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RESOURCE MANAGEMENT PLAN
WEIR FARM NATIONAL HISTORIC SITE
Wilton, Connecticut

1995

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1. Natural Resources

The rural nature of WEFA has essentially been preserved despite the presence of residential development surrounding the site. As development in the region continues, WEFA will continue to provide a valuable picture of the past state of natural resources in the area. In addition, maintenance of certain natural features (i.e. wetlands, forest land, meadows, etc.) at WEFA is essential to the true representation of the site at the time when early artists occupied the area and were inspired by its natural beauty and tranquillity. It is in this light that the wise preservation of natural resources is as essential as the preservation of the cultural and historic themes for which the park was originally created.

2. Cultural Resources

***** PLEASE CONSULT THE APPROPRIATE EXPERTISE *****

D. Cooperative Efforts

The National Park Service (NPS) is committed to working cooperatively with other public agencies, native American authorities, neighboring land owners, and concerned park users and interest groups. Cooperation among WEFA management and other land managers and resource groups (ie The Nature Conservancy, the Town of Ridgefield, and the Weir Farm Heritage Trust) will be a key ingredient to the most effective implementation of this RMP and will be strongly encouraged and fostered.

E. Planning Framework

The GMP, the park's most general guidance, was developed with public participation and analysis of management alternatives consistent with the site's enabling legislation. The GMP was first drafted in 1993 and the process employed in its production will be explored as this RMP is implemented. The final version of the GMP will be completed in 1995.

The Statement for Management (SFM) summarizes the major issues and management concerns facing site managers, delineates management zones, and lists the management objectives for the site. In concert with the GMP, the SFM was developed through public participation and was also finalized in 1993.

RESOURCE MANAGEMENT PLAN WEIR FARM NATIONAL HISTORIC SITE

I. INTRODUCTION

A. Purpose

Weir Farm National Historic Site's (WEFA) purpose, goals, and objectives were developed in the park General Management Plan (GMP) in 1993. The purpose of this Resource Management Plan (RMP) is to expand upon GMP and define and provide management direction for an integrated approach to preserving, protecting, and interpreting the outstanding cultural and natural resources in the park. The RMP is written at a much higher level of detail regarding cultural and natural resources than the GMP and should be used as a guide and blueprint for:

- Management Direction
- Planning and Compliance
- Consultation and Coordination
- Information Gathering
- Research
- Inventory and Monitoring
- Basic and Baseline Studies
- Stabilization, Restoration, and Rehabilitation
- Resource Maintenance and Operation
- Protection and Enforcement
- Mitigation of Impacts to Resource
- Communication, Interpretation, and Education

B. Legislation

WEFA was established by Public Law 101-485, the Weir Farm National Historic Site Establishment Act of 1990. The purposes of the act are:

- (1) to preserve a significant site of tradition of American Impressionism;
- (2) to maintain the integrity of a setting that inspired artistic expression and encourages public enjoyment; and
- (3) to offer opportunities for the inspirational benefit and education of the American people.

C. Park Resource Values

F. Planning Premises

Planning Criteria

The RMP will implement park legislative mandates and will interpret NPS resource management guidelines and policies as they pertain to specific issues at WEFA. A general direction for RMP development was prescribed in the GMP and it includes an integrated, interdisciplinary approach to cultural, natural, scenic, and recreational resource management involving all park organizational units and management levels. In addition, park management will remain informed regarding all aspects of environmental and other external laws and regulations pertaining to WEFA resources.

A system of management zones including development zones, cultural resource zones, and natural resource zones is utilized to help define the scope of activities and operations to be allowed in various resource areas. This zone system will be integrated with an understanding of resource values, capabilities, and limitations for the purposes of planning and implementing the resource management program. It is envisioned that the eventual development and use of a geographic information system (GIS) will greatly enhance the ability of park managers to integrate a variety of resource management program aspects across a variety of management zones and landscapes.

