

RESOURCE MANAGEMENT PLAN

RICHMOND NATIONAL BATTLEFIELD PARK

1994

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INTRODUCTION

Purpose of this plan

The purpose of this Resources Management Plan (RMP) is to provide a guide for the continuous protection, preservation and management of the park's cultural and natural resources. It functions as a broad action plan and serves to detail the more general recommendations of the Park's General Management Plan (GMP), Statement for Management, Land Protection Plan and enabling legislation. It provides a basic framework on which decisions affecting the park's resources are made. It is an outgrowth of the decision making process of the Natural Resources Assessment and Action Program, defines resource management issues and describes what management, monitoring, or research actions are needed to restore damaged resources, mitigate current adverse impacts, or protect sensitive resources from current or future threats. The plan is flexible to allow for continuous updates, reviews and supplements for changing needs of the park and surrounding area. It is not intended to undertake all of the identified projects at this time but rather to recognize those resource activities which must be addressed.

This plan serves as the parent document for more specific park action plans such as forest management, earthwork management, cultural landscape, and environmental assessments.

The natural and cultural resources management programs section includes the following information: an overview and needs section that identifies and summarizes the most significant problems or issues and states priorities and the basis on which they are set; four-year schedules of proposed natural and cultural resource management; monitoring and research actions including the funding and staffing needs for dealing with the identified problems; and tables depicting staffing and funding requirements. The main body of the plan is made up of project statements that define major issues, describe past and current activities, and establish actions that will be taken in the future.

Environmental and cultural resource compliance needs are referenced in each project statement. Compliance documents will be prepared for specific projects prior to their implementation as needed.

The project statements in this plan will be updated annually to include new information gained from current investigations, to refine management actions, and to adjust priorities. The entire plan will be updated every 2 years and will be rewritten every 4 years.

Purposes for which the park was established

Richmond National Battlefield Park evolved from 1920s and 1930s private and state (Virginia) actions to protect battlefields around Richmond. The United States Congress enacted legislation on March 2, 1936 (49 Stat. 1155) enabling certain properties to become Richmond National Battlefield Park:

"for national battlefield park purposes...set apart as a public park for the benefit and inspiration of the people..."

The Park's Statement for Management expands on the above by stating:

"The purpose...is to preserve and interpret significant Civil War historic sites in the vicinity of Richmond, Virginia."

Brief description and background of the park

The park is located 110 miles south of Washington, D.C., near the city of Richmond, Virginia. The park and the city lie along the transition (fall line) between the Tidewater and the Piedmont geographic regions, and between the James and York rivers. Located at the junction of interstates 64 and 95, the city is a major commercial and cultural center in the Mid-Atlantic area. (see figure 1 and 2)

The park comprises 763.99 acres in the west central section of Virginia's coastal plain region. The park is scattered over eleven units, in a semicircle north, east and south of the city of Richmond. The Chimborazo Visitor Center and Headquarters complex is within the city limits. Other units are located in Henrico County: Fort Harrison, Chickahominy Bluffs, Glendale and Malvern Hill; Hanover County: Beaver Dam Creek, Watt House/Gaines Mill, Cold Harbor and Garthright House; and Chesterfield County: Drewry's Bluff/Ft. Darling and Parker's Battery. The units range in size from 1.53 acres to 312.7 acres, from a city block long to seven miles long. The park contains 10.6 miles of earthen Civil War fortifications, 3.7 miles of trails and 25.5 miles of boundaries. A full description of each unit can be found in the Statement for Management.

Park origins and legislative history

Prehistoric sites demonstrate that the Richmond area was settled before European contact occurred. For reasons related to transportation, topography, and climate, the area at the falls of the James River has long been a center for regional commercial contact between the coastal areas to the east and the mountains to

Richmond served as the capital of the Confederate States of America, a major industrial and medical center, a transportation hub and prime supply area for the southern armies.

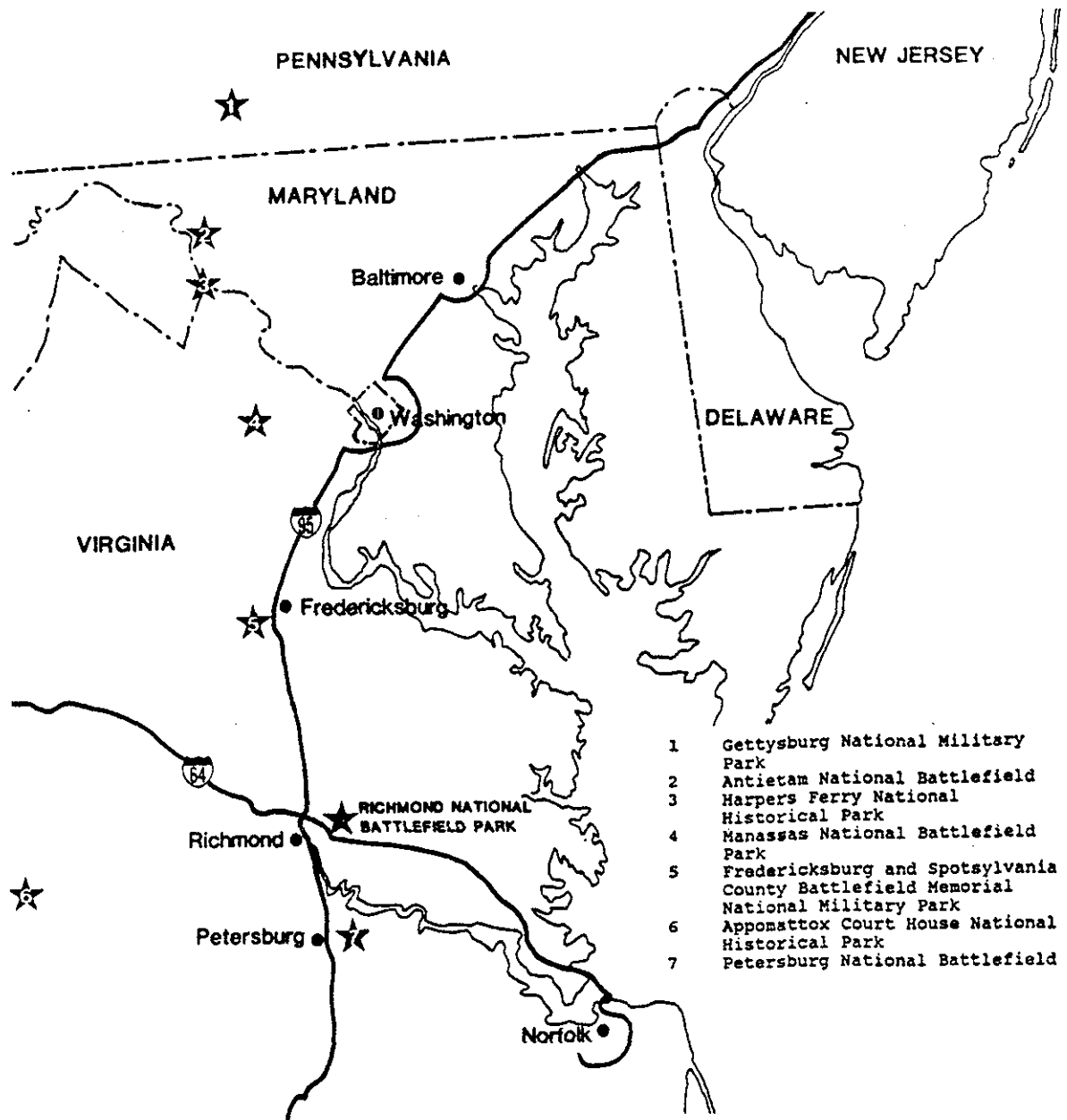
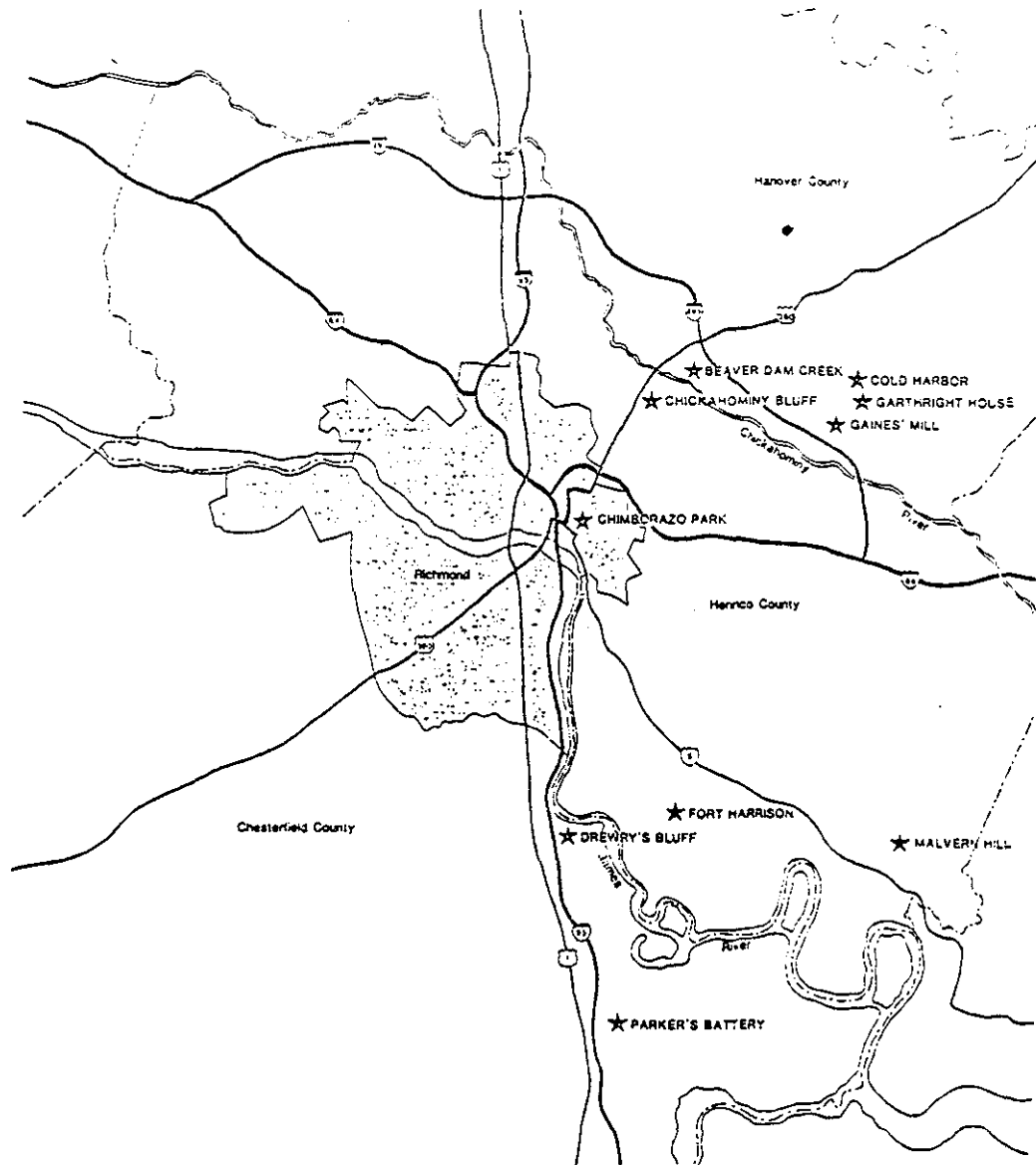


FIGURE 1: Richmond Region and Civil War Battlefield Parks

The park commemorates the battlefield actions between 1861 and 1865 that relate to the struggle for Richmond. Each unit is intended to recognize specific events that were pivotal during these battles. The units are listed below in relation to their primary interpretive and commemorative focus (see Figure 2).



PARK UNITS RELATING TO

1862 BATTLES
 Chickahominy Bluff
 Beaver Dam Creek
 Watt House (Gaines' Mill)
 Malvern Hill
 Drewry's Bluff

1864-65 BATTLES
 Cold Harbor and the
 the Garthright House
 Fort Harrison
 Parker's Battery

ADMINISTRATION
 Chimborazo Park

FIGURE 2: Units of Richmond National Battlefield Park

the west. By the time of the Civil War, Richmond had become the key urban center in the upper south. During the war, the city served as the Confederate capital, a major industrial and medical center, a transportation hub, and a prime supply and staging area for the southern armies.

Richmond National Battlefield Park interprets the repeated efforts by the Union Army in 1862 and 1864-65 to take Richmond, the capital of the Confederacy, and to destroy General Robert E. Lee and the Army of Northern Virginia. Established as a unit of the national park system in 1936, the park evolved from private and state actions to protect the battlefields. As early as 1914, there had been talk of building a road to connect the main battle sites east of the city. In 1921 the well known historian Douglas Southall Freeman encouraged the Rotary Club of Richmond to sponsor what may have been the first organized battlefield tour. An association was formed to mark the important battle sites. By 1928 the Richmond Battlefield Parks Corporation began to purchase battlefield parcels and earthworks. In 1932, the corporation deeded all of its property (572 acres) to the commonwealth of Virginia for a state park.

Shortly after World War I Congress directed the War Department to conduct a study of American Revolutionary War and Civil War battlefields. In 1929 funds were authorized to "study, investigate, and survey for commemorative purposes battlefields in [the] Richmond vicinity." In 1932, the Secretary of War forwarded to Congress, *The Study of Battlefields in the United States for Commemorative Purposes* (Senate Document 151). The study recommended that the battlefield park acreage be accepted by the United States as a donation from the commonwealth of Virginia. It also recommended that an additional 1,905 acres of core battlefield land be purchased, including substantial acquisitions at Beaver Dam Creek, Gaines' Mill, Cold Harbor, Bethesda Church, Savage Station, White Oak Swamp and Malvern Hill. Although the new road access served as a stimulus to residential development on the battlefields, the recommendation to protect additional land was not acted upon. The offer by the commonwealth of Virginia to donate park land was formally accepted by act of Congress in 1936.

Congressional legislation (49 Stat. 1155) signed into law on March 2, 1936, established Richmond National Battlefield Park. The enabling act identified 572 acres managed by the state and 1.9 acres of additional land as the basis for the park. Since then, the park has grown to 763.99 acres as additional land has been donated. According to the enabling legislation, the park can acquire land only through direct donation or with funds donated for land acquisition. The park does not have the authority to receive appropriated federal funds for the purchase of land. All actions that will affect the cultural resources within these lands must comply with National Park Service policies and guidelines developing set by the National Historic Preservation Act of 1966, as amended.

A more detailed description of the park and Richmond's Civil War involvement can be found in the appendices.

National Park Service resource responsibility for cultural and natural resources values

The Resource Management Plan for both cultural and natural resources is designed to provide information vital for park management to draw upon in fulfilling policy and Congressional mandates. Overall authority and guidance for various aspects of the plan are contained primarily in National Park Service Management Policies and Executive Orders, as well as environmental and preservation legislation and the Park's enabling legislation. The major objectives for any given unit of the national park system are identified in two documents: the Statement for Management and the General Management Plan. The Statement for Management reflects current management strategies and plans. The General Management Plan is a comprehensive description of the steps required to direct Park operations over the next 10 to 15 years. Upon approval of the General Management Plan (currently in draft) and Statement for Management by the Mid-Atlantic Regional Director, both are used as the fundamental planning documents in the preparation of a variety of more detailed operational plans, such as the Interpretive Prospectus, Historic Structures Report and the Resource Management Plan.

Management objectives as listed in the 1989 Statement for Management

1. To identify, evaluate, protect, restore and preserve park cultural resources important to the understanding of the military actions during the 1862 Peninsular Campaign and the 1864 and 1865 battle actions that resulted in the final struggle for Richmond.
2. To provide a historic context that will foster public understanding of:
 - a. battlefield actions during the 1862 Peninsular Campaign and the 1864-65 battle actions;
 - b. military strategies of the Union and Confederate forces;
 - c. life in and around Richmond during the Civil War
 - d. the City of Richmond as the social, economic, and political focus during the Civil War
3. To promote the identification and conservation of important Richmond area Civil War battlefields and associated resources

not currently in park ownership through cooperative federal, state, county and private actions

4. To make all of the units easily available and accessible to the visitor
5. To interpret each site in its overall historic context

Current resources-related management objectives

The cultural and natural resources-related management objectives may be summarized as follows: to identify, define and program the monitoring, inventory, research, mitigation and enforcement activities required to preserve park resources and natural processes; to mitigate the negative impacts of natural processes; to achieve the purposes for which the park was established; and, to regulate the use of the Park. Authorities for resource management come not only from the park's enabling legislature but also from the NPS Organic Act (US Code 16 section 1).

Management Objectives by Categories

Natural Resource Management

- To inventory, document, and perpetuate the value of the park's natural resources in a manner consistent with legal mandates and NPS policies.
- 1. To preserve, protect and manage the natural aspects of the historic landscape of the park units to invoke the Civil War setting and enhance visitor understanding. The cultural landscape includes the earthworks, buildings and vegetation, wildlife, floodplains, stream courses and wetlands important to the understanding of the historic actions.
- 2. To protect and enhance important natural areas such as wetlands, critical wildlife habitat, stream courses, floodplains, and forests.
- 3. To inventory and monitor potential threats to the natural resources and develop plans that will minimize or eliminate said threats.
- 4. To monitor and control internal conditions having adverse impacts upon natural resources. Such measures may require restricting public use and by modifying management practices. To protect park resources from impacts caused by land use practices outside the boundary through active participation in local and regional land use management, and resource protection activities.

5. To provide protection for the natural resources of the park.

Cultural Resource Management

- To identify, document, evaluate, protect, maintain and interpret the park's cultural resources in a manner consistent with legislative mandates and National Park Service policies.
 1. To preserve, restore, reconstruct or reproduce the historic scene to the appearance of the relevant time period (1862-1864). Treatments will be decided through planning and no project will be undertaken unless supported by an approved proposal, plan or report.
 2. To preserve, protect and interpret earthworks.
 3. To maintain and preserve the park's historic objects and to acquire, as necessary, objects for interpretation of the Civil War battlefields of Richmond, and the historical context.
 4. To mitigate internal conditions having adverse impacts upon the historic resources by such measures as restricting public use and modifying management practices. To protect park resources from impacts caused by land use practices outside the boundary through active participation in local and regional land use management, and resource protection activities.
 5. To define, develop, implement and evaluate an adequate research data base for accurate and balanced resource management plan objectives, which is used to rank requests for funding and to guide the expenditure of park-based funds devoted to resources management.
 6. To provide protection of the park's historic resources.

Summary

National parks are a complex interaction of natural and cultural resources and human needs. Actions taken to manage or change elements must be carefully considered in light of what effect the action may have on the national significance of the park and its compliance with policies, regulations and laws. The purpose of this plan, therefore, is to assemble in one document a comprehensive, concise, description of the park's resources, the problems associated with them, recommended actions to solve or study the problems and the impacts upon the park's environment of any actions proposed.

PRESENT RESOURCE STATUS

Natural resource baseline information

Richmond National Battlefield Park is responsible for baseline inventory data and monitoring service-wide Standards and Guidelines for Natural Resources Inventorying and Monitoring (NPS-75). The individual project statements describe recommended actions to provide an inventory of park natural resources to be used for present and future reference and planning. These proposed recommended actions either meet or exceed Level I Service-wide standards for development of site specific I&M guidelines and standards from the following data sets: 1) chemical and geophysical, 2) biological, and 3) human use.

The following sections develop a clearer identification of the data elements that do exist and those parameters that are proposed to be required to meet or surpass Level I Service-wide standards.

Physical and chemical inventory and monitoring

Physical I&M includes collection of geological, hydrological, meteorological data to establish baselines and scales for ecological comparison. Similarly, chemical I&M activities include measurement of select substances through examination of air, geology, soils, hydrology, vegetation, and animals.

Per NPS-75, the objective of Level I Service-wide standards is to gather synoptic data describing topography, soils, hydrology, climate and chemistry of water and atmosphere. NPS-75 further states that these data are to provide an inventory of the Park natural resources to be used for future reference and to determine if more detailed studies and/or monitoring at a higher level is required.

United States Geological Survey (USGS) 7.5 minute series topographic quadrangle maps (scale 1: 24000) are available locally and are on file at park headquarters. The maps that include the park units are the following quadrangles: Chester (1981), Drewry's Bluff (1980), Dutch Gap (1986), Roxbury (1974), Seven Pines (1981) and Richmond (1981). Stereoscopic aerial photographs (scale: 1 in. = 250 ft.) of all park units were taken in 1990.

Comprehensive soil maps and descriptions are available at park headquarters or from the Soil Conservation Service, U.S.D.A. These have been published as a "Soil Survey of Chesterfield, Hanover and Henrico Counties, Virginia."

Park watersheds can be discerned on the topographical maps mentioned above. There has been no survey of the groundwater beneath the park in recent years. Within the park unit of Beaver

Dam Creek, water-level recorders have been monitored to obtain groundwater flow data since 1988. However, good data is not available to indicate whether or not stream flows, water levels and water tables are maintaining historic patterns.

Water supply level measurements and measurements of chemical properties for potable water supplies are monitored by the counties involved.

Specific information on the climate of the park can be obtained and is interpreted by the National Weather Service, Norfolk, Virginia. The Commonwealth of Virginia maintains monitoring stations in the area for particulates, ozone, carbon monoxide and acid deposition. Monitoring statistics are published in "Virginia Air". There has never been permanent fire weather monitoring taken at RBNP.

The available physical and chemical information is incomplete and inadequate to meet the full needs of the park.

Biological inventory and monitoring

Biological I&M consists of three logical phases: I) Identification and Location; II) Analysis; and, III) Integration. The tasks and products completed or to be completed are primarily Phase I. Phase I efforts consist of compilation of the park's historical knowledge of its biota and related factors, the location of park resources with respect to contemporary mapping, and an inventory of all lifeforms.

Historical knowledge of the park's biota exists in the form of Historic Landscape Studies and Maps, historic photographs, maps, paintings, manuscripts, dairies and narratives.

Aerial photographs taken in 1990 have been applied to forestry-related activities in the recent reports, "A Handbook for Forest Vegetation Management in Recreation and Historic Parks" and Fire History and Fuel Loads of Upper Coastal Plain Forests".

Inventories of vascular plants were compiled from 1987 to 1992. Participants included Virginia Commonwealth University and the Division of Natural Heritage of the VA Dept. of Conservation and Recreation. No plants listed as threatened and endangered by the federal government were found but one (Carex collinsii [Collin's sedge]) is a Virginia State rare plant. Per NPS-75, all vascular plants and vertebrates are included in the Phase I inventory; however, distribution of plants and animals of special interest or particular concern are to be developed in Phase I. Inventory and distribution maps are recommended for vascular and nonvascular plants and threatened and endangered plants and animals. The available biological information is incomplete and inadequate to meet the full needs of the park.

Human inventory and monitoring

Level I Service-wide standards for Human Use I&M include: documenting direct, human related effects from inside and outside the park's areas on natural ecosystems within Park Service areas; identifying methods that can be used to minimize human impacts; and collecting data for the development of a management plan.

The Statement of Interpretation contains analysis of park visitation and use patterns. Monthly public use reports and traffic flow maps exist which further indicate human effects outside park areas. Land use maps have been developed to delineate the boundaries of human use activities and property. Tax Parcel Maps and other maps, such as land acquisition history and tax assessment maps, are used to predict types of impacts that might be expected in the future.

The available biological information is incomplete and inadequate to meet the full needs of the park.

Condition of and threats to natural resources

It is important to remember that natural resource management priorities, for Richmond, are directly related to the need for preservation and protection of the park's historic resources and scene. It is partially through natural resource actions that the cultural resources will be preserved and protected. All the natural resource management project statements are interrelated to the protection of the park's cultural resource base and operate within the 1989 Statement for Management.

This section identifies and presents the most significant natural resource problems in the park. Without timely action and emphasis from management, these problems have significant and a potentially negative effect on the ability of park management to protect natural and cultural resources.

Even though the park was established to commemorate historical events, its natural resources are a major component in the overall park experience. The park will manage species to maintain health and diversity within the ecosystem, to ensure the continuation of rare, threatened, or endangered species, and work toward implementing planning approved treatments.

Additionally, the park will prepare specific environmental compliance documentation; such as NEPA documents and federal, state and local permits for all major development actions resulting from recommendations of the newly revised General Management Plan. The park will, also, prepare proper NEPA compliance for all actions proposed in this Resource Management Plan.

Soils and Minerals - The continuing erosion of the historic base, such as the loss of earthworks and the loss of river bluff at Drewry's Bluff, combine elements of weathering, flooding, soil structure, geologic substrate and run-off concerns into a complicated issue of human-caused and nature-caused effects. Mineral development, such as pit mining for gravel, adjacent to the park is of concern because of potential impacts to park resources and visitors, including impacts to viewsheds, wildlife, vegetation, water quality, and cultural and historic resources. Cumulative impacts perceived by park visitors may include visual intrusions, air quality degradation, odor, and increased noise. Even though the Surface Mining Control and Reclamation Act of 1978 effectively prohibits surface mining in the park, the National Park Service also has an interest in, and will track and monitor, external mineral development where such development will adversely effect park values.

Surface water - Small permanent and intermittent streams flow through various park units, and the James River flows adjacent to the Drewry's Bluff unit. Human activity has often changed the appearance of the streams, interfered with the pertinent historic and natural hydrology and probably led to species composition change. Management of areas classified as wetlands must be in accordance with guidelines of the Department of the Interior, Executive Order 11990.

Vegetation - More than one-half of park property is secondary growth eastern deciduous forest which has developed since the curtailment of agricultural practices in the later 1800s and early 1900s. Most of the remaining acreage is maintained in agriculture and in a visual state reminiscent of the Civil War era. Since the park's mandate is to preserve, protect and interpret the resources remaining from the war's actions, and since the vegetation and the lay of the land were vital to these activities, the preserving, protecting, and maintenance of the historic scene are primary goals. Important to this end is the preservation of the earthworks, the restoration of the battlefields to historic conditions (mostly by vegetation removal and agriculture) and the control of invading exotic vegetation.

Wildlife - The wildlife population is characteristic of that found on farms and woodlands in Virginia. The physical size of the park does not offer extensive ranges for terrestrial animals. As the Richmond area undergoes continuous development, the habitat "islands" the park units represent become more and more important, but inadequate, refuges. Some park resources have been have adversely affected by populations of ground hogs and deer.

Threatened/endangered species - Some plant and animal species that are in or nearby the park have been listed as being of concern, however no species is federally listed. There is one species: Carex collinsii (Collins' sedge), in the Cold Harbor unit that is

a Virginia state rare plant. NPS policy requires that state plants be treated the same as federally listed plants.

Inventory and Monitoring - Richmond National Battlefield Park is responsible for baseline inventory data and monitoring efforts per service-wide standards and guidelines for natural resources inventorying and monitoring (NPS-75). Lack of basic information may have prevented management from making sound decisions regarding potential impacts upon the resource and has also hindered the initiation of activities to protect park resources. This lack of knowledge may continue to impede sound management of natural resources until baseline data is sufficient.

