

RESOURCE MANAGEMENT PLAN UPDATE

MORRISTOWN NATIONAL HISTORICAL PARK PARK

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MORRISTOWN NATIONAL HISTORICAL PARK

1999 RESOURCE MANAGEMENT PLAN

INTRODUCTION

PURPOSE OF RESOURCE MANAGEMENT PLAN

The purpose of the Resource Management Plan is to guide the resources management program at Morristown National Historical Park. This will be accomplished by doing the following:

Summarizing the resource values and purposes of the park.

Analyze the significance of resources management needs and problems and rank them in importance.

Propose specific actions, including dollars and FTE's for dealing with the most important needs and problems.

Present a multi-year program to achieve measurable progress in accomplishing the proposed actions.

Provide for an annual review and recording of accomplishments to measure the effectiveness of actions.

Provide the forum for an interdisciplinary approach to the park's resources management issues.

PARK PURPOSE

Morristown National Historical Park preserves, protects, and maintains the site-including lands, structures, features and collections-of the Morristown 1779-80 winter encampments, headquarters of General George Washington and the Continental Army, and other Revolutionary War sites for the benefit and inspiration of the public; and to commemorate and relate the history of these winter encampments and Washington's leadership during the Revolutionary War.

LOCATION

Morristown National Historical Park (MORR) is comprised of 1,685 acres situated in north-central New Jersey, approximately 30 miles west of New York City. The park contains four geographically separate units, each of which are associated with the 1777 and/or 1779-1780 winter encampments of the Continental Army.

The Washington's Headquarter's Unit occupies 10 acres surrounded by an urban setting within Morristown. The Ford Mansion, located on this property, served as General George Washington's winter headquarters from December 1779 to June 1780. In addition, this unit houses a historical museum and the National Historical Park's administrative offices.

The 35-acre Fort Nonsense Unit marks the site of defensive trenches and raised embankments constructed on the crest of a hill strategically overlooking Morristown. While commanding excellent views of Morristown and the Watchung Mountains to the East, the unit is also surrounded by adjacent urban and suburban development.

The Jockey Hollow Encampment Unit is located approximately 5 miles southwest of Morristown. This 1,320-acre site served as the 1779-80 winter encampment for 10,000 junior officers and soldiers that constituted the bulk of the Continental Army. At the time of the encampment, the site consisted of the Wick Farm, surrounded by forested hills which provided lumber, game, and water to the poorly supplied troops.

The 321-acre New Jersey Brigade Unit is located approximately 2 miles southwest of Jockey Hollow. This site served as the encampment for the approximately 900 troops of the New Jersey Brigade who camped here on a steep plot of land during the winter of 1779-1780.

LAND USES AND TRENDS

Because of their close proximity to Morristown, the Washington's Headquarter's Unit and Fort Nonsense Unit have long been affected by the urban influence of the nearby town. The Jockey Hollow Unit and New Jersey Brigade Units, however, are located in a formerly rural area, which for the last three decades, has been experiencing a rapid population increase brought about by the completion of new highways and improved access to New York City.

Changing land use patterns, associated with development, have dramatically changed the character of the local area. Surrounding lands, consisting primarily of rolling hills, intersected by stream valleys and wetlands were, until recently, either farmed or covered with hardwood forests. In recent years, the area has developed more of an "affluent-suburban" character, with open lands giving way to low-density residential development (2+ acre, or 5+ acre lots), office parks and commercial development, and an expansion of recreational facilities such as golf courses. In addition, the once rural character of the local area has been heavily influenced by the expanding network of heavily traveled major roads and highways.

VISITOR USE ANALYSIS

In 1998, visitation to Morristown National Historical Park totaled 543,787. Peak visitation fluctuates throughout the year with spring and fall weekends being the busiest. Group visits to the park, particularly from local schools constitutes the bulk of the visitation during the week. Many visitors utilize park roads and trails for hiking purposes with a smaller number using the trails for horseback riding.

MANAGEMENT OF RESOURCES

Planning

The park's master plan was completed in November 1976. A General Management Plan is currently being proposed for the park. In order to comply with the Government Performance and Results Act (GPRA) which requires both strategic planning and performance measurement, a Strategic Park Management Plan was developed in July 1997 to assist the park in establishing GPRA goals.

Management Objectives

The management objectives for Morristown National Historical Park were established at a Management Objectives Workshop held in 1996 and are listed below:

Define a strategy for the management of cultural landscapes in areas of high interpretive value (e.g. PA line, Wick Farm, Washington's Headquarters) to facilitate interpretation of the Continental Army's winter encampments through the development of cultural landscape reports and inventories. Maintain other forested areas as northern temperate hardwood forests similar to those present during the 18th century. The park's landscapes will be maintained through management of plant and animal communities in cooperation with adjacent property owners and land conservation entities.

Work cooperatively with adjacent land owners and other land conservation entities (i.e. county parks, Great Swamp etc.) to develop local interpretive trail system that links distinct park units and connects with regional trail systems (i.e. Highland Trail, Patriots Path, etc.), in order to promote greater appreciation of historic resources.

With the assistance of park partners and New England System Support Office (NESO) cultural resources staff, develop and implement an action plan for stabilization of critical park cultural resources, including cultural landscapes, historic structures with significant deferred maintenance needs, vulnerable archeological sites, and museum collections requiring improved documentation and collections storage.

Management Issues

Inadequate Facilities for Collection Storage, Research and Conservation

The park curatorial collections are nationally prominent. There are approximately 227,428 objects in the collections, which breaks down as follows: 32,827 artifacts in Archeology, 15,138 in History, 179,263 in Archives and 200 in the Biological categories. The most critical problems to collections preservation are inadequate storage and substandard environmental controls. Improved environmental controls have been established at Washington's Headquarter's Museum but are lacking at other storage areas of the park. A museum expansion project has been proposed which would increase and enhance collection storage facilities.

Lack of Planning Documents

Lack of planning documents prevent adequate identification of and action on critical issues affecting park resources. Plans needed include a general management plan, statement for management, park-wide cultural landscape report, vegetation management plan, integrated pest management plan, land protection plan, hazard tree management plan, exotic species management plan, trail management plan, orchard management plan and geographic information system plan. Recommendations from completed plans such as Recommendation for Land Management -Jockey Hollow Area, and Washington's Headquarters & Wick Farm Cultural Landscape Inventory & Assessments are not being acted on in lieu of completion of park-wide documents such as a General Management Plan and overall Cultural Landscape Inventory.

Erosion of Archeological Resources

The archeological resource is being damaged by surface erosion, especially along logs on the ground, and by subsurface disturbance from falling trees and probably also by decaying tree roots and burrowing animals.

Conflicting Adjacent Land Uses and Development

Changing land use patterns and increasing development on adjacent lands is threatening the protection of resources, detracting from the historic integrity and beauty of the park, and contributing to proliferation of local deer population.

Lack of Resources Staff and Fiscal Support

Base funding and staff level have not increased adequately to meet the demands on resources management and programs. Funds are lacking to adequately support existing permanent and personnel and operational costs, much less a minimally acceptable program of resources management, monitoring, visitor education services, interagency relationships, community involvement, protection patrols and facilities maintenance. The requirements placed on staff time and resources by new and changing policies, programs and procedures reduce the time available to fulfill park needs. The duties cannot be performed consistently without resources management expertise and adequate funding to address issues and develop programs.

Lack of Basic Resources Data and Monitoring

Baseline information is inadequate for knowing and monitoring natural and cultural resources. More data must be acquired to serve as a basis for monitoring changes and must be gathered on the flora, fauna, water and soils to identify components of the natural resources, ecosystems, related processes, and individual threats that may be present. Likewise, thorough archeological surveys will provide the data to oversee those sites. Monitoring protocols for natural resources must be designed and carried out on a regular and systematic basis to provide management with sound information to document threats, evaluate trends, and make decisions. There has been some accomplishments to resolve this issue with an herbaceous plant inventory and some monitoring programs. However, comprehensive data gathering, integration, and long-term monitoring must be implemented.

Management of Eighteenth Century Forest Areas

Historic corridors such as roads and trails that follow 18th century routes are engulfed by non-native plants. There is very little native plant growth below the level of deer browse. The forest lacks the structure and diversity which probably characterized the pre-encampment forest as well as apparently lacking regeneration to maintain it in the future. Loss of native understory in the forest interior has probably contributed to a decline in animal biodiversity.

Building and Exhibit Restoration and Rehabilitation

Historic park structures have a backlog of repair needs and environmental control and security improvements. Exhibits in park visitor areas are in need of rehabilitation.