Elements to be included in the integrated approach described above include: management direction; planning and compliance; consultation and coordination; information gathering and research; stabilization, restoration, and rehabilitation; resource maintenance and operation; protection and enforcement; mitigation; monitoring and evaluation; and communication, interpretation, and education. All resource management and implementation plans will follow a format consistent with current NPS project statement guidelines and will incorporate this integrated approach.

1. Park Management Zones

The park's system of management zoning for park lands and waters designates where various strategies for management and use will best fulfill management objectives and achieve the purpose of the park. At WEFA, three types of management zones have been prescribed including cultural resource zones, development zones, and natural resource zones. This prescriptive zoning considers the capability of lands to support identified uses and will be used as a framework for specific planning and management decisions on use and development of the park. In recognizing the mandate for human use and enjoyment of the park's cultural resources, cultural landscapes, and natural resources, the delineation of park development zones presupposes varying degrees of natural resource alterations depending on the zone in question. For example, the maintenance of mowed fields in a cultural zone or the construction of a new of public toilets in a

development zone may both occur in each of those respective zones but neither could occur in each other's zone or in a natural zone.

The selection of zones should incorporate a well-thought understanding of past events and structures which may someday be reconstructed and an understanding of future growth needs which may not necessarily have links to cultural values. These aspects should all be placed into cultural or development zones and all remaining areas should be designated as natural zones or administrative areas (i.e. maintenance yards, park housing, parking lots, roads, etc.).

2. Parkwide Issues

Park Development. A definite need exists to develop at least a minimum infrastructure capable of accommodating visitors at WEFA. The park recently completed the construction of the first parking lot to offer off-road parking. In addition, plans exist to upgrade the existing sanitary facilities (now portable toilets) and to restore historic and create new circulation trails for improved visitor access to the site.

Land Acquisition. As the WEFA GMP states that no new structures will be constructed on the historic farm property, space for maintenance, the visitor center, administrative offices, and curatorial areas is very limited. Therefore, WEFA is currently considering the possibility of acquiring property off-site to house these functions. If acquisition of land for these functions is not advisable or possible, the park may work with the Weir Farm Heritage Trust (a cooperating group created in the park's enabling legislation) to lease the necessary space.

Wetlands Preservation. Much work has been conducted at WEFA to characterize the current extent and content of several wetland areas. Although residential density is low surrounding the park, the use of fertilizers and on-site sewage disposal systems at these developments may pose a threat to future wetland integrity. Educational materials and programs for park neighbors in the future will undoubtedly serve to minimize wetland threats.

Vegetative Easements. Several residential developments are in close proximity to bordering park land and can be easily seen from park trails. This alteration of the viewshed is an intrusion on the historic and natural scenes which detracts from the visitor's experience. A need exists to create easements on adjacent residential property to create natural "screens" comprised of natural vegetation which will restore a sense of isolation and tranquility.

Deer Control. The expanding deer population in the area has increased the incidences of deer feeding on park vegetation (browsing). Given that a great deal of landscape planning and management will eventually be

instituted at WEFA, the need exists to develop an effective deer control strategy. This need is especially keen in areas where the use of ornamental vegetation is planned.

Integration with the Natural Habitat. Since WEFA was primarily created to interpret various cultural and historic themes, the potential exists to develop this function at the expense of the natural habitat function of the site. As the development of park programs and landscapes continue, it will be essential to consider the natural habitat of the area and integrate all park operations and programs to be in harmony with the natural environment.

Weir Pond Dam. The construction of the dam creating Weir Pond in 1896 yielded a new, prominent feature on the landscape which today is important to both cultural and natural resource management at WEFA. Recent inspection of the earthen dam suggests that it may fail if left in its current state and the need exists to reinforce the structure to ensure proper preservation of the pond and its attributes.

