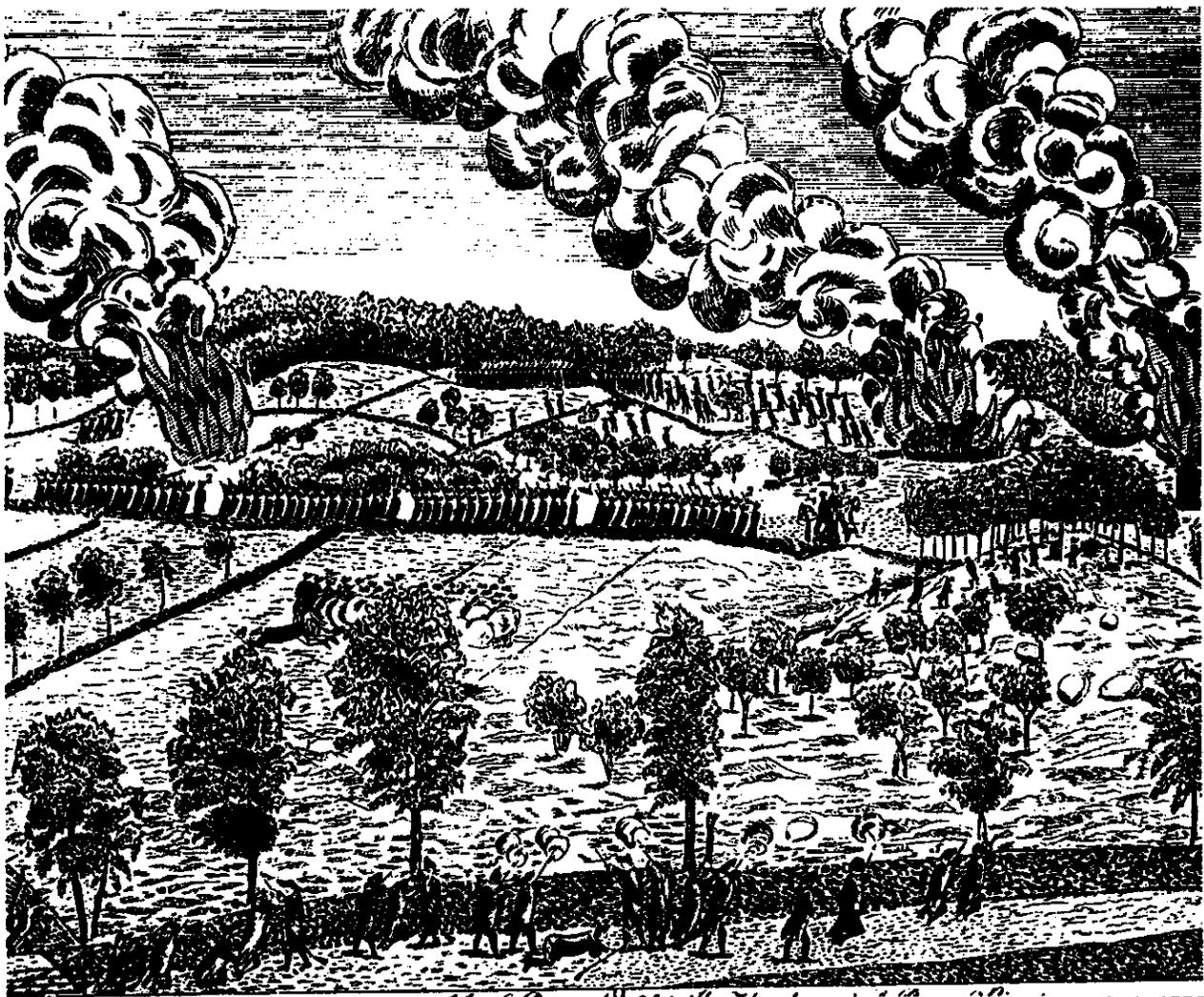


Environmental Assessment
for
"Save Historic Structures and
Cultural Landscapes"

