

**FOREST MANAGEMENT PLAN FOR MORRISTOWN NATIONAL
HISTORICAL PARK**

Statement of Proposed Work

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Forest Management Plan for Morristown National Historical Park

OVERVIEW

Morristown National Historical Par is located in New Jersey's Morris and Somerset Counties and was established (in 1933) for the purpose of preserving the lands and features associated with the winter encampments of General George Washington's Continental Army.

The Park is comprised of four separate units totaling 1,698 acres:

A) Washington's Headquarters (approximately 10 acres), located in the town of Morristown, contains the Ford Mansion, which served as General Washington's headquarters during the winter of 1779-80.

B) Fort Nonsense (approximately 35 acres) encompasses a prominent hill approximately 1 mile west of Washington's Headquarters overlooking the town of Morristown. Here soldiers dug trenches and raised embankments in 1777 on the orders of General Washington.

C) Jockey Hollow (approximately 1,330 acres), lying approximately 3 miles southwest of Fort Nonsense, is the site of the "log-house city" constructed by about 10,000 troops during the winter of 1779-80.

D) New Jersey Brigade (approximately 321 acres), located about a mile southwest of the main encampment area at Jockey Hollow, preserves the site of the encampment of 1,000 troops from the New Jersey Brigade in 1779-80.

The historic vegetation at the time of the encampment in 1779/80 is believed to have been mature hardwood forests dominated by American chestnut, oaks and hickory. Most stands existing at that time were cut by soldiers who built log huts and harvested fuelwood for cooking and warmth. Much of the Park area was used as cropland or wooded pasture through the mid 19th century, when a regional decline in agriculture following the Civil War lead to abandonment of many fields and pastures. Some agricultural activities persisted on lands now within Park boundaries, but most of these had ended by the early 20th century. Decline of the chestnut due to blight in the first two decades of the 20th century prompted salvage cuts which probably included at least some stems of associated species. Today, most of the park landscape is dominated by maturing stands of hardwoods. Areas held in fields until the late 19th and early 20th centuries are occupied by "successional" stands dominated, by tulip poplar and other shade intolerant hardwoods. Understories of most stands have little regeneration and some are dominated by exotic shrub species.

The cultural history of the area – both before and after the arrival of European's in the late 17th and early 18th centuries - is summarized by Thayer (1975). Historic and modern

vegetation have been sampled and described by Ehrenfeld and Southgate (Russell) (see several papers listed in "REFERENCES").

Important goals of modern Park management are to preserve existing mature forests with the character of forests present at the time Washington's army arrived at the site, and to restore "successional" stands to that mature forest condition (2003 Draft General Management Plan for the Park). Perceived impediments to maintenance and restoration of modern hardwood stands are, among other influences, overbrowsing of young stems by a large resident deer population, and competition from a variety of woody and non-woody invasive species. Concern by park personnel that they may not be able to prevent stands from becoming dominated by exotic species has led them to ask us to develop a forest management plan which will identify options for management and evaluate their usefulness with respect to vegetation management objectives.

OBJECTIVES AND PLAN OF WORK

The following specific objectives have been developed for implementation of a forest plan for the Park. In *Italics* following each objective is a description of how we will meet the objective (i.e. our Plan of Work).

1. Articulate the need for sustainable management of forest resources in light of the Park's mission to preserve the lands and features associated with Washington's winter encampments during the Revolutionary War.

This will be facilitated by our discussions with Park staff on their vision for the future Park forest resource. It will be articulated in the preamble of the forest plan, and individual actions recommended in the plan will be identified with respect to how they fulfill the need for sustainable forest management.

2. Synthesize available information related to historic forest structure and composition of Morristown during the period of the encampments.

We will review existing studies (e.g. Ehrenfeld 1977a.) and evaluate these within the context of recently published works on the land-use history and stand dynamics of hardwood forest of the region. A number of resources are available including books by Gordon Whitney and Emily Russell and published research by Mark Abrams and others.

3. Consolidate and review information related to existing conditions and influences of Morristown's forests.

A wealth of data are available from the 205 years of study by Ehrenfeld and Southgate (Russell). We will compile on one, well documented folder existing information, and review that information with an eye toward identifying gaps in knowledge that would hinder our development of a comprehensive forest management plan.

4. Gather additional field data as necessary to further describe current forest conditions and influences.

Through our review of existing information, we will determine if there are portions of the Park for which data on current conditions are lacking (e.g. Fort Nonsense?) for which specific information on forest stands in general are inadequate (e.g. diameter class/age structure information for "mature" and "successional" stands). A sampling protocol and schedule will be developed and delivered to Park staff before the summer, 2004 field season.

5. Describe desired future conditions for the forests of Jockey Hollow, New Jersey Brigade, and Fort Nonsense units, based on the goals enumerated in this document, historic and current forest information, and NPS planning documents for the park. Desired future conditions should be developed for each of the appropriate existing forest zones within these units, such as 'mature' and 'successional' forest zones.

