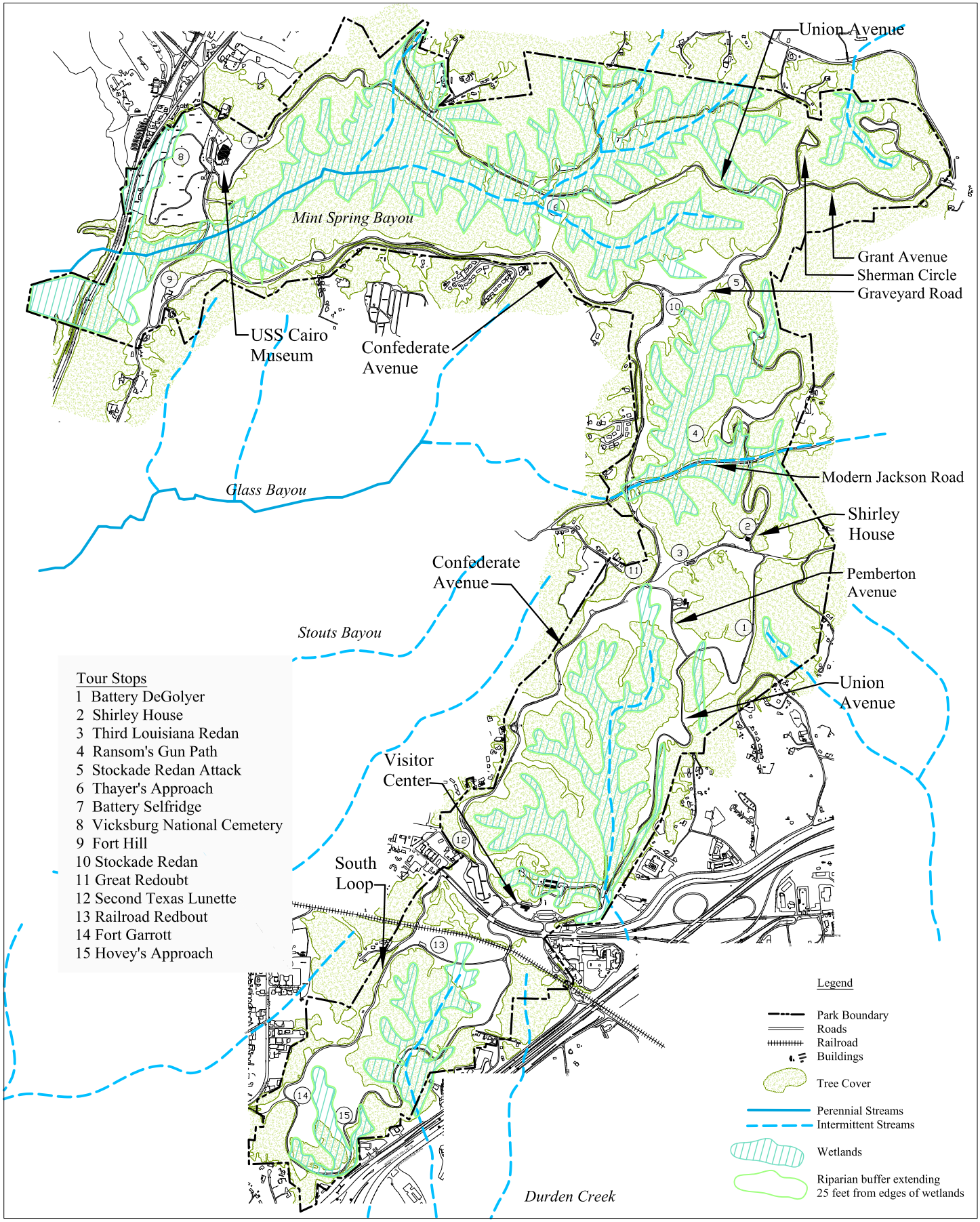
4. Follow proper plant installation methods, including mulching and watering techniques, to ensure the survival of the vegetation. Follow erosion control methods to prevent sediment or chemical runoff into the adjacent watercourse.

5. Monitor regularly post-installation site conditions for plant health and possible invasive or exotic plant species growth.

6. Replace failed vegetation immediately.

7. Avoid mowing within delineated riparian buffer zones.

8. Control colonization by invasive species.



Source: Autocad Base Map, USGS Topographic Data
December 2007 Wetland Delineation, Kovalenko and Dibble.

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Diagram of Wetland Buffers for Implementation Project

No. 2
Figure 319

Alternative Buffers for Establishing Viewsheds. At Vicksburg, certain viewsheds are critical to the visitor's understanding of the Civil War siege. Where interpreted viewsheds and sight lines are desired, standard riparian buffers should be replaced by an alternative buffer comprised of vegetation that can be maintained at a lower height, such as native grasses, sedges, and forbs that maintain a fibrous root system capable of stabilizing the soil, along with small numbers of trees to shade the water course for temperature control.

1. Identify locations where alternative buffers would be desirable to interpret specific open viewsheds between the Confederate and Union lines and their associated fields of fire.

2. Identify the desired buffer composition and select species for inclusion that are compatible with the alternative buffer proposed. Utilize an appropriate low growing landcover at sites where trees are judged to be incompatible with interpretive or management objectives. Select species with a strong fibrous root system that will help stabilize the soil.

3. Maintain alternative buffers through mowing or burning.

4. Consider, as an alternative, selectively removing trees from existing riparian areas to establish or maintain interpreted view corridors. Conserve or establish understory grasses and forbs in locations where trees are removed. Avoid gouging and other soil disturbance during plant removal and installation procedures. Consult with an arborist, archeologist, and natural resource specialist to determine the best method for the selective removal of trees within buffers and the prevention of resprouting and growth of invasive species.

3. Clear and Thin Non-Contributing Woodland using Best Management Practices

A. Clear Non-contributing Woodland Vegetation

Description. The clearing of non-contributing woodland to reestablish historic land cover conditions would enhance interpretation of the 1863 Civil War era siege and battlefield landscape (Fig. 320). Clearing of non-contributing woodland is a key element of the CLR treatment plan that responds to the park's goals and objectives. It is only recommended, however, in specified key visitor use areas where the landscape is interpreted, and where impacts to natural and historic cultural resources can be avoided, minimized, or mitigated. Best management practices (BMPs), as discussed below, should be followed when conducting the tree clearing considered as part of this plan.