Lack of Vegetation Management Program

Vegetation management is rarely accomplished and only on a piecemeal basis. No decision has been arrived at concerning timeperiod of interpretation for Wick House and Washington Headquarters Landscapes. A comprehensive vegetation management program needs to be developed to identify rehabilitation techniques, landscaping needs, exotic species and hazardous tree removal.

NATURAL AND CULTURAL RESOURCES ENVIRONMENT

Historic Structures

Seventy-one buildings were listed in the 1985 Inventory of Structures at Morristown NHP of which thirty eight meet the criteria of historical significance and eligibility to the National Register. The baseline inventory & condition assessment of historic structures was last performed in 1996 (see RMP Appendix # 1). The primary historic structures relating to the park's 18th century historical themes are the Ford Mansion, Wick House and Guerin House, all of which are on the National Register.

Ford Mansion:

The Ford Mansion is a restored two-story Georgian House furnished and interpreted as George Washington's headquarters from December 1779 to June 1780. The house was completed in 1774 and remained in the hands of the Ford Family until 1873. At that time, the house was sold at an auction to a group of men who were to call themselves the Washington Association. In 1933, Morristown National Historical Park was established, the first of its kind within the National Park Service. In May of that year, the Ford Mansion and all of its contents was turned over to the United States by the National Park Service.

In 1935, a museum administration building was constructed just north of the Ford Mansion. Formal tours of the Ford Mansion are offered on a daily basis. Fire and intrusion alarm systems are in the process of being upgraded. The Ford Mansion was entered on the National Register in 1980 as part of Morristown National Historical Park. Although the entire park is listed on the National Register under Criterion A for its association with the American Revolution, the Ford Mansion as part of the Washington's Headquarters Unit is also significant as an example of late Georgian Architecture.

Wick House:

The Wick Farm was the first of three 18th century farms established within the area that would become the Jockey Hollow Unit of Morristown NHP. Henry Wick purchased the approximately 1114-acre property with his father-in-law in 1746. By 1748, the property consisted of over 1400 acres and was under the sole ownership of Henry Wick. Two other neighboring farms, the Kemble and Guerin farms, were established soon after. Henry Wick constructed the farm house around 1750. Although modest by today's standards, the Wick House was a rather impressive farm house for the 18th century. During the winter of 1779-1780, 10,000 soldiers camped on the Wick Farm and the neighboring Kemble and Guerin Farms, which made up the Jockey Hollow area. During the encampment, General Arthur St. Clair used the Wick House as his headquarters. After the American Revolution, the property continued to be farmed into the 20th century. In 1933, the National Park Service acquired the Jockey Hollow area, which was at the time threatened by subdivision and development. The Civilian Conservation Corps (CCC) began researching and documenting Morristown NHP as a whole as well as implementing several preservation projects throughout the park. One project undertaken was to research and document the historic appearance of the Wick House. As a result, it is restored, furnished and interpreted as the headquarters of General Arthur St. Clair during the 1779-1780 winter encampment of the Continental Army and as a typical farm caught up in the war. Living history interpretation is conducted on a daily basis with formal talks to school groups and occasional special event programs. Fire and intrusion alarms protect the structure. Over the past few years, minor renovations have been completed including residing and replacement of doors.

Guerin House:

The Guerin House is a two story clapboard colonial home with later additions. The exterior and surrounding grounds are maintained to present a colonial appearance. The interior has been adapted for colonial use. The house has served as the traditional superintendent's structure since the 1930's when it was restored. Knowledge of the structure was inadequate to do a complete and accurate restoration.

Museum Collections

As outlined in the Summary Chart for Objects there are approximately 227,428 objects in the collections, which breaks down as follows: 32,827 artifacts in Archeology, 15,138 in History, 179,263 in Archives and 200 in the Biological categories. These figures are based on a survey of representative portions of the object collections by category, which was completed as part of the Collections Condition Survey in 1991. The nationally -prominent museum collections consist primarily of 18th century material including fine and decorative art objects, furniture and household goods, military weaponry and accoutrements, archeological specimens, manuscripts, rare books, prints, maps and historic photographs. Most of these materials have a strong association with the Revolutionary War in New Jersey, historic Morristown, park archeological sites, historic structures and George Washington and were collected between 1873 and 1933 by the Washington Association of New Jersey. The park received authorization for both a museum and a research library in its enabling legislation and the latter is one of the largest in the NPS and is also one of the most important Revolutionary War research centers in the country.

Archeological Sites

The major archeological sites in the park are listed in RMP Appendix # 2. Numerous smaller 18th century sites are also located within the park's bounds, though yet unlocated or identified. A good number of archeological sites exist reflecting the later 19th and 20th century land use of the park, although these have never been formally surveyed or assessed.

- A) Jockey Hollow Cantonment Sites: of the 12 major archeological sites in this unit, nine are the remains of brigade cantonment sites from the 1779-80, 1780-81 and 1782 encampments of the Continental Army and /or component units as follows: 1st and 2nd Pennsylvania, 1st and 2^d Maryland, Hand's, Stark's, and the 1st and 2nd Connecticut Brigades along with the 1782 New Jersey Brigade Site.
- B) Fort Hill: The site contains the distinctive remains of blockhouses and artillery emplacements built by Pennsylvania troops during their second winter encampment at Jockey Hollow in 1780-81. The site was briefly examined during the 1930's, but no detailed survey of the site has ever been made;
- C) Wick Farm: The grounds of the Wick Farm include a historic orchard, the original house, and the remains of numerous 18th and 19th century outbuildings. With the exception of the house and a few barn foundations, most of the features are below grade and protected by grass cover, except in the area near the Wick Garden. In the orchard, it is highly likely that the remains of the artillery cantonment site from the 1780-1781 PA encampment are preserved although yet unlocated.
- D) Guerin House: This 18th century domestic site was partially excavated and heavily disturbed during the 1930's structural renovations and reconstruction work. While the grounds may still contain remains of outbuildings and other features, they are not well-documented and it is likely that most structural features were obliterated during the restoration phases. The site is predominantly covered with grass or paving.
- E) Ancillary Sites: Post-Revolutionary War use of the lands at Jockey Hollow reflect agricultural and water supply practices and utilization during the 19th and early 20th centuries. The remains of a number of farms are on park lands - many were razed by the NPS during park development in the 1930's. Historic dumps, traces, roads and other features are in evidence.
- F) Fort Nonsense: The Fort Nonsense Unit contains the subsurface remains of the "upper redoubt", a defensive earthwork built in 1777. Reconstructed after excavation in the 1930's, it was graded during site improvement work in the mid-1960's. However, archeological research programs conducted at the site during 1989-91 confirmed the existence, location and form of the works, as well as confirming that significant 18th century remains survived the 1960's grading. The site is well preserved under grass cover.
- G) New Jersey Brigade Unit: The cantonment site of the New Jersey troops is the primary archeological resource of this park unit. Approximately one-half of the site was believed destroyed by 19th century farming, but a preliminary survey has revealed the existence of

additional features associated with the encampment on lands just outside park boundaries and owned by the New Jersey Audubon Society.

- H) Washington's Headquarter's Units: One of the park's most important cultural resources, this site is well preserved below sod cover and there is little active site damage. The site consists of the Ford Mansion grounds, which include subsurface remains of various outbuildings, including stables, offices, kitchens, cisterns and other potential structures and related features. Archeological testing of the site was done in the 1930's and limited salvage work in the early 1980's, although very little documentation exists for either project.
- I) Non-NPS Associated Sites: There are five sites critical to Morristown's storylines and themes that are not currently preserved within the park's boundaries. The Pluckemin Tract contains significant cultural and natural resources, the most significant of which are Revolutionary War archeological sites. The park is in the process of acquiring this land. A section of the New Jersey Brigade was discussed in section G. In addition, the Lowantica Site-reputedly the site of Washington's 1777 encampment, lies on a mixture of county park and private lands just south of Morristown. Knox's Artillery Brigade Cantonment (the only 1779-80 camp currently not encompassed in MORR) is located on Route 24 across from Burnham Park in Morris Township. A significant portion of the site is well preserved on a wooded hillside and the site is divided into a number of private tracts-one of which is owned by a developer. The final site is the military hospital built and used during 1779-80 by the army and located in Basking Ridge on lands owned by the Somerset County Park Commission.