Desired future conditions will be characterized with respect to quantifiable attribute, which can be monitored by Park staff (see 6. below)

6. Quantify the desired future conditions (DFC) of the forest for the above units and existing forest zones.

This likely to evolve into a set of quantifiable stand characteristics which are attributes of stands representative of the desired future condition. Examples include a diameter class/age distribution for native tree species that suggests a forest that will perpetuate itself, absent catastrophic disturbances, into the future. At the same time, it must be recognized that disturbance has long played a role in deciduous forest stand dynamics and that the present stands regenerated following disturbances (chiefly timber cutting in the late-19th and early 20th centuries. Desired future conditions must take into account the impacts and possible need for control of deer browsing on the one hand and competition from exotic tree, shrub and grass species on the other. Thus DFC might well include, in addition, to an all-aged stand structure, levels of competition (e.g. stem density/height/cover) of exotic species as well as intensity of deer browse/browse heights on seedling/saplings of desired species.

7. Develop management strategies to achieve the desired future conditions. These strategies should be able to be implemented through discrete management treatments that may be monitored to assess their relative success, in the context of an adaptive management strategy. Management strategies should also focus efforts along historic corridors.

This will, of necessity, involve an application of knowledge of best management practices for the silviculture of central hardwood forests including methods of minimizing deer browsing on seedlings/saplings and for control of competition from exotic species. A series of alternative management options will be developed and evaluated with respect to meeting management objectives derived from DFC. Park staff will then be in a position

to chose appropriate management strategies and develop environmental assessments as needed.

8. Describe and quantify, if possible, the desired interim conditions (DFC) at various time stages in the process of forest recovery.

These will evolve from our descriptions of DFC and an application of knowledge about how hardwood stands develop from successional to mature forest conditions. Two models will have to be considered: 1) how stands mature in the absence of catastrophic disturbance, and 2) landscape dynamics that might involve some stands being affected by catastrophic disturbance (e.g. wind storms) while other are not. Thus, we might see all stands in the park at some stage of progressing toward an all-age structure in model 1, but in model 2 – some stands following predictable development toward an all-age structure while others are regenerating, en masse, following a stand-replacing disturbance. An initial, cursory review of published reports by Ehrenfeld and Southgate (Russell) suggests that the second model may have dominated during the past one-two centuries (i.e. through landclearing, agricultural activities, agriculture abandonment, the catastrophic decline of chestnut, and subsequent salvage logging).

9. Describe monitoring methods that will measure the success of management treatments at achieving the stated goals, and that will provide thresholds for changes in management actions, as part of an adaptive management strategy.

An extensive network of monitoring plots has been established in the past through the efforts of Ehrenfeld and Southgate (Russell). We will evaluate these plots and the data that have been obtained from them with respect to their ability to meet future monitoring needs. Our evaluation of future needs will be tempered by the realization that all existing data/plots, no matter how large or small or how well replicated, have the great advantage of providing information based on direct observation of past conditions. Thus, any additions to, or modifications of, existing sampling protocols should be linked to past practices/methods to the greatest extent possible. We would anticipate, at this stage, that proposed additions to existing protocols would focus on individual stand characteristics critical to documenting the meeting of quantifiable objectives and the characterization of stands/management units that are currently underrepresented by the existing suite of plots.

10. Develop management treatments that will reduce the negative impacts of forest vegetation growth and erosion on the areas with sub-surface archeological resources.

On National Park Lands, the preservation of archeological resources is of paramount concern, whether management activities involve suppression of wildfires or the salvage of blown-down timber. All recommendations for active management of forest stands will be evaluated with respect to impacts on archeological resources, with an emphasis on identify stands/units of the Park where archeological concerns are greatest.

11. Identify additional research priorities.

The identification of future research needs should evolve naturally during the course of our literature searches of existing knowledge and our summary and evaluation of Park-specific knowledge. Some ongoing research (e.g. the large deer exclosure/exotic replacement plot of Ehrenfeld and the seedling plots of Southgate (Russell)) may answer current questions or identify new priorities for future research. Work that we do in 2004 to characterize stand size/age structure may shed new light on how individual stands developed, or point to additional work that should be pursued to understand the interactions between past and modern disturbances (e.g. the decline in chestnut and recent gypsy moth defoliations on the one hand and deer browsing and exotic species competition on the other).

SCHEDULE OF WORK

Summer – 2003.

Two-to-three trips from Amherst to Morristown to familiarize ourselves with Park staff and the landscape of MNHP. Collect copies of existing reports, maps and data files. Establish with Park staff the goals and format of the forest management planning effort.

Fall/winter – 2003/2004.

Compile data into a usable format in consultation with Park staff. Identify gaps in data that would hinder our completion of stated objectives.

Develop plans for filling gaps in knowledge of on-the-ground resources.

Update existing literature reviews on invasive species biology/ecology/control. Conduct review of impacts of deer on hardwood stand dynamics.

May - 2004

Deliver draft literature reviews to Park staff for review and comment.

Deliver to Park staff a plan of work for field sampling during Summer, 2004, including identify support required from Park staff.

Summer - 2004

Field sampling, data analysis, revise literature reviews as necessary.

Fall – 2004

Revise and submit literature reviews.

Complete draft management plan.

Draft management plan to Park and Regional staff for review and comment (by December, 2004).

Spring, 2005

Revise draft plan.

Submit revised management plan by May, 2005.
Project complete.

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