Pest infestation - Pest infestations have great potential to inflict detrimental impacts to historic structures (e.g. termites), artifacts (e.g. dermestid beetles) and the natural scene. Invasions of the pine bark beetle and the impending threat of Gypsy Moth damage are of primary concern.

Boundaries - Since the park has many neighbors, ownership plays a significant role in resource issues. Activities occurring near park ownership (such as exploitation of minerals and hunting) may impact resources within the park.

Air quality - The potential for negative impact on resources due to poor air quality has been recognized. Investigators in other similar areas have found corrosive damage to structures, monuments and markers. The park's urban/suburban location may mean that there is a high potential for negative impacts. Compilation of baseline data should be the first step to address this concern.

Cultural resource baseline information

This subsection summarizes the status of documentation for the Park's cultural resources from the Cultural Resource Documentation Checklist. This checklist identifies cultural resource documents as "current and approved," "incomplete; needs revision or updating," and "needed."

The General Management Plan and associated Environmental Impact Statement, along with a Land Protection Plan, are being written and updated now and are scheduled to be released for public review in the spring of 1995. Several unit Development Concept Plans will be developed concurrently. The park's Interpretive Prospectus needs updating. The Statement for Management was rewritten in 1989. An Outline of Planning Requirements is needed.

The entire park is registered in The National Register of Historic Places. The Watt House and the Garthright House are specifically documented, however, other units are not. Every unit, park owned battlefield, and surrounding pertinent area not owned by NPS needs to be registered.

The incomplete List of Classified Structures (LCS) is scheduled to be updated in 1995. A multi-year project, under the direction of the regional historic architect, was initiated in 1991 to update and complete the Region's LCS. Also, the Cultural Resources Bibliography (CRBIB) needs updating. Software currently exists for both LCS and CRBIB databases.

The architectural portions of the Historic Structure Reports have been completed for the Garthright and Watt Houses but are not in the proper format. Historic narratives for the two houses must be completed as well as full reports for the park's earthworks and the Civilian Conservation Corp's constructed log cabin.

Actions needed for basic cultural resource documents have been identified in Appendix A.

Proper preservation documentation and clearance (such as Section 106 and XXX) will be obtained before any undertaking.

Cultural resources and threats

The land designated as Richmond National Battlefield Park is the basis for commemoration and interpretation of the historic events of the Civil War actions around Richmond.

The park has eleven major sites: Chimborazo (headquarters and main visitor center); the Battlefield Park Road complex of 1864-65 activities: Chaffin's Farm, Fort Harrison, Fort Brady (et al.) and associated earthworks; units of the 1862 battle activities: Chickahominy Bluffs, Beaver Dam Creek, Gaines Mill (with the Watt House), Glendale, Malvern Hill and Drewry's Bluff; and units of the 1864 battle actions: Parker's Battery, Cold Harbor and the Garthright House. Although historically connected, each has separate interpretive value and preservation concerns.

Richmond National Battlefield Park has not been completely investigated for cultural resources located above ground. The park's structures need evaluation as well as revised LCS entries.

Although some of the park has been surveyed for archeological resources, more sites and artifacts exist. There is no complete, formal parkwide survey of archeological sites. The park needs a complete archaeological survey.

Richmond NBP houses a artifact collection of approximately 2,000 historical objects. The collection contains Civil War battle, medical and civilian artifacts. Storage space is substandard and the items are subject to humidity and temperature fluctuations. Cataloging and registration of museum objects is on-going with the ultimate goal of entering all items into the ANCS (Automated National Catalog System).

Cultural context/theme

RNBP cultural resources represent the following significant cultural contexts and themes (as listed in History and Prehistory in the National Park System...):

Theme - THE CIVIL WAR (War in the East)

RNBP has cultural landscapes shaped by and/or which served as the setting for battles; it has structures - including extensive earthworks - which were erected during, impacted by, and/or functioned as key landmarks during battles; it has ruins/archeological sites which, as intact structures, were impacted by and/or functioned as key landmarks during battles; and, it has collections of ammunition, documents, uniforms, weapons and other objects generated during the Civil War or used by soldiers who fought in the conflict.

Theme - TECHNOLOGY (Transportation, Military, Extraction and Conversion)

see: resources listed above under: "THE CIVIL WAR"

Theme - PRINTS AND PHOTOGRAPHY:

The park has a collection of original negatives, prints and lantern slices depicting battlefields and Civil War veterans.

Theme - HISTORIC PRESERVATION (Battlefield Preservation, the National Park Service and the New Deal) -

The park has collections of documents - including photographs - and objects generated by the establishment and expansion of the park.

RESOURCE MANAGEMENT PROGRAM

Overview of current program and needs

This section presents a brief history and description of park units and resource concerns. It also discusses each of the significant resource management challenges identified for the park. Since resource management at RNBP is to adhere to nationally accepted standards for resource preservation and to enhance the interpretation of historic resources, close cooperation among management, resource specialists, historians, interpreters, protection rangers, and maintenance personnel is necessary.

Chimborazo Park 5.6 acres

Currently a part of a Richmond city park, this unit is the site of Chimborazo General Hospital, one of the Confederacy's largest medical facilities. From 1861 to the end of the war this complex accommodated a growing number of sick and wounded soldiers under increasingly difficult circumstances. The hospital treated more than 75,000 patients and once covered more than 20 acres. No period structures remain. Today this site is close to the St. John's Old and Historic District and the Church Hill North Conservation Area and provides views of Richmond and the James River, including Rockett's Landing where President Lincoln docked when he visited on April 4, 1865 shortly before the War's end. The two-story structure built for the U.S. Weather Service in 1909 currently houses a visitor center and the park's administrative offices.

The vegetation in the Chimborazo Park unit is entirely maintained in turfgrass beneath thinly scattered specimen trees, mostly oaks and hickories. The city of Richmond maintains the grounds for most of the unit.

Chickahominy Bluff 37.0 acres

On June 26, 1862, from earthworks on this ridge looking toward the crossroads hamlet of Mechanicsville, the Confederate Army of Northern Virginia, for the first time under the command of Gen. Robert E. Lee, controlled a key bridge crossing the Chickahominy and initiated the Seven Days Campaign. The first stop on the battlefield tour, the site contains a part of Richmond's outer defenses, built late in 1862, and commands a key historic river crossing. A short trail leads from the parking area to a viewing platform built on top of the earthwork that provides a view across the Chickahominy River toward the town of Mechanicsville. An access road at the foot of the bluff bisects the unit. This road is owned by an adjoining property holder. The park has the right of usage.

This unit lies 5 miles northeast of Richmond's downtown on Mechanicsville Turnpike. One-tenth of the 37.0 acre site is a maintained lawn, meadow and parking area. Half of the site is a wooded slope of tulip poplar, sweet gum, and pignut hickory dropping 75 feet in elevation to the northeast and southeast to the Chickahominy River floodplain and a tributary stream. Another one-tenth of the site in the northeast corner is a meadow composed primarily of fescue grasses, tall redtop, and three-seeded mercury. A 1-acre area in front of the current lookout platform was cleared of woody undergrowth and planted in grass in 1992 to improve the vista. The remaining northern one-third of the site is a floodplain wooded swamp containing red maple, sweet gum, and scattered loblolly pine.

The vista corridor preserves an overview of the terrain where the preliminary movements of the 1862 Seven Days' battles occurred. As

visitors look beyond park boundaries, they see modern development and high voltage powerlines. The portions of the earthen fortifications that were part of the outer defenses of Richmond will continue to be to be protected. Efforts will continue to be made to persuade the neighboring property owner to cease development activities that are affecting the creek. The NPS will continue efforts to protect and restore the stream from impacts caused by adjoining land owners.

Beaver Dam Creek (Ellerson's Mill) 16.2 acres

On June 26, 1862, after a sharp conflict at Mechanicsville, Union forces in advance of their main line fell back a mile to the east and dug in at a mill site near a bridge over Beaver Dam Creek. Attacking Confederates charged down the slopes and across the creek. Protected by fortifications, Union troops inflicted devastating casualties on the Confederates. Intense fighting at Beaver Dam Creek raged over more than 300 acres. The site contains a small portion of the battlefield where part of the first major battle of the Seven Days took place. Remnants of the millrace and mill site still exist. A portion of the 17-acre privately owned property across the creek from the park, part of the Union defense line, is being developed for housing. An archeological survey was conducted in 1976-1977 on a small portion of the unit.

This unit straddles Beaver Dam Creek, 6 miles northeast of downtown Richmond on Virginia state road 156. Ellerson's Mill, present at this site during the Civil War, harnessed water power from this perennial creek. Narrow woodland borders of red maple, sweet gum, tulip poplar, and oaks surround a wide, silted-in, swampy area on either side of Beaver Dam Creek. The majority of the site is dominated by wetland plants such as sedges and some shrubs. Numerous exotic plant species abound along the developed roadway and interpretive display areas.

The site is greatly impacted by modern intrusions of roadways, bridges, and residential developments. The entire riparian area is sediment choked, to the point that the stream now flows in several dispersed channels and most of the mature hardwoods in the bottom land have been killed by rising water tables and accumulated sediment. The origin of this sediment is road and residential development upstream. Added to this now is the flooding activity of beaver dam building just off-property downstream. The valley is so altered in form and vegetation that it is difficult to get an appreciation for the scene as it was in 1862.

The parking lot and wayside needs to be removed from the middle of the unit's resources and repositioned to a site adjacent to Route 156. Additional archeological survey work is needed to ascertain the historic road trace and bridge crossing. The "plaza" viewing area will be removed. A pedestrian bridge will be built to permit

visitors to cross the creek and experience the battle from the perspective of a Union soldier.

Brush concealing the mill race and the site of the mill will be removed, but a visual screen, in keeping with cultural landscape research and planning, would be retained where possible against adjacent residential development.

Gaines' Mill 59.7 acres

After the battle at Beaver Dam Creek, the Federal army withdrew to a position along Boatswain Creek. The left center of the Union line formed around the Watt House, a typical 19th century farmstead that served as headquarters for Union Brigadier General Fitz-John Porter. The core of the battlefield covered more than 500 acres. On June 27, 1862, attacking Confederates broke through the Union lines a few hundred yards west of the Watt House, forcing the Union army to retreat south across the Chickahominy River. Despite some forest encroachment the portion of the battlefield managed by the park and the surrounding private property retains much of the open agricultural character associated with the battlefield. The exterior of the Watt House has been restored to its historic appearance.

This unit contains wooded slopes and a mixture of wooded and cultivated field on the south side of Boatswain Creek. The older woodland areas are dominated by white oak (some of the large individual trees likely were present during the Battle of Gaines' Mill in 1862), tulip tree, and American holly. Younger successional forest areas bordering the fields are dominated by loblolly pine and a rampant growth of the invasive exotic, Japanese honeysuckle. An adjacent field is in cultivation.

Two special use permits, one to board horses and the other to farm a portion of the unit are in effect. The Watt House is an exterior exhibit with the interior used as park housing. An unrestricted 30-foot right-of-way leads from the Watt House to the rear of the unit gives an adjacent property owner access to a large tract.

The historic treeline will be re-established in accordance with cultural landscape planning. An archeological survey will be completed to locate the outbuildings associated with the Watt House.

Some of the core battlefield adjacent to the park remains in agricultural use and is critical to an understanding of the battle action.

Cold Harbor 149.0 acres

In the 1864 Overland Campaign, Grant and Lee fought at Cold Harbor from May 31 to June 12. The most notable confrontation took place

on June 3, when Federal forces assaulted elaborate Confederate fortifications. At this stage in the war, both sides recognized the essential protection that well designed earthworks could offer. Intense fighting raged along a 6-mile front and the core battlefield area included more than 1400 acres; the entrenchments of the opposing forces were unusually close and sharpshooters had a deadly effectiveness. The assault resulted in thousands of casualties. Failure at Cold Harbor caused Grant to order an unprecedented crossing of the James River to reach Petersburg in an attempt to cut Richmond's supply lines from the south. An interpretive shelter is located at the entrance. From the shelter a .5-mile loop road leads across the Confederate earthworks, traverses the battlefield to the Union lines and exits near the east boundary. There are restrooms at the shelter with a small picnic area nearby.

This unit contains largely dry, sandy soil supporting common upland secondary growth forest types (oak-hickory). The entry way to the unit skirts a gently sloped cultivated field before joining the woodland of maturing oaks, hickories, and the understory tree, chinquapin. Bloody Run Creek bisects the unit from east to west and contains several distinctive shrub and herbaceous species, including a rare sedge. Farther north, the woodland portion of the unit contains a second small creek that joins Bloody Run Creek offsite to the west. A portion of the battlefield area north of Bloody Run Creek is maintained in an open woodland parkland, where trenchworks furrow the land under a canopy of scattered oaks and loblolly pines.

In accordance with cultural landscape research and planning, some parking will be relocated to minimize damage to the resources; some brush clearance and selective tree removal will occur to better maintain the earthworks. An additional interpretive trail will be laid out.

Additional tree removal and brush clearance from the earthworks will occur. Native little bluestem grass will be established on the earthworks to better preserve them. Parking at the Confederate earthworks will be removed to improve resource protection.

Garthright House 2.1 acres

This restored house, portions of which date from the 1700s, served as a Union field hospital during the Battle of Cold Harbor and was later used by the Confederates for the same purpose. The house serves as an exterior exhibit and is used as park housing. This 2.1-acre unit is across Route 156 from Cold Harbor National Cemetery and is surrounded on three sides by a 50.9-acre passive use park being developed by Hanover County.

No archeological survey of this unit has been undertaken therefore the extent of the any outbuildings associated with the house are unknown at this time.

The house is largely maintained as a suburban residential property. Lawn grasses and ornamental shrubs surround the structure.

The predominant natural resource management issues are exotic plant species and structural pest control.

Glendale (Frayser's Farm) 1.53 acres

On June 30, 1862, Glendale offered Lee his best chance during the Seven Days Campaign to destroy McClellan's army by striking the strung out Union column in the center and breaking it in two. After fierce fighting, the Union troops held the vital crossroads at Riddell's Shop and preserved their escape route toward Malvern Hill and eventually to Harrison's Landing on the James River. The zone of intense fighting covered approximately 350 acres. This recently acquired parcel is located across from the Glendale National Cemetery. The Fish and Wildlife Service, currently occupying the gate house at the National Cemetery, is planning to move. The Veteran's Administration would welcome an NPS presence at Glendale. Immediately adjacent to the unit, a housing development interferes with interpretation of the action that took place here; however, other nearby tracts of the battlefield retain their historic appearance.

This donated tract is wooded and located on part of the battle site.

Management options at this site are limited by the small size of the unit. Adequate battlefield protection measures on adjacent land will require memoranda of agreement, easements, donations, fee land acquisition, or other cooperative strategies.

Malvern Hill 130.6 acres

Following the action at Glendale, the Union Army continued its withdrawal toward the James River. On July 1, the final action of the Seven Days took place at Malvern Hill. Steep wooded slopes on one side and swampy ground on the other forced the attacking Confederates to cross open ground directly into the Union artillery where they suffered heavy losses. For the Union it was an ideal defensive position; from the Confederate perspective it was an attack that should not have happened. Later General D.H. Hill said, "It wasn't war, it was murder." The battlefield covered more than 800 acres. This site retains much of its original battlefield integrity. Much of the viewshed and part of the core of the battlefield is privately owned and is in agricultural use.

This unit is a broad hilltop, which has moderately sloping fields in cultivation in its central area immediately adjoining the interpretation stop. Woodland consisting of secondary growth with transitional species of loblolly pines, oaks, and beeches borders portions of the fields both east and west of Route 156. The woodland in the western portion drops steeply to moist bottomlands where tulip poplar and sweet gum are joined by wetland shrubs. The woodland in the eastern portion of the unit gently slopes eastward and northwestward to a wetland swamp that had channeled attacking infantry in the battle for Malvern Hill. This wooded swamp contains a richly diverse herbaceous habitat that is fed by groundwater seepage from the slopes above. In spite of the several natural and diverse vegetative habitats at Malvern Hill, many invasive exotic grasses and herbs are found at the interpretive area and wooded portions of the unit.

The historic treeline will be re-established in accordance with cultural landscape research and planning. An archeological survey will be completed to determine the extent of surviving subsurface cultural resources and the location of outbuildings associated with the Crewe house.

Land adjacent to the Malvern Hill unit has experienced little change and the unit has great potential for a significant enhancement of the cultural landscape. Agricultural fields east, west, and north of the unit are vital to understanding the battle. The surrounding landscape contributes much to site interpretation, and the Park will strive to preserve the present visitor experience and maintain resource protection at the unit.

Agricultural leases will be maintained.

Chaffin's Farm (Fort Harrison) 312.7 acres

After Cold Harbor in 1864, to force the capitulation of Richmond, Grant crossed the James River and invested Petersburg. During the 10-month siege, Grant ordered an attack at Fort Harrison, part of Richmond's outer defenses north of the James River. Grant hoped this would prevent Lee from sending reinforcements to the Shenandoah Valley and would further weaken Lee's forces in the Petersburg trenches. On September 29, 1864, a strong Union force seized the fort. Desperate Confederate counterattacks on September 30 and October 7 failed to recapture the lost works, and the position became part of the Federal anchor north of the James River. The battle raged over more than 4,400 acres. The area is referred to in contemporary accounts as Chaffin's Farm.

This area incorporates a series of fortifications (Forts Gilmer, Harrison, Hoke, Maury, and Brady). All except Fort Brady were part of the Confederate defenses of Richmond; after capture some were modified by the occupying Union troops. Fort Brady, overlooking the

James River a few miles downstream from Drewry's Bluff, was constructed by Union forces to control river traffic.

A small visitor center with restrooms is located a few yards west of Fort Harrison. Near the visitor center is a log building built by the CCC. The structure is used for educational and interpretive programs and other activities. A picnic area is nearby.

During the 1930s the CCC performed maintenance and construction work throughout the Fort Harrison unit. Restoration work was done by the CCC at Fort Hoke.

The largest of the park units, Fort Harrison stretches along a sinuous 6 miles of roadway. This unit has the largest number of vegetative species, primarily because of Fort Harrison's size and habitat diversity. The mostly "parkland"-maintained woodland along the road and earthworks is dominated by a secondary growth oak-hickory forest. The approximately 200-acre Fort Harrison portion of the unit has maintained lawn areas, dense oak-hickory-pine forest, and an extensive wooded swamp. This swamp contains a diverse and distinctive habitat of ericaceous shrub understory. Several other small but unique wetland habitats occur along earthworks south of Fort Harrison and north near Fort Johnson.

Forts Gilmer and Johnson

North of Fort Harrison, these Confederate earth fortifications saw heavy action during the Union attack on September 29, in which U.S. Colored Troops took part.

Forts Maury, Hoke, and Brady

South of Fort Harrison the Confederate fortifications known as Fort Hoke and Fort Maury remained in Confederate hands until war's end. A line of Union earthworks bypassed them and reached to a newly constructed Federal position, Fort Brady, that anchored the Union line on the James River.

A major emphasis would be given to more active earthwork preservation and interpretation. More earthworks would be cleared of trees and brush, planted with native little bluestem grass, and maintained through prescribed burning.

Drewry's Bluff 39.5 acres

Fort Darling, built on Drewry's Bluff overlooking the James River 8 miles downriver from Richmond, protected the capital from attack by water. On May 15, 1862, Federal gunboats, including the famed Monitor, steamed up the river to threaten the city, but were unable to pass the heavy artillery at Drewry's Bluff. The fortified position made attack from the river untenable, and preceded the

campaign which became known as the Seven Days. In May-June 1864, General Butler's attempt to seize control of the fort from the landward side also failed. The Confederate Naval Academy and Marine Corps training facility were located on this site. The attack in May 1862, including actions along both sides of the river, covered approximately 750 acres.

Portions of the fort are in serious danger of collapse into the James River due to erosive action. A platform built over the earthworks provides a panoramic view of the James River and the open farmland across the river toward Chaffin's Farm. Although the vista is important to understanding the site, none of it is protected from development. A recently constructed marina and commercial river terminal intrude on the view downstream approximately in the area where the battle with the Monitor took place in 1862. No period structures remain.

No archeological survey has been done so the full extent of the Confederate naval and marine activities at the site are unknown. A closed and capped landfill occupies part of the unit. The landfill is monitored by Chesterfield County.

Drewry's Bluff contains many different vegetative habitats. Along the access roadway and other maintained (by mowing) landscape areas, numerous grasses, periwinkle, and violets are found. Oak and hickory forest covers much of the site, particularly in the fort area proper. A small stream midway between the parking lot and the fort is bordered by yellowroot and nettle. Below the fort, on the bluff slope leading to the James River, a discontinuous groundwater seepage area supports mosses and liverworts, including the large liverwort Marchantia. Erosion and embankment sloughing caused by river undercutting and the freeze/thaw cycle have left areas open and in need of stabilization. The remaining large habitat is the closed and reclaimed landfill along the entire southern portion of the site. The landfill surface was capped with soil and final graded in the fall of 1991. The area was seeded soon after and a sparse growth of blue stem, some other grasses, and forbs currently cover the site.

A high priority will be to maintain the vistas up and downriver, and across the river toward the Chaffin's Farm area, using easements, memoranda of agreement, or other cooperative techniques.

Parker's Battery 10.0 acres

The earthworks of this Confederate artillery position were part of the outer defenses south of Richmond known as the Howlett Line. This line of works stretched more than 5 miles and served to keep General Butler's army bottled up within an arm of the James River known as Bermuda Hundred. The northern anchor of this line was Battery Danzler. Located 6 miles south of Drewry's Bluff, Parker's Battery is now in an industrial zone adjacent to an active rail

line. The unit and the earthworks on it are wooded. A small monument erected by the United Daughters of the Confederacy is located in this unit.

This unit is predominantly flat and largely covered with secondary growth eastern deciduous mesic forest of oaks, beech, and older loblolly pines. Understory trees and shrubs lie above a poorly developed herbaceous layer similar to the dry woodlands of Malvern Hill and contain pipsissewa, partridge berry, and several orchids. A small moist area in the southeast corner contains possum haw. The western portion of the site underlies high-tension powerlines and is periodically cleared. The powerline right-of-way contains sassafras and sumac trees and a diverse herbaceous layer of grasses, ferns, and wildflowers.

Under a cooperative agreement with Chesterfield County, parking will be provided, and site development and resource protection enhanced. An adopt-a-park program with the local chapter of the Sons of Confederate Veterans would be sought to provide additional resource protection.

The following overall management needs are identified: acquisition of baseline data, restoration and maintenance of the historic landscape and personnel and funding.

Acquisition of baseline data

Fundamental to addressing resource management issues is the development of a base of information about those issues. Whereas topical information has been gathered for inventories of park vascular flora, there are incomplete surveys of non-vascular plants, fauna, archaeological resources and, water resources. In order to provide basic information needed in management decision making these data need to be supplied.

Restoration and maintenance of the historic landscape

Since the interaction of the natural environment with human actions is crucial to understanding the historic actions, reestablishment of the certain historic natural conditions, in accordance with cultural landscape planning, is vital to the purposes of the park. Several interactive environmental mitigations are critical: preservation of earthworks, the re-establishment of the historic vegetation (including fire regimes) and the control of invasive plants. Without implementation of cultural landscape planning actions park management will not be able to preserve and interpret so visitors can grasp a true meaning of the historic events.

Personnel and funding

Personnel who implement resource management activities at RBNP are a Natural Resource Management Specialist, a Chief of Interpretation

and Cultural Resources, a Chief Ranger, a Park Curator, two field Ranger positions and a Chief of Maintenance and his staff. The Resource Management Specialist devotes 100% of his time to resource management activities. The others devote lesser amounts of time: Chief of Interpretation - 20% (.3FTE); Chief Ranger - 20% (.2 FTE); two Ranger positions - 40% each (.8 FTE); Park Curator - 30% (.3 FTE for RICH and .4 FTE for Maggie Walker NHS); Chief of Maintenance and staff - 10% (.5 FTE).

Funding for the Resources Management Program in FY93, including personnel costs, came primarily from Recurring Park Base (other) and Park Special Accounts. Recurring Park Base Funds were used for pest management, trail maintenance and the administration of all natural and cultural resource projects and activities.

Additional manpower and money are needed if the park is to successfully manage and preserve its resources. A Geographical Information Systems technician position and a biological technician, with associated funding, are needed if the park is to approach proper care of natural resources. This document addresses in detail the costs and personnel needed to obtain objectives. It also addresses the results expected if minimal funding and personnel happen.

Refer to Reference Table 2 (Funding) for a summary of funds available for resource management in FY93. Priorities established for all present and future projects reflect Service-wide natural and cultural resource issues as well as the goals and objectives of the park. Issues associated with significant park resources have been given high priority over less urgently needed actions. Additional information on the problems and issues of RBNP may be found in this document's present Resource Status Narratives (project statements) and Cultural Resources Status Summary Charts.