II. NATURAL RESOURCES

A. Natural Resources Management Objectives

Based on the NPS Organic Act, Redwoods Act, park-specific legislation, legislative history, other park designations, NPS Management Policies, and other mandates, the following strategic objectives have been developed for natural resources management in the park:

Maintain, restore, or simulate natural terrestrial, aquatic, and atmospheric ecosystem conditions and processes (succession, predation, erosion and accretion, etc.) to the degree that is physically possible, so they may operate unimpaired from by human influence.

In areas designated as "natural zones," maintain or restore indigenous flora, fauna, and natural communities to achieve species diversity and community structure equivalent to pre-European times or post-European conditions which would have been created by natural events and processes.

In areas designated as "cultural zones," identify and preserve or restore elements of the landscape (such as structures; roadways; fence lines; field sizes; streams, springs, ponds, and wetlands; and the pattern of vegetation heights and textures) to give an accurate representation of the dynamic living environment of the historic period.

Protect rare or sensitive plant species by measures aimed at preventing extirpation but which minimize adverse influences on other indigenous species.

Encourage and participate in efforts to acquire and analyze information through research in order to facilitate development of the best possible management strategies for resource protection.

Assess park resource conditions and detect impacts which may result from external activities and internal management decisions by conducting long-term ecological monitoring.

Mitigate or prevent resource-damaging human influences resulting from activities inside and outside of the park boundaries.

Provide resource-based recreational opportunities within the context of the preceding objectives and in environments which are least vulnerable to resource degradation.

Protect, to the degree practical and when it is not detrimental to park resources, the visiting public from known resource hazards by reducing the hazard and advising the public of potential risks.

Permit only those types and levels of development that do not significantly impair park resources, and direct development to environments least vulnerable to resource degradation.

B. General Description of WEFA Natural Resources

Conservation of ecosystems in the natural state and the associated conservation of biological diversity requires a solid knowledge base for the appropriate management actions. Without a solid scientific understanding of park natural resources and the threats to them, it will be difficult to preserve those resources primarily due to the lack of informed management decisions. Types of information and knowledge gathering functions which will undoubtedly play a major role in protecting WEFA natural resources include scientific research, baseline inventories, appropriate monitoring measures, and an integrated GIS function.

Since many of the knowledge building functions identified above have already been explored to some degree, it is useful to review the information currently available to WEFA resource managers:

1. Physiography

WEFA is located in the Southwest Hills Ecoregion of the United States in the southern part of Connecticut. The park is within 25 miles of the Atlantic

coast (Long Island Sound) and its topography ranges from broad upland areas, to rolling hills, to steep and rugged terrain (North Atlantic Regional Office, Office of Science and Natural Resources, 1991). The site is mainly forested uplands and contains surface streams, an anthropogenic pond, and limited areas of wetlands.

2. Air Resources

Under the Clean Air Act (CAA) as amended in 1990, WEFA, like virtually all areas of the country qualifies as a Class II Area. This designation simply means that the current quality of the air in such an area is afforded a basic level of protection by the CAA but that some degradation of that air quality will be allowed to occur (up to a point). This designation differs from the two other possible designations under the CAA which are Class III Areas (where a high degree of degradation is allowed, none currently exist), and Class I Areas (where a very high level of protection is afforded and only a small amount of degradation from current conditions is allowed). In the NPS, only 48 Class I Areas exist and, like WEFA, all other areas are Class II.

Like most areas in the Northeast United States, WEFA's air quality is primarily affected by the introduction of various pollutants from municipal power generation in the Midwest United States. The combustion of coal and other fossil fuels for this purpose releases many tons of sulfur into the atmosphere each year. Subsequently, the sulfur is transformed into sulfuric acid as it travels through the atmosphere and eventually is deposited on dry particles (dry deposition) or in precipitation (wet deposition; rain, ice, or snow). This acidic deposition (commonly referred to as acid rain) lowers the Ph of wetlands, streams, and ponds and may cause detrimental effects to aquatic life.