Cultural Landscapes

All four park units at Morristown National Historical Park contain significant resources in cultural landscapes. While all four of the units have a primary goal of landscape preservation based on the appearance of period of the Revolutionary War, each unit also includes cultural landscape elements reflecting later periods of land use and site history. These cultural landscapes consist of both natural and human-altered or design features. In addition to the landscape within park boundaries, the contiguous lands and viewsheds outside of the park contribute and sometimes detract to the historic scene. In order to meet GPRA requirements, it has been determined that the park contains 5 cultural landscapes. They are the Jockey Hollow Unit (as a whole), Wick Farm, Washington's Headquarters, Fort Nonsense, and Cross Estate. Cultural Landscape Inventories (CLI's) have been completed for the Wick Farm & Washington Headquarter's and will be completed for the other three landscapes in 1999. As a result of the completed CLI's, landscape condition assessments have been determined for the Wick Farm & Washington's Headquarters. Both are considered to be in good condition according to RMP definitions. The classification of a landscape as good indicates that the cultural landscape shows no clear evidence of major negative disturbance and deterioration by natural and or human forces. The cultural landscape's historical and natural values are as well preserved as can be expected under the given environmental conditions. No immediate corrective action is required to maintain its current condition.

- A) Jockey Hollow Unit: Currently identified and managed cultural landscapes include the Wick Farm Garden, Orchard and Grounds, as well as the Pennsylvania Line and Grand Parade areas. The remainder of this unit is passively managed to reflect the natural landscape or mature hardwood forest appearance that would have been found here during the 18th century. However, certain tree species, such as chestnut and elm, have not survived and would have made up much of the 18th century forest. In addition, oak and other native hardwood tree regeneration is almost non-existent and the forest understory consists mostly of non-native species. Historic corridors include roads, such as Jockey Hollow Road, and trails, such as the Old Camp Road, that follow 18th century routes, but which serve today to connect different parts of the park, such as the tour road from the Wick House to

- the Soldier Huts. Subsequent land use and remaining landscape elements, such as 19th century farms and the Morristown Aqueduct System landscapes are not adequately documented.
- B) New Jersey Brigade Unit: The majority of acreage in this unit is left in a "natural state" reflective of the 18th century. However, the Cross Estate Complex receives a good amount of active management to restore the "formal" landscapes associated with this early 20th century country estate. Formal gardens, planted tree groves, rock gardens and walls remain from this period, in addition to structures and roads, and many of these resources are actively managed to maintain the historic scene of this time period. Exotic species have spread throughout this unit
 - C) Washington's Headquarters: Although surrounded on three sides by housing and roads, with a major highway in its rear, the ten acre unit, according to the 1974 Final Master Plan, attempts to manage the landscape as it may have appeared in the 18th century. However, the existence of these structures postdating this period in close proximity to the Ford Mansion pose significant problems to effectively convey this interpretive objective. Construction of these structures also caused major landscape modification from its earlier appearance. Plantings around the building are not reflective of the 18th century and Norway Maples were introduced to replace native varieties that were unhealthy or dead. Grass mowing reflects a 20th century urban park setting as well. Noted architect John Russell Pope, who designed the site's museum to reflect a colonial revival motif, planned a formal landscape to compliment it, which included 18th century-like formal gardens between the museum and mansion. This was in place until new landscaping was implemented in the 1970's to follow the Master Plan and Interpretive Prospectus guidelines.
 - D) Fort Nonsense: Primarily an interpreted archeological site, this unit is on a high hill overlooking the center of Morristown and surrounded on all sides by housing and cityscapes. The 18th century appearance of this site is partially restored by allowing forest growth to remain on all slope areas, with the exception of historic vistas looking out towards key geographical and historical points or viewsheds that relate to the site's interpretive theme. The 1777 earthen fortifications were destroyed earlier in this century and are now outlined by belgian block and grass plantings.

Vegetation

The vegetation of the park can be divided into two major categories: actively managed and passively managed sites. The first includes mowed fields, orchards, and planted gardens. The second includes a variety of mainly forested stands, including successional and mature stands. Successional stands range in age from 70-120 years old and reflect a slow abandonment of agricultural fields and logging beginning in the 1870's. The mature forest was probably never completely cleared for agricultural purposes. Successional stands in the park fall primarily into two major categories, Black Locust and mixed successional. Presently, most of the mixed-successional stands have well developed canopies which include Red Maple, Tulip and Black Birch. The species composition of the mixed-successional forest has not changed since the early 1940's. Black Locust is a non-local tree species that was utilized by farmers in the early 20th century. The Black Locust successional stands have also not evolved to other tree species, though they are now mixed with White Ash which was probably planted in the 1930's. These stands include dense patches of vines, primarily a mixture of native grapes and non-native bittersweet. They almost typically lack any indication of future succession to more typical mature forest trees, both where the vines are dense and elsewhere. In 1977, understory shrubs and small trees were common in the park including Flowering Dogwood, Grapes, Spicebush and others (Ehrenfeld 1977). In 1989, most lacked leaves below about 1.5 meters. (Russell 1995). Mature forest stands are defined by both their existence and dominance by oaks and beech and most likely resemble the 18th century forest than do the successional stands. The mature forests of the Jockey Hollow Unit consist of 664 acres or 53% of the land area. The successional forests of Jockey Hollow consist of 444 acres or 37.5% of the Jockey Hollow Unit (Ehrenfeld 1977).

The vegetation of the New Jersey Brigade Unit consists of a mixture of several types of upland forest with varying dominance by Yellow Poplar, Black Birch and Chestnut Oak.

Five enclosure/vegetation studies are currently being conducted in the park. In 1987-88, as a result of the recommendations from the White-Tailed Deer Management Study by Christie & Sayre, five deer enclosures were constructed to compare over time the differences in type and structure of vegetation with and without deer browsing. The vegetation inside the enclosure and adjacent unfenced control plots are sampled on a yearly basis. In 1995, four enclosures were constructed to compare over time the rate of range expansion of two invasive non-native species, Japanese Barberry and Japanese Wiregrass with and without browsing. The vegetation inside these enclosures was initially sampled in 1998. Also in 1995, two enclosures were constructed to protect native seedlings. In 1997, under the guidance of Professor Steven Handel of Rutgers University, four enclosures were constructed to evaluate the effect of deer herbivory on Jack-in-the-Pulpit. Also in 1997, ten enclosures were constructed to determine if native wildflowers could be reintroduced to the park.

Five non-enclosure vegetation related studies have recently been completed or are currently being conducted. In 1995, a systematic parkwide Herbaceous Plant Inventory was completed. In 1992, a study of the ecology of Japanese Barberry and Japanese Wiregrass was initiated by Dr. Joan Ehrenfeld of Rutgers University. A draft version of the Final Report was received in January 1999 and is currently under review. A digital data layer delineating Japanese Barberry and Japanese Wiregrass extent and density is part of the project. In 1996, Dr. Ehrenfeld initiated a project to study the ecosystem effects of exotics species. In 1994, an ongoing project was initiated by Dr. Emily Russell to study the dynamics of tree seedling survival. In 1996, a study was initiated by Dr. Charles Leck of Rutgers University to determine the utilization of Japanese Barberry as a nesting site for birds. The field portion of this project is completed and data is currently being analyzed.

The park's first Herbaceous Plant Inventory was conducted in 1995. 291 herbaceous plants were identified along with 22 species of ferns. 6 herbaceous plants found in the inventory are on the State of New Jersey list of threatened plants. The six species are Rattlesnake Plantain, Twinleaf, Slender Pinweed, Strict Blue-eyed Grass, Oak Fern, and American Ginseng. A study is currently being conducted by Rutgers University to verify the presence of these six-state-listed species in the park.

The Wick Farm Orchard contains approximately 170 trees which are a mixture of modern varieties and heirloom varieties. The Wick Farm Landscape presently consists of a manicured lawn and many individual specimen trees. The Washington's Headquarter's Landscape currently consists of scattered canopy trees of various size and age. Shrubs are located around both the Ford Mansion and Museum, and grass is mowed to maintain a somewhat manicured appearance. Fort Nonsense contains many older canopy trees along with a few evergreen shrubs. Andropogon Grass outlines where a redoubt was located during the Revolutionary War. The park currently has a field mowing program designed to recreate the historic scene. Fifteen fields totaling 122 acres are mowed. Twelve fields are mowed once every year or two to maintain the field in an advanced successional or abandoned state. Three fields are mowed two to four times each year to provide a new field appearance for historical aesthetics.

The algae of the park's waterways was studied extensively by Trama & Galloway in 1989. Diatoms were reported to be the predominant algae and maximum growth occurs during the spring. Species found are those characteristic of shallow rocky streams exhibiting high water quality, and appear to form an excellent food base for the herbivorous aquatic macroinvertebrates occurring in these waters (Trama and Galloway 1988). No rooted macrophytes were observed at any sampling site by Trama and Galloway. The absence of these plants could be due to swift currents, rocky substrates, changing water levels, low nutrient availability and/or limiting amounts of solar radiation during the growing season. However, an aquatic moss, *Fontinalis* spp. is common and liverworts are sometimes found on exposed rocks in the stream channel or along the wet banks. (Trama and Galloway 1988).