09/19/94
12:04:41

TABLE 1
NPS RESOURCE PERSONNEL
(current year only)

FY: 94
PARK: RICH
REGION: MARO

26

TYPE OF NPS EMPLOYEE	FTEs OF RESOURCES WORK		
	Natural	Cultural	Total
Research Scientists	0.1	0.0	0.1
Resources Specialists	2.0	2.6	4.6
025 Park Rangers Res Mgmt	0.0	0.0	0.0
025 Park Rangers Res Prot	4.0	4.3	8.3
025 Park Rangers Res Interp	0.0	2.1	2.1
Maintenance Personnel	2.0	6.0	8.0
Total of RES Personnel	8.1	15.0	23.1
TOTAL PARK FTE: 24.0			
PERCENT	33.8%	62.5%	96.3%

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TABLE 1
NPS RESOURCE PERSONNEL
(current year only)

FY: 95
PARK: RICH
REGION: MARO

TYPE OF NPS EMPLOYEE	FTEs OF RESOURCES WORK		
	Natural	Cultural	Total
Research Scientists	0.0	0.0	0.0
Resources Specialists	0.7	0.0	0.7
025 Park Rangers Res Mgmt	0.0	0.0	0.0
025 Park Rangers Res Prot	1.1	1.1	2.2
025 Park Rangers Res Interp	0.0	1.3	1.3
Maintenance Personnel	1.0	1.0	2.0
Total of RES Personnel	2.8	3.4	6.2
TOTAL PARK FTE: 24.0			
PERCENT	11.7%	14.2%	25.8%

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TABLE 1
NPS RESOURCE PERSONNEL
(current year only)

FY: 96
PARK: RICH
REGION: MARO

TYPE OF NPS EMPLOYEE	FTEs OF RESOURCES WORK		
	Natural	Cultural	Total
Research Scientists	0.4	0.0	0.4
Resources Specialists	0.5	0.0	0.5
025 Park Rangers Res Mgmt	0.0	0.0	0.0
025 Park Rangers Res Prot	0.0	0.0	0.0
025 Park Rangers Res Interp	0.0	2.0	2.0
Maintenance Personnel	3.5	0.0	3.5
Total of RES Personnel	4.4	2.0	6.4
TOTAL PARK FTE: 24.0			
PERCENT	18.3%	8.3%	26.7%

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TABLE 1
NPS RESOURCE PERSONNEL
(current year only)

FY: 97
PARK: RICH
REGION: MARO

TYPE OF NPS EMPLOYEE	FTEs OF RESOURCES WORK		
	Natural	Cultural	Total
Research Scientists	0.1	0.0	0.1
Resources Specialists	0.1	0.0	0.1
025 Park Rangers Res Mgmt	0.0	0.0	0.0
025 Park Rangers Res Prot	1.0	0.0	1.0
025 Park Rangers Res Interp	0.0	2.0	2.0
Maintenance Personnel	0.0	0.3	0.3
Total of RES Personnel	1.2	2.3	3.5
TOTAL PARK FTE: 24.0			
PERCENT	5.0%	9.6%	14.6%

End of data

09/19/94
11:09:52

TABLE 2
NATURAL AND CULTURAL
CURRENT YEAR FUNDING
(\$ in thousands - by activity type)

Page: 0001
FY: 94
PARK: RICH
REGION: MARO

28

FUNDING SOURCE	TOTAL	RES	MIT	MON	PRO	INT	ADM
RMC	50.00	0.00	50.00	0.00	0.00	0.00	0.00
RCC	65.00	0.00	60.00	0.00	0.00	0.00	5.00
NPR	2.00	2.00	0.00	0.00	0.00	0.00	0.00
PCR	3.00	3.00	0.00	0.00	0.00	0.00	0.00
POF	283.00	0.00	229.00	45.00	9.00	0.00	0.00
POF2	40.00	25.00	15.00	0.00	0.00	0.00	0.00
PNR	10.00	0.00	9.00	1.00	0.00	0.00	0.00
TOTAL	453.00	30.00	363.00	46.00	9.00	0.00	5.00

End of data

09/19/94
11:10:46

TABLE 2
NATURAL AND CULTURAL
CURRENT YEAR FUNDING
(\$ in thousands - by activity type)

Page: 0001
FY: 95
PARK: RICH
REGION: MARO

FUNDING SOURCE	TOTAL	RES	MIT	MON	PRO	INT	ADM
RMCN	50.00	0.00	50.00	0.00	0.00	0.00	0.00
POF1	284.00	0.00	229.00	45.00	10.00	0.00	0.00
RCCN	60.00	0.00	60.00	0.00	0.00	0.00	0.00
PNR1	10.00	0.00	9.00	1.00	0.00	0.00	0.00
TOTAL	404.00	0.00	348.00	46.00	10.00	0.00	0.00

End of data

09/19/94
11:11:02

TABLE 2
NATURAL AND CULTURAL
CURRENT YEAR FUNDING
(\$ in thousands - by activity type)

Page: 0001
FY: 96
PARK: RICH
REGION: MARO

FUNDING SOURCE	TOTAL	RES	MIT	MON	PRO	INT	ADM
RMCN	50.00	0.00	50.00	0.00	0.00	0.00	0.00
POF1	175.00	0.00	119.00	45.00	11.00	0.00	0.00
PNR1	10.00	0.00	9.00	1.00	0.00	0.00	0.00
TOTAL	235.00	0.00	178.00	46.00	11.00	0.00	0.00

End of data

09/19/94
11:11:19

TABLE 2
NATURAL AND CULTURAL
CURRENT YEAR FUNDING
(\$ in thousands - by activity type)

Page: 0001
FY: 97
PARK: RICH
REGION: MARO

FUNDING SOURCE	TOTAL	RES	MIT	MON	PRO	INT	ADM
POF1	89.00	0.00	84.00	5.00	0.00	0.00	0.00
PNR1	1.00	0.00	0.00	1.00	0.00	0.00	0.00
TOTAL	90.00	0.00	84.00	6.00	0.00	0.00	0.00

End of data

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11:07:15

PROGRAMMING SHEET 1
CULTURAL
CURRENT YEAR FUNDED ACTIVITIES
(\$ in thousands)

Page: 0001
FY: 94
PARK: RICH
REGION: MARO

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM- WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL		
							1994 \$\$	FTE	1995 \$\$	FTE	1996 \$\$	FTE	1997 \$\$	FTE	1994 \$\$	FTE	
001.000	HISTORIC STRUCTURES MANAGEMENT	170	STRC	C12 C18	RG-REG-MT	MIT	50.00	0.0	50.00	0.0	50.00	0.0	0.0	0.0	150.00	0.0	
002.000	CURATORIAL COLLECTION MANAGEMENT		OBJC	C16 C20	RG-CR-MTN	ADM	5.00	0.2	0.0	0.0	0.0	0.0	0.0	0.0	5.00	0.2	
003.000	ARCHIVES MANAGEMENT		OBJC	C02 C26	No data												
004.000	ARCHAEOLOGICAL RESOURCES AND RESEARCH MANAGEMENT		SITE	C02 C07	No data												
005.000	ADMINISTRATIVE AND ORAL HISTORY MANAGEMENT		ETHN	C04 C08	No data												
006.000	DEMOGRAPHIC STUDY		COMB	C10 C04	No data												
007.000	RESEARCH HISTORICAL DOCUMENTATION		COMB	C01 C08	NON-PROFI	RES	2.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.00	0.0	
					PKBASE-CR	RES	3.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.00	0.0	
					Subtotal		5.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	5.00	0.0	
7 projects printed							Grand Total	60.00	0.2	50.00	0.0	50.00	0.0	0.00	0.0	160.00	0.2

End of data

09/19/94
11:00:39

PROGRAMMING SHEET 1
NATURAL and CULTURAL
CURRENT YEAR FUNDED ACTIVITIES
(\$ in thousands)

Page: 0001
FY: 94
PARK: RICH
REGION:

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT SYSTEM- RES WIDE TYPE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL	
						1994		1995		1996		1997			
						\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
001.000	HISTORIC CULTURAL LANDSCAPE MANAGEMENT	170	STRC N08 C11	PKBASE-OT	MIT	50.00	0.0	50.00	0.0	50.00	0.0	50.00	0.0	200.00	0.0
002.000	EARTHWORKS PRESERVATION	170	STRC N08 C17	RG-CR-MTN	MIT	60.00	0.0	60.00	0.0	0.0	0.0	0.0	0.0	120.00	0.0
				PKBASE-OT	MIT	110.00	0.0	110.00	0.0	0.0	0.0	0.0	0.0	220.00	0.0
			Subtotal			170.00	0.0	170.00	0.0	0.00	0.0	0.00	0.0	340.00	0.0
003.000	BATTLEFIELD PROTECTION STRATEGIES		COMB C22 N16	TEMP\$-OTH	RES	25.00	0.7	0.0	0.0	0.0	0.0	0.0	0.0	25.00	0.7
				PKBASE-OT	MON	25.00	0.0	25.00	0.0	25.00	0.0	0.0	0.0	75.00	0.0
			Subtotal			50.00	0.7	25.00	0.0	25.00	0.0	0.00	0.0	100.00	0.7
004.000	BOUNDARY CONTROL		STRC N06 C22	PKBASE-OT	MON	10.00	0.0	10.00	0.0	10.00	0.0	0.0	0.0	30.00	0.0
				TEMP\$-OTH	MIT	15.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.00	0.0
			Subtotal			25.00	0.0	10.00	0.0	10.00	0.0	0.00	0.0	45.00	0.0
005.000	LAW ENFORCEMENT FOR RESOURCE PROTECTION		STRC C20 N24	PKBASE-OT	MIT	40.00	0.0	40.00	0.0	40.00	0.0	0.0	0.0	120.00	
006.000	GEOGRAPHICAL INFORMATION SYSTEM		COMB N20 C22	No data											
007.000	INTEGRATED PEST MANAGEMENT		CULL C12 N08	PKBASE-NR	MON	1.00	0.1	1.00	0.0	1.00	0.0	1.00	0.0	4.00	0.1
				PKBASE-OT	MON	5.00	0.2	5.00	0.0	5.00	0.0	5.00	0.0	20.00	0.2
			Subtotal			6.00	0.3	6.00	0.0	6.00	0.0	6.00	0.0	24.00	0.3
008.000	LANDSCAPE PLANTING AND MAINTENANCE		CULL C11 N16	No data											
009.000	TRAILS MANAGEMENT		COMB N22 C18	PKBASE-OT	MIT	20.00	0.0	20.00	0.0	20.00	0.0	20.00	0.0	80.00	0.0
				PKBASE-NR	MIT	9.00	0.0	9.00	0.0	9.00	0.0	0.0	0.0	27.00	0.0
			Subtotal			29.00	0.0	29.00	0.0	29.00	0.0	20.00	0.0	107.00	0.0
010.000	SPECIAL USE MANAGEMENT		COMB N22 C18	PKBASE-OT	MON	5.00	0.0	5.00	0.0	5.00	0.0	0.0	0.0	15.00	0.0
011.000	INTERPRET CRITICAL		N07 C26	No data											

continued...

09/19/94

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PROGRAMMING SHEET 1
 NATURAL and CULTURAL
 CURRENT YEAR FUNDED ACTIVITIES
 (\$ in thousands)

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FY: 94

PARK: RICH

REGION: MARO

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM- WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL	
							1994 \$\$	FTE	1995 \$\$	FTE	1996 \$\$	FTE	1997 \$\$	FTE	\$\$	FTE

RESOURCE ISSUES

012.000	RECREATIONAL USE OF NATURAL AND CULTURAL AREAS				N08 C18 PKBASE-OT PRO		9.00	0.0	10.00	0.0	11.00	0.0	0.0	0.0	30.00	0.0
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12 projects printed

Grand Total	384.00	1.0	345.00	0.0	176.00	0.0	76.00	0.0	981.00	1.0
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End of data

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11:02:29

PROGRAMMING SHEET 1
NATURAL
CURRENT YEAR FUNDED ACTIVITIES
(\$ in thousands)

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FY: 94
PARK: RICH
REGION:

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM- WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR 1994 \$\$ FTE	OUTYEAR 1 1995 \$\$ FTE	OUTYEAR 2 1996 \$\$ FTE	OUTYEAR 3 1997 \$\$ FTE	TOTAL \$\$ FTE
001.000	DREWRY'S BLUFF EROSION MITIGATION	167	COMB	N20 N08	No data						
002.000	HAZARDOUS TREE REMOVAL		COMB	N22 N24	PKBASE-OT MIT		4.00 0.0	4.00 0.0	4.00 0.0	0.0 0.0	12.00 0.0
003.000	FIRE MANAGEMENT		COMB	N08 N20	PKBASE-OT MIT		5.00 0.0	5.00 0.0	5.00 0.0	5.00 0.0	20.00 0.0
004.000	WETLAND ECOSYSTEMS MANAGEMENT		CULL	N06 N20	No data						
005.000	WATER RESOURCES MANAGEMENT		COMB	N11 N12	No data						
006.000	NATURAL RESOURCES BASE INVENTORY			N20	No data						
007.000	DREWRY'S BLUFF (FORT DARLING) LANDFILL STUDY			N11 N24	No data						
008.000	FLORA INVENTORY			N03 N20	No data						
009.000	NATIVE ANIMAL MANAGEMENT			N01	No data						
010.000	AIR QUALITY MANAGEMENT		COMB	N14 N20	No data						
10 projects printed											
Grand Total							9.00 0.0	9.00 0.0	9.00 0.0	5.00 0.0	32.00 0.0

End of data

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PROGRAMMING SHEET 2
CULTURAL
UNFUNDED ACTIVITIES
(\$ in thousands)

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FY: 94
PARK: RICH
REGION: MARO

PK PRI	PROJECT NUMBER	PROJECT TITL	PKG NUM	CULT RES TYPE	SYSTEM- WIDE ISSUE	FUNDING SOURCE	ACT TYP	STARTING YEAR	OUTYEAR 1	OUTYEAR 2	OUTYEAR 3	TOTAL	
								\$\$ FTE	\$\$ FTE	\$\$ FTE	\$\$ FTE	\$\$ FTE	
1	001.000	HISTORIC STRUCTURES MANAGEMENT	170	STRC	C12 C18	PKBASE-CR	MIT	60.00 1.0	60.00 0.0	60.00 1.0	0.0 0.0	180.00 2.0	
						RG-CR-MTN	RES	5.00 0.0	5.00 0.0	5.00 0.0	5.00 0.0	20.00 0.0	
						RG-CR-MTN	MIT	30.00 0.0	30.00 0.0	30.00 0.0	30.00 0.0	120.00 0.0	
						CRPP	RES	20.00 0.0	20.00 0.0	20.00 0.0	20.00 0.0	80.00 0.0	
						TEMP\$-OTH	MIT	0.0 0.0	0.0 0.0	0.0 0.0	60.00 0.0	60.00 0.0	
						Subtotal		115.00 1.0	115.00 0.0	115.00 1.0	115.00 0.0	460.00 2.0	
2	002.000	CURATORIAL COLLECTION MANAGEMENT		OBJC	C16 C20	PKBASE-CR	ADM	20.00 0.0	20.00 0.0	20.00 0.0	20.00 0.0	80.00 0.0	
						RG-CR-MTN	ADM	20.00 0.0	0.0 0.0	0.0 0.0	0.0 0.0	20.00 0.0	
						REG-OTHER	ADM	0.0 0.0	20.00 0.0	20.00 0.0	20.00 0.0	60.00 0.0	
						Subtotal		40.00 0.0	40.00 0.0	40.00 0.0	40.00 0.0	160.00 0.0	
3	003.000	ARCHIVES MANAGEMENT		OBJC	C02 C26	PKBASE-CR	ADM	20.00 1.0	20.00 1.0	30.00 1.0	40.00 1.0	110.00 4.0	
						REG-OTHER	ADM	30.00 0.0	30.00 0.0	40.00 1.0	50.00 1.0	150.00 2.0	
						Subtotal		50.00 1.0	50.00 1.0	70.00 2.0	90.00 2.0	260.00 6.0	
4	004.000	ARCHAEOLOGIC AL RESOURCES AND RESEARCH MANAGEMENT		SITE	C02 C07	CRPP	RES	100.00 0.0	100.00 0.0	100.00 0.0	100.00 0.0	400.00 0.0	
						REG-OTHER	RES	20.00 0.0	20.00 0.0	20.00 0.0	20.00 0.0	80.00 0.0	
						Subtotal		120.00 0.0	120.00 0.0	120.00 0.0	120.00 0.0	480.00 0.0	
5	005.000	ADMINISTRATI VE AND ORAL HISTORY MANAGEMENT		ETHN	C04 C08	TEMP\$-OTH	RES	50.00 0.0	40.00 0.0	20.00 0.0	10.00 0.0	120.00 0.0	
6	006.000	DEMOGRAPHIC STUDY		COMB	C10 C04	SVC-OTHER	RES	30.00 0.0	30.00 0.0	10.00 0.0	8.00 0.0	78.00 0.0	
7	007.000	RESEARCH HISTORICAL DOCUMENTATIO N		COMB	C01 C08	NON-PROFI	RES	2.00 0.0	2.00 0.0	2.00 0.0	2.00 0.0	8.00 0.0	
						CRPP	RES	50.00 1.0	50.00 0.0	0.0 0.0	0.0 0.0	100.00 1.0	
						Subtotal		52.00 1.0	52.00 0.0	2.00 0.0	2.00 0.0	108.00 1.0	
7 projects printed								Grand Total	457.00 3.0	447.00 1.0	377.00 3.0	385.00 2.0	1666.00 9.0

End of data

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PROGRAMMING SHEET 2
NATURAL and CULTURAL
UNFUNDED ACTIVITIES
(\$ in thousands)

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PARK: RICH
REGION:

PK PRI	PROJECT NUMBER	PROJECT TITL	PKG NUM	CULT SYSTEM- RES WIDE TYPE ISSUE	FUNDING SOURCE	ACT TYP	STARTING YEAR	OUTYEAR 1	OUTYEAR 2	OUTYEAR 3	TOTAL
							\$\$ FTE	\$\$ FTE	\$\$ FTE	\$\$ FTE	\$\$ FTE
1	001.000	HISTORIC CULTURAL LANDSCAPE MANAGEMENT	170	STRC N08 C11	CRPP	RES	25.00 0.0	25.00 0.0	25.00 0.0	25.00 0.0	100.00 0.0
					PKBASE-OT	RES	10.00 0.0	10.00 0.0	10.00 0.0	10.00 0.0	40.00 0.0
					PKBASE-OT	MON	0.0 0.0	4.00 0.1	4.00 0.1	4.00 0.1	12.00 0.3
					Subtotal		35.00 0.0	39.00 0.1	39.00 0.1	39.00 0.1	152.00 0.3
2	002.000	EARTHWORKS PRESERVATION	170	STRC N08 C17	PKBASE-OT	RES	25.00 0.0	25.00 0.0	15.00 0.0	15.00 0.0	80.00 0.0
					PKBASE-OT	MIT	1000.00 2.0	1000.00 0.0	1000.00 0.0	50.00 0.0	3050.00 2.0
					PKBASE-OT	MON	10.00 0.0	10.00 0.2	10.00 0.2	10.00 0.0	40.00 0.4
					PKBASE-OT	INT	0.0 0.0	10.00 0.1	0.0 0.0	0.0 0.0	10.00 0.1
					Subtotal		1035.00 2.0	1045.00 0.3	1025.00 0.2	75.00 0.0	3180.00 2.5
3	003.000	BATTLEFIELD PROTECTION STRATEGIES		COMB C22 N16	PKBASE-OT	RES	60.00 1.0	60.00 0.0	0.0 0.0	0.0 0.0	120.00 1.0
					CRPP	ADM	150.00 0.0	150.00 0.0	0.0 0.0	0.0 0.0	300.00 0.0
					TEMP\$-OTH	RES	0.0 0.0	50.00 0.0	20.00 0.0	20.00 0.0	90.00 0.0
					NRPP	ADM	0.0 0.0	10.00 0.0	0.0 0.0	0.0 0.0	10.00 0.0
					Subtotal		210.00 1.0	270.00 0.0	20.00 0.0	20.00 0.0	520.00 1.0
4	004.000	BOUNDARY CONTROL		STRC N06 C22	PKBASE-OT	MIT	15.00 0.5	15.00 0.5	15.00 0.0	25.00 1.0	70.00
5	005.000	LAW ENFORCEMENT FOR RESOURCE PROTECTION		STRC C20 N24	PKBASE-OT	MIT	60.00 2.0	50.00 1.0	0.0 0.0	0.0 0.0	110.00 3.0
6	006.000	GEOGRAPHICAL INFORMATION SYSTEM		COMB N20 C22	GIS	RES	30.00 0.0	0.0 0.0	0.0 0.0	0.0 0.0	30.00 0.0
					PKBASE-OT	ADM	60.00 1.0	0.0 0.0	0.0 0.0	0.0 0.0	60.00 1.0
					PKBASE-OT	RES	0.0 0.0	50.00 0.0	50.00 0.0	50.00 0.0	150.00 0.0
					Subtotal		90.00 1.0	50.00 0.0	50.00 0.0	50.00 0.0	240.00 1.0
7	007.000	INTEGRATED PEST MANAGEMENT		CULL C12 N08	FR-INSECT	MON	2.00 0.0	2.00 0.0	2.00 0.0	2.00 0.0	8.00 0.0
					PKBASE-NR	MON	10.00 0.0	5.00 0.0	5.00 0.0	5.00 0.0	25.00 0.0
					FR-INSECT	MIT	0.0 0.0	20.00 0.0	20.00 0.0	20.00 0.0	60.00 0.0
					Subtotal		12.00 0.0	27.00 0.0	27.00 0.0	27.00 0.0	93.00 0.0
8	008.000	LANDSCAPE PLANTING AND MAINTENANCE		CULL C11 N16	RG-REG-MT	MIT	25.00 1.0	25.00 0.0	0.0 0.0	0.0 0.0	50.00 1.0
					PKBASE-OT	MIT	40.00 0.0	50.00 1.0	50.00 0.0	60.00 1.0	200.00 2.0
					Subtotal		65.00 1.0	75.00 1.0	50.00 0.0	60.00 1.0	250.00 3.0

continued...

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PROGRAMMING SHEET 2
NATURAL and CULTURAL
UNFUNDED ACTIVITIES
(\$ in thousands)

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FY: 94

PARK: RICH

REGION: MARO

PK	PROJECT	PROJECT TITL	PKG	CULT	SYSTEM-	FUNDING	ACT	STARTING	YEAR	OUTYEAR 1	OUTYEAR 2	OUTYEAR 3	TOTAL		
PRI	NUMBER		NUM	RES	WIDE	SOURCE	TYP								
				TYPE	ISSUE			\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
9	009.000	TRAILS MANAGEMENT		COMB	N22 C18	PKBASE-OT	MIT	80.00	2.0	80.00	0.0	80.00	2.0	80.00	4.0
10	010.000	SPECIAL USE MANAGEMENT		COMB	N22 C18	PKBASE-OT	MON	15.00	0.0	15.00	0.0	0.0	0.0	15.00	0.0
11	011.000	INTERPRET CRITICAL RESOURCE ISSUES			N07 C26	PKBASE-OT	INT	10.00	0.0	10.00	0.0	10.00	0.0	0.0	0.0
12	012.000	RECREATIONAL USE OF NATURAL AND CULTURAL AREAS			N08 C18	PKBASE-NR	ADM	5.00	0.0	0.0	0.0	5.00	0.0	0.0	0.0

12 projects printed

Grand Total	1632.00	9.5	1676.00	2.9	1321.00	2.3	391.00	2.1	5020.00	16.8
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End of data

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PROGRAMMING SHEET 2
NATURAL
UNFUNDED ACTIVITIES
(\$ in thousands)

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PARK: RICH
REGION: [REDACTED]

PK	PROJECT	PROJECT TITL	PKG	CULT	SYSTEM-	FUNDING	ACT	STARTING	YEAR	OUTYEAR 1	OUTYEAR 2	OUTYEAR 3	TOTAL		
PRI	NUMBER		NUM	RES	WIDE	SOURCE	TYP								
				TYPE	ISSUE			\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
1	001.000	DREWRY'S BLUFF EROSION MITIGATION	167	COMB	N20 N08	CRPP	RES	15.00	0.0	10.00	0.0	0.0	0.0	25.00	0.0
						RG-RM-NAT	ADM	5.00	0.0	5.00	0.0	5.00	0.0	20.00	0.0
						LUMPS-CON	MIT	0.0	0.0	2000.00	0.0	2000.00	0.0	6000.00	0.0
						CRPP	MON	0.0	0.0	0.0	0.0	10.00	0.0	20.00	0.0
						Subtotal		20.00	0.0	2015.00	0.0	2015.00	0.0	6065.00	0.0
2	002.000	HAZARDOUS TREE REMOVAL		COMB	N22 N24	PKBASE-OT	MIT	200.00	3.0	100.00	1.0	50.00	0.5	375.00	4.8
3	003.000	FIRE MANAGEMENT		COMB	N08 N20	REG-OTHER	MIT	20.00	0.0	15.00	0.0	15.00	0.0	65.00	0.0
4	004.000	WETLAND ECOSYSTEMS MANAGEMENT		CULL	N06 N20	RG-NS-RES	RES	5.00	0.0	0.0	0.0	0.0	0.0	5.00	0.0
						WATER-RES	MIT	30.00	0.0	15.00	0.0	0.0	0.0	45.00	0.0
						PKBASE-NR	MON	0.0	0.0	5.00	0.2	5.00	0.0	15.00	0.2
						Subtotal		35.00	0.0	20.00	0.2	5.00	0.0	65.00	0.2
5	005.000	WATER RESOURCES MANAGEMENT		COMB	N11 N12	WATER-RES	RES	15.00	0.0	0.0	0.0	0.0	0.0	15.00	0.0
						PKBASE-NR	RES	10.00	0.0	0.0	0.0	0.0	0.0	10.00	0.0
						PKBASE-NR	MIT	0.0	0.0	10.00	0.2	0.0	0.0	10.00	0.2
						WATER-RES	MIT	0.0	0.0	40.00	0.0	20.00	0.0	60.00	0.0
						PKBASE-NR	MON	0.0	0.0	0.0	0.0	2.00	0.0	4.00	0.0
						Subtotal		25.00	0.0	50.00	0.2	22.00	0.0	99.00	0.2
6	006.000	NATURAL RESOURCES BASE INVENTORY			N20	PKBASE-OT	RES	4.00	0.2	4.00	0.0	1.00	0.0	10.00	0.2
						NR-I&M	RES	0.0	0.0	10.00	0.0	10.00	0.0	20.00	0.0
						Subtotal		4.00	0.2	14.00	0.0	11.00	0.0	30.00	0.2
7	007.000	DREWRY'S BLUFF (FORT DARLING) LANDFILL STUDY			N11 N24	PKBASE-NR	MON	2.00	0.2	2.00	0.0	2.00	0.0	8.00	0.2
						WATER-RES	RES	3.00	0.0	0.0	0.0	3.00	0.0	6.00	0.0
						ST-LOCAL	MIT	10.00	0.0	10.00	0.0	0.0	0.0	20.00	0.0
						Subtotal		15.00	0.2	12.00	0.0	5.00	0.0	34.00	0.2
8	008.000	FLORA INVENTORY			N03 N20	RG-RM-NAT	RES	0.0	0.0	0.0	0.0	5.00	0.0	5.00	0.0
						PKBASE-NR	RES	0.0	0.0	0.0	0.0	4.00	0.2	4.00	0.2
						Subtotal		0.00	0.0	0.00	0.0	9.00	0.2	9.00	0.2
9	009.000	NATIVE ANIMAL MANAGEMENT			N01	RG-RM-NAT	RES	0.0	0.0	0.0	0.0	5.00	0.2	5.00	0.2
						PKBASE-NR	MON	0.0	0.0	0.0	0.0	0.0	0.0	2.00	0.1
						Subtotal		0.00	0.0	0.00	0.0	5.00	0.2	7.00	0.1

continued...