In addition, nitrogenous contaminants from industrial, municipal, and mobile (i.e. automobiles) contribute to the formation of ground level or tropospheric ozone. This colorless, odorless gas is toxic to many forms of plant life and has already been shown to cause significant harm in the Southeast United States.

3. Aquatic Resources

In February, 1993, Carl Melberg performed a preliminary wetlands assessment at WEFA. The assessment identified seven individual wetland sites, some of which are linked to others via seasonal overflow or surface streams. The series of wetland complexes present at WEFA offers visitors a glimpse at resource type which is rapidly declining across the country.

A more detailed study of wetland characteristics was completed by the Natural Resources Conservation Service (NRCS, formerly SCS) in 1994 (Resource Evaluation of Wetlands). This study describes WEFA wetlands as palustrine (nontidal and dominated by trees, shrubs, persistent emergents,

and emergent mosses or lichens) and are comprised of two major classes, scrub shrub and forested. Scrub shrub wetlands at WEFA contain sweet pepperbush, alder, winterberry, silky dogwood, blueberry, and willow. Forested wetlands include red maple, black gum, and ash.

The same study expanded on the original list of wetland sites noted by the Melberg study and arrived at a list of eleven separate sites. The difference between studies is most likely due to a more thorough investigation in the latter study using more complex and definitive identification techniques (ie the United States Fish and Wildlife wetlands classification system). Interestingly, most of the wetlands classified by the first study were also noted in the second study (with a few exceptions in the vicinity of Weir Pond). The larger number of areas in the second study is mostly due to "subdivision" of large areas identified as wetland complexes in the first study into separate wetland areas by the second study.

In addition to wetlands, several other types of aquatic resources at WEFA exist including intermittent and ephemeral surface streams and an artificial pond which was created in 1896 by the site's original developer, J. Alden Weir.

Weir Pond is a shallow entity primarily fed by groundwater. Evidence exists to suggest that surface flows to the pond have been altered over time to accommodate development elsewhere making base flows to the pond much lower and storm flows much higher (Resource Evaluation of Wetlands, NRCS, 1994). Despite the fact that the pond is not naturally occurring, it may have reached some degree equilibrium with naturally occurring features (Melberg, 1993).

A detailed study of the pond was conducted by the Natural Resources Conservation Service in 1994 (Resource Evaluation of Weir Pond). This study found the pond to exist in a eutrophic state primarily due to its small size and shallow depth as opposed to nutrient-induced eutrophication (although no water samples were taken and no field parameters were measured). Interestingly, no fish species were identified by the study to exist in the pond despite numerous accounts of fish sightings by park staff. The majority of organisms identified in the study were macroinvertebrates, limited amphibians, and abundant littoral, floating, and submerged aquatic plant life. The study suggested that the future water quality in the pond will remain relatively constant if the current degree of external development is maintained.

The relative health of the intermittent (seasonally flowing) and ephemeral (storm event dependent) surface streams has not yet been evaluated. The lack of perennial stream flow at WEFA may be attributed to the area's "headwater" status for several watersheds at lower elevations beyond park borders (Resource Evaluation of Wetlands, Natural Resources Conservation Service, 1994). Future investigations and assessments of the streams will

bring new insight regarding these elements and their continued preservation.

4. Earth Resources

The most recent description of WEFA soils, geology, and physiography was completed in 1991 by the NPS North Atlantic Regional Office, Office of Scientific Studies, and an earlier, similar study covering a larger area adjacent to WEFA was completed in 1976 by The Nature Conservancy (Peterson, et al.). Both of the studies also include discussions of vegetation (see 5. Vegetation).

In general, the majority of WEFA soil is glacial in origin (glacial till) and contains relatively little organic content. Major, Wisconsinian Age or newer soil types include Hollis, Charlton, Leicester, Ridgebury, and Whitman soils which range from excessively drained to very poorly drained loamy glacial tills respectively. Current soil layers have generally formed under a hardwood forest consisting primarily of oak, hickory, birch, and maple.