Ehrenfeld indicates the presence of relatively extensive riparian areas associated with Primrose Brook on her vegetation maps of the Jockey Hollow Unit and along the floodplain of Indian Grave Brook within the New Jersey Brigade Unit.

MORR is currently prioritized # 127 for plant inventories by the NPS Inventory & Monitoring Program as of 7/28/97. Appendix #3 contains plant species lists for the park

Animal Species

A thorough inventory of the park's white-tailed deer population was conducted by Christie & Sayre in 1985-86. The park has been monitoring the population trends since that time. No other systematic mammal inventories have been conducted. A list of park fauna was produced as part of the NPS North Atlantic Region Status of Natural Resource Inventories Report in 1992. The list was derived from species checklists compiled in the 1970's and 80's. Numerous sightings of wild turkeys have occurred in recent years along with occasional sightings of Red Fox, Coyote and Black Bear. Meadow Voles are numerous in the park's orchard and herb garden and have caused much damage to young apple trees.

A feasibility study of a fertility control program for White-Tailed Deer is currently being conducted by Dr. Brian Underwood of the USGS Cooperative Parks Study Unit at the State University of New York College of Environmental Science and Forestry. Phase I of the immunocontraception study was completed in 1997. Phase II of the study will be completed in March 1999. Phase I provided a population estimate of the White-Tailed Deer population in November of 1996 at the Jockey Hollow Unit of 60.5 deer km² or 151.2 deer mi². In fall of 1985, Christie & Sayre provided an estimate of 65.4 deer km² or 163.5 mi². Lewis Morris County Park which is adjacent to the Jockey Hollow Unit has conducted a deer control program in 1996 & 1997. Deer spotlight counts, which were recommended by the Christie & Sayre study have been conducted in the park since 1987 show an approximate 40-50% lowering in the number of deer observed in the park since the initiation of the Lewis Morris hunt. These numbers have been verified by Dr. Underwood who estimated deer density in the Jockey Hollow Unit in 1998 to be 30 deer km².

Lists of avian species are occasionally compiled by volunteers and a checklist is scheduled to be completed in 1999. A bird inventory funded through the WASO Inventory & Monitoring Program will be initiated in 2000. The Cooper's Hawk, a state listed threatened species, nested in the New Jersey Brigade Unit in 1995. A 1983 water resources assessment by Joseph and Maria Mele produced a list of benthic invertebrates along with population and species diversity assessments of fish, reptiles and amphibians. Fish found in the park's waterways included the Spottail Shiner, Eastern Brook Trout, Rainbow Trout, Mottled Sculpin and Brown Trout. The Eastern Brook Trout is listed as a Threatened Species by the State of New Jersey. Mele and Mele observed thirteen species of amphibians and reptiles associated with their sampling sites during their study. The most commonly observed species included the Redback Salamander, Jefferson's Salamander, the Northern Two-Lined Salamander, the Green Frog, and the Slimy Salamander. Less common species observed included the Red-Spotted Newt, the Northern Dusky Salamander, the Northern Leopard Frog, the Snapping Turtle, the Box Turtle, the Eastern Garter Snake, and the Northern Water Snake. The Wood Turtle, on the New Jersey List of Threatened Species, has been observed on several occasions in the park within the last few years. A reptile & amphibian survey funded by the WASO Inventory & Monitoring Program will be initiated in 2000.

A study of the watershed of Jockey Hollow and the New Jersey Brigade was conducted between 1987-88 by Trama and Galloway. A comprehensive and quantitative survey of benthic macroinvertebrates was an important part of this study. The types of benthic fauna found by both Mele and Mele (1983) and Galloway (1989) indicate a typical stony or hard bottom habitat supporting a number of pollution intolerant indicator species of mayflies, stoneflies and caddis flies. Galloway's (1989) thorough evaluation of community structure indicates that all streams within the park support healthy, diverse, and abundant macroinvertebrate communities.

The NPS Inventory & Monitoring Program Priorities as of 7/28/97 ranks MORR as #5 for bird inventories, #5 for amphibians/reptiles, #60 for mammals, and #75 for fish. Fish inventories will be conducted in 1999 in the park under a cooperative agreement with the University of Massachusetts funded by the NPS Natural Resource Preservation Program. Appendix # 4 lists animal species found in the park.

Aquatic Resources

Significant surface water features in Morristown National Historical Park are found only within the Jockey Hollow and New Jersey Brigade Units. These units are largely located within the upper reaches of the 55.6 square-mile Great Swamp Watershed, a subunit of the Upper Passaic River Basin.

Predominant surface water features within the park include: 1) most of the headwaters of the Primrose Brook subwatershed, which include the East Branch Primrose Brook and the West Branch Primrose Brook; 2) the headwaters of Jersey Brook, a tributary to Primrose Brook; 3) a one-half mile reach of the Upper Passaic River, approximately one mile below Leddels Pond; and 4) a one-half mile section of Indian Grave Brook, a tributary of the Passaic River. In addition, a small artificial pond (Cat Swamp Pond) and two marshes are also located within the upper Primrose Brook drainage (Ehrenfeld 1977), while another small marsh is found adjacent to Indian Grave Brook within the New Jersey Brigade Unit. (Ehrenfeld and Dibeler 1987).

While most of the springs contributing to the headwaters of Primrose Brook surface within the park, the source spring of the East Branch Primrose Brook surfaces in an area known as Military Hill, which is located on private land just outside the northeastern boundary of the park. Primrose Brook, one of the highest quality streams within the Great Swamp Watershed, is probably the least heavily human-influenced stream within the park. (Trama and Galloway 1988).

The New Jersey Surface Water Quality Standards (as amended, May 1998) designate the surface waters of the park as FW2-TP, trout production fresh waters.

Primrose Brook and the section of the Passaic River that flows through the park is also recognized as Category One (antidegradation) Waters.

The high water quality generally found in the streams flowing through the park can be attributed largely to the upper watershed location of the Jockey Hollow and New Jersey Brigade Units. No permitted National Pollutant Discharge Elimination System (NPDES) discharges are known to occur into any of the streams above the park.

Results of water quality inventory studies in the park have been reported by Mele and Mele (1983), Trama and Galloway (1988) and Galloway (1989). These studies indicate that the streams within the park generally exhibit very good to excellent water quality, being well oxygenated at all times, circumneutral in pH, low to moderate in alkalinity, and containing low to moderate nutrient concentrations. Total suspended solids (TSS), total dissolve solids (TDS), specific conductance, and chlorides, while low in streams, were slightly higher in Jersey Brook, Indian Grave Brook, and the Passaic River than they were in Primrose Brook (Trama and Galloway 1988). Increases in these parameters may be associated with the close proximity of Tempe Wick Road to Jersey Brook and the low-density residential development found in the uppermost reaches of the Upper Passaic and Indian Grave Brook subwatersheds.

Mele and Mele (1983) conducted quarterly fecal coliform bacterial monitoring at five stream locations from the fall of 1982 through the fall of 1983. Fecal coliform bacteria levels ranged from 0 to 150 colonies/100 millimeters (mL). While these levels are considered to be generally low, Mele and Mele (1983) suggest that the slightly elevated observations at the Jersey Brook and East Branch Primrose sites might be associated with septic leachate.

Additional bacterial monitoring (fecal coliform and fecal streptococcus) was conducted quarterly by Trama and Galloway (1988) from the summer of 1986 through the summer of 1987. Again fecal coliform levels were found to be generally with the exception of summer samples at two sites along the West Branch Primrose Brook, and a single summer sample exceeding 200 colonies/100mL in each of Indian Grave Brook and Jersey Brook. In the early 1990's, the park was forced to close a public potable water source located at the Pennsylvania Line Parking Lot due to continual high levels of coliform.

A two-year intensive study was completed in December of 1997 to evaluate the extent of bacterial contamination (surface and ground water) and possible sources of contamination within the Jockey Hollow and New Jersey Units of the park. Seven groundwater monitoring wells were installed in the park in conjunction with this study. Five are located along the West Branch Primrose Brook, south of the Trail

Center Parking Area, one at the head of West Primrose Brook, and one near Jersey Brook. The final report concluded that the waterways that flow through MORR are contaminated with respect to fecal coliform and enterococci bacteria. Contamination is not continuous, occurring seasonally in some streams and occurring throughout the year in others. Bacteria standards utilized for this study are established for protection of human health with regard to designated uses. At MORR, the relevant designated uses are contact recreation and potable water supply. The park does not have any untreated public drinking sources and there are no official areas for swimming. The source of bacteria found in the water samples of this study is fecal matter from warm-blooded animals.