Project MIMA-170AB



Battle Road - April 19, 1775

Minute Man National Historical Park

April, 1999

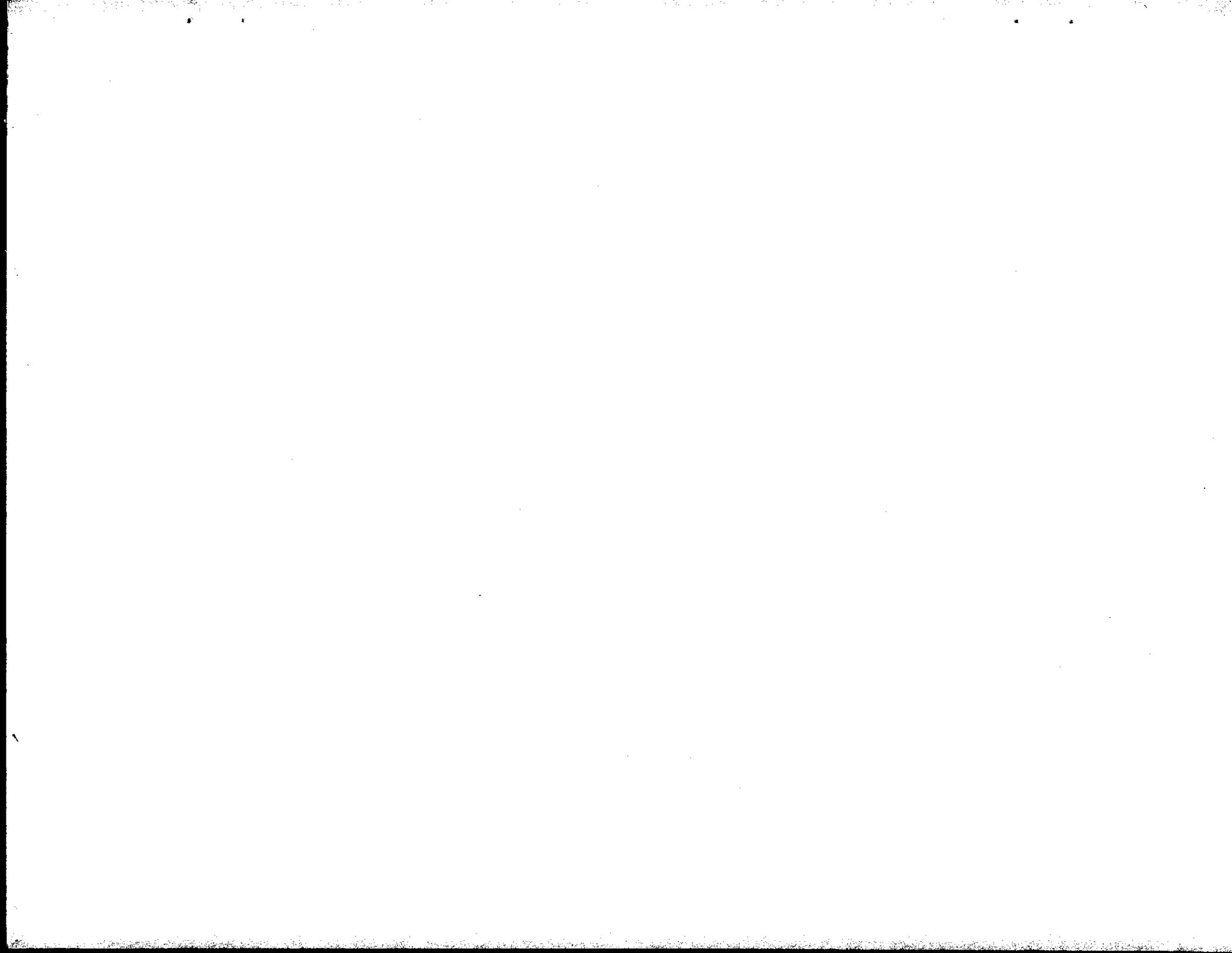


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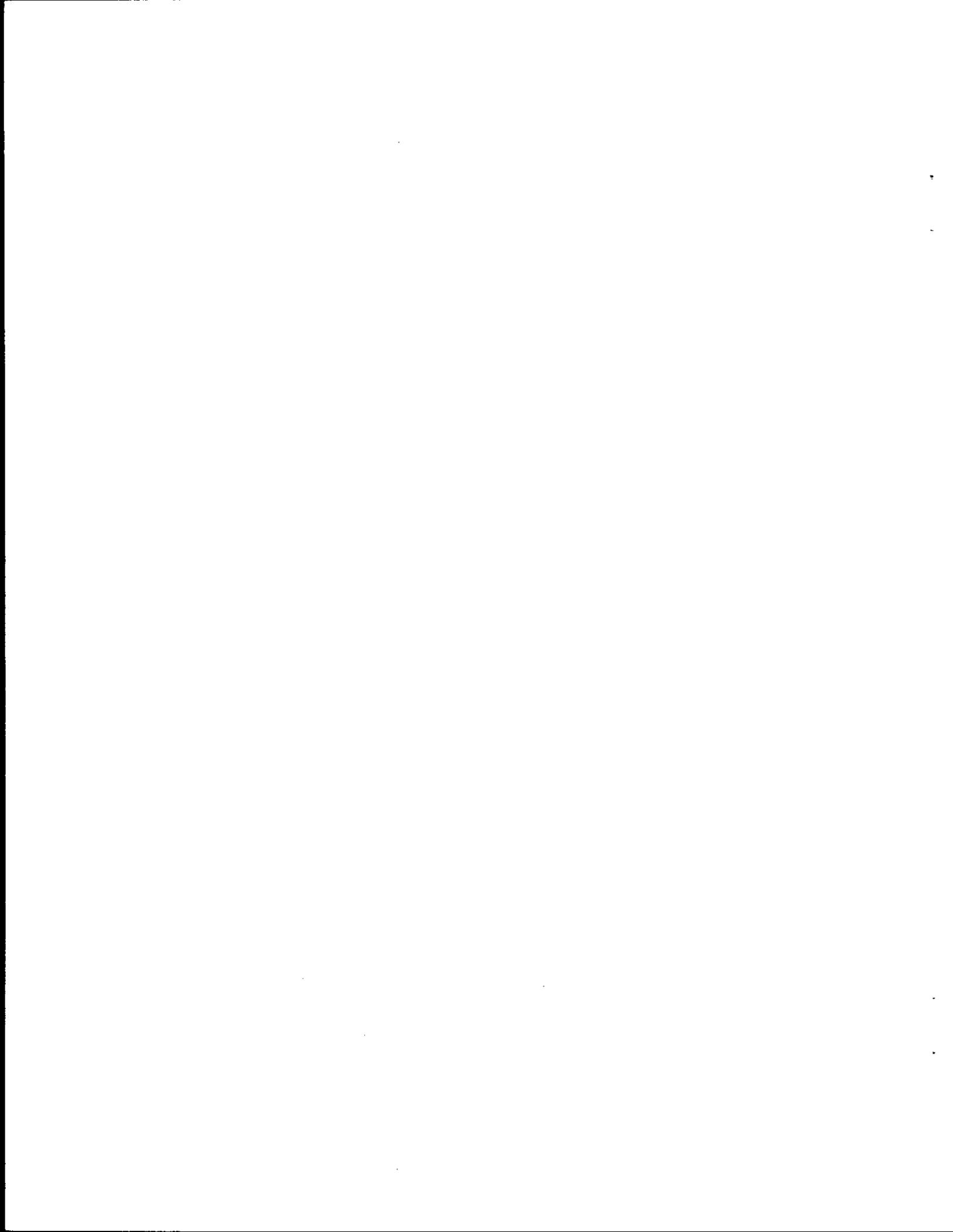
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I. INTRODUCTION

This Environmental Assessment (EA) documents the results of planning activities undertaken to determine the potential impact on cultural and natural features and socioeconomics of a proposed action by the U.S. National Park Service (NPS). The action is the rehabilitation of seven historic structures and their associated landscapes plus the rehabilitation of the Bloody Angle landscape in the Battle Road Unit of the Minute Man National Historical Park (MMNHP) in order to ensure the preservation of significant historical and cultural resources located along the recently opened Safe Visitor Access Trail (Battle Road Trail), and to rehabilitate the associated landscape to conditions similar to those experienced by the participants of the Running Battle of April 19, 1775 (See Appendix A).

This document has been developed in accordance with the National Environmental Policy Act (NEPA) of 1969, 42 USC 4321 et Seq., the Council on Environmental Quality's NEPA regulations, 40 CFR 1500 et Seq., the United States Department of the Interior's Departmental Manual, Part 516 DM 6, Appendix 7, which contains the NPS' NEPA Regulations, NPS-12, which contains the NPS' NEPA Compliance Guidelines. In addition, the EA preparers consulted numerous internal and external sources, including but not limited to the 1989 General Management Plan for MMNHP, the Resource Management Plan (1993), the Interpretive Prospectus (1990), and the Management Plan to Balance Cultural and Natural Resources (1993) and the EA for the Safe Visitor Access Trail (1996).



II. PURPOSE AND NEED FOR ACTION

The primary purpose of the project is to rehabilitate the historic structures and associated landscapes that constitute the primary historic and cultural resources of the Battle Road Unit. Five of the seven structures were extant at the time of the Running Battle and were integral to that first battle of the Revolutionary War, which occurred on April 19, 1775. The Battle Road Unit includes approximately 800 of the Park's 937 acres.

The 1959 enabling legislation for MMNHP stated that the Park was established to "preserve, selectively restore and interpret portions of the Lexington-Concord Battle Road, as well as its associated structures, properties and sites so that the visitor may better appreciate and understand the beginning of the American Revolution..." (House Document 57, 78th Congress, January 27, 1959). Congress expanded that initial mission in 1992 to include more than interpretation of specific events associated with April 19, 1775. "The purposes of the Park shall include the preservation and interpretation of (1) the historic landscape along the road between Lexington and Concord, [and] (2) sites associated with the causes and consequences of the American Revolution." (Public Law 102-488, October 24, 1992).

The 1989 General Management Plan (GMP), was developed to accomplish the original goals set out by Congress. The GMP includes the following Management Goals and Objectives to:

"Protect, rehabilitate and selectively preserve 18th- and 19th-century buildings for interpretation, visitor use and adaptive use for park purposes."

This goal was to be accomplished through a program of rehabilitation, restoration and maintenance of the unit's historic structures. An additional goal of the GMP is to

"Protect and restore the historic scene of April 19, 1775, or the landscape and associated cultural resources in selected areas...."