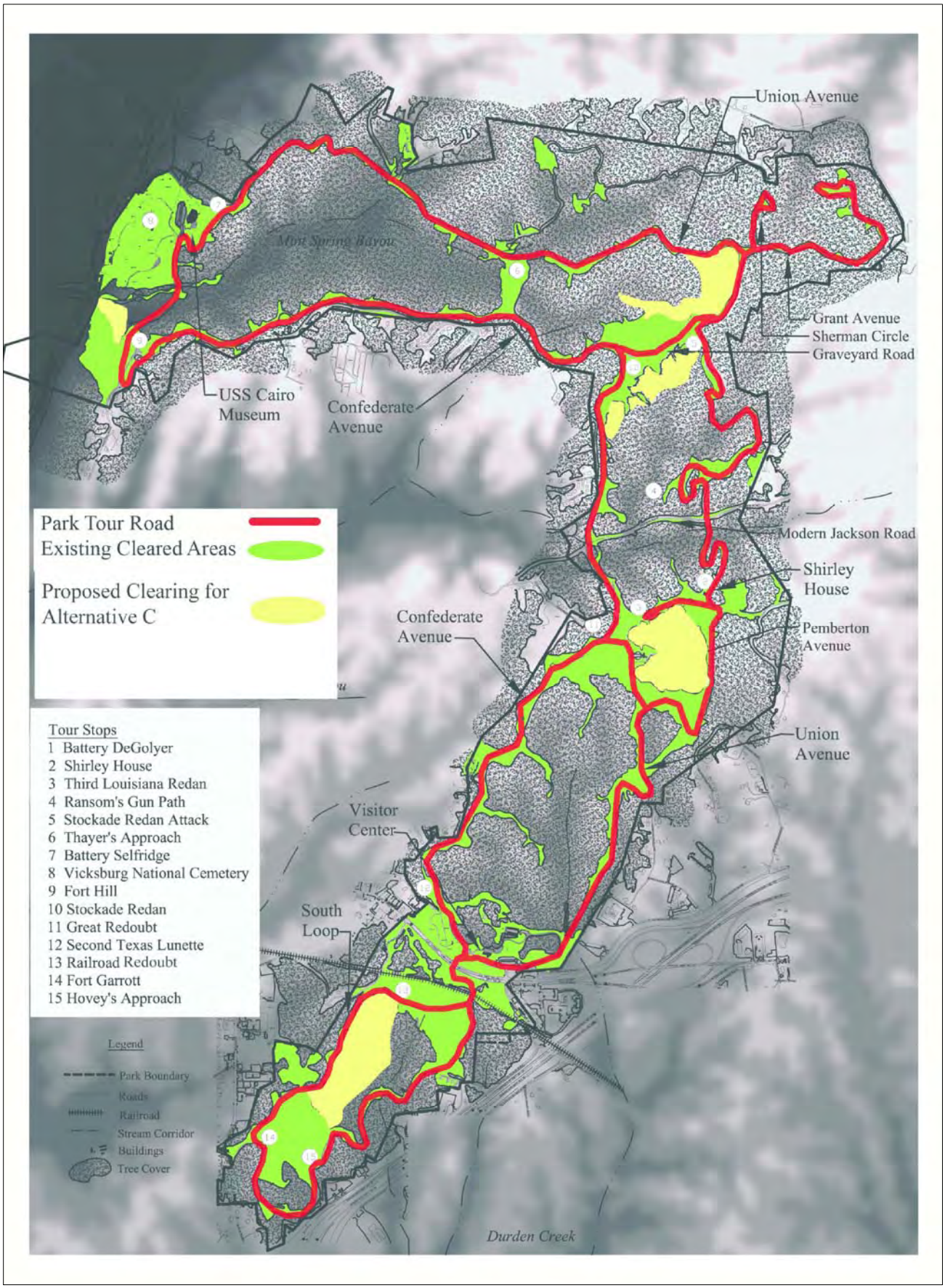
Considerations. Before any existing woodland is cleared, two factors must be considered: the impact of clearing on the environment, and the role that clearing will play in interpretation. In some cases, non-contributing woodland helps to screen views of incompatible contemporary development and should remain. In other cases, non-contributing woodland plays an important role in maintaining the health of the environment. Woodland cover along stream corridors such as Mint Spring Bayou is important as a riparian buffer that protects water quality and should not be removed. (See Riparian Buffer guidelines provided in Implementation Project No. 1 above). Other woodland areas may serve as habitat for plant or animal species of special concern and should not be disturbed. As part of the development of a Long-Term Interpretive Plan, the park should establish priorities for interpretation, the role that clearing will play in conveying the stories of the siege to the visitor, and determine the costs and benefits associated with clearing.

The following criteria should be considered when deciding whether and where to clear woodland:

- The area to be cleared should support the goals of the park's interpretive plan.
- The area to be cleared should be located within view of a primary visitor use area.
- The area to be cleared should not negatively impact water resources or other sensitive ecological areas, and proposed plans should be consistent with all federal, state, and local laws associated with natural resource protection.
- Tree removal should not result in open views to areas outside the park that would have a negative effect on interpreting the historic scene.

The following economic and environmental costs should also be considered when weighing interpretive benefits:

- Will the clearing result in a loss or fragmentation of wildlife habitat?
- Can the potential loss of topsoil and reduction in water quality due to increased runoff during clearing be mitigated to an acceptable degree?
- Can the potential loss or damage of archeological resources due to clearing, stump removal, and seedbed preparation be mitigated to an acceptable degree?
- What is the financial cost of meeting Section 106 compliance in testing, collecting, and inventorying environmental and archeological resources?
- What is the financial cost of monitoring by specialists during clearing?
- Can the costs of clearing be offset by the sale of the timber harvested?
- What is the financial cost of establishing the new desired land cover?
- What is the financial cost of managing new fields by mowing and/or prescribed burning?



Source: Autocad Base Map, USGS Topographic Data

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Diagram of Clearede Areas for Implementation Project No. 3

Figure 320

Location. Three primary areas of woodland clearing are recommended as part of the CLR treatment plan. These include the earthworks, artillery positions, and approaches associated with 1) Old Jackson Road/Battery DeGolyer/Third Louisiana Redan (with Old Jackson Road to Pemberton Avenue being of the highest importance); 2) Railroad Redoubt/Fort Garrott; and 3) Graveyard Road/Stockade Redan. Additional limited tree removal is also proposed near the Water Battery overlooking the Mississippi River northwest of Fort Hill, and around South Fort. Also under consideration is careful and judicious thinning and limbing of tree cover along Confederate and Union Avenues where visitors might access the view and gain an understanding of the opposing lines (See section B. below).

Additional Studies Recommended.

- By law, any landscape management activity that moves, breaks, or disturbs soil requires some level of Section 106 and/or NEPA compliance before activities can begin. An EA has been prepared in conjunction with the treatment plan identified in this CLR.

- Consider conducting a seen-area analysis, such as a DEM (Digital Elevation Model) using ArcGIS Spatial Analyst and 3-D Analyst extension, to help determine the available views and viewsheds important to interpreting the 1863 military landscape from tour road locations and other visitor use areas.

- Coordinate the seen-area analysis with fieldwork to determine appropriate locations for establishing sight lines that will support visitor understanding and interpretation of 1863 military events.

- After identifying the boundaries of the area to be cleared as part of the initial phase of the adaptive strategy, work with botanists/ ecologists to perform necessary environmental impact assessments. All potential cultural and natural resource impacts should be evaluated before making final determinations regarding which sites will be cleared.

- Prepare a set of best management practices (BMPs) identifying the most appropriate methods of tree removal and erosion control given local soils, hydrology, and vegetation types that will minimize the impacts and threats to cultural and natural resources and known and potential archeological resources. Determine how to dispose of the cleared trees, prior to beginning work (see section C. below).

- Engage a team of specialists, potentially including an ecologist, rare plant specialist, hydrologist, forester, archeologist, and historical landscape architect, to delineate the boundaries of the sites to be cleared. The team should also collectively delineate the locations and alignments of all timber haul roads and skid trails, loading areas, streamside management zones, and other related conditions of the tree removal effort. The team should also evaluate the woodlands identified for clearing to ensure that there are no federal or state threatened, endangered, or rare species present, or rare habitats that are likely to support such species, and that there are no cultural resources that will be adversely affected. If endangered or threatened plant or wildlife species are identified, recommended actions that may alter their habitats should be reevaluated.

- Establish protocols to preserve, protect, and maintain cultural features such as monuments in areas undergoing woodland clearing.

Woodland Clearing Options.