Trama and Galloway (1988) reported very low total recoverable aluminum concentrations in the stream water. While these concentrations pose no threat to aquatic life, further analyses revealed high aluminum content in local soils. While it is unlikely that a serious threat of aluminum toxicity to the aquatic organisms in these streams exists, in the event that aluminum from the soil was mobilized, both water quality and aquatic biota could be impacted (Trama and Galloway 1988).

Cat Swamp Pond is the only existing open water pond within the park. This small pond, located in a low area adjacent to the East Branch Primrose Brook, is a remnant of the water collection and storage system that was built as part of the Morristown Aqueduct Water System. Cat Swamp Pond is surrounded by a construction berm. It has no natural drainage and its water level is presumably maintained by a high water table. While Cat Swamp Pond has no natural outlet, it is connected to East Branch Primrose Brook by an overflow outlet pipe along the eastern edge of the berm. The water in Cat Swamp Pond is tannin stained and has a heavy influx of leaf litter and a negligible rate of water exchange. Ehrenfeld (1977) reports Cat Swamp Pond as being remarkably devoid of flora and fauna, possibly caused by deoxygenated conditions brought about by high amounts of natural decomposition and the low water exchange rates.

Aquifers provide the primary water supply to many of the communities and scores of local industries in the area around the park. Both the Jockey Hollow and New Jersey Brigade Unit contain a number of natural springs and seeps emanating from a shallow aquifer. From the historical perspective, these springs provided an important water source to the encamped Continental Army. In the 1890's a growing Morristown began to utilize these natural springs as the town's water supply. A series of trenches and ponds were constructed in order to facilitate the collection and storage of water which then flowed to Morristown via the Morristown Aqueduct Water System. This aqueduct system was abandoned in 1933, but remnants including iron pipes, collection trenches and vaults, and storage ponds remain.

Park visitor facilities, administrative buildings, and residences all rely upon ground water wells for water supply. Seven employee residences and three public use structures have water obtained from wells within the park. While little information is available regarding local ground water use, there are no known well fields or other significant withdrawals in the general vicinity of the Jockey Hollow and New Jersey Units (Mele and Mele 1983).

Ehrenfeld (1977) identified two small marshes within the Jockey Hollow Unit and Ehrenfeld and Dibeler (1987) reported an additional small wetland adjacent to Indian Grave Brook within the New Jersey Brigade Unit. The first marsh, located on the West Branch of Primrose Brook, was formerly a holding pond of the Morristown Aqueduct Water System. Drained when the system was abandoned in the 1930's, this marshy site is currently dominated by forested wetlands including black willows and other wet site trees and shrubs. The second marsh is located below Cat Swamp Pond on the East Branch of Primrose Brook. While neither of these features have been accurately delineated, the presence of the second marsh is indicated on a 1980 surface water map of the Jockey Hollow Unit (Malanka 1980.) Ehrenfeld and Dibeler (1987) identified a small area of forested wetland within the New Jersey Brigade Unit at the intersection of Indian Grave Brook and a small feeder stream which runs southwest from Patriot's Path. This wetland area, which lies in an area of saturated soils, is of ecological significance because of its contribution to species and habitat diversity.

In their assessment of Morristown National Historical Park's aquatic resources, Trama and Galloway (1988) provided the park with a series of recommendations for long term water quality monitoring and management. An important part of these recommendations was the establishment of a systematic water quality monitoring program which consists of a monthly monitoring program for key parameters

including temperature, pH, dissolved oxygen, specific conductance and in recent years sodium chloride. These recommendations were adopted in 1988 with the establishment of a 10 station monthly program. The purpose of this program is to provide a long term record for a minimal set of key parameters which might serve to flag water quality impacts or deteriorating water quality. In addition, the familiarity with stream conditions and visual observations of park staff obtained during monthly visits might also prove useful in detecting possible stream quality deterioration.

The confluence of the East and West Branches of Primrose Brook is utilized as a water quality monitoring site by several state and federal agencies. The US Fish & Wildlife Service has monitored several water quality parameters and sampled aquatic life at this site since 1991. In November 1996, The US Geological Service established a water quality monitoring site at this location and will monitor several chemical and physical parameters including stream flow on a quarterly basis. They will provide the park with data on a regular basis. The State of New Jersey, Department of Environmental Protection, Division of Watershed Monitoring, conducts macroinvertebrate sampling on the West Branch of Primrose Brook near the Trail Center Parking Lot. The New Jersey Audubon Society's Scherman-Hoffman Sanctuary which is adjacent to the New Jersey Brigade Unit has a water quality monitoring program.

A Water Resources Report Scoping Report was prepared by the National Park Service's Water Resources Division. Much of the information used to describe the park's water resources was collected from that report. As part of the NPS Inventory & Monitoring Program, a baseline water quality data inventory and analysis was produced for the park. This report summarized park related water quality information in existing EPA databases, particularly STORET. The NPS I&M Program as of 7/28/97 has MORR prioritized #165 for water body inventories and 999 (unprioritized) for water quality inventories.

Air Resources

The ambient air quality standard for the area covering the park is designated as Level 2. Two-thirds of the approximately 8 million residents of New Jersey live in the northern one-third of the state, the location of Morristown National Historical Park. Many of these residents commute to eastern New Jersey and New York City on a daily basis, residing in the communities surrounding the park. Although air quality elements are not presently measured in the park, it is suspected that pollutants from vehicle emissions may be affecting park resources.

The levels of carbon monoxides, nitrogen oxides, hydrocarbons and at certain times of the year, ozone are particular areas of concern. The unit of the park suffering the most severe air quality is Washington's Headquarters, which has a six-lane interstate highway, Route 287 forming its western boundary. Potential historic structure deterioration, vegetative and other natural resource damage and employee health may be adversely affected by air pollution. Vegetation has been cleared from the Fort Nonsense Unit of the park for the purpose of creating historic vistas. During certain weather conditions the view is impacted by declining air quality and decreasing visibility.

An air quality monitoring site for the State of New Jersey is located in the center of Morristown. The site only monitors a few of the air pollution parameters. There is a lack of similarity between the park and the Morristown sampler location. Unfortunately, no other information on air quality relevant to the park exists.

Although no park-specific monitoring program has been established, it is felt that acidic and pollutant deposition is probably having an adverse effect on cultural and natural resources of the park.

The NPS Inventory & Monitoring Program has MORR prioritized #152 for Air Quality Inventories and #129 for Climate Inventories.

Geology

The Jockey Hollow Unit lies in the Highlands Physiographic Province or the Trowbridge Range which is a component of the Reading Prong. Precambrian gneiss underlies the park. This material is fairly impermeable to water but does contain groundwater in scattered locations.

No geologic studies have been undertaken in the park. An escarpment which runs from the Mt. Kemble area in Jockey Hollow to Fort Nonsense approximately five miles away, provides panoramic views in an easterly direction. The geologic setting is the primary reason for the establishment of one unit of the park, Fort Nonsense. The Watchung Mountains provided a physical barrier which could serve to slow down the British if they approached Morristown from New York City and was a primary reason for Washington utilizing what is now the park as a winter encampment. With the exception of this hilly region, geologic resources play a small role at Morristown National Historical Park. Oil, gas, and other mineral development industries have made no impact on park resources.

The lack of a forest understory due to deer browsing may be accelerating the rate of soil erosion in the park. This may be adversely affecting trail surfaces, archeological sites and streambeds. The park has a small abandoned landfill at the New Jersey Brigade Unit behind the Visitor Parking Lot. The depression is approximately 75 feet in diameter with a relief of approximately 10 feet. Site observations indicated that buried debris was present at a depth of at least 2-3 feet below ground surface. The landfill was active as a family dump site prior to NPS ownership. There are no records as to extent of use or types of refuse. The surface debris has been removed. The soil in the landfill was tested for hazardous contaminants in the fall of 1996. Analytical results indicated no contaminant concentrations above hazardous levels. The presence of TCLP lead may be indicative of elevated total Lead concentrations. Elevated TOX concentration may indicate the presence of elevated concentrations of specific chlorinated organic compounds. A copy of the final report was sent to the New Jersey Department of Environmental Protection for review.

The park's historical archeological base map indicates the presence of two mica mines in the Jockey Hollow Unit of the park. There are no obvious present day surficial features which would point to the locations of these mines.