To accomplish these goals, the GMP calls for a historic structures rehabilitation, restoration, and maintenance program and for development of a landscape management plan which will establish priorities for restoration, rehabilitation, screening of modern intrusions and agricultural leasing, thus enhancing access to and understanding of areas of historical and natural significance. (GMP at p.32)

At present, the park is constructing the Safe Visitor Access Trail, also called for by the GMP and evaluated in the 1996 EA. That trail will provide a link to the majority of interpretive sites in a manner that allows for a safe and high quality visitor experience. The trail will also provide access to numerous natural and agricultural areas, some of which have remained largely unchanged from Revolutionary War times. All of the structures and landscapes that are the subject of this EA are located along that trail, and this project is essentially the second phase of accomplishing two of the GMP's primary goals, in order to follow the directives set out by Congress.

The urgent need for this project is clear: Due to their poor and dangerous condition, the Meriam House and Joshua Brooks House have been mothballed. In 1968, the Samuel Hartwell House burned down due to the lack of a fire suppression system, resulting in an irreplaceable loss of a significant historic structure. The historic fabric of these structures, and that of the Noah Brooks, Samuel Brooks

and Jacob Whittemore houses, are in serious decline and have not been properly addressed due to staffing and financial constraints. If this deterioration continues, rehabilitation will become impossible due to the loss of historic fabric and financial considerations. This may result in the total loss of the principal resources for which the park was established.

Historic landscapes associated with these structures are rapidly passing beyond a point where field or scene reclamation/rehabilitation is practicable. Invasive and non-indigenous plant species are becoming more established each year, to the point where efforts to eradicate them will prove futile if not addressed soon.

Agricultural fields and vistas are becoming overgrown degrading the integrity of the cultural landscape and obscuring historic field patterns, other landscape elements, and historic vistas. Historic resources including stone walls, drainage ditches, and farm roads are being damaged or destroyed by the overgrowth.

Historic stone walls that have defined the landscape for 300 years face continuing degradation. Deteriorated stone walls give the appearance of a lack of importance, stones have been removed from these resources, and in many areas, the walls themselves are covered by vegetation. Unless they are repaired, this piecemeal degradation will continue until the walls lose their integrity and cannot be rehabilitated.

In some cases, historic structures are threatened by hazardous trees or limbs. These must be removed in order to avoid damage to these historic structures and injuries to visitors and park staff.

There are numerous physical and legal constraints imposed on the design of the structure and landscape rehabilitation. These constraints include term reservations, the location of cultural resources, and the location and characteristics of wetlands.

III. PROPOSED ACTION AND ALTERNATIVES

PREFERRED ALTERNATIVE – REHABILITATION OF HISTORIC STRUCTURES AND HISTORIC LANDSCAPES

The Preferred Alternative (See Appendix B, narrative to Section III and IV of the 9-97 CJA submittal) will provide the greatest balance between rehabilitating the park's historic structures, rehabilitating their associated landscapes, improving interpretation of these resources and accommodating improved visitor access afforded by the Safe Visitor Access Trail (Battle Road Trail) while protecting the Park's natural and cultural features and providing a safe experience for visitors. Maintaining the fabric of historic structures and the cultural landscape; conservation of natural and archeological resources; and improving interpretive and educational opportunities were the primary issues considered during the development and selection of this alternative (See Appendix C and D).

ALTERNATIVE 2 – STRUCTURES OR LANDSCAPES

Due to the critical nature of accomplishing the primary goals of the GMP, the NPS has essentially considered two options other than the Preferred Alternative. These two options both involve a partial accomplishment of the GMP's goals. The first option is to rehabilitate the historic structures while leaving the surrounding landscapes as they are. The second option is restoring only the landscapes associated with these structures, leaving the structures themselves in their current conditions.

Due to funding limitations, these projects may be completed in phases. If this is to be the case, the NPS will undertake the preservation of the historic structures as the first phase of the project. The structures are the park's priority due to the critical nature of their condition, their irreplaceable historic value (as stated in the park's enabling legislation), and the safety issues associated with visitor access to them.

ALTERNATIVE 3 - NO ACTION

The No Action Alternative will not change existing maintenance programs for the historic structures and associated landscapes. These programs involve periodic mowing of open fields and ongoing stabilization projects such as patching leaking roofs and combating active insect infestations.

If existing conditions and operations are allowed to continue, historic landscapes will deteriorate past the point where field or scene rehabilitation is practicable. Historic structures will continue to deteriorate to the point where they can not be rehabilitated, and may in fact, be destroyed by fire, water damage or insect infestation. Without taking action, the eventual result will be the total loss of the principal resources for which the park was established.

ALTERNATIVES CONSIDERED BUT REJECTED

The NPS initially considered a wide range of landscape and structural rehabilitation options. Given the wide range of options for separating the various components of the structures rehabilitation and the landscape rehabilitation, it was deemed not to be administratively efficient to conduct environmental compliance, engage in planning and design work and seek funding for individual components.

Therefore, the NPS rejected alternatives for key historic structures and their associated landscapes which resulted in only partial accomplishment of specific GMP goals and Congressional directives.

IV. AFFECTED ENVIRONMENT

A. CULTURAL FEATURES - HISTORIC STRUCTURES, CULTURAL LANDSCAPES, ARCHAEOLOGICAL RESOURCES, ETHNOGRAPHIC RESOURCES

This section describes the current conditions in the Battle Road Unit including historic structures, the cultural and natural landscape, archaeological resources and ethnographical resources. These elements are contained within a single section in order to give the reader a complete picture which more closely resembles what a visitor will encounter in the park, as opposed to describing each element of the affected environment at each site in separate sections. Section IV.A. does break down the impacts to Park resources in terms of specific elements. Archeological investigations were conducted in each of the proposed work areas associated with vegetation clearance and stump and tree removal (See Appendix E).

For the purpose of this section, the Battle Road Unit has been divided into four distinct areas representing the locations where structures and landscapes will be rehabilitated. These areas include smaller component landscapes that represent land once included in individual family farmsteads as well as areas that have a connection to events that took place during the running battle.

The four areas described here include Meriam's Corner, the Brooks Farm, the Bloody Angle and Nelson Farm. They are described as a visitor proceeds west to east. Throughout these areas are numerous undocumented features such as stone walls, levees, drainage ditches, farm roads and other physical features indicative of a bucolic 18th century community.

Meriam's Corner

Meriam's Corner is the first of several distinct historic zones found along the Battle Road. It is located at the Park's western gateway and was home to five generations of the Meriam family. It played a critical role in the events of April 19, 1775 as the start of the Running Battle. The British flankers following the main column of troops crossed a small bridge in front of the Meriam House. The colonists were positioned in and around the house and barn. Shots were fired, with two British soldiers possibly killed. It was at this point that the running battle began and went all the way back to Boston.

The Meriam House dates from 1705 and only minor alterations have occurred since then. It is a 2-story saltbox with 5 bays and a central chimney, set in a grass lawn area that abuts Lexington Road to the south and Old Bedford Road to the west. Few historic features remain in the yard area immediately surrounding the Meriam House, however, archaeological evidence of 18th century outbuildings has recently been found in an area south of the Meriam House. Minutemen may have used these structures for concealment. Future archaeological investigations may be conducted in this area. The field to the south of Lexington Road is maintained in its historic open character.