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14:10PROGRAMMING SHEET 2
NATURAL
UNFUNDED ACTIVITIES
(\$ in thousands)Page: 0002
FY: 94
PARK: RICH
REGION: MARO

PK PRI	PROJECT NUMBER	PROJECT TITL NUM	PKG NUM	CULT SYSTEM- RES WIDE TYPE ISSUE	FUNDING SOURCE	ACT STARTING TYP	YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL		
10	010.000	AIR QUALITY MANAGEMENT		COMB N14 N20	AIR-QUAL	MON	0.0	0.0	0.0	0.0	15.00	0.2	0.0	0.0	15.00	0.2	
10 projects printed							Grand Total	319.00	3.4	2226.00	1.4	2152.00	1.1	2067.00	0.4	6764.00	6.3

End of data

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PROJECT LIST

Page: 0001

PRIORITY	PROJECT NUMBER	YEAR	PROJECT TITLE	SUB-TITLE	FUNDED	UNFUNDED
1	RICH-C-001.000	93	HISTORIC STRUCTURES MANAGEMENT		285.00	460.00
2	RICH-C-002.000	93	CURATORIAL COLLECTION MANAGEMENT		5.00	160.00
3	RICH-C-003.000	93	ARCHIVES MANAGEMENT		0.00	260.00
4	RICH-C-004.000	93	ARCHAEOLOGICAL RESOURCES AND RESEARCH MANAGEMENT		0.00	480.00
5	RICH-C-005.000	93	ADMINISTRATIVE AND ORAL HISTORY MANAGEMENT		0.00	120.00
6	RICH-C-006.000	93	DEMOGRAPHIC STUDY		0.00	78.00
7	RICH-C-007.000	93	RESEARCH HISTORICAL DOCUMENTATION		5.00	108.00
1	RICH-I-001.000	85	HISTORIC CULTURAL LANDSCAPE MANAGEMENT		200.00	152.00
2	RICH-I-002.000	88	EARTHWORKS PRESERVATION		340.00	3180.00
3	RICH-I-003.000	93	BATTLEFIELD PROTECTION STRATEGIES		150.00	520.00
4	RICH-I-004.000	93	BOUNDARY CONTROL		55.00	70.00
5	RICH-I-005.000	93	LAW ENFORCEMENT FOR RESOURCE PROTECTION		160.00	110.00
6	RICH-I-006.000	88	GEOGRAPHICAL INFORMATION SYSTEM		0.00	240.00
7	RICH-I-007.000	89	INTEGRATED PEST MANAGEMENT		24.00	93.00
8	RICH-I-008.000	93	LANDSCAPE PLANTING AND MAINTENANCE		0.00	250.00
9	RICH-I-009.000	89	TRAILS MANAGEMENT		116.00	320.00
10	RICH-I-010.000	93	SPECIAL USE MANAGEMENT		20.00	45.00
11	RICH-I-011.000	93	INTERPRET CRITICAL RESOURCE ISSUES		0.00	30.00
12	RICH-I-012.000	93	RECREATIONAL USE OF NATURAL AND CULTURAL AREAS		38.00	10.00
1	RICH-N-001.000	89	DREWRY'S BLUFF EROSION MITIGATION		0.00	6065.00
2	RICH-N-002.000	93	HAZARDOUS TREE REMOVAL		16.00	375.00
3	RICH-N-003.000	89	FIRE MANAGEMENT		20.00	65.00
4	RICH-N-004.000	93	WETLAND ECOSYSTEMS MANAGEMENT		0.00	0.00
5	RICH-N-005.000	93	WATER RESOURCES MANAGEMENT		0.00	99.00
6	RICH-N-006.000	88	NATURAL RESOURCES BASE INVENTORY		0.00	30.00
7	RICH-N-007.000	89	DREWRY'S BLUFF (FORT DARLING) LANDFILL STUDY		0.00	34.00
8	RICH-N-008.000	88	FLORA INVENTORY		0.00	9.00
9	RICH-N-009.000	93	NATIVE ANIMAL MANAGEMENT		0.00	7.00
10	RICH-N-010.000	93	AIR QUALITY MANAGEMENT		0.00	15.00
Grand Total=====					1434.00	13450.00

29 projects printed

PROJECT NUMBER: RICH-C-001.000

TITLE: HISTORIC STRUCTURES MANAGEMENT

FUNDING STATUS: FUNDED: 285.00 UNFUNDED: 460.00

SERVICEWIDE ISSUES: C12 PRESERVE MGMT C18 CTRL VIS IMPAC

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER: 170

PROBLEM STATEMENT:

TO PRESERVE HISTORIC STRUCTURES

Richmond NBP has ten miles of earthworks, two main historic Civil War era buildings, a log cabin constructed by the Battlefield Parks Corporation and park headquarters (a ca. 1909 National Weather Bureau building) The preservation of the earthworks is dealt with in detail in the Earthwork Preservation Management statement of this document. The two Civil War buildings are the Watt House associated with the battle action at Gaines Mill and the Garthright House associated with the action at Cold Harbor. The structures date from the 1800s, and have obviously aged through the years. Both are closed to the public and are used for NPS personnel quarters. They have modern climate control and security systems. No building fire suppression systems exist, although fire extinguishers are supplied. Documentation shows that outbuildings (important in the battle actions) are known to have existed. The log cabin, once the park's visitor center, is now used for interpretive activities and meetings.

Major rehabilitation of the exterior Garthright House was completed in 1982 and a shake roof was installed in 1984. The exterior porches, windows and siding of the Watt House were rehabilitated in 1992.

Both the Watt house and the Garthright house exhibit symptoms that indicate the need for ongoing maintenance - including, but not limited to, loss of mortar; plaster deterioration; and structural cracks.

Cyclic maintenance is provided by the maintenance staff. While there is currently no formal cyclic maintenance or janitorial service plan for the any buildings, there are well established routines for upkeep.

The park has one monument, and eleven closely associated, unowned markers that are rectangular three feet high by two feet square stone pillars with bronze plaques dedicating and describing battle actions. These markers were initiated and placed in the 1920s

through the endeavors of the noted historian, Douglas Southall Freeman, and other Richmonders of the early 1900s.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Complete a comprehensive Historic Structure Preservation Guide for the repair, rehabilitation and cyclic maintenance of historic structures addressing the long term needs of structure preservation. Complete Historic Structures Reports for the Garthright House and the Watt House, as well as for all other park structures. The List of Classified Structures needs updating (planned for 1995). These documents are necessary and required for the management of historic structures.

Establish a prioritized schedule for examining possible "problem symptoms" in historic structures and, where necessary, implement preservation actions. Determine the legal/policy requirements and the extent of preservation needed for the 20th century historic buildings. Inspect the monuments for deterioration.

Both fire detection and fire suppression in the Civil War houses must be upgraded if the park is to preserve the artifacts and historic structures in its care.

BUDGET AND FTEs:

-----FUNDED-----			
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	RG-REG-MT MIT	50.00	0.0
	PKBASE-CR MIT	60.00	0.9
	RG-CR-MTN RES	5.00	0.1
	RG-CR-MTN MIT	20.00	0.1
	Subtotal:	135.00	1.1
Year 2:	RG-REG-MT MIT	50.00	0.0
Year 3:	RG-REG-MT MIT	50.00	0.0
Year 4:	RG-REG-MT MIT	50.00	0.0
	Total:	285.00	1.1
-----UNFUNDED-----			
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-CR MIT	60.00	1.0
	RG-CR-MTN RES	5.00	0.0
	RG-CR-MTN MIT	30.00	0.0
	CRPP RES	20.00	0.0
	Subtotal:	115.00	1.0
Year 2:	PKBASE-CR MIT	60.00	0.0
	RG-CR-MTN RES	5.00	0.0
	RG-CR-MTN MIT	30.00	0.0
	CRPP RES	20.00	0.0
	Subtotal:	115.00	0.0
Year 3:	PKBASE-CR MIT	60.00	1.0
	RG-CR-MTN RES	5.00	0.0
	RG-CR-MTN MIT	30.00	0.0
	CRPP RES	20.00	0.0
	Subtotal:	115.00	1.0
Year 4:	TEMP\$-OTH MIT	60.00	0.0
	RG-CR-MTN RES	5.00	0.0
	RG-CR-MTN MIT	30.00	0.0
	CRPP RES	20.00	0.0
	Subtotal:	115.00	0.0
	Total:	460.00	2.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

Stop action:

Stopping management action would result in deterioration of the structures. Also lack of proper management might result in inappropriate usage of the historic structures. Stopping the current action would be against the preservation policies of the NPS. Fire will, almost assuredly, destroy the structures.

Continue current action:

Lack of basic planning documents makes good preservation, management and interpretation difficult. The lack of a formalized cyclic maintenance plan may hasten deterioration of the structure, diminish the visitor experience and allow improper "improvements". The current fire detection and suppression systems are inadequate. Fire damage could occur.

COMPLIANCE CODE(s): NHPA

EXPLANATION:

Proposal Date: 93

PROJECT NUMBER: RICH-C-002.000

TITLE: CURATORIAL COLLECTION MANAGEMENT

FUNDING STATUS: FUNDED: 5.00 UNFUNDED: 160.00

SERVICEWIDE ISSUES: C16 MUS STORAGE C20 INADEQ SECURIT

CULTURAL RESOURCE TYPE CODE: OBJC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Manage curatorial collection consistent with NPS policy.

The park has approximately 2,000 artifacts, numerous photographs and much documentation of Civil War events. The artifacts range from munitions such as shells and minnie' balls, and weapons such as cannon, rifles, bayonets and swords, to medical materials and living utensils and everyday paraphernalia. These are stored in a basement room in Chimborazo, the main visitor center and headquarters building. Exhibits are displayed on the main (visitor center) floor and replicas are exhibited in the small visitor center at Fort Harrison. Items are maintained and acquired according to the park's approved Scope of Collection and all objects are accessioned upon receipt and catalogued within one year of acceptance into the collection. The collection is inventoried annually.

The storage conditions do not meet NPS minimum standards for fire protection, climate control, space or security. The small dehumidifier in use in the storage area is inadequate and fluctuations of humidity and temperature occur frequently, not only here but all over the aged 1909 Chimborazo structure. Limited access to the curatorial room, which is in an alarmed and secured building, approximates security specifications. A number of large water pipes extend across the ceiling of the storage area. A rupture in just one would have a disastrous impact upon the collection.

The Scope of Collection Statement is current, a Collection Management Plan is being written and a Collection Condition Survey.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Complete Collection Management Plan. This plan will cover all aspects of curatorial management such as storage, fire protection, climate control, accession, preservative treatments of artifacts, security and future anticipations. Establish a dedicated work space/examination area free of stored objects and large enough to be practical. Acquire furniture for expanded curatorial area to allow for proper storage of objects. Place all accessions and cataloging records on ANCS.

BUDGET AND FTEs:

			-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs	
Year 1:				
Year 2:	RG-CR-MTN ADM	5.00	0.2	
Year 3:				
Year 4:				
Total:		5.00	0.2	

			-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs	
Year 1:	PKBASE-CR ADM	20.00	0.0	
	RG-CR-MTN ADM	20.00	0.0	
	Subtotal:	40.00	0.0	
Year 2:	PKBASE-CR ADM	20.00	0.0	
	REG-OTHER ADM	20.00	0.0	
	Subtotal:	40.00	0.0	
Year 3:	PKBASE-CR ADM	20.00	0.0	
	REG-OTHER ADM	20.00	0.0	
	Subtotal:	40.00	0.0	
Year 4:	PKBASE-CR ADM	20.00	0.0	
	REG-OTHER ADM	20.00	0.0	
	Subtotal:	40.00	0.0	
Total:		160.00	0.0	

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

Stop current action

The artifact collection will suffer further deterioration from environmental exposure and from inadequate storage.

Discontinuation of artifact preservation is not a reasonable alternative. Legislation dictates that NPS will preserve historic objects, therefore, this would not meet NPS standards.

Continue current action

The artifact collection will suffer further deterioration from inadequate storage and environmental exposure. Danger from fire will be present without adequate protection provided. NPS policy will not be met.

COMPLIANCE CODE(s): NHPA EXCL

EXPLANATION: 516 DM2 APP. 2, 1.6

Proposal Date: 93

PROJECT NUMBER: RICH-C-003.000

TITLE: ARCHIVES MANAGEMENT

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 260.00

SERVICEWIDE ISSUES: C02 INADEQUATE INV C26 OTHER

CULTURAL RESOURCE TYPE CODE: OBJC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The park has large collections of: modern maps and photographs, copies of historical maps and photographs, blueprints and plans, files on past maintenance and Cultural Resources Management programs, and files on sites and structures. Unfortunately, these valuable resources are disorganized; not stored in accordance with archival standards; and otherwise maintained in a way that delays completion of Cultural Resources Management projects. Moreover, these records contribute to confusion, disorganization, and space shortages within the park's administrative archives, interpretation/research archives, and museum collection.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Prepare a records-management plan for all types of Cultural Resources documents. Prepare an adequate archives space. Acquire all necessary storage equipment, including acid-free containers, metal shelves, and map racks. Move Cultural Resources documents to this central location. Obtain copies of documents that are properly part of the park's museum collection, but which are also important as Cultural Resources Management records.

BUDGET AND FTEs:

			-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs	
Year 1:				
Year 2:				
Year 3:				
Year 4:				
Total:			=====	=====
			0.00	0.0

			-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs	
Year 1:	PKBASE-CR ADM	20.00	1.0	
	REG-OTHER ADM	30.00	0.0	
	Subtotal:	50.00	1.0	
Year 2:	PKBASE-CR ADM	20.00	1.0	
	REG-OTHER ADM	30.00	0.0	
	Subtotal:	50.00	1.0	
Year 3:	PKBASE-CR ADM	30.00	1.0	
	REG-OTHER ADM	40.00	1.0	
	Subtotal:	70.00	2.0	
Year 4:	PKBASE-CR ADM	40.00	1.0	
	REG-OTHER ADM	50.00	1.0	
	Subtotal:	90.00	2.0	
Total:			=====	=====
			260.00	6.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 APP. 2, 1.6

Proposal Date: 93

PROJECT NUMBER: RICH-C-004.000

TITLE: ARCHAEOLOGICAL RESOURCES AND RESEARCH MANAGEMENT

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 480.00

SERVICEWIDE ISSUES: C02 INADEQUATE INV C07 INADEQUATE LCS

CULTURAL RESOURCE TYPE CODE: SITE

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Archaeological knowledge is vital if the park is to accurately and fully interpret its historic mandate.

The park has a potential wealth of archaeological resources, most of which have not been studied or researched. A limited survey preliminary to the placement of a sewage line at Beaver Dam Creek was conducted in the early 1970s and a report exists from an amateur metal detector survey done at Cold Harbor in the 1950s. These two attempts cannot and do not reflect an accurate assessment of the park's substantial and important archaeological remains.

It has no archeological overview and assessment. Archaeological activities have been programmed and not funded.

Written documentation and accounts indicate the existence of historically pertinent out-buildings at Malvern Hill, Gaines Mill (associated with the Watt House) and at the Garthright House (associated with the Cold Harbor engagements).

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Prepare an archaeological overview and assessment. The park cannot develop a true and complete interpretation of these battle actions without the knowledge of the placement of key structures. The General Management Plan calls for Phase I and II archaeological procedures.

Conduct archaeological explorations and stabilization at the structural sites of primary interpretive potential: the Watt House, the Garthright House and at Malvern Hill. These represent archaeological sites currently undeveloped due to lack of information. Ground Penetrating Radar (GPR) should be considered as a tool to locate outbuildings.

Actively pursue increased law enforcement patrol and undercover operations to curtail unlawful taking of artifacts through the Visitor Resource Assessment Program (V-RAP). This will require increases in ranger law enforcement personnel.

Seek alternative methods of scheduling archeological investigations, such as:

- Identifying changes in vegetation patterns by using infrared and satellite photography to recognize soil compaction along the trace.

- Utilizing a graduate class from a University under proper supervision to conduct one of our small, non-critical projects. Extra care would have to be taken to insure that less valuable sites are attempted by this last method until such time as the quality of work is acceptable.

BUDGET AND FTEs:

			-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs	
Year 1:				
Year 2:				
Year 3:				
Year 4:				
Total:			=====	
			0.00 0.0	

			-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs	
Year 1:	CRPP RES	100.00	0.0	
	REG-OTHER RES	20.00	0.0	
	Subtotal:	-----	-----	
		120.00	0.0	
Year 2:	CRPP RES	100.00	0.0	
	REG-OTHER RES	20.00	0.0	
	Subtotal:	-----	-----	
		120.00	0.0	
Year 3:	CRPP RES	100.00	0.0	
	REG-OTHER RES	20.00	0.0	
	Subtotal:	-----	-----	
		120.00	0.0	
Year 4:	CRPP RES	100.00	0.0	
	REG-OTHER RES	20.00	0.0	
	Subtotal:	-----	-----	
		120.00	0.0	
Total:			=====	
			480.00 0.0	

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): ARPA NHPA

EXPLANATION:

Proposal Date: 93

PROJECT NUMBER: RICH-C-005.000

TITLE: ADMINISTRATIVE AND ORAL HISTORY MANAGEMENT

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 120.00

SERVICEWIDE ISSUES: C04 ETHNOGRAPHY C08 NEED ADMN HIST

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Preserve important historical data

The administrative history of Richmond NBP began before the national park was established. Various groups of Richmonders and Virginians began the process of establishing a tour of the battlefields and memorializing Civil War events around Richmond in the early 1900s. These parcels were donated to the State of Virginia in 1933 who, in turn, donated them to the National Park Service in 1936.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Initiate update administrative history. The administrative history should be revised and updated. An attempt to locate, interview and record the memories of participants in the CCC endeavors in and around the park should be made soon before this valuable source of information disappears.

BUDGET AND FTEs:

-----FUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1:

Year 2:

Year 3:

Year 4:

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Total:	0.00	0.0
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-----UNFUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1: TEMP\$-OTH RES 50.00 0.0

Year 2: TEMP\$-OTH RES 40.00 0.0

Year 3: TEMP\$-OTH RES 20.00 0.0

Year 4: TEMP\$-OTH RES 10.00 0.0

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Total:	120.00	0.0
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(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 APP. 2, 1.6

Proposal Date: 93

PROJECT NUMBER: RICH-C-006.000

TITLE: DEMOGRAPHIC STUDY

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 78.00

SERVICEWIDE ISSUES: C10 SPECIAL STUDY C04 ETHNOGRAPHY

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Understanding the visitor.

As defined, demographics is the statistical study of human populations with reference to size, densities, distributions and vital statistics. It is important for a park to be aware of the nature of its visiting populations. Richmond and the surrounding counties are dynamic areas of high population and diverse cultures. Park allocations of personnel, time and monies, as well as the day to day scheduling of facilities and interpretative themes should be based on sound knowledge of visitor patterns, needs and numbers. This is even more important since the park, through the General Management Plan process, is considering locating and building new visitor centers and a new headquarters. The park has no in-depth demographic study but does have a visitor use survey currently being written.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The park will initiate a demographic study to ascertain information on visitors needs, wants and expectations as well as to determine economic impacts. The Statement of Interpretation will be rewritten and updated. Baseline information on visitor use and impacts, economic impacts, park program effectiveness and park/community relations is important if the park is to make reasonable decisions and to properly allocate diminishing resources.

BUDGET AND FTEs:

-----FUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1:

Year 2:

Year 3:

Year 4:

=====

Total:	0.00	0.0
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-----UNFUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1: SVC-OTHER RES 30.00 0.0

Year 2: SVC-OTHER RES 30.00 0.0

Year 3: SVC-OTHER RES 10.00 0.0

Year 4: SVC-OTHER RES 8.00 0.0

=====

Total:	78.00	0.0
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(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 APP. 2, 1.6

Proposal Date: 93

PROJECT NUMBER: RICH-C-007.000

TITLE: RESEARCH HISTORICAL DOCUMENTATION

FUNDING STATUS: FUNDED: 5.00 UNFUNDED: 108.00

SERVICEWIDE ISSUES: C01 INADEQUATE DOC C08 NEED ADMN HIST

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Without proper documentation it would be difficult, if not impossible, to plan & present historically accurate interpretive programs. Park management would not have the material available to make informed decisions impacting park resources. Providing detailed answers to historical inquiries would be limited.

Two serious gaps in the parks documentation would receive an immediate boost from this project. The first concerns sets of troop movement maps on many of the battles associated with Richmond. The park lacks the narratives that support these maps. Research would bring together materials necessary to produce these narratives. The second gap is the lack of proper documentation for each of the park units. No battlefield of Richmond NBP has been documented to National Register standards.

The basis for fulfilling the historical and educational mission of the service begins with a comprehensive inventory of research material. The park's small library and limited inventory of manuscripts severely limits its ability to fulfill this mission.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The park needs to obtain documentation, write and submit draft National Register nominations.

The park staff would continue to identify important collections and locate depositories and institutions around the country. Qualified staff or contracted researchers would then visit these sites in order to review and photocopy collections.

Important collections would be photocopied or, in the case of maps and illustrations, photographed. All materials would be inventoried then added to the park's research files. Both visitors and staff would have access to all collected materials.

BUDGET AND FTEs:

			-----FUNDED-----	
	Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	NON-PROFI	RES	2.00	0.0
	PKBASE-CR	RES	3.00	0.0
		Subtotal:	5.00	0.0
Year 2:				
Year 3:				
Year 4:				
Total:			5.00	0.0

			-----UNFUNDED-----	
	Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	NON-PROFI	RES	2.00	0.0
	CRPP	RES	50.00	1.0
		Subtotal:	52.00	1.0
Year 2:	NON-PROFI	RES	2.00	0.0
	CRPP	RES	50.00	0.0
		Subtotal:	52.00	0.0
Year 3:	NON-PROFI	RES	2.00	0.0
Year 4:	NON-PROFI	RES	2.00	0.0
Total:			108.00	1.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION:

Proposal Date: 85

PROJECT NUMBER: RICH-I-001.000

TITLE: HISTORIC CULTURAL LANDSCAPE MANAGEMENT

FUNDING STATUS: FUNDED: 200.00 UNFUNDED: 152.00

SERVICEWIDE ISSUES: N08 CULT LANDSCAPE C11 CULT LAND REPT

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER: 170

PROBLEM STATEMENT:

National Park Service practice for historic battlefields has focused on preserving landscapes that reflect historical events. Many of the park's areas of significant action have changed physically to an extent that interpretation of historic events has become difficult. In order to interpret historic events of the Civil War battles of Richmond, the NPS chooses to restore the natural scenes to their historic appearances.

The general historic scene of the park has changed since the Civil War from natural and human causes. During the Civil War, the parklands were deforested for agricultural and military reasons. Since then much of the park has grown up in secondary growth deciduous forest and is being impinged upon by urban/suburban development.

This secondary forest growth is also responsible for dense tree populations and heavy vegetative undergrowth on the earthworks. These earthworks are easily damaged when large trees are uprooted by storms, displacing large quantities of soil.

As in the general secondary growth succession of the eastern forest, pines are replaced by hardwoods, the dead and dying pines become susceptible to insects and disease. Southern pine bark beetle (Scolytus spp.), root rot (Fomes annosus), fungal decay (Fomes rimosus), stress from drought and competition from hardwoods all increase die-off, particularly of pines. These predisposed pines were attacked by bark beetles in 1983-1984. Also, since before the Civil War, normal fire events have been prevented. This, plus the other mentioned stresses have created many hazardous trees and a heavy, dangerous fuel load condition resulting in severe wildfire danger and in safety hazards to people and equipment.

US Forest Service site inspections in October, 1987, and February, 1988, indicated no gypsy moth egg masses and no current bark beetle infestations. However, Pine Bark Beetle infestations are cyclical and Gypsy Moths have been on the rise in northern Virginia, are moving southward and are on the increase in the area.

Urban encroachment has created a need for forested screens to block the visual intrusion of adjacent development.

Also, the park has maintained semi-open areas at Cold Harbor based on a historic vegetation study and tradition. A few small vistas in other units have been cleared for visitor appreciation.

The park contracted with Virginia Tech to produce a Forest Management Plan. This plan, recently received, recommends actions and methods for establishing and maintaining a healthy forest environment. The report, based on park goals and objectives, recommends methods/techniques for historic scene restoration in identified interpretive zones.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Develop and implement a comprehensive cultural landscape report including sections on forest management, agriculture management, historic landscape restoration, fire and exotic plant control. The plan should also have a detailed section on each park unit.

Continue and augment the current vegetative baseline data inventory and monitoring survey.

Continue vista clearing, hazardous tree and stump removal and scene restoration at Cold Harbor. Refine policies for wood removal, insect/diseased tree removal and exotics. Develop a landscape plan for vegetative screen plantings. Assist management in the development of the park's forest management goals and objectives. Continue to coordinate with the Division of Interpretation to identify interpretive zones and target them for historic scene restoration. Develop action plans and task directives for projects.

A most important objective is to create a healthy and vigorous forested buffer along the perimeter of select park units while opening interiors to reflect the historic scene.

The park must increase awareness of and control of exotic plants that influence cultural landscaping actions or played a role in cultural landscape values.

Even though a cursory survey of the park was made for ETR plants by the Virginia state Dept. of Natural Heritage, a more intensive and park centered reconnaissance is required to determine the status of plants of special concern.

The increased cost, effort and time necessary to conduct professional surveys is off-set by the risk of losing valuable habitat and/or by the inability to make wise, informed choices on park mitigation problems.

Monitoring Actions: Conduct annual inspections for insect and disease infestations. Initiate other monitoring actions as identified in action plans to be developed.

BUDGET AND FTEs:

			-----FUNDED-----	
	Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-OT	MIT	50.00	0.0
Year 2:	PKBASE-OT	MIT	50.00	0.0
Year 3:	PKBASE-OT	MIT	50.00	0.0
Year 4:	PKBASE-OT	MIT	50.00	0.0
Total:			200.00	0.0

			-----UNFUNDED-----	
	Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	CRPP	RES	25.00	0.0
	PKBASE-OT	RES	10.00	0.0
Subtotal:			35.00	0.0
Year 2:	CRPP	RES	25.00	0.0
	PKBASE-OT	RES	10.00	0.0
	PKBASE-OT	MON	4.00	0.1
Subtotal:			39.00	0.1
Year 3:	CRPP	RES	25.00	0.0
	PKBASE-OT	RES	10.00	0.0
	PKBASE-OT	MON	4.00	0.1
Subtotal:			39.00	0.1
Year 4:	CRPP	RES	25.00	0.0
	PKBASE-OT	RES	10.00	0.0
	PKBASE-OT	MON	4.00	0.1
Subtotal:			39.00	0.1
Total:			152.00	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EA NHPA

EXPLANATION:

Proposal Date: 88

PROJECT NUMBER: RICH-I-002.000

TITLE: EARTHWORKS PRESERVATION

FUNDING STATUS: FUNDED: 340.00 UNFUNDED: 3180.00

SERVICEWIDE ISSUES: N08 CULT LANDSCAPE C17 CTRL ENV IMPAC

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER: 170

PROBLEM STATEMENT:

Over 10 miles of earthworks remain within the park. They are a significant cultural resource of the park, which the NPS is responsible for preserving. Historic zones within the park include forts, battery positions and trenches. Many earthworks are overgrown and obscured by trees, briars, ivy and vines while other earthworks are bare and subject to erosion. In some instances it is difficult for a visitor to appreciate them and understand the park story.

The earthworks were constructed to last the duration of the Civil War and even then required continuous repair. The bare soil surface was continuously vulnerable to erosion by wind and water. Natural weathering, vegetative cover, compaction, visitor use, and management practices by the NPS, the State of Virginia and the Battlefield Parks Corporation all have contributed to earthwork erosion. Also, large trees subject to windthrow can cause soil displacement of earthwork sections.