- **Clear-cutting.** Although clear-cutting is potentially the quickest and most-efficient method of removing forest, the following must be taken into consideration:

    - Clear-cutting leads to a drastic change in appearance that can disturb visitors.

    - Invasive species can become opportunistic within surrounding woodland stands.

- Clear-cutting can be more expensive than gradual removal due to the need for heavy machinery and increased labor.

- **Gradual removal.** Gradual removal does not provide the immediate gratification of clear-cutting and may take five to ten years to complete. It also requires continual maintenance and periodic hiring of tree removal labor. A management plan for removal may be required to adequately address issues involved with this type of tree removal, but offers other advantages such as:

  - The method will likely have less impact on the surrounding woodlands and environment.

  - It will be a less abrupt change for visitors.

Project Implementation Process. After an area has been identified as suitable for clearing, the following steps are recommended:

1. Engage a tree removal service to conduct the clearing that can demonstrate successful experience working at historically significant sites. Ensure that tree clearing and erosion control BMPs developed for this project are an integral component of the process to be conducted by the tree removal contractor.

2. Ensure that appropriate measures to stabilize the soil and minimize erosion are established by the contractor prior to clearing.

3. Regularly inspect tree removal operations to monitor compliance with the terms of the contract and applicable laws. An archeologist, soil scientist, and/or other professionals should participate in monitoring and regular inspections of the tree clearing operations.

4. Begin immediate establishment of desired new landcover in areas where trees have been removed (see Implementation Project No. 3 below). Minimize disturbance to the soil surface when planting new landcover.

B. Thin Woodland to Establish Viewsheds for Interpretation

Description. Interpretation of the Vicksburg military landscape will be enhanced through increased visual accessibility of the opposing lines of fortifications, and their connection to each other and the surrounding landform and topography (Fig. 321). The park's existing woodland areas were generally open during the Civil War and today obscure important military views and relationships. As noted above, removal of non-contributing woodland is recommended in three key areas to support interpretation of 1863 military events. Some areas of non-historic woodland, however, have high natural resource values and should be retained, or will remain in woodland cover due to other considerations such as the park's maintenance capabilities. Other options exist to facilitate interpretation where existing woodland is recommended to remain. These include careful manipulation of existing woodland cover by site-specific thinning of trees, limbing up or pruning of the lower branches of canopy trees, removal of saplings and shrubs, removal of invasive species and dead or dying trees, and/or limited clearing along a targeted view corridor.

Considerations. Woodland thinning techniques presented herein are intended to render the ground plane and landform of important interpretive viewsheds more visually accessible in places where removing non-contributing woodland is not a viable option. In implementing these projects, care must be taken to avoid disturbing woodland areas that serve as habitat for species of special concern or that are important to protecting water resources.

Thinning within designated riparian buffer areas can be considered if an alternative buffer community is established. Alternative riparian buffer communities are described in Implementation Project No. 1 above.

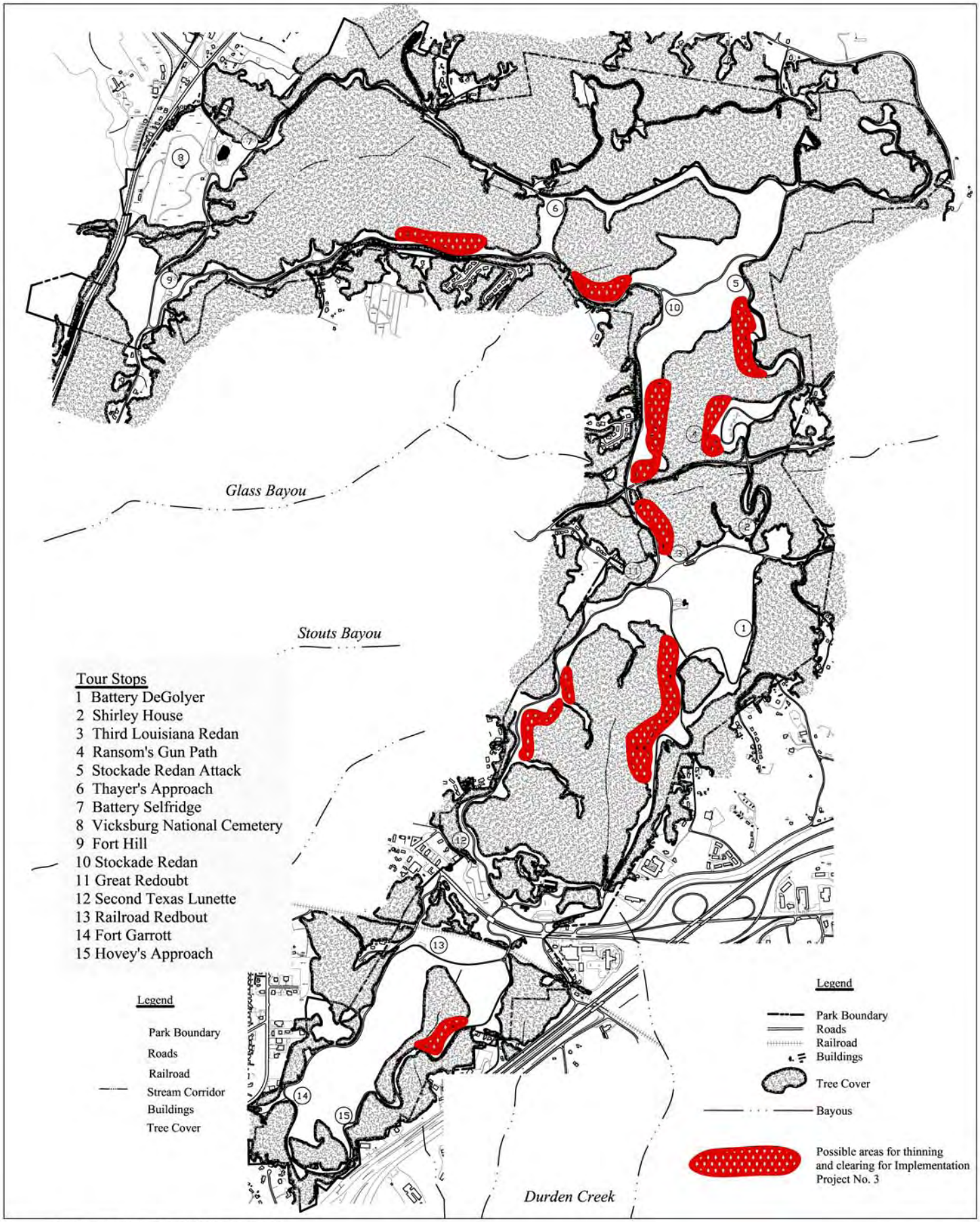

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Diagram of Thinning and Clearing Along Tour Road for Implementation Project No. 3

Figure 321

Location. Thinning and clearing of specific sight lines may be desirable along Confederate and Union Avenues where woodland removal is not anticipated but views between the lines are possible.

Additional Studies Recommended.

- The identification of potential views and viewsheds should be determined as part of a seen-area analysis (using technology such as ArcGIS Spatial Analyst and 3-D Analyst extension).

- The park should prepare a Long-Range Interpretive Plan that describes the interpretive goals and programs associated with the cleared areas.

Project Implementation Process.

1. Engage an archeologist, natural resource specialist, and historical landscape architect to field-check and evaluate the areas to be thinned or cleared and ensure that no cultural or natural resources will be adversely affected prior to removal of woodland vegetation. Evaluate the likely efficacy of the clearing to establish the desired view. Adjust the planned thinning operation if the amount of vegetation in need of removal proves extensive or the operation is anticipated to become ecologically unsound or a financial burden.