The Burke House, a 2-1/2 story Dutch Colonial Revival constructed in 1904, is visible from the Meriam House, located to the northwest. The remains of an old foundation are located in the wooded area at the east boundary of the Meriam house lot. Just east of this woodlot, is the East Quarter School House, a 2-story end gable constructed in 1853-1854.

At the time of the Battle, much of the Meriam's Corner area was farmland. Today, some of these fields have reverted to wetlands or woodland. Farm fields are located to the north and south across Lexington Road. Hedgerows have grown between many fields, obscuring views to and from the Meriam House, and altering the historic scene. Many of the fields retain their historic patterns. These fields are crossed with stone walls, mostly dry-laid fieldstone, ranging from 2 to 5 courses high.

The exact location of the Battle Road is unclear in many locations, including where it crossed the Mill Brook, south of the Meriam House. An archaeological study has been completed in this area in order to determine the exact location of the crossing, the actual road and other historic foundations or structure remnants. The report for that study will be completed in early 1999.

The Willow Pond Kitchen, located between Meriam's Corner and the Jones/Stow Farm areas, is set back from Lexington Road by an asphalt and gravel parking lot. It is a mid-20th century structure, but is no longer operating.

The Minot Farm House, whose lands formerly encompassed the area known as the Perry Fields, dates from 1865 and has been only slightly altered since its construction. It is located on the site of an earlier Minot residence from 1765 until 1808. The site, including the house location, agricultural fields and orchards, has been a farm since the early 17th-century.

Brooks Farm

This area came into the Brooks family in 1652 and was farmed continuously by them until 1862. The four Brooks home lots are located along both sides of Route 2A along the route of the original Battle Road.

The Samuel Brooks House, a two-story Georgian structure on the north side of Route 2A, was built in 1733. The Samuel Brooks House is currently used as seasonal NPS housing

The Noah Brooks Tavern, a two-story Federal house with clapboard siding and brick end walls on the south side of Route 2A, was built in 1810. The Noah Brooks Tavern also serves as NPS seasonal housing. Rogers Barn, a 20th-century barn built on top of a 19th-century foundation, is associated with the Noah Brooks Tavern.

The Job Brooks House (1760), is a two-story pre-classical box house with a central chimney on the north side of Route 2A. This structure has undergone a complete facade restoration to 18th century conditions. The interior is being used for museum storage with state of the art environmental controls. Hastings Barn, a large 19th century foundation is located near the northwest corner of the Job Brooks House.

Joshua Brooks House, on the south side of Route 2A, is a two-story pre-classical box constructed in 1779-81. This house which is currently vacant, has significant views to the north across the Elm Brook wetland and to the agricultural fields beyond where Colonial Militias crossed to set up their ambush at the Bloody Angle. There is evidence that the Brooks family owned and operated a slaughterhouse and tannery in this area. To date, archaeological studies have not uncovered any physical evidence of these facilities.

Bloody Angle

For purposes of this document, the Bloody Angle extend from the intersection of Route 2A and Old Bedford Road to the intersection of Route 2A and Virginia Road. Some of the fiercest fighting occurred in this location as the British rounded the two bends and were met by Colonists concealed in the tree and rock cover along both sides of the road. At the time of the battle, this area was a diverse agricultural landscape with open and wooded pastures, meadows, tilled fields, orchards and wooded areas.

Two modern structures exist along the Battle Road route, now Old Bedford Road, from the intersection with Route 2A to Virginia Road. These houses are occupied under life estate reservations. For approximately 400 yards north of this intersection, Old Bedford Road is paved, but in poor condition.

Three modern homes are located on the Battle Road route, now Virginia Road, from its western end at Old Bedford Road to the intersection with Bedford Lane. Two of these homes are occupied. From Old Bedford Road to near Hartwell Tavern this section of Virginia Road is still paved with asphalt.

As part of the Safe Visitor Access Trail construction approximately 1,500 feet of Virginia Road, beginning roughly 200 feet west of Bedford Lane, was rehabilitated to a condition closely resembling that which occurred at the time of the Running Battle. The road in this area is bordered by historic stone walls and is paved. Two archeological sites, the Joseph Mason House site and the Samuel Hartwell House Site, adjacent to Virginia Road have been studied by archeologists.

Hartwell Tavern, constructed as a residence in 1733, is located near the intersection of Virginia Road and Bedford Lane. The building, used as a tavern from 1756-1787, is a two-story side gable with a large central chimney and a 1783 gambrel addition on one end. A livestock pasture adjacent to the Hartwell Tavern is used as part of the park's living history program. McHugh Barn, behind Hartwell Tavern, was constructed in 1939 on a 19th-century cut stone foundation. A visitor parking area is located south of the tavern on Route 2A.

The Samuel Hartwell House was constructed east of Hartwell Tavern on Virginia Road in 1693. Only a stone and mortar foundation and a large chimney remain. A timber shelter has been constructed around the site to protect it. The site is surrounded by a maintained yard. The remains of a fieldstone farm cellar foundation associated with the house are preserved near the site.

The William Smith House, at the east end of Virginia Road, is a two-story colonial house with a large central chimney, built in 1693. The house has been rehabilitated to its 17th-century appearance. The surrounding yard is currently maintained as an open field. Views in this area are limited to the Battle Road corridor.

Nelson Farm

The Nelson Farm area diverges from Route 2A at the Hop House site and rejoins it at the intersection with Old Massachusetts Avenue. In the western portion of this area the Battle Road has had its historic surface recreated from the Hop House site to the bluff and Route 2A. Stone walls and mature oak and maple trees line the road. The Hop House site, consisting of a visible foundation, dates from

circa 1805 and an archaeological investigation of the site has been completed.

The John Nelson House, built during 1808-1810, is a two-story Federal/Georgian house with a low hip roof. A one-story garage wing and a two-story ell have been added. This house may incorporate the relocated Daniel Brown House (c.1700) and has exceptional architectural integrity. The Nelson Barn, an early 19th-century, one-story side gable with a 20th-century addition in the rear is associated with the John Nelson house. The area surrounding this complex is maintained as an open field by current tenants.

The next site along the Battle Road, is the Daniel Brown site, which was abandoned as a residence by the 1770's. The structures no longer remain, but the site has archeological significance and was excavated. It is currently overgrown with trees and brush and is not interpreted. Also on the north side of the Battle Road, (east of the Brown site) are the Josiah Nelson and Thomas Nelson Jr. sites. Evidence of the structures on these two sites remain. This evidence includes foundations, chimneys, and land forms. The areas surrounding these sites are maintained in an open character. Both sites have historical and cultural value, and are interpreted to visitors.

The Tabitha Nelson site's surface features were largely obliterated by previous construction of Airport Road. However, it is presumed that there are subsurface archaeological resources.

The Minute Man Visitor Center (MMVC) and its parking area is located east of the Nelson sites, with parking located near the house sites and the visitor center located toward the eastern portion along Route 2A. The MMVC now has a single vehicular access from Route 2A.

Located along the northeast side of Marrett Street (which runs parallel to Airport Road) is the Jacob Whittemore House, constructed prior to 1745. It is a two-story, side-gable Georgian with a five-bay layout and a large central chimney. The Hargrove Barn located near the house is an early 19th-century one-story side-gable structure. The area surrounding the Whittemore House is maintained as an open lawn. This site currently serves as NPS housing.