The park straddles two of the four geological provinces found in New Jersey. Most of the park lies in the Highlands Physiographic Province. A section of the fault line runs through the park. Several park residences have been measured to have high radon. The highest count was measured at the residence closest to the fault.

The park's archeological resources are being damaged by surface erosion, especially along logs on the ground that cause erosion by channeling water and by subsurface disturbance from falling trees and probably also by decaying tree roots and burrowing animals.

The wooded areas of the park serve several purposes within the overall goal of preserving the historic scene and contributing to understanding the nature of the historical events. Analysis of pollen or cores taken from marshy spots in the park may provide an accurate historical record of the changing importance of the dominant species in the park. This information would be very useful to the park should it consider active management of wooded areas for evocation of the historic scene.

The park's knowledge concerning its bedrock geology are general in nature having been acquired through information gathered for this area of New Jersey. Lying along a fault line, the park could utilize specific research about the effect of fracture zones and bedrock formations on springs, aquifers and groundwater.

Aesthetic Resources

The purpose of Morristown National Historical Park is to present the story of the winter encampment in Morristown; to tell how the Continental Army was held together during these critical periods; and to arouse visitors interest in that vital aspect of the American Revolution. As a result, protection of aesthetic resources such as landscapes and vistas are critical to the preservation of the park scene. During the past twenty years, the area has undergone tremendous socioeconomic change and development has occurred at an extraordinarily rapid rate. Indirectly the development surrounding the park has caused disruption of the historic scene through both noise and visual impacts.

ROLE AND USE OF MORR'S RESOURCE MANAGEMENT PLAN

The RMP is foremost a plan for the park's use in management of park resources. It provides a tool for integrating the responsibilities of all park operations in meeting park resource objectives and serves as a reference document for all current and future park staff, for development of needed detailed action plans, and for cooperating with adjacent landowners. The RMP is also used outside the park. Both the automated data and the RMP narrative are regularly used by WASO staff and support offices to identify priority needs, describe and provide examples of resource concerns, and develop and justify budget increase requests. The data are consulted by GAO, the Inspector General, researchers, and interest groups, the latter evaluating park's resource needs and programs, as well as to identify projects that might be of interest to donors.

The RMP differs from a park strategic plan, prepared under the Government Performance and Results Act (GPRA), since it looks at long-term goals, objectives, and strategies needed to resolve resource deficiencies and meet mandates, policies, and guidance without the constraint of expected budgets over the near term (5 years). Thus, it provides an important context for developing GPRA plans. The RMP provides a complete vision, the GPRA plan maps out the near-term priorities. The Project Management Information System (PMIS) is a Department of Interior Program designed to develop and document a backlog of projects that are non-recurring. PMIS projects utilize the Choosing by Advantages method to prioritize and fund projects.

Resource Stewardship Strategy

The Resource Stewardship Strategy includes four elements:

The Vision

The capabilities and programs that should be in place by the year 2003.

Critical Needs

What needs to be achieved in specific program areas within the next four years

Key Actions

What needs to be done administratively to fulfill the Vision and meet the needs.

Project Statements

The individual projects that should be accomplished within this planning period.

Resource Management Program Vision

By the end of this planning cycle (2003) Morristown National Historical Park's Resource Stewardship Strategy will include resource management objectives and action plans to implement these objectives. The primary purpose of these objectives and plans is to integrate and preserve the park's cultural and natural resources in order to foster an awareness of the Revolutionary War timeperiod. Park staff, neighbors, the general public, stakeholder groups and cooperating agencies will understand, appreciate and support MORR's resource-stewardship objectives and programs.

Resource Management Critical Needs

These critical needs are established to provide program guidance on how the National Park Service and partners will achieve its resource-stewardship mission at Morristown National Historical Park. The needs provide the foundation for the stewardship strategy, and serve to focus NPS staff and partners on critical issues and projects. The needs are broken down into natural, integrated and cultural projects.

Cultural Resource Critical Needs

1. Develop a historic preservation program so that historic structures are maintained inside and out. Protect and improve the character and fabric of historic buildings and structures through preservation, restoration, register listing and other appropriate means.

Structures needing immediate improvement:

Ford Mansion: roof, HVAC, abate water damage, repoint foundation

Wick House: roof replacement, rehabilitate exterior and interior

Museum: library: install fire suppression system, improve archival storage, repair/replace flashing

Soldier Huts: repair & rehab

Guerin House: replace roof & drainage system

2. Obtain and maintain appropriate inventories of cultural resources including a survey of archeological sites.

Project Statements in the RMP that address these needs include:

Complete Cultural Landscape Inventory

Initiate & Complete Parkwide Cultural Landscape Report

Develop Action Plan to Improve Cultural Landscapes

Complete Orchard Management Plan

Initiate & Complete Archeological Landuse Study: Phase I & II

Initiate Archeological Assessment Report

3. Facilitate the achievement of an effective museum-collection program that is up-to-date, reflects current preservation policies, meets most information and research needs, and provides for the effective housing and cataloging of the collection.

Project statements in the RMP that address these needs include:

Improve storage conditions for collections

Preserve cellulose nitrate film negatives

Integrated Resource Critical Needs

1. Develop and maintain a comprehensive multi-disciplinary research & monitoring program that includes cultural and natural resources and visitors and their impacts, with an emphasis on obtaining specific knowledge to define and resolve management issues.

Project statements in the RMP that address these needs include:

Develop Historic Structures Report.

Develop Ethnographic Study.

Complete Adjacent Land Use Study

2. Continue to develop and maintain an interpretation and outreach program focused on enhancing public understanding of the values and resource stewardship issues associated with Morristown National Historical Park.

Project statements in the RMP that address these needs include:

Update Headquarters Museum Orientation Film

Replace Film Trees at Washington Headquarters

Rehab Outdated Museum & Visitor Exhibits & Waysides

Develop Resource Education Program

Implement Park Watch Program

3. Delineate and maintain park boundary to protect natural and cultural resources.

Project statement in the RMP that addresses this need is:

Complete Boundary Marking

4. Maintain roads and trails to prevent resource damage & protect visitors

Project statements in the RMP that address these needs are:

Fire Road/Trail Bridge Assessment & Repair

Implement Hazard Tree Removal

5. Protect natural resources from direct damage or removal by human activities by maintaining an effective law enforcement function.

Projects that meet these needs are:

Conduct ARPA & Trail Patrols

Complete Washington's Headquarters Security System

6. Maintain Park Landscapes

Project statements in the RMP that address these needs include:

Continue Field Mowing Program

Maintain Fort Nonsense Vistas

Prepare Interim Historic Fence Mgt. Plan

7. Mitigate Damage to Park Structures & Vegetation

Project statement in the RMP that address this need:

Prepare & Implement Integrated Pest Management Plan

Natural Resource Critical Needs

1. Through the development and operation of a science-based comprehensive natural resource inventory and monitoring program, develop and maintain an understanding of the status and trends of populations, communities and ecosystems.

Project statements in the RMP that address these needs include:

Initiate Reptile & Amphibian Survey

Initiate Sytematic Bird Survey

Continue State-Listed Plant Study

Enhance Deer Population Monitoring

Initiate Patterns & Processes for Freshwater Fish Distribution at MORR

Expand Water Quality Monitoring Program

Expand Vegetation Monitoring Program

Initiate Wetlands Mapping Program

2. Perpetuate natural and ecological conditions through management planning to restore to the degree possible an 18th century forested landscape.

Project statements in the RMP that address these needs include:

Develop Deer Management Plan

Continue Non-Native Plant Removal Program

Develop Vegetation Management Plan

3. Preserve Integrity Of Park Resources

Project statement in the RMP that address this need:

Reduce Archeological Site Erosion

KEY ACTIONS

1999

1. Initiate Soldier Hut Restoration Project
2. Complete Washington's Headquarter's Security & Fire Protection System
3. Complete Immunocontraception Feasibility Study
4. Complete Adjacent Land Use Study
5. Initiate Reptile & Amphibian Survey
6. Initiate Patterns and Processes For Freshwater Fish Distribution Study.
7. Complete Coliform Contamination Study
8. Complete Cultural Landscape Inventory & Assessment
9. Initiate Deer Management Plan
10. Initiate White-tailed Deer Marker Dart Study
11. Initiate Project to Digitize New Jersey Brigade Historical Resource Maps.