The existing location of trails, parking lots and cannons encourage visitors to walk on the earthworks, causing further damage. Visitors have created impromptu trails up and across the earthworks. This is especially true at Ft. Gilmer, Ft. Greg, Ft. Hoke, Ft. Johnson and Cold Harbor where site design and the placement of cannons draws the visitor to the earthworks where the increased erosion creates barren paths. These bare areas are vulnerable to accelerated erosion from rain and snow. These problems exist at Ft. Harrison, Chickahominy Bluff, Cold Harbor, Parker's Battery and Ft. Darling.

Since 1977, management actions have consisted of removal of limited numbers of large trees from the Fort Harrison and Cold Harbor earthworks. Annually, small trees, shrubs and vines are cut from some earthworks to enhance visitor appreciation. Since there was disagreement and practically no knowledge about the best management practices for preserving earthworks, MARO funded a 1986 study of earthwork preservation problems and management practices at Richmond National Battlefield Park (RICH), Fredericksburg and Spotsylvania National Military Park (FRSP), Petersburg National

Battlefield (PETE) and Colonial National Historical Park (COLO) by Andropogon Associates, Ltd. The results of the study produced an Earthworks Landscape Management Manual which was accepted by MARO in May, 1987. In 1987 and early 1988, Andropogon conducted several field workshops to demonstrate the methods and techniques of earthwork preservation identified in the manual.

For the last several years Andropogon plugs have been planted on the earthworks at Fort Harrison with mixed success in propagation. This plant is deep-rooted and this trait is considered vital in stabilizing earthworks. An integral part of this plan calls for prescribed fire to help fire-adaptive Andropogon become established while eliminating broadleaf and other unwanted vegetation. This part of the procedure has not been completed, due to lack of funding, change of park personnel, policy concerning fire after the Yellowstone fires, lack of appropriate funds and the complex logistics of prescribed burns. The park recognizes the need to establish goals and priorities for earthwork management based on the final results of this study, therefore, these prescribed burns are now essential to ascertain the efficacy of the process.

The results of these procedures will be used to develop a landscape management plan for each of the park units.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Develop a landscape management plan for each unit that identifies the interpretive and preservation objectives for the earthworks within the comprehensive cultural landscape management plan (see PS RICH-C-001.000). Further implement the recommendations of the Earthworks Landscape Management Manual based on park management and interpretive objectives.

Vegetation management:

Complete prescribed burns to carry through with the experiment of Andropogon establishment. Monitor efficacy of fires as a method of vegetation control (Andropogon establishment). Describe specific manipulative vegetation management techniques, meeting natural and cultural compliance guidelines and assign responsibilities. Coordinate planning and procedures with the Vegetation management Plan and the Fire Management plan. Develop action plans and task directives for projects.

Inventory management:

Inventory earthworks outside the park before they are lost. Inventory the park's earthworks. Review historical earthwork inventories for information. Include these data in the GIS. Coordinate and supplement GPS mapping actions with Washington office. Coordinate efforts with MARO cultural resources personnel.

A. Mitigation actions:

Relocate trails to minimize erosion from human causes. Block and/or revegetate impromptu trails.

B. Monitoring actions:

Monitor earthworks based on recommendations of the Earthworks Landscape Management Manual. Also, continue monitoring impromptu trails.

C. Research Actions:

Continue vegetative research plots to determine the best earthwork preservation and maintenance practices.

BUDGET AND FTEs:

			-----FUNDED-----	
	Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	RG-CR-MTN	MIT	60.00	0.0
	PKBASE-OT	MIT	110.00	0.0
		Subtotal:	170.00	0.0
Year 2:	RG-CR-MTN	MIT	60.00	0.0
	PKBASE-OT	MIT	110.00	0.0
		Subtotal:	170.00	0.0
Year 3:				
Year 4:				
		Total:	340.00	0.0

			-----UNFUNDED-----	
	Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-OT	RES	25.00	0.0
	PKBASE-OT	MIT	1000.00	2.0
	PKBASE-OT	MON	10.00	0.0
		Subtotal:	1035.00	2.0
Year 2:	PKBASE-OT	RES	25.00	0.0
	PKBASE-OT	MIT	1000.00	0.0
	PKBASE-OT	MON	10.00	0.2
	PKBASE-OT	INT	10.00	0.1
		Subtotal:	1045.00	0.3
Year 3:	PKBASE-OT	RES	15.00	0.0
	PKBASE-OT	MIT	1000.00	0.0
	PKBASE-OT	MON	10.00	0.2
		Subtotal:	1025.00	0.2
Year 4:	PKBASE-OT	RES	15.00	0.0
	PKBASE-OT	MIT	50.00	0.0
	PKBASE-OT	MON	10.00	0.0
		Subtotal:	75.00	0.0
		Total:	3180.00	2.5

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

A. Stop Action:

This would be counterproductive to the efforts already made. This action would also ignore the preservation mandate the park has concerning its historic sites.

B. Continue Present Action:

The Earthworks Landscape Management Manual has been completed as well as field training in preservation methods and techniques. The four vegetative plots to test Andropogon establishment would still be monitored. Without burns, however, a true test of this procedure will not be possible and its true use unknown. Also, moneys used to date would be wasted. The next step for the park is to develop earthworks landscape goals by unit.

COMPLIANCE CODE(s): NHPA EA

EXPLANATION:

Proposal Date: 93

PROJECT NUMBER: RICH-I-003.000

TITLE: BATTLEFIELD PROTECTION STRATEGIES

FUNDING STATUS: FUNDED: 150.00 UNFUNDED: 520.00

SERVICEWIDE ISSUES: C22 OUT THREATS CR N16 NEAR-PARK DEV

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Recent external changes near the park threaten the park resources, prevent full interpretation of the historic mandate, and minimize visitor education and enjoyment. Development of significant battlefield land unowned by the NPS but part of the history also destroys important resources.

Threats to the integrity of Richmond Civil War Battlefields include development surrounding the park, incompatible land use on the boundary, noise encroachment, visual encroachment, air quality, and water quality are all concerns. The number and severity of threats to the park's historic scene and its natural and cultural resources have accelerated over recent years.

At Beaver Dam Creek upstream development has caused serious erosion and sediment loading of the creek. The buildup of sediment in the creek has caused the creek to overflow its banks and now the character of the area is that of a swamp. The historic millrace pond has been filled in by sediment and part of the millrace cut through. Residential development has impacted the southeast boundary and other developments are planned that will abut the east and west boundaries. At Chickahominy Bluffs a residential subdivision rises on the farm fields to the south and east. Commercial development is sure to follow.

At Cold Harbor, the once rural setting of the NPS's 149 acres is now surrounded by houses that are built on significant battlefield land. At the entrance two new homes are proposed to be built on the farm fields to the east.

At Fort Harrison, over the past ten years, right-of-ways (row's) every 500 feet or so have been used for new homes. Nearby the new I-295 exchange has been constructed along with a new regional waste water treatment plant. Land speculation continues. The once rural setting of this area is slowly changing to a series of subdivisions.

The once secluded Parker's Battery is now surrounded by industrial and commercial development on three sides.

Residential development pressure in the form of applications and building permits has accelerated throughout the area surrounding the park units, especially at Fort Harrison, Garthright House and Cold Harbor. Zoning variances have been granted for property adjacent to Ft. Harrison.

This type of developmental pressure will only increase. Patrol rangers keep a close watch on all external land threats: zoning notices, "for sale" signs, new construction, boundary encroachment, vegetation damage, erosion and off-road vehicle use. Also, they regularly patrol and keep posted all 25 miles of park boundaries.

Concomitant with this pressure is the physical loss of earthworks associated with the developed property. In this manner, miles of historic earthworks have been lost during the last half-century.

In cooperation with MARO Division of Park and Resource Planning, WASO and the National Park Service Advisory Board a draft "Protection and Enhancement Strategy" for the park was developed.

The park realizes that vigilance and cooperation are necessary to achieve goals. At the Garthright House, the Hanover County Planning Commission is developing the surrounding fifty acres as a passive recreation park. Cooperation and mutual planning such as this between the park and county are essential if the interests of the NPS and visitors are to be maximized and the threats of development are to be minimized.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

A. Resource Management Action:

Continue participation and communication with public and private organizations, individuals and neighbors to encourage compatible land use adjoining park boundaries. Appropriate personnel will continue to attend public hearings and communicate with outside developers in order to explain the Service's policies and to express the park's concerns.

Continue cooperation in the development of an area wide adjacent land use plan.

Continue to recognize (research) legal deeded accesses and deny any new or additional accesses or rights-of-way that are detrimental and/or not legally documented.

Continue to review all boundary surveys and where necessary have boundaries resurveyed and monumented.

Continue to minimize, and where feasible eliminate, adverse effects on the park's resources and historic setting resulting from

incompatible and uncontrolled access, utility rights-of-way, vandalism and other conflicting uses and environmental intrusions.

Rewrite, update and re-implement the Land Protection Plan. This plan addresses the issues of legislation, zoning, ROW's, deeded accesses, viewsheds, adjacent land use, boundary study, marking and survey. Develop adjacent lands study.

Where possible and legal the park will seek mitigation of adverse impacts of adjacent developments.

Develop a landscape plan for Beaver Dam Creek to identify present goals and objectives for the unit based on its current condition and to reduce negative impacts.

Identify and implement a planting regimen consistent with the Cultural Landscape Report to screen incompatible developments and views. Improve boundary and neighbor information with GIS. Install in the park GIS a land protection theme to include all park legal descriptions/boundaries, adjoining landowners tax maps and owner information, ROW and special use permits, historic and current vegetation, topography, soils, earthworks, and roads. The GIS will track current and proposed changes to the adjoining parklands. Identify other GIS applications to assist with land protection strategies.

All park personnel should take opportunities available to listen to and educate visitors about park and NPS policy.

Park personnel will monitor all out-of-park actions that could have an effect and review all regulations.

The park will continue present monitoring of zoning notices, for sale signs, new construction, boundary encroachment, and Beaver Dam Creek water/sediment monitoring for potential external threats to the park. These actions, while vigilant on the part of park staff, do not adequately cover and protect the many and widely spread units of the park. Ranger and other staff must be increased, as called for in the GMP.

C. Research Action:

Investigate alternative means of resource protection and/or purchase. Identify growth trends, local and state land use ordinances and laws, land ownership patterns, and real estate interest. Identify research needs to assist with land protection strategies and restoration of damaged resources.

BUDGET AND FTEs:

			-----FUNDED-----	
	Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	TEMP\$-OTH	RES	25.00	0.7
	PKBASE-OT	MON	25.00	0.0
		Subtotal:	50.00	0.7
Year 2:	TEMP\$-OTH	RES	25.00	0.7
	PKBASE-OT	MON	25.00	0.0
		Subtotal:	50.00	0.7
Year 3:	PKBASE-OT	MON	25.00	0.0
Year 4:	PKBASE-OT	MON	25.00	0.0
		Total:	150.00	1.4

			-----UNFUNDED-----	
	Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-OT	RES	60.00	1.0
	CRPP	ADM	150.00	0.0
		Subtotal:	210.00	1.0
Year 2:	PKBASE-OT	RES	60.00	0.0
	CRPP	ADM	150.00	0.0
	TEMP\$-OTH	RES	50.00	0.0
	NRPP	ADM	10.00	0.0
		Subtotal:	270.00	0.0
Year 3:	TEMP\$-OTH	RES	20.00	0.0
Year 4:	TEMP\$-OTH	RES	20.00	0.0
		Total:	520.00	1.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

A. Stop Action:

The park would become a collection of islands surrounded by development. Discontinuing current actions will negate park efforts and ignore MARO and WASO support in bringing the park's concerns to the attention of zoning boards, developers and the public. This would also ignore land protection planning efforts already underway.

B. Continue current action:

The continuation of communication with neighbors will provide the park with some protection, boundary review, and cooperation with outside agencies. Without increased efforts and an updated Land Protection Plan the park's actions will be inefficient and will not yield the best use of moneys, time or personnel. Without purchase ability, the park's property will become more tiny islands within development.

COMPLIANCE CODE(s): NHPA

EXPLANATION:

Proposal Date: 93

PROJECT NUMBER: RICH-I-004.000

TITLE: BOUNDARY CONTROL

FUNDING STATUS: FUNDED: 55.00 UNFUNDED: 70.00

SERVICEWIDE ISSUES: N06 LAND USE PRAC C22 OUT THREATS CR

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Maintain park boundaries.

When established in 1936, the 11 separate units of RBNBP were situated among rural farm lands with sparse population and ownership. Since then, the partitioning of adjoining properties into housing lots and subsequent building have greatly increased the number of park neighbors and have complicated boundary concerns. For example, the narrow Battlefield Park Road (Ft. Harrison unit) has had numerous homes built with associated access. Other units have similar development on or near the boundary. This development with its changing deeds and ownership and the increased possibilities of encroachment, create the need for accurate, timely boundary marking and patrol.

The park currently has 25 miles of boundary and over 200 contiguous neighbors. The boundary is well signed and monumented and a recent survey has been completed. Bordering land owners and hunters are well aware of property lines.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The recommended action is to continue current boundary marking and to continue to remain informed of boundary owner activities and changes of ownership that may affect the park. Regular patrol of boundary and regular contact with park neighbors will continue. The boundary will be inspected and marked, as necessary, on a three year cycle.

BUDGET AND FTEs:

		-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-OT MON	10.00	0.0
Year 2:	PKBASE-OT MON	10.00	0.0
	TEMP\$-OTH MIT	15.00	0.0
	Subtotal:	25.00	0.0
Year 3:	PKBASE-OT MON	10.00	0.0
Year 4:	PKBASE-OT MON	10.00	0.0
	Total:	55.00	0.0

		-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-OT MIT	15.00	0.5
Year 2:	PKBASE-OT MIT	15.00	0.5
Year 3:	PKBASE-OT MIT	15.00	0.0
Year 4:	PKBASE-OT MIT	25.00	1.0
	Total:	70.00	2.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 APP. 7.4 A(3)

Proposal Date: 93

PROJECT NUMBER: RICH-I-005.000

TITLE: LAW ENFORCEMENT FOR RESOURCE PROTECTION

FUNDING STATUS: FUNDED: 160.00 UNFUNDED: 110.00

SERVICEWIDE ISSUES: C20 INADEQ SECURIT N24 OTHER

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Protect resources by conducting law enforcement patrols

Richmond NBP contains a variety of resources subject to use and misuse. The significant cultural resources of the park units along with habitats of forest, field, stream, river and historic landscape combine to provide opportunities for visitors to enjoy the park. This use, if unanticipated and/or excessive, can damage resources. As an example, visitors often unknowingly and/or uncaringly tread on fragile earthworks, causing erosion. The park, often through its own ignorance, has exacerbated this activity by placing parking facilities and such near sensitive areas. In addition, the unlawful activities of poaching, relic hunting and other ARPA violations, and boundary encroachments take their toll on resources.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

All park areas will be patrolled on a regular basis with the frequency of coverage based upon amounts of public use and vulnerability of resources. Adequate personnel must be available to provide coverage for all park areas throughout the day and year. Special conditions, such as seasonal changes in wildlife populations or hunting seasons, will also be taken into account in scheduling patrols. A variety of means will be used to carry out these patrols, with the choice of transport based upon existing conditions. In most cases, patrols conducted for natural resource protection will be concurrent with those to protect cultural resources.

Other activities, such as undercover work and investigations, will be conducted as necessary and adhering to all NPS policy such as NPS 9.

Park management must plan for increased personnel and other suggestions as referenced in the park's Law Enforcement Needs Assessment. Without active and proactive law enforcement to protect the park, significant resource damage will occur.

BUDGET AND FTEs:

		-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-OT MIT	40.00	3.0
Year 2:	PKBASE-OT MIT	40.00	0.0
Year 3:	PKBASE-OT MIT	40.00	0.0
Year 4:	PKBASE-OT MIT	40.00	0.0
		=====	
Total:		160.00	3.0

		-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-OT MIT	60.00	2.0
Year 2:	PKBASE-OT MIT	50.00	1.0
Year 3:			
Year 4:			
		=====	
Total:		110.00	3.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 APP. 2, 1.4

Proposal Date: 88

PROJECT NUMBER: RICH-I-006.000

TITLE: GEOGRAPHICAL INFORMATION SYSTEM

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 240.00

SERVICEWIDE ISSUES: N20 BASELINE DATA C22 OUT THREATS CR

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Park management needs to understand resources, developments and actions that are spatially and chronologically related.

Over the past 45 years the park has collected scores of maps of park buildings, earthworks, trails, utility lines, boundary surveys, topography and soils among others. The maps are too large, at different scales, and themes are not easily related for various operation and management needs. Internal and external influences that change park resources are not easily or accurately recorded. Currently the park must rely upon the above map resource, handmade schematics and data that is located in many different files and locations. The end result is repetitive, time consuming searches, that are only of a limited success for management and operational needs. Often, specific mapped needs cannot be met. The accuracy and ability to analyze and predict changes and trends is not readily available or non existent under the current conditions. Most resource management decisions require the use of maps and drawings, and the ability to relate physical attributes to man-made ones.

The implementation of an automated mapping and display system (i.e. a GIS) could solve many current problems. A GIS can identify park resources and be used to predict possible future trends and conditions. It can quickly and easily retrieve mapped information in different formats, scales and theme combinations. It would provide for calculations of distances, lengths and areas. It can connect mapped information to tabular data. A GIS can create, manage, analyze and display mapped information in a scale or detail needed, from different vantage points (e.g. zooming in). It can create new types of mapped information and analysis from updated themes and data. Changes and trends can be predicted (e.g. fuel load models for fire prediction, bluff erosion, vegetation management and changes in surrounding developments of private lands). Finally, the effects of proposed development can be analyzed.

With the above in mind, the park initiated a Cooperative Agreement with North Carolina State University (NCSU), to produce a park

micro GIS. The park and NCSU have collated eleven themes, digitized this information, selected GIS software and developed a data base for the tabular information. Attributes (themes) were selected and include: boundary, topography, soils, roads, trails, streams, earthworks, buildings/structures, current vegetation, historic vegetation and adjacent land ownership. Digitized information was entered into ATLAS software (revised) and a dBASE tabular base and menu has been developed. Hardware and software has been procured by the park which includes a plotter and a color graphics monitor. The WASO ABDP branch has agreed to put all the above referenced data into GIS. A timeframe has not been established for this. Already the system has been put to use in the adjacent lands issues and new applications identified.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

A. Resource Management Action:

The park will develop a GIS program. The park will use a GIS to achieve a level of understanding not possible without a computer system. This systematic collection of data will be a valuable useful tool for management decision making.

This program will explore and implement a "cluster park concept" in which several parks with similar needs and make up (such as RICH, PETE, APCO, and FRSP) will share GIS responsibilities, at least in the short term. This may entail sharing position(s), equipment, money, and expertise.

The park will make a long term plan in which a permanent GIS position, along with all needed updated computer hardware and software, will be programmed. The park will obtain appropriate training for all pertinent personnel. The due date for this plan will be October 31, 1994 as delineated by the park's operation evaluation of April 4-7, 1994.

The park GIS plan will include:

- tracking external land use, a major element of the GIS program.
- creating maps for park reports and planning documents, the maintenance management system, resource management activities, law enforcement functions, interpretive displays and programs and adjacent lands issues.
- updating current themes as well as identifying and implementing additional attributes/themes with the help of MARO and NCSU. Future attributes may include fuel load models for wildfire prediction, legal and illegal ROW's, ROW's not currently in use and other adjacent lands issues.
- developing a data base system for monitoring actions and

providing in-park updating capabilities with the use of a digitizer.

Park management will seek appropriate expertise (personnel and/or training) and computer software and hardware. The park will develop action plans and task directives for projects. The park will cooperate with WASO and MARO initiatives on GIS data input and other GIS matters.

There are several useful applications for a GIS system with regard to water resources. Mapping of wetlands, floodplains and other sensitive water related features is an important use that can help guide park management and planning. The park will consider additional project statements for wetlands and floodplains after examination of the water resources scoping report now being written. Overlays of developable land, soil erodability, and slope should target those lands most likely to increase sediment loading in park streams, and where the park should be concentrating efforts to raise concerns with local governments. The park will track land uses and developments of the watersheds upstream of the park.

BUDGET AND FTEs:

-----FUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1:

Year 2:

Year 3:

Year 4:

=====

Total: 0.00 0.0

-----UNFUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1: GIS RES 30.00 0.0
 PKBASE-OT ADM 60.00 1.0

Subtotal: 90.00 1.0

Year 2: PKBASE-OT RES 50.00 0.0

Year 3: PKBASE-OT RES 50.00 0.0

Year 4: PKBASE-OT RES 50.00 0.0

=====

Total: 240.00 1.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

A. Stop Action:

This would be counterproductive to the 5 years of work put into the project by the park and NCSU and counter to NPS initiatives. B. Continue Present Action:

The system will combine eleven different themes of mapped information for use in reports, presentations, field work, inventorying and monitoring. Updating will be done in-park. Without further training, updating and planning full benefit of GIS will not be realized.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 APP. 7.4 B(4), 7.4 E(2)

Proposal Date: 89

PROJECT NUMBER: RICH-I-007.000

TITLE: INTEGRATED PEST MANAGEMENT

FUNDING STATUS: FUNDED: 24.00 UNFUNDED: 93.00

SERVICEWIDE ISSUES: C12 PRESERVE MGMT N08 CULT LANDSCAPE

CULTURAL RESOURCE TYPE CODE: CULL

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Pest animals and/or plants, whether native or exotic, can be detrimental to natural and cultural resources and to the visiting public. Minimizing these effects is vital to the integrity of the park.

Since 1980 NPS has used an Integrated Pest Management (IPM) strategy in treating pests. The strict guidelines of NPS IPM programs mandate thorough evaluation of any strategies to address pest problems. When pest identification and monitoring indicates a specified threat level, park management will initiate mechanical, cultural biological and, as last resort, chemical means of controlling pests. Strong efforts are made in devising alternative programs to the use of chemicals, which may have harmful effects upon park ecosystems. These IPM procedures apply to all pest problems in the park.

The Park HQ's at Chimborazo has had active infestations of, and approved treatments for, termite infestations. Termites have been discovered and are being monitored at Fort Harrison maintenance area. Most other park buildings have had approved treatments for roaches and mice. Powder post beetle and old house borer infestations have occurred at Fort Harrison maintenance and the CCC log cabin structures. Topical treatment was conducted on the interior of the log cabin. Follow-up monitoring has observed only minor activity at all structures.

USFS investigations during 1983-84 determined widespread Southern pine bark beetle (SPB) and Fomes annosus problems at many of the parks forested areas. Indications were that the SPB came from outside the park. Some selective wood removal was undertaken at Cold Harbor and Ft. Harrison at the time. However, the park is now left with many dead standing trees. This is discussed more fully in the Forest Management Plan statement.

Gypsy Moth monitoring has been conducted for over 8 years. At present, the trapping levels indicate only minor activity, while the problem of the gypsy moth has increased in other parts of the

state. The park will continue monitoring each summer with USFS support.

In 1985, IPM practices were incorporated into revised special use permits for all agricultural permittees. Past pesticide use had been very minimal. Under the new regulations farmers have decided not to use chemical pesticides. In one case, a farmer changed from grain to vegetable crops which resulted in a greater financial gain. Vegetation problems include: weeds in the parking lots, sidewalks and the brickwork in front of the Watt House; exotic vegetation; resprouting stumps; and trail vegetation. For weeds Glyphosate, a contact systemic herbicide, is used to control leafy vegetation while Triclopyr is used as a cut-stump treatment to prevent resprouting.

In the fall of 1987, a study plot was established at Ft. Harrison to test methods of reducing the impact of honeysuckle on the earthworks. A 9,000 square foot area was treated with Round-Up. Then, 500 grass plugs of Andropogon scoparius were planted. In April, 1988, 8500 square feet of that same area were resprayed with Round-Up and the remainder of the site plugged with grass. This experiment was partially successful in reducing honeysuckle on the short term, but long term results have been negligible. Pests may be divided into two major groups for practical purposes: native species and exotic species. Many of the pests found in the park are native species that exist under natural conditions. Exotic pests are alien species that, if not already impacting environments, may have the capacity to spread rapidly and dominate ecosystems or may have demonstrated this in other similar environments. NPS management policies state these native "pests" should be allowed to exist unimpeded. Exceptions that apply to native pest management at RICH include: 1) protecting natural resources, 2) preserving, maintaining or restoring the historic integrity of cultural resources or 3) protecting human health and safety.

Native and exotic species can each be sub-divided into animal and plant categories.

Native pest plants that can be a problem at RICH include, but are not necessarily limited to, poison ivy, various grasses and forbs and other lawn species conflicting with historic landscape management.

Native pest animals are: deer (overbrowsing), ground hogs (overbrowsing and digging in earthworks), other rodents (mice entering and damaging buildings), structural insects (termite, ant, cockroach, etc., damage in buildings), landscape insects, stinging insects (human safety and health), fall webworms and cicadas (foliage damage), occasional bats trapped in buildings and stinging insects. Other native animals can be pests, as well.

Hazardous animals and wildlife occasionally pose threats to health and safety. In 1987, a rabies outbreak occurred in Chesterfield, Hanover and Henrico counties. Brochures were handed out to employees about rabies and notices were put on visitor bulletin boards.

Exotic pest plants include, but are not limited to, honeysuckle, Ailanthus (Tree of Heaven), Japanese Bunch Grass and Kudzu.

Exotic pest animals include, but are not limited to, Norway rats, house mice, feral dogs and cats, cockroaches, Mediterranean Meal Worms and Gypsy Moths.

The park uses physical means to clear roadside brush. Artifacts and exhibits are examined monthly, and those in the study collection annually for signs of insect and/or rodent damage. If damage is evident, steps outlined in NPS-28 and the Manual For Museums are followed. Prevention of damage by pests must be a high priority if the park is to meet its mandated goals of protection and interpretation. The systematic and scientific management of pests requires full time attention, expertise, long term planning.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Continue full implementation of Integrated Pest Management procedures. The park will develop and implement IPM individual pest action plan strategies. The park will implement WASO-IPM Coordinator recommendations. The park will continue the vegetative study and implement the pigeon action plan. The park will develop a hazardous animal policy and action plans and task directives for projects.

Monitoring of rodents, deer damage, insect infestations and structural and landscape problems will continue. Action plans and distribution maps will be made delineating exotic pest plant distributions.

Once identified as a problem, pest population will be treated following established IPM procedures. Pests can be excluded from protected areas by the use of fencing to exclude deer and ground hogs from vegetation and plugging building holes to stop rodent entry. Ground hogs will be live-trapped and relocated. Cockroach and ant infestations will be minimized by maintaining cleanliness, particularly in food areas. Cockroach infestations will be monitored by sticky trap capture, and, when action population thresholds are reached, control procedures will begin. Termite damage and other structural damage will be monitored by park personnel and/or by contracted professionals on an annual basis, however, cyclical preventative chemical treatment will not be allowed. Where feasible, stinging insects will be prevented from nesting. Extant populations will be treated with approved spray.