Located within a triangle bordered by Marrett Street, Airport Road and Route 2A are the sites of the Bull Tavern and John Muzzy house site. North of Marrett Street is the archaeologically significant site of an eighteenth century blacksmith shop.

Access to the eastern portion of the Nelson Farm area is by Airport Road, which runs parallel to Marrett Street, which is the Battle Road.

Access to the Nelson Farm area is from Route 2A for vehicles or by use of the Battle Road Trail. Marrett Street pavement has been removed and the surface has been rehabilitated in the same manner as the Virginia Road area.

Many of the agricultural fields in this area have become overgrown but are still identified by stone walls. The close proximity of intensive residential development within Hanscom Air Force Base and the Town of Lexington is buffered in some locations by this growth.

B NATURAL FEATURES

1. VEGETATION

A biological survey was completed under contract with the Massachusetts Natural Heritage and Endangered Species Program in 1992. One aspect of the study included a vegetation survey which documented and evaluated the plant communities occurring in the Park, located any exemplary communities, and found rare species (Thompson and Jenkins 1992). This study was not comprehensive but included the most common plant communities in the Park and concentrated on native communities.

The vegetation within the Battle Road Unit includes active and abandoned agricultural fields, shrub lands, deciduous, coniferous, and mixed woods, and open and forested wetlands. In the late 1700's, 90% of this area had been cleared for agriculture. When much of the agriculture was abandoned in the 1800's, re-forestation occurred. The area was logged at least once more by the late 1800's. Because of fairly complicated land use and successional histories, all the plant communities in the Park tend to occur in small patches (1-4 acres). Small patches have a lot of edge, making them less able to resist invasion by alien species and that, combined with continual disturbance by human activities, has produced plant communities which are extensively invaded by non-native species.

Active agricultural fields used for row crops or hay are found mostly in the western end of the Battle Road Unit. Much of this land is drained wetland that has been farmed since the 1600's. The open wetlands, mostly post-agricultural land, are generally dominated by loosestrife, cattails, and common grasses and sedges. They are almost all weedy and disturbed. Dense shrub wetlands have also developed from post-agricultural wetlands and are very common and generally invaded by aliens.

The woods are all fairly young (most trees with a diameter at breast height of less than 12-14") and range from very dry oak-hickory to mesic maple-oak woods, to wet red maple swamps. The dry woods are dominated by a mixture of oaks, often with pignut or mockernut hickory, and with white pine or pitch pine. Beech is usually present in small amounts. Herb diversity is low and aliens only occur in small numbers. The dry woods are considerably less weedy than the mesic woods. Native species in the dry woods range in diversity from low to about average for this community.

The mesic woods are typical mixed red maple-sugar maple-red oak woods and are fairly patchy. They generally have very low native species diversity and are extensively invaded by European bush honeysuckle and two species of buckthorn.

Forested wetlands are red maple woods which vary from seasonally to permanently wet. These areas range from disturbed and very weedy communities to relatively undisturbed, almost weed-free communities. They are the most diverse communities in the Park, however, they are noticeably less diverse than this type of community is elsewhere. Most of the individual swamps have relatively few species. This is probably a consequence of succession in small, fragmented patches.

There are several small ponds in the Battle Road Unit. Some are kettlehole ponds; others are farm ponds. Like the wooded areas, the ponds exhibit a wide range of disturbance and native plant species diversity.

The majority of the plants in the Park are wide-ranging species commonly found throughout the northeastern United States. A small group of plants are limited to a particular geographic region or to a particular community, including plants of the dry forest in the oak zone (e.g., *Carya tomentosa*, *Quercus coccinea*, *Q. velutina*) and plants in coastal plain wetlands (e.g., *Rhododendron viscosum*, *Glyceria acutiflora*). No rare species were found in the Park. However, the sedge *Carex atlantica* is probably a scarce species in eastern Massachusetts, and the bladderwort *Utricularia geminiscapa* may be a new county record.

2. WILDLIFE

Surveys of selected fauna (Martinez 1992, Windmiller and Walton 1992, and Jones 1993) indicate that a moderately diverse representation of the fauna of eastern Massachusetts occurs in the Park. Sixty-one species of birds and 11 species of amphibians breed in MMNHP. Observations of other taxa include 32 mammal species, 8 reptile, 12 fish, 42 butterfly, 30 odonate, and a variety of macro-invertebrates.

The birds in MMNHP are typical of the mixed deciduous/coniferous transitional forest, second growth fields, agricultural edges, and wetlands of eastern Massachusetts. Five species observed in MMNHP have declined locally and so are of particular interest: Eastern Meadowlark *Sturnella magna*, Brown Thrasher *Toxostoma rufum*, Rufous-sided Towhee *Pipilo erythrophthalmus*, Indigo Bunting *Passerina cyanea*, and Bobolinks *Dolichonyx oryzivorus*.

The most common mammal species in the Park appear to be the short-tailed shrew *Blarina brevicauda*, eastern chipmunk *Tamias striatus*, eastern cottontail *Sylvilagus floridanus*, eastern gray squirrel *Sciurus carolinensis*, raccoon *Procyon lotor*, opossum *Didelphis virginianus*, and white-tailed deer *Odocoileus virginianus*. Aside from state-listed species (see Threatened & Endangered Species), all of the amphibian species seen in MMNHP are relatively common in eastern Massachusetts except for the northern leopard frog *Rana pipiens* (a possibly declining species) and the northern dusky salamander *Desmognathus f. fuscus* (not particularly common in NE Massachusetts).

While most species common in eastern Massachusetts were found in the Park, species with large home ranges and those with specialized habitat requirements were either absent or present in fairly low numbers. Contributing ecological factors include: fairly dense human development along portions of the Battle Road Unit's boundary at both the eastern and western ends of the Park and near the central portion (although there are conservation lands bordering much of the central portion of the park) which limits the available species pool due to habitat fragmentation and encroachment, major roadways bisecting the Park which causes significant mortality of small terrestrial vertebrates and the long linear shape of the Park which puts all areas fairly close to a roadway and allows negative edge-related phenomena.

3. THREATENED AND ENDANGERED SPECIES

The U.S. Fish and Wildlife Service has indicated, by letter dated January 13, 1999, that except for occasional transient animals, no federally listed or proposed threatened or endangered plants or animals are known to exist in the Park. (Appendix F)

Two classifications of the Massachusetts Natural Heritage and Endangered Species Program in 1994 apply to species found in the Park. However, none of these species have been documented in the project

area. The "Species of Special Concern" found at MMNHP are the Elderberry Borer Beetle *Desmocerus palliatus*, the Mystic Valley Amphipod *Crangonyx aberrans* and the Spotted Turtle *Clennys guttata*. "Watch-Listed Species" found in the Park are the Common Shiner *Notropis cornutus*, the Frosted Elfin Butterfly *Incisalia irus* and the Spotted Salamander *Ambystoma maculatum*. As part of the Trail project, 35 elderberry bushes were planted in the park to increase habitat for *Desmocerus palliatus*.

4. AGRICULTURAL LANDS/SOILS

MMNHP has some of the richest agricultural land in the Concord and Sudbury River Valleys. At the time of the American Revolution, the landscape was primarily open land consisting of agricultural fields, pastures, and home lots interspersed with orchards, woodlands, and marshy areas. Much of the western portion of the Battle Road Unit has been in agricultural use continually since 1700, while many fields in the eastern and central portion have become brushy and wooded.