2. Clear as little vegetation as possible to achieve the desired viewshed opening. Perform work in phases to ensure that the minimum amount of vegetation is removed to meet interpretive needs:

    - Phase One: Begin by removing exotic and invasive vegetation and trees that are diseased, unhealthy, present a danger to visitors, or are a windthrow hazard. Follow BMPs for vegetation removal and thinning. Remove the majority of saplings and shrubs. Prune and remove branches up to fifteen feet above the ground when the action will not result in damage to the tree. Revegetate with a desired new low growing landcover.

    - Phase Two: Evaluate the success of phase one thinning operations. Further enhance visibility as needed by selectively thinning additional trees. Continue to remove exotic, invasive, and diseased vegetation.

    - Phase Three: Evaluate the success of phases one and two thinning operations. If the viewshed remains obscured, continue to selectively thin trees without negatively affecting water quality and erosion problems until the viewshed meets interpretive needs. As woodland is opened, continue to revegetate with the desired new landcover to prevent soil erosion and establishment of unwanted opportunistic and invasive species. Maintain understory grasses by periodically removing woody competition as needed. Also thin woody cover on a periodic basis to maintain visual access.

    - Alternatively, opt to clear trees between a specific view point and a viewed landscape feature in a narrow corridor. Interpret the cleared area for visitors.

C. Best Management Practices associated with Tree Clearing

Description. Any tree clearing that occurs within the park should follow carefully considered best management practices (BMPs) to avoid soil erosion and impacts to wetlands. BMPs for tree clearing have been developed by the state of Mississippi that provide important guidance for planning and implementing tree clearing plans. The most current BMPs, prepared in September 2008 by the Mississippi Forestry Commission are titled *Mississippi's BMPs: Best Management Practices for Forestry in Mississippi*. Another good source of information for developing appropriate BMPs is the June 2005 *FSC Regional Forest Certification Standard for the Mississippi River Alluvial Valley and Gulf Coastal Plan (MAV Region)* (see principal 6 in particular.) Both of these documents are available on-line.

Considerations. Consideration should be paid to performing clearing or thinning operations in the fall and winter when fewer visitors are at the park, dormant trees are less likely to be damaged, there are no nesting birds or animals in the vegetation, and sufficient time would be available to remove ground vegetation before spring growth.

The use of heavy vehicles should be minimized, and consideration should be paid to using low tire-pressure vehicles. Operations should occur only when the soil is firm to reduce the degree of compaction. Also consider cutting stumps to the ground to avoid the need to uproot or grind them; treating stumps and sprouts with herbicide, such as glyphosate, to discourage and control woody regeneration; and removing felled trees without dragging, which gouges the ground surface.

Based on review of the Mississippi Forestry Commission report *Mississippi's BMPs; Best Management Practices for Forestry in Mississippi*, the following should be considered carefully in developing BMPs for tree clearing at Vicksburg National Military Park:

1. Do not allow surface water runoff from any type of soil disturbance to run directly into a watercourse.

2. Maintain the integrity of all streambeds and banks. When it is necessary to alter a stream's course for any reason, return the streambed and banks, as near as possible, to their original condition.

3. Do not leave debris of any type (logging or inorganic) in streambeds.

4. Do not spray chemicals directly into water or allow chemicals, herbicides, fertilizers, or petroleum products to degrade surface or groundwater.

5. Leave streamside management zones along watercourses both to filter sediment from overland flow and to maintain the inherent, normal temperature of water in all streams and other bodies of water.

6. Provide for rapid revegetation of all denuded areas through natural processes supplemented by artificial revegetation where necessary.[301]

Additional considerations derived from the *FSC Regional Forest Certification Standard* include:

- Establish safeguards that protect rare, threatened and endangered species and their habitats. Establish conservation zones and protection areas as needed. Void inappropriate timber extraction.

- Create or maintain conservation zones for existing sensitive, rare, threatened, and endangered species and other protected areas to enhance the viability of populations and their habitats including their connectivity within the landscape.

- Maintain, enhance, or restore ecological functions and their values.

- Prepare and implement written guidelines to control erosion; minimize forest damage during harvesting, road construction, and all other mechanical disturbances; and protect water resources.

- Conduct logging operations and construction of roads and skid trails only during periods of weather when soil is least susceptible to compaction, surface erosion, rutting, or sediment transport into streams and other bodies of water.

- Minimize construction of skid trails to the extent possible.

- Plan felling and extraction to minimize adverse effects on standing trees, ground cover, soil, and sensitive environmental features.

- Select silvicultural techniques and logging equipment according to slope, erosion-hazard

301. Mississippi Forestry Commission, "Mississippi's BMPs; Best Management Practices for Forestry in Mississippi." (Jackson: September 2008), 3, available online at www.mfc.state.ms.us.

rating, and/or risk of landslides in order to minimize soil disturbance and erosion, and avoid mass failure.

- Minimize impacts to forest resources by implementing the following mitigation measures:
    - Slash is concentrated only as much as necessary to achieve the goals of site preparation and the reduction of fuels to moderate or low fire hazard levels.
    - Scarification of soils is limited to the minimum necessary to achieve successful regeneration of desired species.
- Minimize removal and relocation of mineral and organic layers of soil during logging and site preparation.
- Design, construct, and maintain the transportation system to minimize the extent of the road network and its potential cumulative adverse effects.[302]

Both of the referenced guides suggest that preharvest planning is one of the keys to preventing soil erosion and sedimentation. Careful planning of road locations, logging, harvesting practices, and watercourse protection are recommended. To avoid non-point pollution problems such as excessive sediments, organic debris, chemicals, nutrients, and an increase in average water temperature, the guide recommends the establishment of streamside management zones (SMZs), which are vegetated areas adjacent to streams and watercourses that help protect them from pollutants. (See also riparian buffer section above.)

SMZs are zones that extend from both stream banks to a distance determined by the slope of the land. The zones are designed to trap sediments so are recommended to be thicker as the steepness of the adjacent slope increases due to the associated increased velocity of overland stormwater flow. The intent of SMZs is also to maintain sufficient overstory and understory crown cover to provide shade, maintain bank stability, and protect water quality. Additional benefits include enhancing wildlife habitat, creating wildlife corridors, and providing habitat diversity in harvested areas. The vegetation acts as a filter to trap sediments, chemicals, and nutrients before they reach the water. Some of this vegetation along perennial streams also provides the shade necessary to avoid adverse changes in water temperature.

The proper use of SMZs depends on the individual stream type. The guide considers two stream types in Mississippi: perennial (watercourse that flows in a well-defined channel throughout most of the year under normal climatic conditions) and intermittent (watercourse that flows in a well-defined channel during wet seasons of the year but not the entire year). The stream type will dictate the types of forestry activities that are appropriate.[303] The principals associated with SMZs within the guidelines include:

1. Never use a stream channel as a skid trail or road.
2. Always remove logging debris from stream channels.
3. Minimize the number of stream crossing points.
4. Cross streams only at a right angle.
5. Never block the flow of water through a stream channel.
6. Avoid rutting through streams.
7. Avoid high intensity fire in SMZ.
8. Minimize residual tree damage.
9. Harvest of any stems on the edge of a stream channel must be accomplished in such a

302. Forest Stewardship Council, "Regional Forest Certification Standard for the Mississippi River Alluvial Valley and Gulf Coastal Plain (MAV Region), v. 3.3" (June 1, 2005).