2000

1. Initiate Parkwide Cultural Landscape Report
2. Initiate Vegetation Management Plan
3. Initiate Bird Inventory
4. Complete State-Listed Plant Study
5. Initiate Archeological Landuse Study
6. Initiate Orchard Management Plan
7. Implement Deer Management Plan
8. Complete Project to Digitize New Jersey Brigade Historical Resource Map

2001

1. Complete White-tailed Deer Marker Dart Study
2. Complete Patterns & Processes for Freshwater Fish Distribution Study
3. Complete Archeological Land Use Study
4. Complete Orchard Management Plan
5. Complete Parkwide Cultural Landscape Report
6. Complete Soldier Hut Rehabilitation Project

2002

1. Initiate Archeological Assessment Report
2. Develop Cultural Landscape Action Plan
3. Complete Bird Inventory
4. Complete Reptile & Amphibian Survey

Top Ten Project Statements

Cultural

1. Preserve Priceless Park Collections & Archives
(MORR-C-006)
2. Rehab/Restore Ford Mansion (MORR-C-014)
3. Rehab/Restore Wick House (MORR-C-015)
4. Library & Archival Storage Collections Improvement
(MORR-C-008)
5. Museum & Visitors Center Exhibits Rehabilitation
(MORR-C-010)
6. Preserve Cellulose Nitrate Film Negatives (MORR-C-013)

7. Cultural Landuse Study Phase I (MORR-C-001)
8. Cultural Landuse Study Phase II (MORR-C-002)
9. Boundary, Aerial & Topographic Mapping (MORR-C-007)
10. Wick House Furnishing Project (MORR-C-009)

Natural

1. Conduct Deer Immunocontraception Experiment (MORR-N-015)
2. Develop Exotic Species Mgt. Plan (MORR-N-005)
3. Investigate Vegetation Dynamics of Vines (MORR-N-016)
4. Continue Lyme Disease Surveillance Program (MORR-N-020)
5. Planning for Historic Orchard Management (MORR-N-007)
6. Remove Non-Natives, Plant Natives (MORR-N-056)
7. Enhance Park's Natural Resource Capabilities (MORR-N-063)
8. Develop & Implement Archeological Site Mitigation Plan (MORR-N-038)
9. Interpret Natural Resource Issues (MORR-N-049)
10. Fire Road/Trail Bridge Assessment (MORR-N-054)

RESOURCE MANAGEMENT PROGRAMS

Cultural Resource Management Program

1. Archeological Resource Management

Morristown National Historical Park has a large collection of in-ground Revolutionary War artifacts. Over the past five years significant strides have been made in beginning a program of active archeological site management including assessment and protection. Several protection rangers have received ARPA training and conduct archeological site patrols on a regular basis. The Soldier Huts, Connecticut Line, Stark's Brigade, and New Jersey Brigade Sites were mapped in 1996 with the assistance of NPS archeologist Dick Hsu and have been entered into the park's Geographical Information System.

An Archeological Cultural Landuse Study has been approved for MORR for 1999. This project will identify the major historical trends and contexts of land use within the park, develop historic contexts to assess the significance of historic period archeological resources as required by NPS-28 and the National Historic Preservation Act and to nominate sites to the National Register. It will also serve the purpose of aiding in the development of a research design for a parkwide archeological survey.

MORR had a parkwide Archeological Overview & Assessment completed and approved in 1976, but many of the resources may have changed dramatically since that time. The park has a Historic Base Map (1973) and Archeological Base Map (1976). Both are in need of update.

The systematic approach to understanding the park's archeological resources will result in the following projects that MORR will need to apply for funding through the Combined Call:

The project titles are:

1. Cultural Landuse Study-two phases:
 Phase I-Conduct Study \$18,000, one year
 Phase II- print & distribute study \$10,000 one year
2. Archeological Overview & Assessment Report: two phases
 Phase I -Conduct study & write report \$30,000 one year
 Phase II- print & distribute report \$5,000 one year
3. Parkwide Archeological Survey: four phases
 Phase I-write research design \$45,000 one year
 Phase II-conduct survey \$70,000 two years
 Phase III-write report, assess significance of sites involved , write National Register nominations for

applicable sites

Phase III - print & distribute reports

These archeological studies will assist the park with achieving Park GPRA Goal Ia8-1 (by 9/30/2002, 50 % of the recorded archeological sites are in good condition).

Cultural Resource Program (continued)

2. Historic Structure Management

The Maintenance Operation is responsible for daily preventive maintenance and corrective maintenance to all park structures, including historic buildings. In some cases, rehabilitation work such as reroofing is completed by contract labor overseen by the Systems Support and the park. Many historic structures are being adaptively reused to fill other park needs, while ensuring for their continued preservation, such as park housing, office space and storage. The two primary historic structures, the Ford Mansion & Wick House open to the public are both furnished with original furniture. Many structures particularly the Ford Mansion and Wick House are in dire need of major repair and rehabilitation. A comprehensive needs assessments for both these structures would assist with development of project statements to acquire funding and meet compliance requirements. The Cultural Resources Operation and the park ranger/historian from the Interpretive Operation provide historical research and technical assistance. Environmental monitoring and Integrated Pest Management in park structures are performed by both the Maintenance and Natural Resources Operations. The List of Classified Structures was last performed in 1996 (see RMP appendix). 41 of the 52 historic structures on the LCS are in good condition. The list needs to be updated and potential additions evaluated.

Resource Management Plan project statements that will address structural needs include:

Rehab/Restore Ford Mansion (MORR-C-014)

Rehab/Restore Wick House (MORR-C-15)

Replace Guerin House Roof & Drainage System (MORR-C-016)

Develop Integrated Pest Management Plan (MORR-N-061)

Completion of these projects will assist the park with meeting GPRA goal Ia5-1 (by 9/30/2002, 80% of the 52 historic structures on the 1998 List of Classified Structures are in good condition)

3. Museum Collection Management

While the park's museum and archives collections are extensive and of great intrinsic and monetary value, the Cultural Resources Operation currently consists of an archivist and museum technician. The curator position has remained vacant for the past four years. The operation is responsible for all facets of the collections management and research programs, including inventory, cataloging, furnishing programs, research, preventive maintenance and exhibit preparation and maintenance.

Almost all historical objects are now entered into ANCS. An active program of preventive maintenance and monitoring is in place for the two furnished structures and all objects receive inspection at least once a year. The entire library collection is catalogued into Library of

Congress System in manual format and a new project is underway to place the entire library catalog in a computer database for management and retrieval improvements. Most of the park's rare books, historic photographs and park-related archeological collections are now catalogued into ANCS, as well as a good portion of the archival collections. Protection and security of museum collections has been greatly increased by the recent installation of a state of the art intrusion alarm system at the museum. No Exhibit Plan currently exists.

Resource Management Plan project statement that will address museum collections needs:

Library & Archival Collections Storage Improvement (MORR-C-008)

This project will assist the park with meeting GPRA Goal Ia6-1 (by 9/30/2002 76% of the 501 preservation & protection conditions in park museum collections meet professional standards)

4. Cultural Landscape Management

Cultural landscapes are extremely important components of each park's unit's management. Internal maintenance of the cultural landscapes is accomplished through the combined efforts of the park's Maintenance, Natural Resource and Visitor Services & Resource Protection Operation with additional support from the Cultural Resources Operation and volunteer gardening groups. This work includes mowing, gardening, tree maintenance, tree replacement, road & trail work, historical research and vista clearing.

Cultural Landscape Inventories have been completed for the Wick Farm (1996) and Washington's Headquarter's (1997). CLI's for the park's other three cultural landscapes (Fort Nonsense, Jockey Hollow & Cross Estate) will be completed in 1999. CLI's document and assess cultural landscapes as it relates to its primary area of significance (association with the American Revolution) and identifies additional areas of potential significance. The inventories will document, as best possible, the landscape's 18th century appearance, the changes the landscape has undergone since that time, and existing conditions on the site. Furthermore, character-defining features of the landscape from key time periods will be identified and described. In 2000 a Parkwide Cultural Landscape Report will be initiated at MORR. Development of a CLR will provide a historic and existing picture of the landscape, and overall perspective of the site's cultural context. An Orchard Management Plan has been approved for MORR for 2000. This project will research and document the historic Wick Orchard, conduct a comprehensive inventory and condition assessment to document the variety and condition of all existing fruit trees, prepare park-wide orchard management objectives, provide site-specific maintenance procedures and schedules and pesticide alternatives. The Olmsted Center for Landscape Preservation will once again assist the park with pruning the Wick Orchard in 2000.