The prime agricultural land in the Park is found in lowlands and on shallow slopes where rich soils have been deposited over glacial and outwash deposits. Upland soils include Paxton, Scio, Hinckley, Windsor, and Woodbridge series. Paxton and Woodbridge are well-drained soils that are found on the slopes of drumlins. Hinckley and Windsor soils are excessively drained and are found on outwash plains, and terraces. Scio soil is moderately well-drained, nearly level and gently sloping and formed in glacial outwash and lake beds.

Wetland soils in MMNHP are typically Wareham, Freetown, and Scarboro. Wareham loam is a poorly drained soil formed on glacial outwash plains and terraces. These soils generally support the richest variety of vegetation and are often in agricultural use.

Silt and clay soils, such as Freetown and Scarboro mucks, tend to be waterlogged. The Freetown series is very deep, very poorly drained organic soils (muck) found in depressions and on flat areas of uplands and glacial outwash plains. Scarboro is nearly level, deep, very poorly drained soils in depressions and outwash plains and terraces. They form in sandy glacial outwash. Both of these soils are too wet to be used for agriculture. However, in many areas of the Park where these soils are present, ditches have been dug to drain the fields, rendering them suitable for agriculture.

5. WATER RESOURCES & WATER QUALITY

Water Resources

The main water resources in the Battle Road Unit are Mill Brook and Elm Brook, both of which are in the Merrimack Drainage System. Mill Brook is part of the Concord River Basin and a portion of its headwater lie within MMNHP. Additionally, Mill Brook is the outlet for Crosby Pond which is south of the Park in Concord. Within the Battle Road Unit, Mill Brook generally flows in a southerly direction. Elm Brook is part of the Shawsheen River Basin and its headwaters lie outside the Park in Lincoln. Elm Brook flows in a northerly direction. The watershed boundaries of Mill Brook border those of Elm Brook. Both brooks have been ditched extensively in the past 200 years and each has several intermittent tributaries. In many instances, the original watercourses have also been altered.

Throughout the Battle Road Unit, there are numerous small streams which drain seasonal run-off

from wetlands. Additionally, there are a number of kettleponds, vernal pools, and man-made farm ponds.

Water Quality

The NPS is currently conducting a Level I Water Survey, the results for which will be made available to the public upon completion in December, 1999. No other water quality studies have been conducted in the park.

Under 314 CMR 4.00 of the Massachusetts Surface Water Quality Standards, Elm Brook is designated as a class B water source. Class B refers to water sources designated as habitats for aquatic life and wildlife as well as primary and secondary contact recreation. These waterways may be used for agriculture and industrial processes at designated points.

The Concord Tributary Monitoring Project of 1973 is a study that was conducted for the Concord Department of Natural Resources to determine the water quality of waterways in Concord. Both Elm Brook and Mill Brook were monitored. Elm Brook and Mill Brook were both recorded to have pollution levels exceeding those of the rivers into which they flow, thereby polluting them rather than diluting them. Possible sources of pollution include runoff from highways and agriculture. Due to high total coliform counts, which are results of sewage effluent, both brooks were declared unsafe for swimming. The most recent study conducted by the Town of Concord was completed during 1995-1997.

The monitoring stations of the Concord study were located upstream from the areas of the brooks that flow through the Park. Thus, the information from the study is not conclusive concerning the water quality of the Park. It is likely that roadways and agricultural lands surrounding the brooks in the Park are sources of runoff pollution.

6. WETLANDS & FLOODPLAINS

Wetlands

There are numerous physical and legal constraints imposed on the design of the structure and landscape restoration. These restraints include term reservations, the location of cultural resources, and the location and characteristics of wetlands. In order to accomplish Congressional objectives, project activities in some areas will occur within 100' of some wetland areas in some areas.

The wetlands within the Battle Road Unit are primarily associated with perennial and intermittent streams and ponds. Initially, wetlands located within the unit were identified by the University of Rhode Island's Ecological Reconnaissance Project in 1992. Nine classifications of wetlands were identified through photo-interpretation of color aerial photographs at 1:4800 scale dated April 5, 1986. Additionally, the six wetland areas located within 100 feet of Trail project areas were delineated in the field by a Natural Resource Management Specialist with Minute Man National Historical Park, in conjunction with the NPS' consultant. Jurisdictional areas were delineated using the 3-parameter method (soils, vegetation and hydrology) outlined in the Army Corps of Engineers Wetlands Delineation Manual (1987). Where the Trail project work was to occur within 100' of work areas, those wetlands were delineated using primarily vegetation (and soils where necessary) in compliance with the Massachusetts

Wetlands Protection Act, corresponding regulations and local by-laws and regulations. For more specific descriptions of these wetlands and impacts, see the Environmental Assessment for the Safe Visitor Access Trail, Sections IV.B.6 and V.B.6 and related appendices (See Appendix G).

The actions proposed under this project will be located near three jurisdictional wetlands, including two in Lincoln and one in Lexington. In Lincoln, these areas are Elm Brook near the Joshua Brooks House, and the vernal pool near the Smith House. In Lexington, the subject area is the vernal pool near the Whittemore House. Notices of Intent have been filed with the appropriate Conservation Commissions for these actions (See Appendix H). A stream located northwest of the Samuel Brooks House in Concord is also jurisdictional but work proposed under this project will occur more than 200 west of this stream.

Floodplains

The Federal Emergency Management Agency (FEMA) has completed flood insurance rate maps for all areas subject to potential flooding within the study area. Areas showing 100-year flood and 500-year flood hazards were mapped. No activities are proposed in the 100-year floodplain (classified as "Zone A"). The Joshua Brooks House is located in an area that is classified as "Zone B" - an area between limits of the 100-year flood and the 500-year flood, or an area subject to 100-year flooding with average depths less than one foot, although no work is proposed in that area.

7. AIR QUALITY & CLIMATE

Report on Air Quality in New England (USEPA Region 1), which tests levels of carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide, the air in Massachusetts is in compliance with the National Ambient Air Quality Standards (NAAQS).

The only pollutant tested in the vicinity of the Park is ozone, which is recorded to be one day over the standard, thus being in excess of the NAAQS. The trend graph for Massachusetts shows that the number of days over the standard is relatively constant, varying between zero and six days over the standard for the sites selected for the study. Carbon monoxide levels are known to exceed the 8-hour NAAQS in Springfield and Worcester. The highest levels of nitrogen dioxide were recorded in Kenmore Square, Boston, however the five-year trend graph shows stable levels of nitrogen dioxide. Particulate matter levels across the state are well below the 24-hour NAAQS. Of 28 monitoring sites, there are no exceedances of sulfur dioxide levels in the state, with the five-year trend graph showing a slight decreasing trend.

According to information provided by Hanscom Air Force Base (Revised Uniform Summary of Surface Weather Observations, Feb 1943-May 1965, Office of Acquisition Meteorology), which is located adjacent to the Park, average temperatures in the area range from 42-62°F in autumn, 26-29°F in the winter, 36- 57°F in the spring and 67-72°F in the summer.

The average annual precipitation is 43.7 inches. Typically, snow fall ranges from 12-15"/month December through March and thunderstorms account for 3-5"/month May through August. Winter and spring winds come out of the west-northwest while summer winds blow from the southwest.