303. Mississippi Forestry Commission, "Mississippi's BMPs," 5.

manner as to minimize impact to the stream bank.[304]

Another topic addressed by the cited sources is the establishment of routes to haul cleared trees. These routes are referred to as skid trails and haul roads. Erosion control measures are needed in association with each of these constructed corridors. Skid trails are used for moving harvested materials from stump to landing. They need to be designed to avoid potentially sensitive areas and problem soils and to drain properly. Skid trails also require maintenance if they are to retain an effective drainage system.[305]

Haul roads are the primary roads used to transport timber from a site. Like skid trails, haul roads need to sited to avoid potentially hazardous areas and problem soils, and to accommodate drainage in such a way as to limit soil erosion. Haul roads should be constructed and used during dry periods as possible. These road surfaces will also require maintenance to avoid the development of ruts. Both road types should be revegetated after they are retired.[306]

The referenced guides provide additional guidance on establishing water control methods in association with roads established to support tree clearing that are intended to reduce sedimentation from logging activities. The methods described include slash dispersal, revegetation, silt fences and hay bales, water bars, water turnouts, and broad-based drainage ditches.

Slash is debris created in the process of a logging operation. Slash dispersal is an immediate solution for preventing soil movement on an active logging site. Scatter slash over exposed soil or use it to build water bars.

Revegetation is using seed or mulch to protect trails, roads, or other exposed soil.

Silt fences and hay bales reduce erosion and sedimentation. They can be used to stabilize exposed soil around stream crossings, or embedded roadways and trails.

Water bars are mounds of soil or placed wood to divert runoff water from a road.

Water turnouts are extensions of a drainage ditch into a vegetated area, providing for the dispersion and filtration of stormwater runoff.

Broad-based drainage ditches are carefully-constructed outslope sections of roads that serve as a water catchment and drainage channel.

For more information, see "Mississippi's BMPs; Best Management Practices for Forestry in Mississippi" available on-line at www.mfc.state.ms.us.

304. Ibid, 6.
305. Ibid, 8-9.
306. Ibid, 9-10.

4. Establish New Landcover where Woodland is Cleared using Best Management Practices

Description. Areas of the park slated for removal of non-contributing woodland will require immediate revegetation to protect against erosion. New vegetation established within these areas, to meet the goals and objectives of clearing, will need to be maintained at a relatively low height to allow visitors to personally see and experience the terrain. The plant species or communities established within newly cleared areas must also meet additional criteria such as viability within the park's natural environment, be efficacy in protecting the local soil from erosion, and within the park's maintenance capabilities (see the specific criteria for selection below). As with tree clearing, the establishment of new landcover in cleared areas should be effected in such a way as to promote environmental stewardship and avoid impacts to sensitive natural and cultural resources. Best management practices for establishing new landcover will be developed and followed as part of this project.

Considerations. One of the current conflicts inherent in the park's treatment of landcover within cleared areas is that the two primary species used to protect against erosion are Bermuda and bahia grass. Both of these are considered non-native invasive species in states other than Mississippi. Both offer little in the way of wildlife habitat, and their use constitutes a monoculture, which can be dangerous should the species be susceptible to loss due to a pest or pathogen. It is recommended that the park continue to consider a variety of plants and plant community types that meet the criteria for new landcover listed below in cleared areas. It may be necessary to convene a committee of wildlife biologists and ecologists with knowledge of local soils and plant communities to determine the range of plants and plant communities that might be considered for use within cleared areas of the park. In fact, the park's varied terrain and environmental conditions may be best served by the establishment of a variety of communities that are suited to local soil moisture, solar orientation, and slope conditions.

Investigation into the potential to establish oak woodland/savanna, warm season grass fields with combinations of Indiangrass, switchgrass, and bluestems on uplands and slopes, and moist forb and grass meadows in swales and drainages should be explored. Challenges such as long establishment periods can be met with techniques such as the planting of annual grasses to hold the soil, overseeding, or managing to promote warm-season grasses over cool-season grasses. While establishing, managing, and maintaining these communities may require specialized attention and practices, they will also likely yield worthwhile environmental and aesthetic benefits.

Location. This project is specifically intended to address the proposed cleared areas, but alternative land cover types could also be considered wherever non-native grasses or invasive plants currently exist.

Additional Studies Recommended.

- Preliminary studies such as soil analysis will be needed prior to determining the specific process for and species associated with establishing new landcover.
- A committee comprised of park personnel and scientists with local expertise in ecology should consider the options for new landcover that meets the following identified criteria:
    - Species must be able to be maintained at a height of three feet above the ground at or near the grade of the tour road and other visitor use areas, and up to fifteen feet at lower elevations where visitors could still see across the vegetation because of the lower elevation.
    - Species must be suited to loess soil, planting zone, and rainfall conditions (soil testing must precede species selection).
    - Species should be drought tolerant.

- Species must provide above ground cover and/or a root system that protects against soil erosion characteristics particular to loess soil.

- If the species provides long-term soil erosion protection but no short-term protection, there must be a viable annual or interim landcover option for the establishment period.

- The long-term cover species must be perennial or self-perpetuating, although temporary cover species may be annual.

- Preference will be given to a species that is relatively easy to establish.

- Preference will be given to species with greater benefits to wildlife.

- Preference will be given to a species that has less onerous maintenance requirements than the existing Bermuda grass, particularly concerning mowing frequency.

- Preference will be given to species that can be maintained through alternatives to mowing, such as prescribed fire.

- Preference will be given to native species over non-native species.

- Invasive species will not be used. (Bermuda grass is not currently listed as invasive within the state of Mississippi.)

- Consideration will be paid to establishing appropriate species compositions in different areas of the park: requirements for frequent mowing is less problematic on relatively level sites; on steeper sites, maintenance requiring less frequent mowing is more desirable.

- Consideration will be paid to replicating the character of local landcover at the time of the battle.

Native Warm-Season Grass and Forb Fields. One option to be considered for newly cleared areas is the establishment of warm-season grass and forb fields or meadows. Converting woodland to native warm-season grass and forb fields will allow the perpetuation of important open conditions while supporting NPS sustainability initiatives. The park expends a great deal of energy in the form of fuel and labor to regularly mow turf grass. Native warm-season grass and forb fields can be managed through mowing once or twice per year, or through a combination of mowing and prescribed burning.

Native warm-season grass and forb fields are generally composed of regionally-native perennial bunch grasses that are more ecologically sustainable than Bermuda grass. They can provide high-quality wildlife habitat, while also serving as components of riparian buffer plantings. Established using a modicum of soil amendments, warm-season grasses require few or no additional applications of herbicides, fertilizers, or pesticides. They are generally drought tolerant as well.

Native warm-season grass fields can be difficult to establish and maintain in the early stages. A temporary cover of an annual grass such as rye can be used during the early phase of establishment. The desirable mix of grasses and native prairie forbs can include bahia and/or Bermuda grass to help maintain even and complete coverage of the soil. (Refer to the list of Jackson Prairie species appropriate for use in the area, Appendix C.)

The conversion of woodland to warm season grass and forb fields should be undertaken in an adaptive or phased manner. Knowledge gained from the Railroad Redoubt clearing as well as other early-phase conversions can be applied to the on-going conversion of additional fields.