The park will apply approved pesticide only. Such methods as hot steam to control sidewalk growth will be used. The park will continue to write and submit pesticide use proposals; maintain and submit pesticide use logs; and conduct and obtain IPM training, as needed. In all pest control, NPS policy will be followed and close communications with MARO and WASO IPM personnel will be maintained.

Expansion of the park's pest monitoring and action programs will insure the safest and healthiest environment for the park's resources, visitors and employees.

Develop action plans per pest, as needed.

Monitoring Action:

Monitor park pest activity. Included in this is the obtaining of equipment and training necessary to accomplish this task.

BUDGET AND FTEs:

			-----FUNDED-----	
	Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-NR	MON	1.00	0.1
	PKBASE-OT	MON	5.00	0.2
		Subtotal:	6.00	0.3
Year 2:	PKBASE-NR	MON	1.00	0.0
	PKBASE-OT	MON	5.00	0.0
		Subtotal:	6.00	0.0
Year 3:	PKBASE-NR	MON	1.00	0.0
	PKBASE-OT	MON	5.00	0.0
		Subtotal:	6.00	0.0
Year 4:	PKBASE-NR	MON	1.00	0.0
	PKBASE-OT	MON	5.00	0.0
		Subtotal:	6.00	0.0
Total:			24.00	0.3
			-----UNFUNDED-----	
	Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	FR-INSECT	MON	2.00	0.0
	PKBASE-NR	MON	10.00	0.0
		Subtotal:	12.00	0.0
Year 2:	PKBASE-NR	MON	5.00	0.0
	FR-INSECT	MON	2.00	0.0
	FR-INSECT	MIT	20.00	0.0
		Subtotal:	27.00	0.0
Year 3:	PKBASE-NR	MON	5.00	0.0
	FR-INSECT	MON	2.00	0.0
	FR-INSECT	MIT	20.00	0.0
		Subtotal:	27.00	0.0
Year 4:	PKBASE-NR	MON	5.00	0.0
	FR-INSECT	MON	2.00	0.0
	FR-INSECT	MIT	20.00	0.0
		Subtotal:	27.00	0.0
Total:			93.00	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

Alternative A (Stop current action).

This action would ignore the damage caused by pests and negate current protection. It would also be against NPS policy and directives.

COMPLIANCE CODE(s): EA NHPA

EXPLANATION:

Proposal Date: 93

TITLE: LANDSCAPE PLANTING AND MAINTENANCE

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 250.00

SERVICEWIDE ISSUES: C11 CULT LAND REPT N16 NEAR-PARK DEV

CULTURAL RESOURCE TYPE CODE: CULL

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The park maintains over 25 acres of roadside grounds along 10 miles of park roads and monitors vegetation along 25.5 miles of boundary. A formal comprehensive Cultural Landscape Report including plans for roadways and critical buffers has never been developed. There exists a need for a professional landscape and maintenance design to manage roadways and vegetative buffers that enhances the cultural and natural scenic values.

The present mowing is accomplished to enhance viewing of the earthworks and to promote turf borders along roadways, retard erosion, and control weeds, brush, and trees. Some woody vegetation is removed from monuments, entrances, vistas, and overlooks on a random schedule each year.

Many areas of park boundary have no vegetative screen from the visual and audio intrusions of modern buildings, auto traffic, and noise pollution. Comprehensive plans for vegetative buffers do not exist. An inventory of critical vistas and scenes is needed in order to plan and mitigate screening of intrusive adjacent land usage.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Prepare and implement approved portions of comprehensive Cultural Landscape Report for all roadways and boundaries. This would help management make efficient and effective decisions and would enable management to study and monitor existing problems. Mowing, landscaping, and planting activities, in relation to short- and long-term needs, would be analyzed. Work plans would be developed, implemented, and evaluated. This would help to improve overall visual quality of park roads and boundaries while enabling management to better manage these developed areas. Preparation of the plan would be by the regional office, private landscape firm or the park. Contractors and park interpretive staff would oversee all design work to work out solutions to the inherent conflicts of present-day aesthetics with the actual 1860's appearance.

A comprehensive monitoring program will focus on the condition of resources and the detection of natural and human influences over time.

Research would analyze the current planting composition and species associations in relation to the intent of the landscape plan. Areas of special concern include park entrances, roadways, vistas, proposed construction of new park facilities, and critical buffers from intrusions of adjacent land usage.

BUDGET AND FTEs:

-----FUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1:

Year 2:

Year 3:

Year 4:

=====

Total: 0.00 0.0

-----UNFUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1: RG-REG-MT MIT 25.00 1.0
 PKBASE-OT MIT 40.00 0.0

Subtotal: 65.00 1.0

Year 2: RG-REG-MT MIT 25.00 0.0
 PKBASE-OT MIT 50.00 1.0

Subtotal: 75.00 1.0

Year 3: PKBASE-OT MIT 50.00 0.0

Year 4: PKBASE-OT MIT 60.00 1.0

=====

Total: 250.00 3.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

No Action:

Under this alternative an analysis and proper evaluation of the sites would be nonexistent. Problems of traffic control where vehicles have caused damage to turf on road shoulders and turn-arounds will continue. There has not been a study that would integrate the various functional uses of plants, for example, as barriers to autos, to improve aesthetic values, for screening, and to maintain vistas of battlefields.

Continue Present Management:

Management will continue to remove and plant vegetation on a case-by-case basis.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 APP. 7.4 E(2)

Proposal Date: 89

PROJECT NUMBER: RICH-I-009.000

TITLE: TRAILS MANAGEMENT

FUNDING STATUS: FUNDED: 116.00 UNFUNDED: 320.00

SERVICEWIDE ISSUES: N22 VIS USE-DEV ZN C18 CTRL VIS IMPAC

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Management objectives for the park include providing visitor facilities which support interpretive experiences in a manner which is compatible with preservation of the park's historic resources. To that end, the park provides to the visitor and maintains 3.45 miles of trails located in five of the ten park units.

However, the existing trail design in some of these units results in erosion to the earthworks because the trail runs along the crest of the earthworks. Other trails are located adjacent to the earthworks and direct visitor attention and activity onto them. Some parking areas and interpretive facilities are adjacent to earthworks and encourage impromptu trails. Visitors have worn paths up and onto the earthworks. In turn, erosion of the earthworks is accelerated. These problems currently exist at Fort Harrison, Chickahominy Bluffs, Cold Harbor and Drewry's Bluff.

In 1985 the park relocated the impromptu trail from the earthworks at Chickahominy Bluffs. Vegetation has partially returned to the earthworks, and most visitors are using the trail that parallels the earthworks. However, additional site design needs to be accomplished to get the visitor from the parking lot or the interpretive facility to the trail. Also, several impromptu trails emanate from the overlook.

At Ft. Harrison, the fort trail was successfully relocated off the earthwork. Impromptu trails exist at all the fortifications of this unit.

At Drewry's Bluff the trail is maintained on top of the earthwork. Impromptu trails are located between the fort and the river trail and along the bluff edge down to the river. Because the river trail was in dire need of repair and because of the potential for serious injury from a fall on the steep grade, the trail was removed in February, 1988.

At Cold Harbor, the trail was relocated in 1987 from where it passed through wet areas or where it crossed over the earthworks. Now the trail moves around the earthworks and has been relocated to

higher elevations. New trails here are being constructed under concepts and procedures delineated in the Earthwork Landscape Management Manual. New trails planned at Malvern Hill are in compliance with all compliance policy. They are carefully planned to evolve with scene restoration.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

A. Resource Management Actions:

Continue with present trail relocation and planning efforts at Drewry's Bluff. Coordinate and implement the Earthworks Landscape Management Manual recommendations for revegetation (as portions of the comprehensive Cultural Landscape Report). Assist management with neighbor contacts at Fort Harrison. Coordinate with Division of Interpretation for trail relocation and signing. Construct vegetative or other barriers needed to discourage impromptu trail walking and reduce the inherent erosion.

As described in project statement RICH-I-002.000, Earthwork Preservation, a Cultural Landscape Report needs to be developed (for each unit) to address these concerns. At the minimum, these impromptu trails need to be obliterated and rehabilitated using the methods and techniques of the Earthworks Landscape Management Manual.

Develop action plans and task directives for projects.

B. Monitoring Actions:

Continue monitoring for new impromptu trails parkwide.

C. Research Actions:

Conduct historic site research of Ft. Darling, and other areas as needed, to assist with trail relocation.

BUDGET AND FTEs:

		-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-OT MIT	20.00	0.0
	PKBASE-NR MIT	9.00	0.0
	Subtotal:	29.00	0.0
Year 2:	PKBASE-OT MIT	20.00	0.0
	PKBASE-NR MIT	9.00	0.0
	Subtotal:	29.00	0.0
Year 3:	PKBASE-OT MIT	20.00	0.0
	PKBASE-NR MIT	9.00	0.0
	Subtotal:	29.00	0.0
Year 4:	PKBASE-OT MIT	20.00	0.0
	PKBASE-OT MIT	9.00	0.0
	Subtotal:	29.00	0.0
	Total:	116.00	0.0

		-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-OT MIT	80.00	2.0
Year 2:	PKBASE-OT MIT	80.00	0.0
Year 3:	PKBASE-OT MIT	80.00	2.0
Year 4:	PKBASE-OT MIT	80.00	0.0
	Total:	320.00	4.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

A. Stop Action:

This action would be counterproductive to the actions taken to relocate the trail at Cold Harbor and Chickahominy Bluffs. It would also ignore the impromptu trail erosion problems at Drewry's Bluff, Ft. Harrison and Chickahominy Bluffs. Implementation of the Earthworks Landscape Management Manual would not take place.

B. Continue Present Action:

Would proceed with planning efforts for trail relocation.

COMPLIANCE CODE(s): NHPA EA

EXPLANATION:

Proposal Date: 93

PROJECT NUMBER: RICH-I-010.000

TITLE: SPECIAL USE MANAGEMENT

FUNDING STATUS: FUNDED: 20.00 UNFUNDED: 45.00

SERVICEWIDE ISSUES: N22 VIS USE-DEV ZN C18 CTRL VIS IMPAC

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Manage special uses in accordance with NPS mandated goals and policies in order to protect the historic and environmental integrity of the park.

Numerous special use corridors cross the park. There are currently two agricultural special uses. Park management has been diligent in communicating NPS concerns and requirements to special use groups and, although an occasional question does arise, the park currently has a satisfactory special use operation.

Presently, the park has special historic events that require groups to obtain special use permits or sign as volunteers. Occasionally, permits for collecting or filming are administered. The park is advising all operators of restrictions or special conditions on their activities before action.

The agricultural leases reduce maintenance costs by preserving the historic scene and by keeping the farm fields open and maintained. Historically grown crops such as corn, wheat, oats, and grasses are allowed to be cultivated. Non-historical soybeans and alfalfa are allowed to be grown and raised in areas where park staff determine that these agricultural efforts will not conflict with interpretive themes and are necessary for good farming practices.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The current SUP Program is recommended. The continuation of current action will maintain open communication with special use operators which will be the best way to assure compliance and cooperation. The park will maintain close communication with and awareness of neighboring actions that could potentially effect it. All Special Use Permits will be modified and maintained under current NPS 53 guidelines.

The primary objective of the park, as stated in the General Management Plan, is to restore wherever possible the historic scene as it existed during the battles of the 1860s. The SUP program offers a low-cost long-range-technique of maintaining the historic

scene in perpetuity. Permits will be monitored for historical appropriateness. Conflicts may arise between modern farming techniques and the 19th-century setting, but an acceptable compromise is absolutely necessary to preserve the historic setting.

This program may see a moderate increase as new scene restoration areas are established. The farmers may be required to pay modest fees, but in return would be required to meet stringent special use requirements necessary to maintain "Minimum Impact Sustainable Agriculture".

There may be conflicts between the SUP program and the restoration of the historic scene of the 1860s. Modern farming methods and soil conservation techniques require practices such as strip cropping, contour plowing, and crop rotation. These farming practices must be employed to assure the maximum soil protection and perpetuation of natural resources. The park's cultural resource staff will review all SUP's and offer recommendations for mitigation of issues affecting the protection of cultural resources and the historic scene.

Although historic crops planted in the fields are desirable from the interpretive point of view, soil erosion, and pesticide use have become major concerns.

For the modern farmer to remain profitable, he may have to use limited amounts of pesticides to control pests. Good farming practices and the implementation of a Integrated Pest Management program will reduce the dependency on chemical treatment. Monitoring for historical appropriateness and for pests damage and pesticide use is needed.

BUDGET AND FTES:

-----FUNDED-----				
Source	Act Type	Budget (\$1000s)	FTES	
Year 1:	PKBASE-OT MON	5.00	0.0	
Year 2:	PKBASE-OT MON	5.00	0.0	
Year 3:	PKBASE-OT MON	5.00	0.0	
Year 4:	PKBASE-OT MON	5.00	0.0	
		=====		
Total:		20.00	0.0	

-----UNFUNDED-----				
Source	Act Type	Budget (\$1000s)	FTES	
Year 1:	PKBASE-OT MON	15.00	0.0	
Year 2:	PKBASE-OT MON	15.00	0.0	
Year 3:				
Year 4:	PKBASE-OT MON	15.00	0.0	
		=====		
Total:		45.00	0.0	

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

Stop Current Action:

If the use of modern farming and conservation methods stopped through discontinuation of SUP's, the level of soil erosion and deterioration of water quality would violate NPS standards and guidelines. The park's maintenance crew would become responsible for farming historic open areas, or these services contracted, both expensive procedures. If farming is stopped, these lands would revert to second growth forest. This alternative would not meet the mandates of park objectives to maintain the cultural scene present during the 1860's battles.

Implement 1860's Farming Method:

The use of 19th-century farming equipment and methods is cost prohibitive and destructive to soil and water resources. This alternative would violate the provisions of the Chesapeake Bay Act, "to reduce soil erosion and its impacts on the water quality of Bay tributaries.

COMPLIANCE CODE(s): NHPA EA

EXPLANATION:

Proposal Date: 93

PROJECT NUMBER: RICH-I-011.000

TITLE: INTERPRET CRITICAL RESOURCE ISSUES

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 30.00

SERVICEWIDE ISSUES: N07 NAT FIRE REGM C26 OTHER

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Visitors to Richmond NBP need to be informed of critical natural resource issues facing the National Park System and the park.

Currently, interpretive emphasis is on the historical significance of the park resources. Little attention has been given to interpreting the natural resource issues of the park or of servicewide issues. This interpretation will become more important to explain to visitors as such mitigation efforts as prescribed fires are undertaken.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The recommended action is to develop special emphasis interpretive programs to inform the visiting public about critical resource management issues.

Key issues needing explanation are human impact on the environment, the regeneration of vegetation, vegetation management, integrated pest management actions and wildlife management. For example, visitors and neighbors often do not understand why the National Park Service actively removes a seemingly pretty exotic plant such as honeysuckle and yet does not attempt to completely eradicate Gypsy Moth infestations. Interpreting our actions and explaining our policies is crucial to maintain public support.

BUDGET AND FTES:

		-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTES
Year 1:			
Year 2:			
Year 3:			
Year 4:			
		=====	
Total:		0.00	0.0

		-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTES
Year 1:	PKBASE-OT INT	10.00	0.0
Year 2:	PKBASE-OT INT	10.00	0.0
Year 3:	PKBASE-OT INT	10.00	0.0
Year 4:			
		=====	
Total:		30.00	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 APP. 7.4 B(3)

Proposal Date: 93

PROJECT NUMBER: RICH-I-012.000

TITLE: RECREATIONAL USE OF NATURAL AND CULTURAL AREAS

FUNDING STATUS: FUNDED: 38.00 UNFUNDED: 10.00

SERVICEWIDE ISSUES: N08 CULT LANDSCAPE C18 CTRL VIS IMPAC

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Manage recreational use of the park to provide for visitor activities and to protect natural resources.

The park offers some recreational activities. There are several miles of easy hiking trails and a picnic area. The trails traverse field and forest and usually depict historically significant events in keeping with the park's interpretive theme.

Currently, park outlay of personnel commitments to trail maintenance is minimal, primarily committed to keeping the trails functional; clearing, mowing and marking. Motorized vehicles are restricted to the park roads open to the public.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Continue to provide and monitor the minimum recreational opportunities as they exist now. New trails developed to better interpret historic events will have recreation as a minor emphasis.

Initiate activities that will develop trail systems which minimize impacts upon the natural resources of the park and provide for visitor safety within the National Park Service guidelines.

Current and projected recreational uses of park lands will be evaluated and formal park policies will be developed to address these uses. Natural use areas will be monitored and actions initiated to mitigate any degradation of these resources.

BUDGET AND FTEs:

		-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-OT PRO	8.00	2.0
Year 2:	PKBASE-OT PRO	9.00	0.0
Year 3:	PKBASE-OT PRO	10.00	0.0
Year 4:	PKBASE-OT PRO	11.00	0.0
		=====	
Total:		38.00	2.0

		-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	PKBASE-NR ADM	5.00	0.0
Year 2:			
Year 3:	PKBASE-NR ADM	5.00	0.0
Year 4:			
		=====	
Total:		10.00	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

Stop current action

Visitor use of the natural aspects of the park area will be haphazard and undirected. Safety of users will be neglected and the trails will deteriorate and become unusable for the majority of park visitors. Local and regional park visitors who are repeat visitors may stop coming to the park. Public perception of management of park resources may become negative.

Continue current action:

Under this alternative the park will continue to focus on the historical aspects of the park and expend minimum budgetary outlays on trail system improvement and expansion. Safety concerns will continue to be addressed by park personnel.

COMPLIANCE CODE(s): EXCL 106

EXPLANATION: 516 DM6 APP. 7.4 C(3)

Proposal Date: 89

PROJECT NUMBER: RICH-N-001.000

TITLE: DREWRY'S BLUFF EROSION MITIGATION

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 6065.00

SERVICEWIDE ISSUES: N20 BASELINE DATA N08 CULT LANDSCAPE

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER: 167

PROBLEM STATEMENT:

The eroding face of Drewry's Bluff is undercutting the remains of Fort Darling. The park needs a plan to stabilize the slope before the entire site is lost.

Drewry's Bluff, an eroding clay-gravel bluff 90 feet above the James River, is the site of Fort Darling. Built by the Confederates in 1862 it denied Union forces access to Richmond via the James River.

The bluff is rapidly eroding away. Ironically, the natural eroding processes that made this steep slope an attractive defensive position continue and threaten to destroy the fort. Civil War photographs indicate erosion losses of up to about 100 feet since 1862, or, an annual loss averaging 9 to 12 inches. Gun emplacements, parapet, a ditch and the base of the forts' outer wall are eroding away into the James River. Ultimately erosion will destroy the fortification and visitor overlook. Any erosion now destroys some of the fort. One catastrophic hurricane-induced flood combined with normal freeze-thaw cycles and wave action from ship traffic will destroy significant portions of the site. This may not happen within a century or it may happen now.

The bluff, itself, runs along the James River for approximately 1000 feet. Situated on the outside bend of the river, the bluff receives the full force of the strong currents at flood stage and from daily river traffic. The bluff slopes vary from concave to vertical. Vegetation on the bluff consists of landslide areas of locust, Virginia pine, poplar and red oak. No vegetation exists on vertical slopes. A number of large trees (red oak and loblolly pine) that stand on the rim of the bluff are undermined.

The soils of the bluff are Coastal Plain loamy and clay sediments. The surface soils range from sandy loam to clay loam, 6 to 20 inches thick. The stratified subsoils vary from loose to firm sands to clay. The soils are unstable in the deep cuts because of the stratified sediments, thus adding difficulty to erosion control. The instability of the soils, slope, lack of vegetation, rainstorms, geomorphology of the bluff and the river itself

contribute to the problem. Furthermore, use of impromptu visitor trails from the bluff overlook down the steep bank to the rivers edge causes displacement of soils.

Unless some action is taken to minimize this erosion, the park can expect to lose portions of the bluff, the overlook and the outer wall of the fort.

The solution is not a simple one. In 1970, a Project Construction Proposal in the amount of \$1,220,000 to repair and stabilize about 100 feet of this bluff was approved but never programmed. In 1975, a safety fence was constructed across the length of the bluff to prevent visitors from getting too close to the bluff edge but the fence was built too low and is easily jumped. In 1976, the Soil Conservation Service undertook a study of the bluff and recommended that a massive freestanding structure of rip-rap be constructed at the base of the bluff. But it was an expensive, complicated solution. In March 1987, MARO and WASO-WRD coordinated a bluff erosion study with COLO, PETE and RICH. Alternatives were discussed and only general, possible solutions offered. The cost of full stabilization was placed at several million dollars. A recent (1991) engineering study conducted by Virginia Geotechnical services and reviewed by Schnabel Engineering Associates reports on the geomorphology of the Bluff and gives expensive (\$5 - 7 million) engineering alternatives for stabilization. There is disagreement between these two firms on the main cause of erosion. VA Geotechnical holds that the river is the primary culprit while Schnabel feels the normal freeze-thaw weathering cycle is the problem. An independent review of this report coupled with site visits by U.S. Army Corps of Engineers personnel supported Schnabel's views. Furthermore, the Corps emphasized the logistical difficulties of construction in such things as placement of cranes for lifting heavy concrete, etc.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

A. Resource Management Actions:

Develop a comprehensive, workable plan for this problem. Assist management in identifying the goals and objectives for Drewry's Bluff. Re-examine the recommendations of the bluff erosion conference. Fund soil bioengineering study. Explore any and all new concepts, procedures and expertise available. Obtain all clearances necessary, such as Section 106 and Environmental Assessment. This plan will be a decision making tool for determining whether the government will undertake the large expence of stabilizing the slope, or accepting the loss of the historic site.

Make all administrators and NPS personnel aware of the problems, the results of inaction and the anticipated costs. The concept of "pay a little now or a lot latter" applies.

Concrete, immediate actions to consider are:

- Revegetate areas of recent sloughing.
- Remove trees on the top of the bluff that have the potential for windthrow.
- Reshape actively eroding sections at the top of the bluff to decrease the angle of the slope, if such action will not significantly cut into the fort structure.
- Revegetate bare areas on bluff face.
- Raise and extend the safety fence as a further deterrent to visitor access to the bluff.
- Revegetate and bar impromptu paths around cannon, overlook and down to river.
- These actions can be only considered stop gap measures and those providing funding should not expect a long term solution.

B. Monitoring Actions:

Continue visual monitoring of impromptu trails and erosion paths on the bluff face and along the rim. Develop a fixed-point measurement system to monitor soil loss from the bluff crest. Identify areas of sloughing for revegetation at the appropriate time. Begin photographing the bluff from the river and other identified locations to record the progress of erosion and gather any historical photographs of the bluff.

C. Research Actions:

Fund a soil bioengineering study. Conduct a historic research study to reconstruct the bluffs condition during the Civil War and changes since then.

BUDGET AND FTEs:

-----FUNDED-----			
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:			
Year 2:			
Year 3:			
Year 4:			
Total:		0.00	0.0
-----UNFUNDED-----			
Source	Act Type	Budget (\$1000s)	FTEs
Year 1:	CRPP RES	15.00	0.0
	RG-RM-NAT ADM	5.00	0.0
Subtotal:		20.00	0.0
Year 2:	LUMP\$-CON MIT	2000.00	0.0
	CRPP RES	10.00	0.0
	RG-RM-NAT ADM	5.00	0.0
Subtotal:		2015.00	0.0
Year 3:	LUMP\$-CON MIT	2000.00	0.0
	CRPP MON	10.00	0.0
	RG-RM-NAT ADM	5.00	0.0
Subtotal:		2015.00	0.0
Year 4:	LUMP\$-CON MIT	2000.00	0.0
	CRPP MON	10.00	0.0
	RG-RM-NAT ADM	5.00	0.0
Subtotal:		2015.00	0.0
Total:		6065.00	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

A. Stop Action:

This alternative would surely see the bluff continue to erode with a catastrophic collapse inevitable. The Fort's historical integrity would be destroyed. The park would not be able to preserve, protect and interpret this site as mandated by law and policy. Recognizing that erosion is inevitable this alternative would be the cheapest one in cost but the most expensive in loss of history and interpretation. The stoppage of visitor access control would expose people to increasing hazards.

B. Continue Present Action:

Following through with the recommendations of the bluff erosion conference, examination of soil bioengineering applications and conducting an unit wide trail and earthwork management study would be steps in gathering information on Bluff stabilization. Continuation of visitor access control will keep visitors as safe as possible. The cost of further study is a problem; the park cannot afford to support any such from its base.

C. Interpretation of the process

The Bluff does offer an unique, dramatic as well as excellent opportunity to describe and interpret the natural occurrence of erosion. This could be done at little expense, but, again, the loss of the Bluff would mean the loss of a significant historic site.

COMPLIANCE CODE(s): NHPA EA

EXPLANATION:

Proposal Date: 93

PROJECT NUMBER: RICH-N-002.000

TITLE: HAZARDOUS TREE REMOVAL

FUNDING STATUS: FUNDED: 16.00 UNFUNDED: 375.00

SERVICEWIDE ISSUES: N22 VIS USE-DEV ZN N24 OTHER

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

There are a number of areas within the park where trees pose a special risk to personal safety and property. These include roads, trails, and public use areas such as wayside exhibits, picnic areas, and the grounds of visitor centers. Trees prone to failure are not always easily recognizable and may appear to be healthy by outward indications. The Service has a responsibility to make reasonable provisions to protect visitors from identifiable hazards without unduly manipulating the natural environment.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Write and implement Hazard Tree Management Plan. This plan sets specific standards of safety and management for different zones within the park. A comprehensive systematic inventory system will be implemented. This system will enable the park to stay in compliance with all NPS guidelines and standards.

Maintenance, Ranger and Resources Management staff will perform routine, scheduled inspections of all visitor use areas to identify potential hazard trees. Park boundaries adjacent to private homes would be inspected once a year to prevent possible property damage. Structural indicators of tree decline will be examined and the level of hazard documented.

All personnel assigned hazard tree control duties would receive training in hazard tree identification and removal treatment techniques.

BUDGET AND FTEs:

-----FUNDED-----		
Source	Act Type	Budget (\$1000s) FTEs
Year 1:	PKBASE-OT MIT	4.00 1.0
Year 2:	PKBASE-OT MIT	4.00 0.0
Year 3:	PKBASE-OT MIT	4.00 0.0
Year 4:	PKBASE-OT MIT	4.00 0.0
Total:		=====
		16.00 1.0

-----UNFUNDED-----		
Source	Act Type	Budget (\$1000s) FTEs
Year 1:	PKBASE-OT MIT	200.00 3.0
Year 2:	PKBASE-OT MIT	100.00 1.0
Year 3:	PKBASE-OT MIT	50.00 0.5
Year 4:	PKBASE-OT MIT	25.00 0.3
Total:		=====
		375.00 4.8

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

No Action:

This alternative is unacceptable due to the potential of visitor and employee injury from a hazardous tree.