8. TOPOGRAPHY AND GEOLOGY

Tectonic activities, erosion, and glaciation formed the topography of Southern New England. MMNHP straddles an area where an early "North Africa" collided into the predecessor of "North America" approximately 630 million years ago. Roughly 200 million years ago, the North Atlantic basin opened up near the same boundary. This left a remnant exposed in southern New England that had been attached to northwest Africa. The "collision zone" encompasses roughly the area between U.S. Routes 128 and 495 along Route 2A and is the largest fault zone in the United States. The major fault forming the boundary is named after Bloody Bluff (or The Bluff), where a skirmish took place during the events of April 19, 1775. Other features related to the collision can be found throughout the Park.

Erosion and glaciation followed the tectonic activity. Together, these processes created a landscape at Minute Man National Historical Park of low, rolling hills and wide, flat plains with elevations ranging from 128' along Mill Brook in Concord to 307' at the top of Fiske Hill in Lexington. There are landforms within the Park that were produced by ice and are related to the continental glacier retreat which occurred in the area about 12,000 years ago. The smooth, rounded hills, such as Brooks Hill, are "drumlins" composed of unconsolidated glacial till. "Glacial erratics" (large rocks dislodged from bedrock) are scattered throughout the Park, and were used as cover by the Minute Men and the British during the Running Battle. Impervious layers are common throughout the unit, and there are a number of small kettle hole ponds and swampy basins where large blocks of ice remained after the glaciers retreated. The flat topography and lake deposits found in the soils at the western end of the Battle Road Unit are typical of areas once covered by Glacial Lake Concord and these soils are some of the most productive agricultural soils in the Park. Any of the modification of the topography following the ice retreat is primarily a result of human activity.

C. SOCIOECONOMICS

1. NOISE & TRAFFIC

The 800+ acre, five mile long, Battle Road Unit of Minute Man National Historical Park is bisected by Route 2A and Lexington Road. Present average visitation at the Park exceeds one million visitors per year. Each day up to 20,000 vehicles commute on these roads. Traffic data indicates that all of Route 2A intersections within the Park are at Level of Service (LOS) ratings F. Stretches of Route 2A within the Unit are particularly congested. Segments of the roadway are prone to high speed traffic and frequent accidents. Six intersections within the Park have been the sight of frequent injury producing accidents requiring ambulance or helicopter responses. Of these intersections, along Route 2A, fatalities have occurred within the last six years at both the Old Massachusetts Avenue and Massachusetts Avenue intersections. (Appendix I)

As part of the Safe Visitor Access Trail project, several traffic safety improvements were accomplished. Virginia Road was closed to traffic, thus improving the old intersection of Virginia Road and Route 2A. Airport Road traffic was reduced by closing the MMVC parking lot entrance on that road and access to the MMVC was improved by reconfiguring the Route 2A entrance.

The Chiefs of Police for the towns of Concord, Lincoln and Lexington, members of the public and elected officials have expressed their concerns to the Park about the traffic congestion on Route 2A and

Lexington Road. The extremely heavy and dangerous congestion necessitates the need, daily, during commuting hours, for traffic control officers at the Hanscom Drive intersection, the Airport Road intersection and the Wood Street and Massachusetts Avenue intersection. As part of the Trail project, a tunnel will be installed under Hanscom Drive (currently four lanes with a 50 MPH speed limit) to eliminate crossings by pedestrians and bicyclists. That work is expected to commence during 1999 or 2000. Traffic control officers are also frequently required at other intersections such as Massachusetts Avenue and Lexington Road when traffic becomes inordinately congested. The heavy traffic makes it difficult and dangerous for Park visitors to use Route 2A and Lexington Road by vehicle, by foot or by bicycle. The Massachusetts Highway Department recently lowered the maximum speed limit on any zone within the park from 45 MPH to 40 MPH. NPS protection Rangers have also been trained in use of radar guns to enforce speed limits within the park.

Through the Trail project, numerous cultural resources have been made more accessible to visitors. Significant levels of visitor usage have already been observed on the Trail, and has made improvements to the park's cultural and historic resources more important than ever to the Park's visitors and the host communities.

During the past 30 years the Park has arduously acquired properties and agricultural land along a five-mile stretch of this historic road. However, little has been done to interpret, preserve, or use the historic lands acquired, due to the heavy and dangerous traffic and the lack of NPS development. Public access to much of the Park--and to its historic message--has thus been almost non-existent. Now that nearly all use and occupancy reservations have expired, providing safe, interpretive access to the Park's significant historic resources, and where necessary, restoring those resources to a condition that is safe for visitors, is an important step toward fulfilling the mission of Minute Man National Historical Park.

2. LAND USE

MMNHP lies within the towns of Lincoln, Concord and Lexington. The dimensions of the Battle Road Unit are approximately 4.7 miles east/west and vary between 1 mile and 1/10 of a mile north/south. These towns and other surrounding towns are predominantly suburban, with primary concentrations of single family residences. Numerous commercial and residential developments are contained within these towns adjacent to park lands, and the Hanscom Air Force Base and MassPort land abuts a large portion of the Battle Road Unit to the north. The towns contain a significant amount of active agricultural lands and protected conservation land, some of which abut the Park.

More than 25% of the Battle Road Unit is comprised of active and fallow agricultural lands. Of the fallow agricultural lands, many have remained inactive since the NPS assumed ownership roughly 40 years ago, resulting in the late field succession condition which currently exists in many areas. Over 60% of the unit is presently wooded, scrub brush or wetlands (when fallow agricultural fields are included the total of un-maintained land is approximately 70%), with the remaining acreage comprised of houses, farms and associated structures, roads and Park facilities, such as the Battle Road Trail, parking areas and a visitor center.

3. COMMUNITY RELATIONS

Minute Man National Historical Park is located within the three towns of Concord, Lincoln and

Lexington and abuts the Hanscom Air Force Base, a portion of which is located in Bedford. One of the primary goals of the 1989 General Management Plan (GMP) is to "continue cooperative efforts with Concord, Lincoln and Lexington; regional planning groups; and local and national organizations towards preserving and interpreting historic events and resources, including planning efforts affecting the three Park units," (GMP at 33). Several special events occur throughout the year including the participation of numerous re-enactment groups in the annual April 19th celebrations and ceremonies as well as other activities throughout the year. Area residents tend to use the Park during off-peak time periods. Although many do not frequent the Park, one of the things they invariably do with their out of town guests is to show them around the internationally significant Historical Park located in their community.

The primary concerns to emerge over the years have been the hazardous traffic conditions along the main Park roads and the lack of public access to interpretive sites in the Battle Road unit. This lack of access was due in part to numerous occupancy and use reservations and the need to respect the rights and privacy of these tenants. Another major contributing factor was the lack of physical access caused by natural features such as wetlands and dense vegetation, active agricultural operations and heavy vehicular traffic within Park lands and resources. The Trail project has alleviated these concerns to a large degree, but area residents have voiced concern over the condition of and access to the historic structures located within the Park.

One of the most frequent concerns that the Park hears is that in spite of a major public investment, the Park has not provided adequate access to public resources. The safe visitor access trail partially addressed that concern, and the completion of rehabilitation of many of the park's historic structures and landscapes should address the balance of that major public concern. Local visitation has also increased since the completion of the Trail.