The park's interpretive plan should consider the role that native warm-season grass and forb fields can play in the interpretation of historic conditions. Mowing patterns, for example, can be utilized to create visual aids for interpreting missing historic conditions. Grass species with distinctions in texture, height, and/or color can be planted in limited areas in support of interpretive

needs to delineate former field patterns, military lines, or other missing features of the Civil War-era landscape. The seasonal nesting cover and food requirements of open-field wildlife in the park, such as birds and small mammals, should be accommodated when determining mowing schedules.

Project Implementation Process.

1. Determine the vegetation species and compositions for areas to be cleared using the criteria developed for the project.

2. Develop a set of BMPs for establishment and maintenance of the vegetation communities to be established. Consider the guidance offered in the state of Mississippi's Best *Management Practices for Forestry in Mississippi* available on-line at www.mfc.state.ms.us.

3. Establish the new vegetation in conformance with the BMPs developed.

5. Establish or Maintain Vegetative Screen Buffers to Protect the Park's Setting and Feeling

Description. Maintenance of the historic rural character of the park landscape depends on the control of views to adjacent and/or non-contributing properties and features (Fig. 322). Vegetative buffers are one of the primary tools for screening incompatible views. However, the park may also take into consideration the procurement of scenic easements, and/or coordination with local and regional planning authorities to control development within sight of the park.

Considerations. A seen-area analysis could be used to determine where visual buffers and possibly development controls are needed. Such a study could be used to evaluate existing buffers and identify areas where buffers may either exceed or be insufficient to the task of controlling non-contributing views. As the park weighs goals of removing non-contributing woodland, it may be desirable to diminish the current extent of perimeter woodland buffers, and/or extend buffers in other carefully-considered areas.

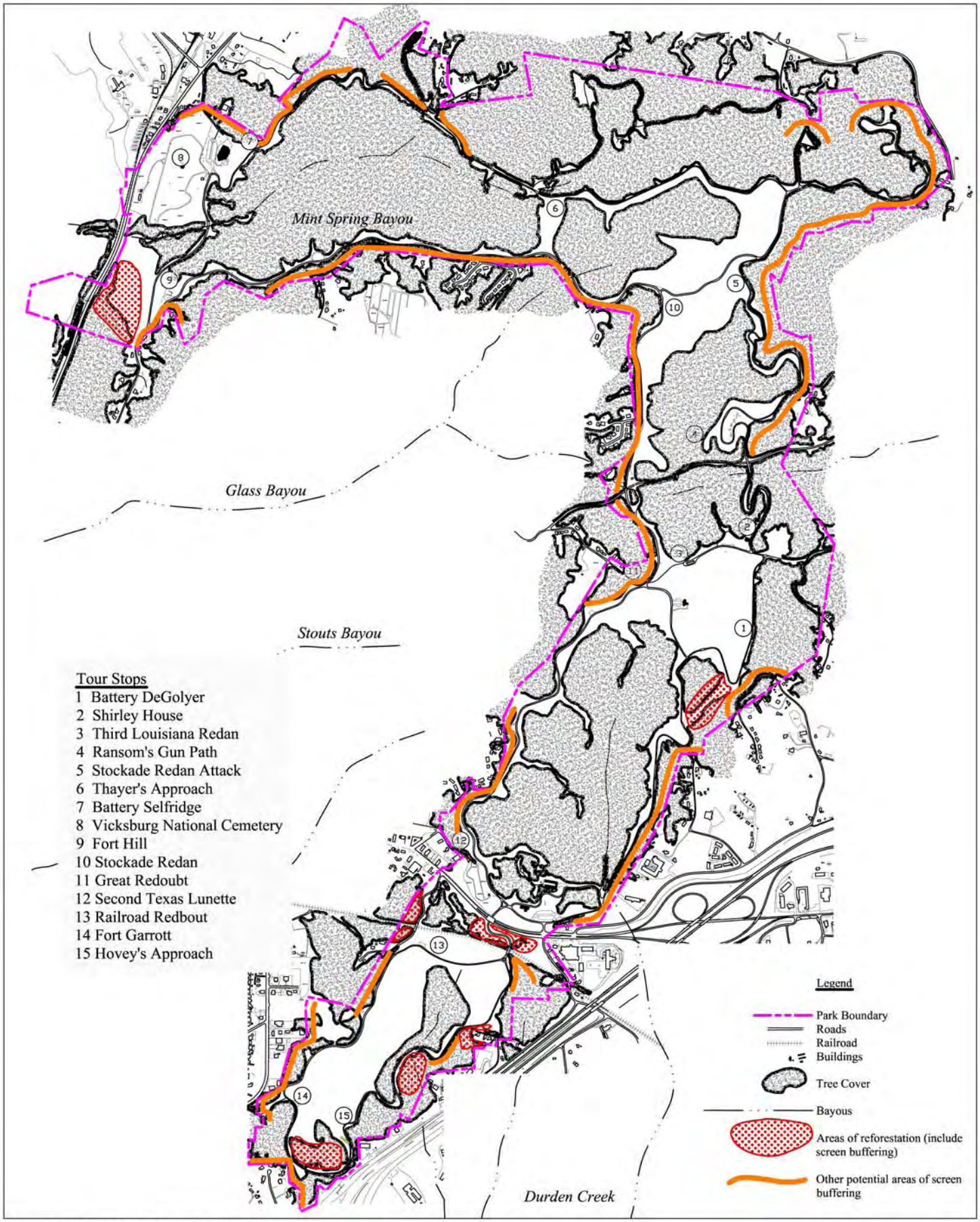
Many of the park's existing buffers benefit from the evergreen character of privet, an invasive alien species that should be removed from the park if possible. A suitable native species replacement for privet should be identified.

Location. Vegetative screen buffers are in place along the majority of the park's boundaries. Development pressures with the potential to impact views are occurring along the eastern, southern, and northwestern park boundaries.

The park proposes to establish woodland areas in specific locations to enhance screening of features such as the park visitor center. Establishment of woodland in these areas should follow the same guidance as buffer establishment.

Additional Studies Recommended.

- Minimize development impacts adjacent to and near the park by working with developers during the planning process, suggesting increased setbacks and the least intrusive location and character for new structures and roads.
- Monitor and participate in regional planning activities in order to protect adjacent resources and the larger setting of the park.
- Develop working relationships with adjacent landowners to yield information that may determine where additional buffers should be established to most effectively screen proposed development.
- Coordinate with adjacent and nearby property owners to determine if they are amenable to selling or donating scenic easements on their land to help fulfill the park's interpretive mission.
- Obtain scenic easements for all adjacent property that will remain visible from the interior of the park. Scenic easements are legal documents stating that the owner of a property agrees not to build anything on their land that will be visually intrusive to the owner of an adjacent or nearby property.
- Coordinate with planning authorities on the development and construction of new features within the landscape that may impact the park visually or physically such as roads, zoning changes that may result in higher density residential or non-residential uses, sale of land to non-governmental entities, and cell towers or antennae.
- Design a woodland vegetation plan for park screen buffers. Include native evergreen and deciduous trees and shrubs with a dense character that are suited to local conditions. Plant trees in groves rather than in rows to present a more natural appearance. Plant evergreen understory trees and shrubs where a solid screen is needed. Avoid planting monocultures of a single tree species, such as pines. Not only is this practice ecologically unsound, but it may create a distracting view that does not blend with the surrounding



Source: Autocad Base Map, USGS Topographic Data

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Vicksburg National Military Park

Diagram of Areas Needed for Buffer Enhancement for Implementation Project No. 5

Figure 322

woodland character. Consider the following native evergreen species for inclusion within the plan:

- American holly (*Ilex opaca*)
- Eastern red cedar (*Juniperus virginiana*)
- Southern magnolia (*Magnolia grandiflora*)
- Loblolly pine (*Pinus taeda*)
- Carolina cherrylaurel (*Prunus caroliniana*)

And consider the following locally and regionally native deciduous vegetation to supplement the evergreen material:

- Oaks: black (*Quercus velutina*); cherrybark (*Q. pagoda*); chinkapin (*Q. muehlenbergii*); northern red (*Q. rubra*); Shumard's (*Q. shumardii*); southern red (*Q. falcata*); water (*Q. nigra*); and white (*Q. alba*)
- Sycamore (*Platanus occidentalis*)
- Tulip poplar (*Liriodendron tulipifera*)
- Pecan (*Carya illinoiensis*)
- Sassafras (*Sassafras albidum*)
- Flowering dogwood (*Cornus florida*)
- Redbud (*Cercis canadensis*)
- Deciduous holly (*Ilex decidua*)
- Rusty black haw (*Viburnum rufidulum*)
- Rough-leaved dogwood (*Cornus drummondii*)

- Assessment and protection of cultural features should precede planting.

Project Implementation Process

1. Evaluate the current effectiveness of visual screening along the park perimeter. Determine where sufficient screening of intrusive views exists and where it should be reinforced with additional plantings, particularly as privet is removed.

2. Delineate the extent of each area where screen plantings are to be established, using a historical landscape architect, archeologist, and botanist/ecologist.

3. Remove all invasive species within the area designated for buffer establishment or to be converted to woodland

4. Implement the re-vegetation plan, either by allowing woodland to develop through secondary succession, or by planting saplings of native trees. Follow proper plant installation methods, including mulching and watering techniques, to ensure survival of newly planted vegetation.

5. Initiate a periodic monitoring program to evaluate the development of the woodland and to look for evidence of colonization by invasive species.

6. Manage vegetation to promote the establishment of stable, healthy woodland comprised of species typically found in similar natural areas.

6. Establish New Interpretive Trails

Description. Expansion of the existing opportunities for visitors to access and learn about the park's significant historic resources is recommended in the CLR treatment plan (Fig. 323). To address this topic in sufficient detail, the Long-Range Interpretive Plan (LRIP) currently under development will be needed. Expanding these programs will likely encompass a range of physical features including new trails, parking pull-offs, exhibits, land cover and vegetation management, and sign systems. The design of these new site improvements will be driven by the LRIP as it examines the park's interpretive systems as a whole.

The final designs for new trails will respond to more precise information developed in the LRIP about the manner in which the park is to be interpreted. The CLR recommendations emphasize resource-driven interpretation of the military events of 1863; meaning that trail alignments should provide connections between the tour road and sites that are of interpretive value.

Considerations. Trail recommendations and guidelines must consider the advantages and disadvantages of all proposed routes, identify problems to avoid, provide connections to interpreted resources and meet other interpretive goals, consider the potential for making the route universally accessible, and indicate connections to main roads and parking. Trail designs should ultimately distinguish between primary routes comprised of universally-accessible trails that provide access to the park's most important resources and stories and that are connected to safe and convenient parking areas; and secondary routes that may not necessarily be universally accessible, but may offer a range of challenge levels that could provide an extended tour for interested visitors.

Trails can require a certain amount of modification of the landscape, such as grading, to ensure a well-drained and relatively even tread and prevent erosion. It is currently anticipated that most new trails will be unimproved, non universally-accessible mown paths leading from universally-accessible trailheads at or near existing parking pull-offs or minimal new pull-offs. The routes followed by these trails should still be evaluated for any potential impacts to cultural or natural resources.

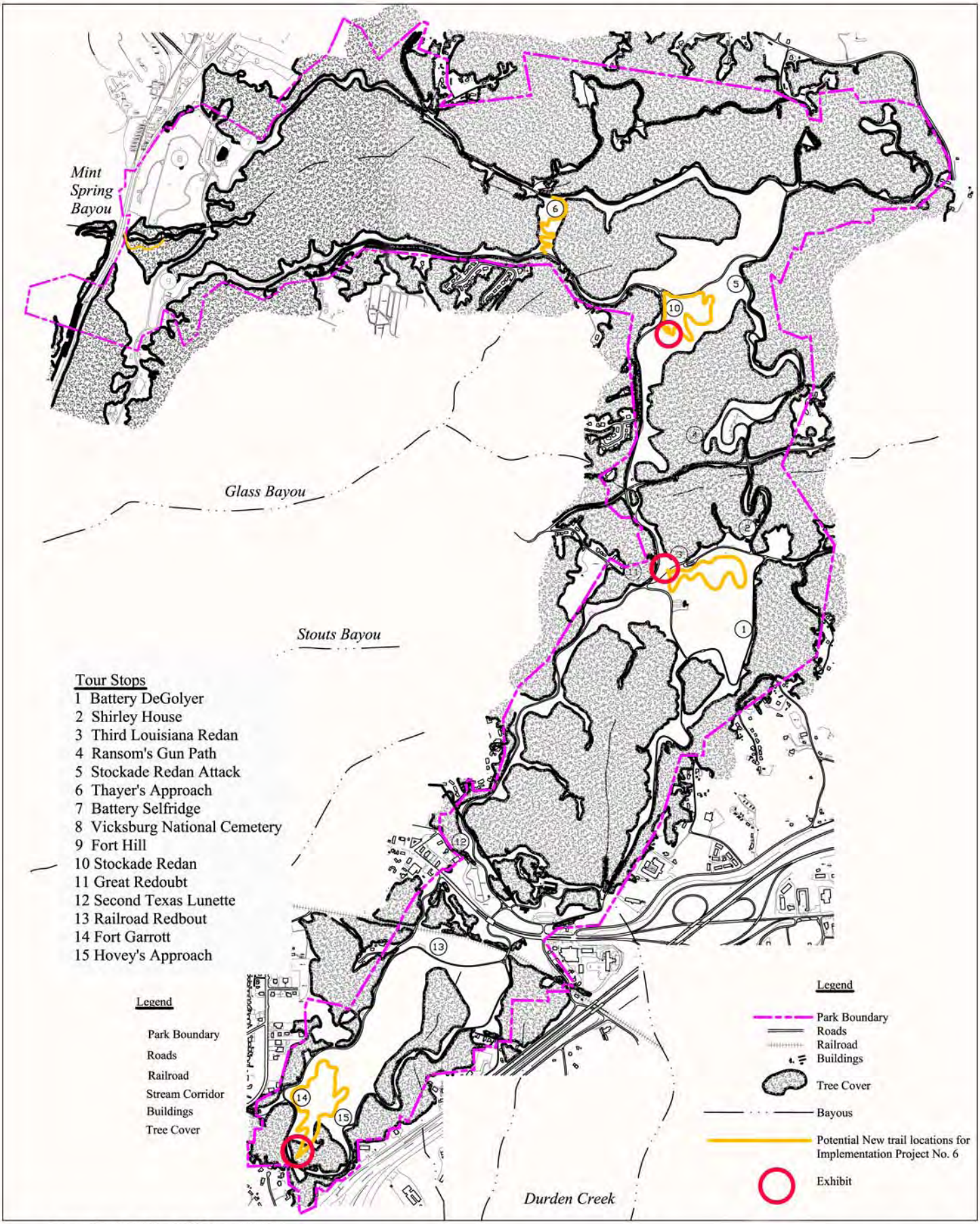
Location. Proposed new trails will extend into existing or proposed cleared areas where interpretation of the events of spring and summer 1863 is desirable.