Continue Present Management:

Not all potential tree hazards would be identified. Observation would continue and work would be conducted on a regular but insufficient basis. The potential of hazardous tree injury and tort claims would be increased. Some trees that are not hazardous could also be removed simply at the discretion of tree crews, thus potentially removing important buffers or valuable wildlife habitat.

COMPLIANCE CODE(s): EXCL 106

EXPLANATION: 516 DM6 APP. 7.4 E(2)

Proposal Date: 89

PROJECT NUMBER: RICH-N-003.000

TITLE: FIRE MANAGEMENT

FUNDING STATUS: FUNDED: 20.00 UNFUNDED: 65.00

SERVICEWIDE ISSUES: N08 CULT LANDSCAPE N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Manage wildfire and structural fire programs.

When park lands were acquired in the 1930s and 1940s few attempts were made to maintain the historic scene or a healthy forest environment. Most of the historic farmland and meadows are now overgrown with dense vegetation. This makes it difficult for a visitor to appreciate and understand the park story. Occasionally, however, the dense vegetation creates a desirable screen from outside incompatible developments.

Competition among the hardwood and coniferous trees creates stress in the pines as the hardwoods begin to outcompete and replace them in normal succession. Pines then become susceptible to insect infestations, disease and fire. Because of the pine bark beetle infestations of the early 1980s, many pines have died off and many more have succumbed to natural mortality. These, coupled with the suppression of, and lack of, normal fire incidents have increased the fire fuel load to dangerous levels. Many of these trees now pose a serious threat to public safety, also. Some areas, especially Cold Harbor, are wildfire holocausts waiting to happen. Until these areas burn under controlled conditions or the wood removed mechanically they will pose a serious management situation.

The potential for wildland fire is complicated by RBNP's eleven separate units. The terrain is about half forest and half field. The forest stands are secondary growth eastern deciduous with age about 50/60 years. The region experiences a spring and fall fire season although no park fire incidents have been recorded in recent history.

The park contains two major historic structures, one historic cabin, two residences, and one maintenance building/complex. None has fire suppression systems. The Watt House and the Garthright House have alarm systems the others do not. These systems alert NPS personnel and the local volunteer fire department.

Currently the burden of fire suppression is placed on the local volunteer fire department with support on wildland fires coming

from the Virginia State Department of Forestry. Understandings with the local fire departments and the state are vital to park protection. The park maintains fire suppression equipment and a ten person fire cache, but because there are few trained and eligible staff, suppression of wildland fires are limited to initial attacks.

The potential behavior and effects of wildland fire on park resources are unknown. The current policy of total suppression may be difficult to enact immediately in the event of fire due to limitations of training and organization. It may be difficult to contain fires within park boundaries because of the small size and numerous neighbors of the park. Occupancy of park residences by rangers would allow for quick response to fire emergencies.

Present management activities have concentrated on the removal of hazardous trees from high visitor use areas, and the clearing back of underbrush from the primary earthworks at Ft. Harrison, Ft. Brady, Ft. Hoke and Cold Harbor. This is a labor intensive effort; even with the help of volunteers most of the vegetation returns within a year.

Fire is a component of the natural process and can be an effective and inexpensive means of controlling vegetation. Prescribed burning may be used to create narrow fuel breaks along park boundaries thereby reducing the probability of wildfires crossing into or out of the park. Prescribed burning may be used to recreate or perpetuate a historic setting, reduce exotic or unwanted vegetation, provide nutrients for desirable vegetation, reduce hazardous fuels, reduce insects or to attain other resources management objectives. In developed zones, it may be used to replace high energy consumption practices such as mowing, brush cutting and chemical control of vegetation. The use of fire should be an integral part of the Forest Management Plan, Earthwork Vegetation Management and Integrated Pest Management. Therefore, a fire management plan is needed to provide direction for prescription burns to reduce hazardous fuels, control vegetative growth and assist in historic scene restoration.

To this end, arrangements were made with MARO for the development of a fire management plan. VA Tech was contracted for fire fuel analysis and fire history documentation. A draft fire management plan is being written. It will require review and additional information before being submitted to MARO and BIFC for approval.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

A. Resource Management Actions:

Develop a Fire Management Plan: review draft fire management plan and submit it to MARO and the National Interagency Fire Center for approvals. Park staff, NPS personnel, Virginia Division of Forestry

and local fire departments will implement the plan. Good communications with local fire fighting units will insure the maximum utilization of their capabilities. Joint firefighting practices will allow park personnel to be better prepared and promote a greater sense of cooperation. Fire suppression needs should be identified and training funds and time allocated to meet these perceived needs. Eligible staff should be adequately trained and fire drills routinely performed.

Any new buildings should have fire alarm systems and sprinkler systems. Sprinkler systems should be retro-fitted in all buildings not now having them, if feasible. Such systems, and fireproof safes, are needed to protect the park's curatorial collection which is now housed in unprotected areas.

Continue present actions of hazard tree removal, vista clearing and vegetation control. Investigate use of prescribed burn to manipulate vegetation to meet management objectives. Develop prescription burn plans for Cold Harbor and the Ft. Harrison vegetative test plot. Identify other areas where prescription burns can be used. Develop action plans and task directives for projects.

B. Monitoring Actions:

Conduct biological monitoring on the effects of the prescribed burns, if they meet park goals, implement recommendations for additional burns.

C. Research Actions:

Research the different types of burns to decide the correct prescription to accomplish the objectives of the Earthworks Management Manual and proposed Forest Management Plan.

BUDGET AND FTEs:

			-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs	
Year 1:	PKBASE-OT MIT	5.00	0.0	
Year 2:	PKBASE-OT MIT	5.00	0.0	
Year 3:	PKBASE-OT MIT	5.00	0.0	
Year 4:	PKBASE-OT MIT	5.00	0.0	
		=====		
Total:		20.00	0.0	

			-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs	
Year 1:	REG-OTHER MIT	20.00	0.0	
Year 2:	REG-OTHER MIT	15.00	0.0	
Year 3:	REG-OTHER MIT	15.00	0.0	
Year 4:	REG-OTHER MIT	15.00	0.0	
		=====		
Total:		65.00	0.0	

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

A. No action

Discontinuation of pre-fire suppression activities is not a reasonable alternative. NPS-28 dictates that all historic structures be protected by fire detection and fire suppression systems unless economically unfeasible.

This choice would continue to ignore the serious hazard fuel buildup in various units of the park. It would also fail to recognize a more cost-effective, less labor intensive means of vegetation management and it would ignore the decline of visitor appreciation of the resource.

B. Continue Present Action:

The effectiveness of current suppression efforts relies on the response and cooperation of outside groups. Since, in some cases, the arrival time of the nearest fire department is a function of the arrival of the volunteers it may be reasonably assumed that some of the park buildings are susceptible to fire damage.

Current park policy is to suppress all wildfires and this will continue. Current practices of removing hazardous trees and physically removing vegetative growth from earthworks is time and effort consuming. Current staffing is insufficient to correct the problem. Without the re-establishment of the normal fire regime, fuel loading will continue to create extreme fire hazards.

COMPLIANCE CODE(s): EA NHPA

EXPLANATION:

Proposal Date: 93

PROJECT NUMBER: RICH-N-004.000

TITLE: WETLAND ECOSYSTEMS MANAGEMENT

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 65.00

SERVICEWIDE ISSUES: N06 LAND USE PRAC N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: CULL

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Interpreting the historic scene while protecting wetlands requires a coordinated planning effort.

Wetlands are among the most biologically productive ecosystems and provide habitat for many numbers and species of flora and fauna. Furthermore, because they contain approximately 35% of listed rare, threatened or endangered species, they are even more valuable as sources of food, nesting, breeding, or other habitat requirements. Wetlands also provide a number of other important functions including: floodpeak reduction, water quality improvement by filtration, ground water recharge, reduction of pesticide runoff, shoreline stabilization and filtration of sediment.

The term "wetland" encompasses a broad variety of ecotypes including marshes, estuaries, bogs, fens, swamps, and bottomland hardwood forests. Some wetlands are saturated with water only for a brief period during the growing seasons, which often makes their identification difficult to the casual observer.

Less than 45% of an original 200 million wetland acres now remain in the continental U.S. NPS guidelines for implementation of Executive Order 11988 (Floodplain Management) and Executive Order 11990 (Protection of Wetlands) directs the Service to avoid the long- and short-term adverse impacts associated with the modification of floodplains and the destruction or modification of wetlands. It also directs the NPS to improve and coordinate research, plans, programs and actions involving wetlands.

Further protection of wetlands has been mandated by the State of Virginia with passage of the Chesapeake Bay Act and by the NPS entering into agreement.

Parkland meeting the Federal Manual (1989) criteria defining wetlands exist in or near areas proposed for future scene restorations.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Delineate wetlands and provide for protection and/or mitigation: Review and implement the Wetlands Management Guide in preparation by VA Tech now. A comprehensive inventory and delineation of areas meeting the Federal Manual's criteria of wetlands will be undertaken. This is fundamental in making sound management decisions and would also allow for consideration of wetland values while achieving the overall objective of historic scene preservation and interpretation. If such an inventory is not undertaken an evaluation of each project on a site-by-site basis will be necessary to determine if the area includes a wetland.

The baseline information provided by such a comprehensive survey would greatly facilitate park planning, particularly if coordinated in a GIS. The proposed survey would produce a map which clearly delineates all wetlands within the park according to the Federal Manual Standards and unnecessary impacts could be avoided while assuring compliance. Another consequence of not undertaking this action and continuing with scene restoration in wetlands would be to place us out of compliance with the Clean Water Act and subject us to lawsuit or enforcement action by the U. S. Army Corps of Engineers.

BUDGET AND FTEs:

-----FUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1:

Year 2:

Year 3:

Year 4:

=====

Total:	0.00	0.0
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-----UNFUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1:	RG-NS-RES RES	5.00	0.0
	WATER-RES MIT	30.00	0.0

Subtotal:	35.00	0.0
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Year 2:	PKBASE-NR MON	5.00	0.2
	WATER-RES MIT	15.00	0.0

Subtotal:	20.00	0.2
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Year 3:	PKBASE-NR MON	5.00	0.0
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Year 4:	PKBASE-NR MON	5.00	0.0
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Total:	65.00	0.2
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(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

No Action:

Scene restoration efforts would continue, but sensitive wetland areas might be overlooked. This could unnecessarily impact wildlife habitat, increase erosion and produce many other untenable environmental consequences.

COMPLIANCE CODE(s): EA 106

EXPLANATION:

Proposal Date: 93

PROJECT NUMBER: RICH-N-005.000

TITLE: WATER RESOURCES MANAGEMENT

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 99.00

SERVICEWIDE ISSUES: N11 WATER QUAL-EXT N12 WATER FLOW

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Manage water resources to maintain the historic scene, provide habitat and to provide potable water for visitors and staff.

As a whole, Richmond NBP has several small streams and wet areas; one unit, Drewry's Bluff, borders on the James River. These wet areas are historically significant and formed major geographical features that influenced the outcomes of battle and were (are) raised to mystic proportions. References to the streams running red with blood are common and one stream, "Bloody Run" at Cold Harbor, got its modern name in such a manner. These watercourses provide valuable habitat for plants and animals, particularly since these places are island habitat refuges surrounded by intense urban and suburban environments.

Management of water resources is based on NPS policy, guidelines, the Chesapeake Bay Act (VA), and the Clean Water Act. Policy dictates that a balance between historical accuracy and environmental soundness be maintained.

A number of threats exist to the various bodies of water within the battlefields. These include impacts associated with development adjacent to park boundaries, potential overuse and contamination of groundwater, agricultural practices and contamination due to mineral development. The two most serious threats are to the Chickahominy Bluffs and Beaver Dam Creek units. At Chickahominy Bluffs a park neighbor has altered water flow and water quality on his property and these actions have affected resources in the park. Henrico County officials investigated the situation, at the park's request, but found no violations or improprieties upon which the park could seek legal action. Currently, the park is pursuing federal (such as Fish and Wildlife Service) assistance in obtaining grounds for action. The Beaver Dam Creek unit has received considerable sedimentation from upstream development and road construction through the last 50 years. This process has completely changed the environment from a free-flowing small creek with associated habitat to one of a broad, shallow, mostly stagnant, swamp-like marsh.

Much of the park is adjacent to agricultural lands. In addition, the park issues agricultural Special Use Permits to maintain approximately 70 acres in its historically open condition. Although these practices are more compatible with park objectives than is urban development, the injudicious use of chemicals to control pests could threaten the quality of surface and groundwater in the park. Unsound agricultural practices may also result in erosion and sedimentation which further threaten water quality.

At the present time pesticide usage is monitored by park staff and is limited to those approved by the Regional and Washington Offices. The NPS has just become a member of the "Alliance for the Chesapeake Bay" an organization of concerned citizens, local, state and federal agencies dedicated to the study of, and the sound mitigation of the Chesapeake Bay to natural conditions. The Chesapeake Bay Act mandates "to reduce non-point pollution into the tributaries of the Chesapeake Bay". Adherence to a Soil Conservation Plan prepared in coordination with the Soil Conservation Service is required of all permittees as a condition of their permit. Farmers are encouraged to follow the "Best Management Practices" recommended by the State Water Control Board to minimize erosion.

Additional research could reveal integrated pest management approaches that would reduce impacts associated with pesticide usage. Monitoring of water resources could detect non-compliance.

Since many areas that were open fields during the Civil War are now forested, a program of historic scene restoration by clearing woodlands has been initiated to more accurately portray highly significant scenes of battle. Although these activities enhance the park's interpretive objectives, great care must be exercised to prevent adverse effects on the park's water, soil loss due to erosion, and the resulting degradation of water quality.

To prevent these and other adverse effects, some riparian woodlands will be left in place when not in conflict with the portrayal of a significant historical vignette. This practice reduces sedimentation and preserves important wildlife and fishery habitat. Contracts are prepared and enforced to ensure that "Best Management Practices" for forestry, prepared by the State Water Control Board, are followed. Stumps are left in place and ground a few inches below the surface to minimize soil loss. Consultation with the Soil Conservation Service, the Fish and Wildlife Service, and State Forestry personnel takes place when planning such efforts to minimize adverse impacts.

Perhaps the greatest threat to park resources is the rapid rate of urbanization in the Richmond area. Important factors which affect stream quality are highway run-off, urban run-off, construction activities, oil and chemical spills and sewer main breaks and

overflows. These factors seem to be increasing in frequency, severity, and duration.

Existing information relating to the Park's water resources is mostly non-existent. Baseline inventory studies of park streams have never been undertaken. However, toxicology and a metal content study has been done on the unnamed creek at Drewry's Bluff whose effluence emanates from a recovered landfill there. This study showed that although heavy metal concentrations exist in the creek and the creek looks aesthetically awful, the water shows no clinical toxicity at this time. No information is available on populations or diversity of aquatic organisms, elsewhere.

Water Resources Division of the WASO office has been writing a Water Resources Scoping Report which will detail water issues and include the following: 1) Identification of water related issues. 2) Summary of any available hydrological information pertaining to the above issues. 3) Assessment of present monitoring program and requirements, 4) Basic framework to address monitoring needs, data collection, and recommendation of mitigation activities. The park will use this document to revise portions of this project statement and generate others.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The park will develop and complete a Water Resources Management Program.

The park will continue to gather basic water quality data.

The park will continue to pursue means of mitigation at Chickahominy Bluffs and Beaver Dam Creek. Each site will have an individual plan written that will detail conditions and recommendations for actions.

The Water Resources Management Scoping Report will be completed. This effort is a major step in identifying water resource related issues and concerns, and will also provide a blueprint for the development of a comprehensive Water Resource Action Plan. In the interim, the park requests technical assistance from the Water Resources Division to evaluate the current basic water monitoring program and make recommendations for quality control.

Coordination with sister agencies relating to prevention of erosion and water pollution will be continued. Adjacent landowners, farmers leasing land under permits, park staff would be encouraged or required to use "Best Management Practices" to prevent erosion and sedimentation. Water quality monitoring would be performed as time permits or when emergencies arise.

BUDGET AND FTEs:

-----FUNDED-----		
Source	Act Type	Budget (\$1000s) FTEs
Year 1:		
Year 2:		
Year 3:		
Year 4:		
=====		
Total:		0.00 0.0

-----UNFUNDED-----		
Source	Act Type	Budget (\$1000s) FTEs
Year 1:	WATER-RES RES	15.00 0.0
	PKBASE-NR RES	10.00 0.0
	Subtotal:	25.00 0.0
Year 2:	PKBASE-NR MIT	10.00 0.2
	WATER-RES MIT	40.00 0.0
	Subtotal:	50.00 0.2
Year 3:	WATER-RES MIT	20.00 0.0
	PKBASE-NR MON	2.00 0.0
	Subtotal:	22.00 0.0
Year 4:	PKBASE-NR MON	2.00 0.0
=====		
Total:		99.00 0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA EA

EXPLANATION:

Proposal Date: 88

PROJECT NUMBER: RICH-N-006.000

TITLE: NATURAL RESOURCES BASE INVENTORY

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 30.00

SERVICEWIDE ISSUES: N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The park does not now have a consolidated natural resources base inventory which would provide management information with which to insure the resources' integrity.

The park does have a few of the elements of a sound inventory and monitoring program. The park has a vascular flora inventory, and the next step, a plant condition inventory, is in draft. Other inventory needs include soils, land cover, topography and threats. Monitoring includes water and soil sampling, sedimentation sampling, hazardous tree identification, ROW'S and internal and external threats. Also, monitoring continues as identified in Integrated Pest Management, Land Protection Strategies and Trails Management. Although air quality monitoring is not conducted in the park, information is received on a quarterly basis from the State Air Pollution Control Board.

The policy of the NPS pertaining to inventory and monitoring is to collect baseline inventory data on the natural and cultural resources and systems under its stewardship; and to conduct longterm monitoring to detect and/or predict changes. This includes information on the presence, distribution and condition of the park's flora and fauna, water, soils, air, natural and cultural features and condition, land cover, natural processes and external and internal threats. This inventory and monitoring policy has established a guideline for the purpose of listing the kinds and frequencies of activities that take place in the park. The guideline has defined five Levels of Effort of inventory and monitoring. The park's first priority in this area will be to complete Level of Effort I inventories. This inventory is the minimal data base which subsequent, more intensive data sets can complement.

Elements of this inventory will include: chemical (pH & conductivity of rainfall); geophysical (event records, meteorologic data, geologic & hydrologic maps); biological (species inventory, biological maps, photographic records); and anthropological (park use maps, human activities, land ownership, visitor demographics, livestock use, legal matters, education activities, regional land

use planning, social science studies). To accomplish the goals of a baseline inventory the park needs to acquire information on forest condition, historic scene, water quality and supply (surface and groundwater) and regional land use planning. A photographic interpretation of aerial records is needed as well as inventories of wetlands, aquatic resources, fauna, earthworks. Park information on livestock use, legal matters, land ownership, education activities, climatic data, air quality and human activities needs to be consolidated. Park maps must be generated on vegetation, streams, groundwater, soils, topography and park uses. In addition, visitor use survey data needs to be evaluated and updated, as needed.

It is apparent from the above requirements that the park's development of a GIS will be necessary to manage the large and growing data sets. The GIS is a tool that permits collection, management and analysis of inventory and monitoring information, rendering it more readily usable by management. It will also be capable of producing the required maps once the data has been entered.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

A. Resource Management Actions:

Develop a systematic Inventory and Monitoring Program. Identify inventory requirements and prioritize. Seek funding and outside assistance where necessary. Consolidate information that the park already possesses into a computerized data base system compatible with GIS. Continue development of GIS. Work with MARO to establish a cooperative agreement with a University to begin data collection of the identified prioritized activities. Other planning would consolidate information that the park already possesses into a computerized data base system. Identify elements for the program. Set-up a cyclical data collection program. Develop action plans and task directives for projects.

B. Monitoring Actions:

Continue current inventory and monitoring data collection. Identify current and future monitoring actions to be placed in a cyclical program.

C. Research Actions:

Work with MARO to accomplish goals of Inventory and Monitoring program. Identify research needs requiring outside assistance.

BUDGET AND FTEs:

-----FUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1:

Year 2:

Year 3:

Year 4:

=====

Total:	0.00	0.0
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-----UNFUNDED-----
 Source Act Type Budget (\$1000s) FTEs

Year 1:	PKBASE-OT RES	4.00	0.2
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Year 2:	PKBASE-OT RES	4.00	0.0
	NR-I&M RES	10.00	0.0

Subtotal:	14.00	0.0
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Year 3:	PKBASE-OT RES	1.00	0.0
	NR-I&M RES	10.00	0.0

Subtotal:	11.00	0.0
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Year 4:	PKBASE-OT RES	1.00	0.0
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Total:	30.00	0.2
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(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

A. Stop Action:

This would negate park efforts of data collection. It would also ignore the many responsibilities of the park pertaining to the preservation and protection of the park's significant resources and it would hamper the planning process.

B. Continue Present Action:

Current inventory and monitoring practices are gathering valuable information but there is little systematic coordination and analysis of this data. Continued development of the GIS would provide the computer capability to accomplish this task. Acquired information includes ROW's, vegetation, boundaries, soils, trails, roads, streams, earthworks, buildings and adjoining land ownerships. Without proper data management, any information, new or old, however properly attained, is not useful or recallable. Valuable information will be lost in "the files" or when personnel transfer. Many new projects will be started and completed that reproduce past efforts.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 7.4 B(4) AND E(2)

Proposal Date: 89

PROJECT NUMBER: RICH-N-007.000

TITLE: DREWRY'S BLUFF (FORT DARLING) LANDFILL STUDY

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 34.00

SERVICEWIDE ISSUES: N11 WATER QUAL-EXT N24 OTHER

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Mitigate and monitor effects of landfill.

In 1972 Chesterfield County closed a landfill adjoining the Drewry's Bluff unit of Richmond National Battlefield Park. The following year the County donated the land to the park. The regulations concerning the landfill did not require the recording of what was dumped at the site. The ditch and fill method was used to dispose mostly such things as tires, batteries, refrigerators and so forth. When it was closed there was exposed trash on the hillside above the park creek so the landfill was covered by a layer of clay soil and revegetated by Chesterfield County and the park. There is no record of what plant material was used for revegetation, however, over the years various types of grasses, pines and cedars have covered these exposed areas and stabilized the hillside. The ground cover has been successful, except for a few bare areas, and one area of erosion. There are cylinders and drums (empty), refrigerators batteries and other exposed trash along the creek bottom. Leachate seeps coming from the landfill flow into an unnamed creek which then flows into the James River 800 feet downstream. In addition, the creek drains surface waters from the landfill during periods of precipitation.

In 1983 the Environmental Protection Agency (EPA) funded a study of the landfill by NUS Corporation. Water and soil samples were taken and analyzed. The final report in 1985 indicated no human health hazards, including polluting of the groundwater or James River. However, the lab analysis suffered from poor quality control. As only surface water samples were collected, groundwater was not analyzed.

After initial study by local U.S. Geological Survey (USGS) personnel and the NPS-Water Resources Division (WRD) recommendations were made for a monitoring project to determine the deficiencies in the original EPA study, and to determine if further action is needed to negate any impact on the water quality and biota of the area. Recently completed toxicity testing and water analysis by WRD indicate no toxic effect on stream vertebrates or

invertebrates. There is, however, continued concern due to high levels of heavy metals found to be in the landfill leachate.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

A. Resource Management Action:

Park staff or contractors would finish removing refuse from along the creek bottom, repair erosion points on the landfill, and revegetate bare spots on the top of the landfill.

The park will remove the refuse along the creek bottom and the exposed trash on the hillside of the landfill. If the refuse is hazardous then removal would be by contract. Removed refuse would be disposed of properly by a contractor, as necessary.

The park will repair the eroding areas on the top of the landfill and revegetate any bare spots. USGS and NPS-WRD recommendations are not to disturb the vegetative top or sides of the landfill until further monitoring determines if there are any problems that need action.

Chesterfield County's responsibility to monitor leachate and bush-hog the cap will continue. Once review of a monitoring program demonstrates, recommendations regarding further monitoring and/or action e.g. recapping top of landfill will be made.

Develop action plans and task directives for projects. Mitigation efforts will not compete for funding with monitoring and research efforts. The cost for mitigation will approximate \$10,000 per year for two years.

B. Monitoring Action:

Although the year long investigation by WRD indicates no biological toxicity at this time, the high levels of heavy metals and the potential for change in the chemistry within the landfill warrant continued monitoring. The park and WRD will devise and implement a process to monitor the landfill and its water quality. Further testing and analysis would be considered or contracted out based on NPS-WRD specifications and recommendations for the organic contaminants and heavy metals on the EPA's current priority pollutant list.

Funding for this action should be separate from mitigation monies and would cost approximately \$2,000 per year with a .2 FTE to implement monitoring.

C. Research Action:

Current research indicates that further intense research is not needed at this time, however, if monitoring efforts show change in toxicity or other detrimental effects, additional action will be taken. Legal research eventually may need to be undertaken to determine the financial responsibility of the County of Chesterfield.

Money estimates of \$3,000 each year for two non-consecutive years are expected for this activity.

BUDGET AND FTEs:

			-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs	
Year 1:				
Year 2:				
Year 3:				
Year 4:				
Total:			=====	
		0.00		0.0

			-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTEs	
Year 1:	PKBASE-NR MON	2.00	0.2	
	WATER-RES RES	3.00	0.0	
	ST-LOCAL MIT	10.00	0.0	
	Subtotal:	-----	-----	
		15.00	0.2	
Year 2:	PKBASE-NR MON	2.00	0.0	
	ST-LOCAL MIT	10.00	0.0	
	Subtotal:	-----	-----	
		12.00	0.0	
Year 3:	PKBASE-NR MON	2.00	0.0	
	WATER-RES RES	3.00	0.0	
	Subtotal:	-----	-----	
		5.00	0.0	
Year 4:	PKBASE-NR MON	2.00	0.0	
Total:			=====	
		34.00		0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

A. Stop Action:

This action may be in violation of federal laws and regulations pertaining to landfills and could open the park to legal action. Doing nothing may negatively affect the groundwater, biota and public health of the area.

B. Continue Present Action:

The present action, after the major toxicity testing by WRC, is one of non-systematic monitoring. Whereas, this is not costly, it is not scientifically rigorous or in keeping with NPS environmental policy as well as probably violating other law (EPA).

COMPLIANCE CODE(s): NHPA EA

EXPLANATION:

Proposal Date: 88

PROJECT NUMBER: RICH-N-008.000

TITLE: FLORA INVENTORY

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 9.00

SERVICEWIDE ISSUES: N03 T&E PLANTS N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Knowledge of an area's flora is fundamental for the park to carry out its management commitments for the lands under its stewardship.