5. Vegetation

WEFA vegetation consists primarily of three main forest community types (North Atlantic Regional Office, Office of Science and Natural Resources, 1991) including Mixed Oak Forest (represented by oak-maple leaved viburnum forest), Sugar Maple-White Ash Forest (represented by maple-ash-New York fern forest), and Red Maple Forests (represented by red maple-sweet pepperbush forest and red maple-spicebush forests). One unforested type of limited areal extent at WEFA is the Buttonbush Thicket which is comprised primarily of the shrub wetlands discussed above. No state or Federal threatened or endangered plant species occur at WEFA.

6. Animal Species

No unusual, critical, or essential habitats are found at WEFA (North Atlantic Regional Office, Office of Science and Natural Resources, 1991) and, accordingly, WEFA's animal population is comprised of common woodland species native to the area. No state or Federal threatened or endangered animal species occur at WEFA. One of these species, the white-tailed deer is present in moderate numbers and is beginning to exert a degree of browsing pressure on forested areas within WEFA in addition to a number of ornamental shrubs in "maintained" areas (Underwood, 1993).

7. Aesthetic Resources

The natural setting at WEFA is comprised of a variety of rural land forms critical to site significance which, when taken together, provide visitors with an interesting picture of the site in the past. Wetlands, forest land, meadows, and Weir Pond are large-scale features which are complemented

by detailed features such as ledge outcrops and glacial remnants. As landscape management planning continues, care must be taken to balance essential natural features with the restoration and maintenance of the historic setting.

C. Natural Resources Issues and Management Concerns at WEFA

This section of the RMP discusses the nature and severity of threats to the park's natural resource values, ecological processes and natural systems.

1. Air Resources

Both acid deposition and ozone are likely to be exerting some effect on the natural communities of WEFA. The Washington, and regional levels of NPS are currently involved in a number of programs aimed at reducing air pollutant loadings. These efforts, in conjunction with the CAA will hopefully serve to improve air quality nationwide and at WEFA.

NPS Class I Areas are required by the CAA to actually monitor air quality to detect changes which jeopardize the integrity of that designation. WEFA, as a Class II Area, is not mandated for such actions and an in-house monitoring program could be implemented voluntarily if desired. However, the cost of reliable air quality monitoring data is extremely high and interpretation of that data must be performed by individuals with formal background in air resources management. Therefore, it usually does not make sense, nor is it feasible to institute an in-house program at such a park.

Despite that in-park air quality monitoring at WEFA is highly unlikely, concern about air quality still exists and access to current air quality information is important. This information may be available from other agencies and organizations with formal monitoring programs in close proximity to the park and may often be accessed easily and interpreted for park staff once appropriate ties have been made. Common sources of air quality data and its subsequent interpretation include state air quality bureaus, nearby Class I Areas (selected other National Park Service areas, National Forests, National Wildlife Refuges), and even monitoring systems required for the operation of private industry and municipal power companies.

2. Aquatic Resources

Since wetland resources at WEFA are so important, future wetlands projects will be essential to advancing the park's understanding and management of these areas. The wetlands work done to date has offered a valuable start to wetland delineation and characterization at WEFA. In the future, more

detailed studies documenting the ecological role of WEFA wetlands and their interrelatedness with other WEFA features is highly recommended.

The scientific evaluation of wetlands is also related to the management zone concept introduced at WEFA. Laws and regulations governing the preservation of wetlands do not permit many activities or operations beyond research, monitoring, and other invasive functions to occur in wetlands. Therefore, a more detailed understanding of the extent of park wetlands will undoubtedly assist park managers to refine management zone boundaries and hence, to better define the scope of permissible visitor experiences within the park.