The park is also involved in local land use decisions that could impact viewsheds or otherwise have a negative impact on cultural landscapes. The acquisition of 15 acres in the early nineties provided an additional buffer on one park border. If Congressional funding is approved, the park may be in a position to acquire the 15 acre Warren Property in the Mt. Kemble Area of the Jockey Hollow Unit. This acquisition will assist with retaining the rural character of the area and assist with park protection and boundary management. Development plans proposed by St. Mary's Abbey at the intersection of Sugarloaf & Jockey Hollow Rds. present a threat to the cultural integrity of that section of the Jockey Hollow Unit. Completion of an Adjacent Land Use Study will assist park management with developing proactive strategies to retain a rural and historical character adjacent to the park's boundary.

Resource Management Plan project statements that will address cultural landscape needs :

Develop landscape maintenance program for cultural landscapes (MORR-C-27, C-29)

Assist with cultural landscape maintenance needs (MORR-C-030)

Conduct needs assessment for park historic fencing (MORR-C-031)

These projects will assist the park with meeting GPRA goal 1a7-1 (by 9/30/2002, 3 of the 5 cultural landscapes on the CLI are in good condition)

RESOURCE MANAGEMENT PROGRAM

NATURAL RESOURCES

VEGETATION MANAGEMENT

According to park management objectives, the park's wooded areas should be preserved as a northern temperate hardwood forest similar to an 18th century forest. Over the past decade, research studies have been conducted to determine the spread of non-native plants, management options to preserve & foster growth of the park's hardwood forests and tracking of tree seedling growth. Park-based programs have focused on determining the differences in vegetation with and without the pressure of deer browsing and removal of non-native plants from cultural landscapes and high visibility areas such as road & trail edges.

A lack of regeneration of native hardwood and herbaceous plants due at least in part to deer browsing and the spread of non-native plants is a concern to park management. Development of a Vegetation Management Plan in 2000 will assist the park with determining conservation & possible restoration strategies.

Non-native plant removal is accomplished by park Resource Management staff, summer youth groups, interns and volunteers. The strategy for removal includes concentrating on new growth in the forested areas and removal along edges and cultural landscapes. Over the past year, the removal of Oriental Bittersweet vines has been initiated. A small to mid-size non-native tree, Siebold's Viburnum has been spreading rapidly the past few years. An active program of removal, utilizing a weed wrench has kept the spread in check and will continue on an annual basis.

Highest priority hazard trees are removed by the park maintenance staff and occasionally by contract. The park maintenance staff implements a field mowing program. Most fields are maintained in an advanced successional stage or abandoned state but to the exclusion of woody plants. A mowing once every year or two achieves this objective. Three fields are mowed two to four times each year to provide a new field appearance for historical aesthetics. In 2000, the fields maintained in an advanced successional state will implement a new mowing strategy. One half the field will be cut one year, and the other half the following year. This will provide continual tall grass habitat & cover for birds, reptiles and small mammals.

Park trails are maintained by Resource & Visitor Protection staff and volunteers. Major trail projects have been accomplished with assistance from the New York/New Jersey Trail Conference. Volunteers maintain two historic gardens in the park. Cultural landscapes are maintained by both maintenance & resource management staff. An herbaceous plant inventory was conducted in the park in 1995 utilizing Garden Club of America volunteers. A study is currently being conducted by Rutgers University to determine the status of state-listed plants in the park.

The interconnection of natural and cultural resource management is best illustrated in the preservation, restoration and management of the cultural landscapes of the park. The significance of the cultural landscape is suggested in the enabling legislation in the words "military camp-grounds areas and other areas of Revolutionary War interest" and forms the cornerstone of resource management at Morristown National Historical Park. Current formal landscape vegetation consists of many older trees and smaller

plantings, many of which are not reflective of any particular time period. Completion of a Cultural Landscape Report will provide the park with guidance to develop action plans based on objectives & themes for a particular landscape.

Resource Management Plan project statements that will address vegetation management needs include:
Develop Exotics Species Management Plan (MORR-N-005)
Study Tree Seedling Dynamics (MORR-N-010)
Remove Non-Natives, Plant Natives (MORR-N-056)
Conduct Field Mowing Program (MORR-N-060)
Implement Vegetation Monitoring Program (MORR-N-009)

These projects will assist the park with meeting GPRA Goal 1aB-1 (By 9/30/2002 5% of targeted 220 acres of disturbed park lands, as of 1997, are restored, and 5% of priority targeted disturbances are contained at MORR. GPRA Goal 1b01-1 (MORR contributes to knowledge about natural & cultural resources & associated values; management decisions about resources & visitors are based on adequate scholarly & scientific information and planning documents.

WILDLIFE MANAGEMENT

The role of resource management staff has been to propose, coordinate and assist scientists studying the park's white-tailed deer population. Recommendations resulting from research has been implemented by park staff. The White-Tailed Deer Management Study conducted by Christie & Sayre recommended spotlight counts of deer to provide a gross indicator of population trends through time. Spotlights counts have been conducted by park staff since 1989 approximately forty nights per year. In 1998, based on recommendations from the Immunocontraception Feasibility Study, the Distance Sampling Method of determining deer population density has been incorporated into the park's white-tailed deer monitoring program. Also, white-tailed deer population counts have been conducted in areas not traditionally covered by the spotlighting technique such as Mt. Kemble Field in the Jockey Hollow Unit & the Jarvis Field in the New Jersey Brigade Unit.

Deer population monitoring by park staff and researchers conducting the Immunocontraception Feasibility Study will provide the park with numerical abundance & trends. Vegetation exclosure studies & completion of Ehrenfeld's Exotic Plant Species Study will provide documentation on the effect of deer browsing on its native plant population. Completion of the Immunocontraception Feasibility Study in 1999 will assist park management with determining whether management action should be taken and what type of action should be taken to alleviate the problem of overabundant deer. Park staff will assist with implementation of a White-Tailed Deer Marker Dart Study scheduled to be initiated in 2000.

Park staff will be supporting bird, reptile & amphibian inventories scheduled to be initiated in 2000. These inventories will be funded through the WASO Inventory & Monitoring Program.

Resource Management Plan project statements that address wildlife management needs include:

Conduct White-Tailed Deer Immunocontraception Experiment MORR-N-015

Inventory Red Fox Population MORR-N-027

Inventory Bat Population MORR-N-031

Continue Lyme Disease Surveillance Program MORR-N-020

These projects will assist the park with meeting GPRA goal Ib01 (MORR contributes to knowledge about natural & cultural resources & associated values; management decisions about resources & visitors are based on adequate scholarly & scientific information and planning documents).

FRESHWATER RESOURCES MANAGEMENT

The role of the resource management staff has been to coordinate and assist scientists studying the park's aquatic resources. Recommendations resulting from research have been implemented by park staff. Based on recommendations from an assessment of MORR's aquatic resources conduct by Trama & Galloway in 1988, the park established a systematic water quality monitoring program which consists of a monthly monitoring program for key parameters including temperature, pH, dissolved oxygen, specific conductance and chlorides. An intensive chemical assessment was conducted in September, 1999. Parameters tested for included aluminum, total suspended solids, total phosphorous, total dissolved solids, nitrates, total alkalinity and nitrogen ammonia. Many of the parameters showed a marked rise in 1998 as compared to the Trama & Galloway study in 1988.

As time permits, park staff will be monitoring coliform levels in the seven groundwater monitoring wells installed as part of the Analysis of Surface & Shallow Ground Water Bacterial Contamination Study conducted by Louis Berger & Associates. Also, as time permits, staff will begin to delineate the park's wetlands with the assistance of the Delaware Water Gap National Recreation Area. Assistance will be provided to the researchers conducting the Patterns & Processes for Freshwater Fish Distribution Study.

Resource Management Plan project statements that address freshwater resources management needs include:

Monitoring Long Term Water Trends MORR-N-001

Wetland/Riparian Zone Inventory & Assessment MORR-N-019

These projects will assist the park with meeting GPRA goal Ib01.

GEOGRAPHIC INFORMATION SYSTEMS

MORR has made significant strides in the past year with development of its GIS program. The GIS Field Tech Support Center (FTSC) provided the park with a digital database in 1998 that includes numerous datalayers. In 1999, the park should be receiving a data layer in conjunction with an Adjacent Landuse Study. Also, historical resource maps for the New Jersey Brigade Unit will be digitized. Park staff are currently concentrating on utilizing its Geographical Positioning System to map cultural landscape features such as fields and fences. Creation of a cultural landscape data layer will facilitate the development of a Cultural Landscape Report scheduled to be initiated in 2000. RMP Appendix lists Digital Spatial Data For MORR.

Resource Management Plan Project Statements that address geographic information system needs include:

Develop GIS Plan MORR-N-037

Aerial Photography & Photogrammetric Survey MORR-N-057

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