Additional Studies Recommended.

- Complete a Long-Range Interpretive Plan.
- Conduct necessary research and archeological investigations to determine if any resources will be adversely affected by trail establishment.
- Identify potential impacts to archeological resources within the proposed trail corridor and recommend actions to protect those resources.
- Engage a historical landscape architect to design the new trail.

Project Implementation Process

1. Stake the trail in the field. Engage a qualified archeologist to perform archeological assessment of the site.
2. Grade the trail if necessary to ensure positive drainage.
3. Revegetate any graded areas with the desired landcover type.
4. Install interpretive signage in accordance with the resource-driven plan for the trail.
5. Maintain the new trail corridor in good condition.



Source: Autocad Base Map, USGS Topographic Data

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Vicksburg National Military Park

Potential New Trail Locations for Implementation Project No. 6

Figure 323

7. Enhance Interpretation within the Park Emphasizing the Cultural Landscape

Description. There are numerous sites of interest within the park where features important to the events of 1863 are no longer present. These include the landscape associated with the Shirley House as well as military engineering features of the fieldworks and camps for soldiers such as the shebangs known to have existed on the embankment below the Shirley House. The park generally has a good understanding of these features and their role in the events of spring and summer 1863 and has conveyed an interest in developing new means for sharing an understanding of the resources and their history with the visitor. Living history demonstrations, creative interpretation of missing features, and the establishment of removable exhibits are three examples of interpretive programs that feature the cultural landscape in storytelling (Fig. 323). These activities can be tied to the recommended tree clearing and thinning enhancements noted in projects described above. A Long-Range Interpretive Plan will be needed to integrate all of these ideas, as well as the new trails discussed above, into the park's interpretive experience.

Considerations. While clearing vegetation to re-open views may enhance interpretation efforts, there remain many important historic features that are no longer present within the landscape that visitors may have trouble imaging without interpretive aids. Conveying what is known about their form, configuration, materials, intended and actual use, and spatial organization to visitors would enhance existing interpretive programs at the park. There are various means to mark the locations of missing features that may be employed to convey this information without jeopardizing the integrity of the park. The existing commemorative monuments may be employed in some cases.

Interpretation of missing features should occur through creative exhibit design that depicts the general locations of and physical relationships between missing features as well as what is known and not known about the sites. Options for representing missing features include outlining the footprint or three-dimensional form of a missing feature, providing an artist's rendering of the feature, marking the corners or foundation of a missing feature, or establishing plant material that contrasts with its surroundings that indicate the former location of a missing feature. These options not only avoid historical inaccuracy, they are often less expensive in terms of initial installation and maintenance.

Determination of the features to be interpreted and the most appropriate representation methods should be made as part of the preparation of the Long-Range Interpretive Plan.

Location. Possible sites of interest for enhancing interpretation include the Shirley House, the major fieldworks, various artillery positions, and soldier encampment areas.

Additional Studies Recommended.

- The Long-Range Interpretive Plan should assess which features should be interpreted by determining those that have the most significant educational value.
- Archival research should occur as part of the data collection required to support development of new interpretive exhibits, along with archeological investigations of the sites of missing military features and features associated with the Civil War-era landscape.
- Archeological inventory and assessment should be conducted throughout the park, particularly in association with sites where new features are proposed to be established to ensure protection of potential resources.

Project Implementation Process.

1. Prepare designs for new interpretive and access improvements. Enlist an exhibit designer, in coordination with park staff, to plan representative features. Consider interpreting missing features using

documentary or archeological information, through various means, including:

- Foundation outlines. When the dimensions and location of the footprint of a missing feature are known, an outline or other demarcation such as corner markers or plantings can be placed on the ground to aid interpretation. Foundation outlines should clearly be a product of their own time so they are not confused with historic foundations or ruins.

- Markers. When locations of missing structures are known, but overall dimensions cannot be determined, consider installing metal signs or medallions in the ground. These may be coordinated with installation of an interpretive wayside featuring an artist's rendering of the interpreted feature to represent its character and bring the historic scene to life.

- Ghost structures. When the overall dimensions, roofline, and massing of a missing building or structure are known, consider developing a three-dimensional "ghost structure" on the site.

- Alter vegetation management regimes, such as mowing schedules and planting palettes, in such a way as to yield a diversity of appearances.

- Supplement existing interpretive media and programs with new materials to enhance the depiction of the life and work of the inhabitants of the area when the battle began. Locate new interpretive media in as unobtrusive a manner as possible to avoid detracting from the historic scene.

2. Conduct archeological investigations to determine the potential impacts of proposed site improvements.

3. Establish the new interpretive exhibits and materials. Enlist a qualified archeologist to monitor ground-disturbing activities during construction.

4. Establish interpretive trails to link the new exhibits to the existing tour road.

5. Provide directional and regulatory signage along trails, as well as interpretive information. Enlist qualified park staff or a landscape contractor to install the chosen representative features, as well as any wayside signage.

8. Establish Design Guidelines for Contemporary Park Features

Description. Implementation of new interpretive and access improvements within Vicksburg National Military Park will require the NPS to consider the design and character of the physical features associated with the improvements. Preparation of a design guide that establishes a comprehensive standard for contemporary landscape features and systems would facilitate the addition of necessary new features, as well as the replacement of non-historic features currently in poor condition. The guide would illustrate standards for new landscape features and systems to accommodate park visitor use, interpretation, and management and maintenance. Features to be considered in the guide include paths, walks, trails, road surfaces, parking and pull-off areas, contemporary fencing, site furnishings such as benches, and parking area features such as bollards, wheelstops, and curbing. The guide would identify products, materials, and dimensions for non-historic site furnishing, and include typical details and installation information. Use of the guide would enhance the park's unique identity, and serve to simplify the palette of materials within the park, which in turn would diminish the impact of non-historic features on the historic scene.

Considerations. Design guidelines for contemporary park features at Vicksburg National Military Park would need to be compatible with NPS system-wide standards as well as the existing character of the park. New features should always clearly be a product of their own time, and as simple, sturdy, and unobtrusive as possible. The design guidelines would address appropriateness of scale, materials, and physical composition to ensure visual compatibility, consistency, and integration with the overall character of the battlefield landscape. Park-wide standards for signage should also be developed.

Location. This project applies to the park as a whole.

Additional Studies Recommended.

- In anticipation of preparing these design guidelines, the park should collect the information available regarding NPS standards for contemporary landscape features.

Project Implementation Process

1. Assemble a design team, including a landscape architect, architect, and park maintenance staff to develop the park-wide design guidelines.

2. Consider carefully the character and identity that is appropriate for necessary non-historic features associated with Vicksburg National Military Park.

3. Review photographs of current examples of site furnishings, fencing, road edging materials, circulation surfacing, signage, and visitor use and interpretation features. Consider whether to use these existing features as park-wide standards.

4. Review product catalogues for images of additional appropriate features.

5. Review the individual elements proposed for inclusion within the design guideline.

6. Develop details, installation procedures, and other supporting information for each standard feature.

7. Consider the palette in its totality to ensure the individual elements are cohesive and work well together, and are consistent with NPS standards, before making final selections.

8. Develop a comprehensive signage program, and follow the recommendations included therein, as well as the guidance offered in the NPS Sign Standards Reference Manual, NPS Uniguide Sign Program, NPS Uniguide Standards Manual, and NPS Graphic Identity Program.

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