One element common to all WEFA aquatic resources is that none of the resources is beyond the influence of detrimental developments and practices which could potentially increase outside of the park boundary. Even though WEFA is at the head of several watersheds, runoff from residential development still flows through the park and may carry enriched nutrient/pathogen loads (from on-site sewage disposal and fertilizer use), sediment loads (from new construction or lot expansion), and contaminants such as road deicers (from municipal operations). In addition, the proportion of impermeable surfaces (roads, driveways, parking lots, etc.) may increase which may eventually elevate the magnitude of runoff flows and change aquatic system morphology. The institution and development of a cooperative approach to drainage basin and watershed management which includes local, state, and private interest education and "buy-in" will be essential to the future of WEFA's non-self contained water resources.

Other factors potentially detrimental to WEFA aquatic resources include sedimentation from trails if not properly maintained, septic leachate from systems on park property, and the ubiquitous and difficult problem of acid precipitation. Although no extensive or well-traveled trail system exists at WEFA, plans for trail system expansion and restoration do exist. An essential part of this trail revitalization effort will be a well-planned trail design and maintenance effort to minimize erosion (sedimentation) to adjacent water resources.

On-site sewage disposal currently occurs in three separate systems (Weir House, Burlingham House, and the Caretaker's House) comprised of cesspools with crude overflow areas for leaching. The system at the Weir House is currently in failure and septic effluent has broken out to the surface, presenting a public health and environmental threat. Plans are currently being developed to correct this problem and to accommodate the installation of a public bathroom facility. This task is hampered by extremely shallow soils which are not recommended for the construction of new conventional septic systems. Most likely, the sewage disposal needs, both current and future, at WEFA will be met by implementing some type of alternative/innovative septic disposal design such as composting toilets or recirculating sand filter systems.

3. Earth Resources

The soils at WEFA are not particularly high in alkalinity (buffering capacity) and, as a result, may not protect the park's aquatic resources from acidification caused by acid precipitation to any great degree. This aspect of WEFA soils warrants future study and must be thoroughly integrated with both atmospheric and aquatic information and future studies for a holistic understanding of the dynamics operating.

4. Vegetation

The types of vegetation found at WEFA today are very similar to those of Weir's time. However, several intrusive native (wild rose, greenbrier) and exotic (Japanese Barberry) plant species are rapidly spreading across park land and have the potential to change the vegetative character of the area. As landscape management plans are developed, it will be important to include strategies for intrusive plant control.

5. Animals

It has been suggested (Underwood, 1993) that WEFA institute another type of "zone" system to most efficiently manage deer browsing. Under such a system, small areas with a large proportion of ornamental plants would be managed intensively using elixirs (deer repellents) applied to the plants and with the physical repair of damaged specimens. Other zones could then be established with decreasing degrees of active deer management. This approach would serve to concentrate effort in critical areas since it is highly unlikely that intensive deer management on a park-wide basis would be successful. Another, more drastic measure could include the removal of deer from the area if browsing pressure becomes unacceptable or the zone concept is somehow ineffective.

In addition to the deer browse issue, WEFA management is concerned that the development of park programs and cultural landscapes has the potential to adversely affect the proper functioning of the surrounding natural habitat. As planning continues, it will be essential to consider the habitat requirements and life cycles of area animal populations in order for the park to exist in harmony with its natural setting.

6. Aesthetic Resources

The protection of WEFA aesthetic resources involves both an understanding of how internal operations and actions as well as adjacent external operations and actions will effect aesthetic character. For example, one type of solution for the internal septic problems discussed above may include the construction of "mounded" septic system designs. However,

this type of construction, although meeting health and environmental protection requirements, may be considered an intrusion to the rural aesthetic character of the park.

Also, adjacent residential developments can be easily seen from vantage points at several locations within the park. This obstruction of the viewshed is a detraction from the historic natural scene when no adjacent development was present near the farm. Therefore, vegetative screening techniques incorporating spruce, hemlock, mountain laurel, rhododendron, and other appropriate plants may be used in the future to help restore this historic natural scene.