In 1984, existing information on the vegetative resources of the park was inadequate to properly manage the park's natural and cultural scene. To remedy this, a cooperative agreement was entered into between the park and the University of Richmond and Virginia Commonwealth University to inventory the vascular flora of the park and to develop maps of the vegetative zones. The study was begun in 1985 and included the park units: Chickahominy Bluffs, Cold Harbor, Ft. Darling, Ft. Harrison, Garthright House and Watt House. The final report for these units was submitted in January, 1986, and included a unit checklist. The checklist included 635 species and indicated that native plants make up 76.5 percent of the species checklist. None of the plants encountered were identified as rare or endangered species.

In August, 1986, a subsequent agreement was made by the same parties to complete the flora inventory of the remaining park units: Malvern Hill, Parker's Battery and Beaver Dam Creek. Field collection was conducted during 1987 and a draft final report was received in February, 1988.

This inventory has already been of help in creating vegetative maps for the Geographic Information System. The information will be used in earthworks vegetation management, forest management, prescription burning and will help us to meet the park's Level of Effort I goals for a natural resources base inventory.

The next step was to determine the condition of the park's flora. This was necessary to assist in the development of forest, fire and earthworks management plans. These plans are basic to managements commitment to the preservation of the lands under its stewardship. VA Tech was contracted to conduct research on the condition of the park's flora. These documents are now complete and in review at the park and regional offices.

Knowledge of non-vascular plant species and their composition is lacking, as well as specific, in depth, analysis of wetland communities.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Continue efforts to incorporate this inventory into GIS and management plans relating to earthworks, fire and forestry. Review studies conducted by VA Tech: "Forest Vegetation and its Management for Aesthetics, Recreation and Historical Interpretation ", and "A Handbook for Forest Vegetation Management in Recreational and Historic Parks". Develop appropriate portion of Cultural Landscape Report to identify vegetative goals and objectives and to incorporate information from these papers. Develop action plans and task directives for projects.

B. Research needs:

Obtain non-vascular plant survey and wetland plant survey.

BUDGET AND FTEs:

-----FUNDED-----		
Source	Act Type	Budget (\$1000s) FTEs
Year 1:		
Year 2:		
Year 3:		
Year 4:		
=====		
Total:		0.00 0.0

-----UNFUNDED-----		
Source	Act Type	Budget (\$1000s) FTEs
Year 1:		
Year 2:		
Year 3:	RG-RM-NAT RES	5.00 0.0
	PKBASE-NR RES	4.00 0.2

Subtotal:		9.00 0.2
Year 4:		
=====		
Total:		9.00 0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

A. Stop Action:

This action would ignore the efforts already made in developing a flora inventory. It would also ignore the many uses to which this inventory could be applied.

B. Continue Present Action:

Would utilize the inventory in further planning efforts in earthworks management, forest management, prescription burning and expanding the park's natural resources base inventory. Use of the current inventory alone and not the supplemental flora condition studies (the VA Tech papers) would limit knowledge, waste money and produce incomplete and potentially inadequate resource actions.

COMPLIANCE CODE(s): EXCL 106

EXPLANATION: 516 DM6 7.4 B(4) AND E(2)

Proposal Date: 93

PROJECT NUMBER: RICH-N-009.000

TITLE: NATIVE ANIMAL MANAGEMENT

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 7.00

SERVICEWIDE ISSUES: N01 NAT ANML OVPOP

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Manage wildlife to enhance habitat and protect the park's resources.

Some of the park's eleven separate units represent natural habitat islands within an ocean of urban/suburban/rural development. These habitats consist of wetlands, tributaries of streams that run into the Chesapeake Bay, grasslands and coastal eastern deciduous forest. There has never been a systematic study of the faunal communities of the park and how rapid urban growth may be affecting these populations. In addition, the park may implement ambitious plans to restore the historic battlefields that have become reforested. The effect of this work on the native fauna has not been projected.

Although there are no known rare, threatened, or endangered species currently listed for the area, this may be the result of academia's lack of interest more than actual existing conditions. Park records indicate several observations of State listed "Sensitive" bird species and one mammal, the River Otter.

Until wildlife becomes a hazard to visitors, park property, agricultural crops or the health of its population is threatened, species are allowed to exist freely within the ecosystem. Objective information on deer and other wildlife populations is needed to evaluate results of current and proposed management actions.

As in much of the East Coast, sighting frequencies and numbers indicate a sizeable deer population. This population appears healthy (visual observation) and is probably resident, moving in and out of park as a function of season or habit patterns and human pressure. Other populations of wildlife exist within the park, some occasionally sighted, others part of seasonal migrations, and no doubt some appearing as changes occur in the park vegetation or social use patterns.

Currently, active management actions relating to the wildlife resources at the park are focused upon wildlife protection through enforcement of park regulations.

Rabies occurrence in wild wildlife populations has fluctuated throughout this region. Park management is sensitive to any outbreaks and quickly controls any animal which appears to be acting strangely or aggressively within the park.

Wildlife populations within the park are allowed to exist naturally. Isolated incidents of poaching have been identified, but it is felt this is not a significant impact upon wildlife populations. Because there has never been an in-depth study of park fauna, species diversity and dynamics cannot be evaluated to determine such effects as carrying capacities, influences of social use patterns, protection of endangered species, etc. Severity of outside threats to environmental integrity of park resources and any influences on wildlife populations are mostly unknown at this time.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Initiate an inventory and monitoring program for wildlife.

A thorough study surveying mammals, birds, reptiles, lesser vertebrates and invertebrates is needed on which to base mitigation actions and to help management predict effects of actions. The park will continue present management while seeking funding for graduate students or consultants to prepare an inventory and monitoring plan. The plan will spell out specific needs and actions per unit. The Malvern Hill unit will be targeted for first action because of its size and its more rural location.

The continued emphasis on feral animal control and hunting patrol activities with dissemination of park regulations and policies will provide a better working understanding with local area residents and, hopefully, curtail poaching.

Long term monitoring will focus on the status and condition of wildlife populations over time and on the detection of human and environmental induced changes.

Inventorying of resource information would begin by acquiring, analyzing and managing data, including the distribution and health of vertebrate and key invertebrate animals. The much needed inventory of park fauna will allow the park's natural resources to be managed in a much more professional light as well as begin to satisfy NPS 75 Inventory and Monitoring policy. Decisions will be made using quality data and will be reflective of short and long term impacts of any actions taken. Park policies dictate identification and mitigation of any harmful impacts upon the park.

BUDGET AND FTES:

		-----FUNDED-----	
Source	Act Type	Budget (\$1000s)	FTES
Year 1:			
Year 2:			
Year 3:			
Year 4:			
		=====	=====
Total:		0.00	0.0

		-----UNFUNDED-----	
Source	Act Type	Budget (\$1000s)	FTES
Year 1:			
Year 2:			
Year 3:	RG-RM-NAT RES	5.00	0.2
Year 4:	PKBASE-NR MON	2.00	0.1
		=====	=====
Total:		7.00	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

No Action:

The park would fail to meet legislative mandates under this alternative. Hunting problems will increase quickly and encourage poaching activities. Rabies within park wildlife populations may go undetected and present a major visitor safety concern. Feral dogs may decimate wildlife populations.

Continue Current Action:

Park staff would continue to respond to wildlife needs as they occur. Due to the lack of staffing, no comprehensive monitoring is being performed. Random data on wildlife observations is recorded sporadically.

The high visibility hunting patrols and contacts with hunters appear to be having a positive effect on discouraging poaching within the park. Wildlife populations will continue to evolve within the habitat parameters of the park. The absence of an inventory of park fauna restricts management from making decisions influencing the park wildlife populations. This lack of knowledge may have negative impacts upon the park wildlife.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 APP. 2,1.6

Proposal Date: 93

PROJECT NUMBER: RICH-N-010.000

TITLE: AIR QUALITY MANAGEMENT

FUNDING STATUS: FUNDED: 0.00 UNFUNDED: 15.00

SERVICEWIDE ISSUES: N14 AIR POLLUTION N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The Richmond area has experienced tremendous urban and suburban growth in the past forty years. This increased development and concomitant traffic adjacent to the park suggests serious air quality problems. Hydrocarbon pollution from autos and industry are potential contributors to the decline of air quality in the park. Air pollution may be causing yet undetermined impacts on the park's natural and cultural resources.

The park was designated as a Class II park in the Clean Air Act Of 1977. This classification allows only moderate amounts of degradation of the existing air quality condition. It is incumbent upon the federal government to protect the air quality related values that have national significance as a provision of this act.

Recent studies by the U.S. Geological Survey found the most acidic rain in the nation was measured in Virginia. The major source of acidic pollution and sulfur, comes from coal-burning sources. Sensitive resources that would be threatened by poor air quality include the scenic vistas of Drewry's Bluff, Malvern Hill and Chickahominy Bluff. Impairment of visibility in these areas would dramatically reduce the ability to interpret these sites and the role they played in the battles fought there.

The park contains one monument at the Parker's Battery unit, historic structures and several associated, but unowned Douglas Southall Freeman markers that are constantly exposed to the polluted elements. Authorities in the field of outdoor monumentation are concerned that the increase in air pollution, especially sulfur dioxide content, destructive to bronze, stone, and marble structures.

Although the effects of air pollution and acid rain on natural systems are not comprehensively documented, certain forested areas and individual plant species in the northeastern states and southern Appalachian region are suspected of dying as a direct result of air pollution.

A number of plant species native to the park are known to be susceptible to air pollution. Recent surveys have indicated ozone injury to common milkweed, yellow poplar, black cherry, white pine, and flowering dogwood. Continued degradation of air resources could eventually decrease the plant diversity extant during the historic period.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Establish Air Quality Management Program in cooperation with other state and federal agencies.

The park will continue to maintain contacts with the Virginia Air Pollution Control Board, the NPS Air Quality Division and Shenandoah National Park.

Establish a data link with the Virginia Air Pollution Control Board and Air Quality Monitoring Stations. Identify criteria pollutants that pose the greatest and most immediate threat to park resources and gather data on these pollutants from state air monitoring stations.

Respond to development proposals/actions that the park suspects will cause damage to air quality values. Offer support and assistance to state monitoring programs upon request.

Monitoring of vegetative impacts would be expanded to include several tree species used in maintaining buffer strips.

The park would seek out and maintain lines of communication with state and agency officials. Information pertaining to local industrial activities which might impact air quality will be forwarded to appropriate officials for comment.

Conduct research/monitoring into the effects of air pollution on the many monuments, markers, cannon, vegetation, buildings, etc. Research should be initiated by a thorough survey of the park's sensitive air quality related values.

BUDGET AND FTEs:

-----FUND-----			FUND	FTEs
Source	Act	Type	Budget (\$1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
Total:			0.00	0.0

-----UNFUNDED-----			UNFUNDED	FTEs
Source	Act	Type	Budget (\$1000s)	FTEs
Year 1:				
Year 2:				
Year 3:	AIR-QUAL	MON	15.00	0.2
Year 4:				
Total:			15.00	0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

No Action:

This alternative is not acceptable because continued deterioration of park resources does not meet congressional mandates.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 APP. 7.4 E(2)

Proposal Date: 93

CULTURAL RESOURCE DOCUMENTATION CHECKLIST

TITLE	CURRENT AND APPROVED	INCOMPLETE; NEEDS REVISION OR UPDATING	NEEDED
<u>PLANNING DOCUMENTS</u>			
Preauthorization and Authorization			
Statement for Management (SFM)	X (1989)		
Outline of Planning Requirements (OPR)	X (1989)		
General Management Plan (GMP)		in progress X (1971)	
Development Concept Plan (DCP)		in progress	
Resource Management Plan (RMP)		in progress	
Interpretive Prospectus (IP)		X (1971)	

<u>SERVICEWIDE INVENTORIES, LISTS, CATALOGS, AND REGISTERS</u>			
Cultural Resources Bibliography (CRBIB)			X
Cultural Sites Inventory (CSI)			X
List of Classified Structures (LCS)		X (1978)	
National Catalog of Museum Objects		in progress	
*National Register of Historic Places			X

TITLE	CURRENT AND APPROVED	INCOMPLETE; NEEDS REVISION OR UPDATING	NEEDED
<u>BASIC CULTURAL RESOURCE DOCUMENTS</u>			
Archeological Overview and Assessment			X
Archeological Identification Studies			X
Archeological Evaluation Studies			X
Ethnographic Overview & Assessment			NA
Ethnographic Oral Histories & Life Histories			NA
Ethnographic Program			NA
Historical Base Map		X (areas w/in legal bound.	
Historic Resource Study (HRS)			X

TITLE	CURRENT AND APPROVED	INCOMPLETE; NEEDS REVISION OR UPDATING	NEEDED
<u>BASIC CULTURAL RESOURCE DOCUMENTS</u> (cont'd)			
Park Administrative History		X (1957)	
Scope of Collection Statement	X (1986)		
<u>SPECIAL RESOURCE STUDIES AND PLANS</u>			
Archeological & Ethno. Collections Studies			NA
Archeological Date Recovery Studies			
Collection Management Plan			X (1994)
Collection Storage Plan			X
Collection Condition Survey			X
Cultural Landscape Report (CLR)			X
Ethnohistory			NA
Exhibit Plan			X

TITLE	CURRENT AND APPROVED	INCOMPLETE; NEEDS REVISION OR UPDATING	NEEDED
<u>SPECIAL RESOURCE STUDIES AND PLANS</u> (cont'd)			
Historic Furnishings Report			NA
Historic Structure Preservation Guide (HSPG)			X
Historic Structure Report		X (Garthright House - 1971)	X (needed for Watt House)
Social Impact Study			
Special History Study			X
Traditional Use Study			NA

SUMMARY CHART FOR ARCHAEOLOGICAL SITES

Significance		Condition					Impacts				Documentation		
		Good	Fair	Poor	Destroyed	Unknown	Severe	Moderate	Low	Unknown	Good	Fair	Poor
National													
State & Regional													
Local													
Not Evaluated	34	11	19			4	1			33	1		33
TOTAL	34	11	19			4	1			33	1		33

SUMMARY CHART FOR OBJECTS - DOCUMENTATION

Documentation	Archeology	Ethnology	History	Archives	Biology	Paleontology	Geology	TOTALS
Registration Data Only			125					125
Registration & Catalog Data			970					970
Total Items Cataloged			970					970
Backlog to be Cataloged			125					125
Total Collection Summary			1095					1095

SUMMARY CHART FOR OBJECTS - CONDITION

CONDITION The percentage of collection in the following categories	Archeology	Ethnology	History	Archives	Biology	Paleontology	Geology	TOTALS
Excellent								
Good								
Fair			100%					
Poor								
Unknown								

SUMMARY CHART FOR CULTURAL LANDSCAPES

Significance		Condition					Impacts				Documentation		
		Good	Fair	Poor	Destroyed	Unknown	Severe	Moderate	Low	Unknown	Good	Fair	Poor
National													
State & Regional													
Local													
Not Evaluated	12	2	6	4			12					10	2
TOTALS	12	2	6	4			12					10	2

SUMMARY CHART FOR STRUCTURES

Significance		Condition					Impacts				Documentation		
		Good	Fair	Poor	Destroyed	Unknown	Severe	Moderate	Low	Unknown	Good	Fair	Poor
National													
State & Regional													
Local													
Not Evaluated	40	3	5	30		2	2		37	1		36	4
TOTALS	40	3	5	30		2	2		37	1		36	4

A brief description of the civil war around richmond and the establishment of the park

INTRODUCTION

During the American Civil War, from the first battle of Manassas until the guns fell silent four years later at Appomattox, the cry of the Army of the Potomac was "On to Richmond." From 1861-1865, sacrifices in the name of principle and deeds of valor on behalf of cherished ideals (as well as cruelty, horror, and boredom) were common soldier experiences. The farms, fields, woodlots, and swamps through which the Union and Confederate soldiers struggled made up the rural surroundings of 19th century Richmond, which had a pre-war population of fewer than 40,000 people. Today most of the battlefields have been engulfed by urban and suburban expansion, and those few battlefields that retain their integrity are endangered.

From minor skirmish to major confrontation, enormous effort and sacrifice through much of the war focused on Richmond and what it symbolized. As the Confederate capital, Richmond was essential to both sides. Richmond was a transportation hub and an economic and industrial center. Symbolically, as long as the city and its protecting army survived, the right to divide the union survived, and the right of some to hold others in bondage continued.

At Richmond National Battlefield Park there is an opportunity to convey to visitors the meaning of the war—a sense of the past that is as important to present and future generations as it was to our forbears. When set in appropriate context by the National Park Service, Richmond's battlefields will have a deep and abiding story to tell visitors. Not only is there a strategic explanation for the battles at Richmond, but also the Confederate capital's industrial, economic, political, and social fabric merge with the battlefield stories there. Visitors will be encouraged to think critically about America's past, and the park can become a powerful and positive stimulus to enlightened citizenship. The Richmond story will have meaning for all Americans and for international visitors as well. The American tragedy of the Civil War retains its relevance in a modern world confronted with religious, ethnic, and linguistic divisions.

The concentration of diverse Civil War resources found in the Richmond area is unparalleled. A site-specific focus on the battles at Richmond, the combatants, and an understanding of why those battles occurred at Richmond can contribute to a visitor's larger understanding of the American ideal and be a means by which to appreciate strengths and shortcomings in the American experience. With a carefully developed battlefield preservation, commemoration, and interpretive effort, including close cooperation with other public and private agencies preserving Civil War resources, Richmond National Battlefield Park can become that place where visitors can critically examine for themselves the meaning of the American Civil War and its relevance in the modern world.

Brief description and background of the park

Richmond National Battlefield Park is located 110 miles south of Washington, D.C., near the city of Richmond, Virginia. The park and the city lie along the transition (fall line) between the Tidewater and the Piedmont regions, and between the James and York rivers. Located at the junction of interstates 64 and 95, the city is a major commercial and cultural center in the Mid-Atlantic region. Interstate 295 opened in June 1992, and bypasses Richmond on the east, near several park units.

The park contains 762.4 acres in 11 individual units spread over a 132-square mile area. The Chimborazo Park unit contains the main visitor center and administrative office and is the only unit within the Richmond city limits. The remaining units lie north, east, and south of the city, in Chesterfield, Hanover, and Henrico counties, 8 to 15 miles from the visitor center. All units are in the Third and Seventh congressional districts as reconfigured after the 1990 census.

Park Origins and Legislative History

Prehistoric sites demonstrate that the Richmond area was settled before European contact occurred. For reasons related to transportation, topography, and climate, the area at the falls of the James River has long been a center for regional commercial contact between the coastal areas to the east and the mountains to the west. By the time of the Civil War, Richmond had become the key urban center in the upper south. During the war, the city served as the Confederate capital, a major industrial and medical center, a transportation hub, and a prime supply and staging area for the southern armies.

Richmond National Battlefield Park interprets the repeated efforts by the Union Army in 1862 and 1864-65 to take Richmond, the capital of the Confederacy, and to destroy General Robert E. Lee and the Army of Northern Virginia. Established as a unit of the national park system in 1936, the park evolved from private and state actions to protect the battlefields. As early as 1914, there had been talk of building a road to connect the main battle sites east of the city. In 1921, the well known historian Douglas Southall Freeman encouraged the Rotary Club of Richmond to sponsor what may have been the first organized battlefield tour. An association was formed to mark the important battle sites. By 1928 the Richmond Battlefield Parks Corporation began to purchase battlefield parcels and earthworks. In 1932, the corporation deeded all of its property (572 acres) to the commonwealth of Virginia for a state park.

Shortly after World War I Congress directed the War Department to conduct a study of American Revolutionary War and Civil War battlefields. In 1929 funds were authorized to "study, investigate, and survey for commemorative purposes battlefields in [the] Richmond vicinity." In 1932, the Secretary of War forwarded to Congress, *The Study of Battlefields in the United States for Commemorative Purposes* (Senate Document 151). The study recommended that the battlefield park acreage be accepted by the United States as a donation from the commonwealth of Virginia. It also recommended that an additional 1,900 acres of core battlefield land be purchased, including substantial

acquisitions at Beaver Dam Creek, Gaines' Mill, Cold Harbor, Bethesda Church, Savage Station, White Oak Swamp and Malvern Hill. Although the new road access served as a stimulus to residential development on the battlefields, the recommendation to protect additional land was not acted upon. The offer by the commonwealth of Virginia to donate park land was formally accepted by act of Congress in 1936.

Congressional legislation (49 Stat. 1155) signed into law on March 2, 1936, established Richmond National Battlefield Park. The enabling act identified 572 acres managed by the state and 1.9 acres of additional land as the basis for the park. Since then, the park has grown to 763.99 acres as additional land has been donated. According to the enabling legislation, the park can acquire land only through direct donation or with funds donated for land acquisition. The park does not have the authority to receive appropriated federal funds for the purchase of land. All actions that will affect the cultural resources within these lands must comply with National Park Service policies and guidelines developing set by the National Historic Preservation Act of 1966, as amended.

Baseline Information Data

Basic Thematic Map Files at Richmond NBP:

Location Maps,

Area Maps,

Park Tour Maps/Brochure,

Historic Base Maps: Gaines Mill, Cold Harbor, Malvern Hill, Chaffin's Farm.

Land Classification Maps: Chimborazo, Malvern Hill, Ft. Harrison. Chickahominy Bluffs, Beaver Dam Creek, Watt House, Cold Harbor, Garthright House, Parker's Battery, Ft. Darling and Maggie L. Walker National Historical Site.

Topography

Basic 7.5 minute series topographic quadrangle maps are available locally and are on file at headquarters. Quadrangle maps covering the various park units consist of: Chester (1981), Drewry's Bluff (1980). Dutch Gap (1986), Roxbury (1974), Seven Pines (1981) and Richmond (1981). All are at a scale of 1:24000.

Land Use and Ownership

Plat maps of areas adjoining Park boundaries are on file at the Chesterfield, Hanover and Henrico County offices and the City of Richmond office. Maps delineating park boundaries are on file at Park headquarters and at the Mid-Atlantic Regional Office.

Soil

Comprehensive soil maps and descriptions are available at Park headquarters or from the Soil Conservation Service. U.S.D.A. These have been published as a "Soil Survey of Chesterfield, Hanover and Henrico Counties, Virginia."

Hydrology

Park watersheds can be discerned on the topographical maps mentioned above. There has been no survey of the groundwater beneath the Park in recent years.

Vegetation

A flora inventory has been completed (1987) and has been published as "Flora of Richmond National Battlefield Park. It is on file at Park headquarters and at the Mid-Atlantic Regional Office. Also, a U.S.D.A. Forest Service report on "Vegetation Analysis and Vegetation Management Considerations for Richmond National Battlefield Park" is on file at the above locations.

Wildlife

No formal fauna survey has been conducted within the park. However, the park has begun recording wildlife sightings and this data is on file at park

headquarters. Also, area wildlife information is available from the U.S. Fish and Wildlife Service, Richmond, Virginia.

Climate and Air Quality

Specific information on the climate of the Park can be obtained and is interpreted by the National Weather Service, Norfolk, Virginia. The Commonwealth of Virginia maintains monitoring stations in the area for particulates, ozone, carbon monoxide and acid deposition. Monitoring statistics are published in "Virginia Air."

Environmental Impacts

Two studies have been conducted in the park. The environmental impacts of the construction of 1-295 on Beaver Dam Creek was a doctoral dissertation entitled, "An Analysis of the Contamination by and Effects of Highway-Generated Heavy Metals on Roadside Stream Ecosystems," (1985). The other study was of the closed Chesterfield County landfill donated to the park. It is entitled, "Site Inspection of Fort Darling Landfill." (1985). All of the above reports are on file at Park headquarters.

List of Contacted Agencies

Andropogon Associates, Ltd.
Appalachian Trail Club
Boise Interagency Fire Center
Chesterfield County
Colonial National Historical Park
Environmental Protection Agency
Fredericksburg and Spotsylvania National Military Park
Hanover County
Henrico County
National Park Service: Mid-Atlantic Regional Office
National Park Service: Washington Office
National Park Service: Water Resources Division
National Parks and Conservation Association
North Carolina State University
Petersburg National Battlefield
Soil Bioengineering Corporation
Soil Conservation Service
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Geological Survey
University of Richmond
Virginia Commonwealth University
Virginia Division of Forestry
Virginia Game Commission
Virginia Polytechnic Institute and State University
Virginia State Air Pollution Control Board

Bibliography

A Micro-Computer Mapping System for Resource Management at Richmond National Battlefield Park. 1988. Recreation Resources Administration, School of Forest Resources, North Carolina State University.

Andropogon Associates, Ltd. and Soil Bioengineering Corp. Earthworks Landscape Management Manual. 1987. Philadelphia, PA.

Brown, Lauren. Grasses: An Identification Guide. 1979. Houghton Mifflin Co., Boston, MA.

Davis, Kenneth P. Forest Management: Regulation and Valuation. 2nd edition. 1966. McGraw-Hill Book Co., NY.

Margolin, Malcolm. The Earth Manual. 1985. Heyday Books, Berkeley.

Mudre, John M. An Analysis of the Contamination by and Effects of Highway - Generated Heavy Metals on Roadside Ecosystems, 1985. Virginia Polytechnic Institute and State University, Blacksburg, VA

Olkowski, William and Olkowski, Helga. Integrated Pest Management for Park Managers. 1983. John Muir Institute, Inc., Napa, CA.

Sharpe, Grant W., Hendee, Clare W. and Sharpe, Wenonah F. Introduction to Forestry. 5th edition. 1986. McGraw-Hill Book Co., NY.

Site Inspection of Fort Darling Landfill. 1985. NUS Corporation, Superfund Division.

Sloane, Eric. A Reverence for Wood. 1965. Ballantine Books. NY.

U.S.D.A.-Forest Service. A Guide for Prescribed Fire in Southern Forests. 1978. Southeastern Forest Experiment Station, Atlanta, GA.

U.S.D.A.-Forest Service. Vegetation Analysis and Vegetation Management Considerations for Richmond National Battlefield Park. 1984. Southern Region -Forest Pest Management, Atlanta, GA.

U.S.D.I.-National Park Service. A Manager's Guide to Geographic Information Systems. 1986. WASO Geographic Information Systems Field Unit, Denver. CO

U.S.D.I.-National Park Service. Resources Management Plan and Environmental Assessments. 1987. Colonial National Historical Park, Yorktown, VA.

U.S.D.I.-National Park Service. Flora of Richmond National Battlefield Park. 1986. W. John Hayden and Miles F. Johnson. University of Richmond and Virginia Commonwealth University, Richmond, VA.

U.S.D.I.-National Park Service. Resources Management Plan and Environmental Assessments. 1986. Fredericksburg and Spotsylvania National Military Park, Fredericksburg, VA.

U.S.D.I.-National Park Service. Resources Management Plan and Environmental Assessments. 1986. Petersburg National Battlefield, Petersburg. VA.

U.S.O.I.-National Park Service. Statement for Management. 1987. Richmond National Battlefield Park, Richmond, VA.

Virginia Pest Control Guide. 1983. Virginia Polytechnic Institute and State University Blacksburg, VA.