4. UTILITIES

The Park is served by a variety of utilities, including sewer, water, electric, gas and communications lines, many of which are either buried or overhead. A Boston Edison right of way with large overhead lines and towers bisects the Park at the eastern end by Fiske Hill. Over the years, numerous ideas have been considered and plans formed to either relocate certain lines to outside the Park or to bury lines having visual impacts on Park resources. Many of the existing lines are abandoned or non-functional where structures have been abandoned or removed. Utilities will be buried along Bedford Lane by Hartwell Tavern as part of the Battle Road Trail project. Septic systems and underground storage tanks exist at various locations within the Park. The NPS has recently removed several known underground tanks and only one or two are known to remain.

5. VISITOR EXPERIENCE AND ACTIVITIES

The average annual visitation for the last five years is over 1 million, with the average length of stay in the area being 1.7 days per visitor. General and local visitation has increased with the addition of the Battle Road Trail. This new facility has provided visitors with significant opportunity to tour the Park without the use of vehicles. Peak visitation occurs in April due to special ceremonies and celebrations commemorating the events of April 19, 1775, as well as July through October. Visitation drops significantly from November through most of March with week-long increases during each of the holidays.

Approximately 45 percent of the Park's visitors are from the general New England region, including 37 percent from Massachusetts. 48 Percent visit from the rest of the United States, including 11 percent from the West coast. A significant number (7 percent) of visitors are from foreign countries. Visitors travel to the Park by car, bicycle, foot, canoe (Concord River) and bus. The most heavily visited site is the North Bridge; approximately 6 of every 10 visitors visit this site. About 2 out of every 10 visitors visit the Minute Man Visitor Center and/or Fiske Hill area. The other main attractions presently suited to receive visitors are the Hartwell Tavern area and the Wayside Unit. Visitors can now walk or bike the entire length of the Battle Road unit on the new trail. For those who choose to use their vehicles, there are five parking areas at various points along the trail.

A type of use which has recently increased is by local residents of surrounding towns who often do not show up on Park surveys, as they usually do not use the visitor centers. These visitors are often picnicking, jogging, walking or bicycling through the Park, and often use the park primarily in the early morning, late afternoon or weekends. This type of visitation is on the increase.

The single biggest event of the year is the Annual Concord Parade, which usually falls on Patriots Day. This event draws visitor crowds which have exceeded 10,000 people. The main historical event which is formally interpreted is April 19, 1775, which marks the beginning of the American Revolution when Colonial Minutemen first stood together against the British; an event which eventually led to American independence. This is the day of the Running Battle, which is the primary event for which the Battle Road Unit was created. Commemorative events of this battle are also held at other sites including Nelson Road, Fiske Hill, Bloody Angle, Meriam's Corner, Captain William Smith House and Hartwell Tavern. Current conditions do not allow for large groups to attend ceremonies at these areas. The reasons are parking limitations, use and occupancy reservations and lack of suitable space for visitors to observe activities.

Beginning in 1998, as part of the annual April events, approximately 1,000 Colonial and British re-enactors marched along the Battle Road Trail performing commemorative ceremonies at various points. This was done as a rehearsal for the 225th anniversary of the Battle in 2000, which is expected to be much larger, both for participants and visitors. The march along the new trail is expected to be incorporated into the annual event. Parking and traffic continue to be an issue during this event, but are expected to be alleviated with the addition of the new parking areas associated with the completion of the trail project. (See "EA for Safe Visitor Access Trail" and associated Appendices for descriptions and locations, Appendix G).

Since the opening of the Minuteman Commuter Bikeway (MMCB), there has been a noticeable increase in the number of bicyclists using the Park. Many cyclists leave the MMCB, ride south on Hartwell Avenue to Wood Street which leads to the Fiske Hill area. From there, bicyclists ride along the Battle Road Trail (2A, Virginia Road, Old Bedford Road, Lexington Road and all sections of the trail where it deviates from the Battle Road) on their way to points west. Cyclists traveling west beyond Hartwell Avenue take the MMCB to its most western point and then leave it to points west, mostly by way of Route 62. They then travel back through the Park taking Lexington Road out of Concord. Before the Battle Road Trail was available cyclist rode on Route 2A and Lexington Road.

A variety of interpretive programs are presented by Park rangers and volunteers. They consist of

interpretive talks presented by rangers in uniform or historical garb and volunteers dressed in historical garb. Living history programs are presented at the Minute Man Visitor Center, Captain William Smith House and Hartwell Tavern.

With the completion of the new trail, visitors now have access to the majority of the interpretive sites north of Route 2A. The development of the trail has allowed visitors safe access to many more of the important interpretive sites. The restoration of several historic structures along that trail will create opportunities to use those structures for public benefit and for interpretive purposes. In these same areas, visitors will also see rehabilitated cultural landscapes, stone walls and agricultural fields, thus improving the visitor's overall experience.

6. PARK OPERATIONS

The Park includes three distinct units with the following characteristics:

The North Bridge Unit is located in Concord and consists of approximately 115 acres, one visitor center and two parking areas. The Concord River flows in a northerly direction from the Lowell Road Bridge, under the North Bridge to the Monument Street Bridge. A segment of this river, including the area within the Park, has been under a Congressionally authorized study to determine eligibility and suitability for inclusion into the National Wild and Scenic Rivers System. In the spring of 1996, a study report recommended designation. This recommendation is based in part on votes in favor of designation having been made by all eight towns within the study area. Those votes were made in the spring of 1995, and included the towns of Concord and Lincoln. The Congressional Bill granting this designation passed the week of March 22, 1999.

The North Bridge Visitor Center includes the Buttrick Mansion, which houses administrative offices and contains a number of visitor facilities, including a 30 person theater, rest rooms, an exhibit room and bookstore. The associated parking area includes 48 spaces which can accommodate up to 4 buses and 2 handicapped needs vehicles. There is a second parking area, known as the North Bridge Lot, which contains 132 spaces, including 2 for handicapped needs vehicles and 4 for buses, and 70 overflow spaces.

The Wayside Unit is located in Concord and consists of six acres, one parking area, and two historic structures; one used for a visitor center. It includes a 28 space parking area.

The Battle Road Unit, located in the towns of Concord, Lincoln and Lexington, is approximately 4.5 miles long and consists of approximately 800 acres, three loop trails, the Minute Man Visitor Center (formerly known as the Battle Road Visitor Center), and three historic structures open to the public during the summer. The Minute Man Visitor Center (MMVC) has a fifty person theatre and a 100 person theater, rest rooms, newly installed exhibits and a bookstore. The new exhibits feature a 17' by 32' mural depicting the April 19, 1775 battle and a multi-media show about the scene. There is parking capacity for 114 vehicles including 28 regular spaces, 4 for handicapped needs vehicles, 12 buses and 70 overflow spaces. Additional parking is currently available at the Fiske Hill site, at the intersection of Old Massachusetts Avenue and Route 2A. This lot will be reduced in size from 22 spaces to 13 including one handicapped, in the Battle Road Trail project.

As part of the trail project, a new asphalt parking area for 35 cars (including 2 handicapped spaces)

and two buses was constructed on Route 2A at Bedford Lane in order to remove parking from the historic scene around the Hartwell Tavern and Smith House. Fields and stone walls were also rehabilitated in this area. The two lots, which were at those locations, were removed and the landscapes loamed and seeded with native grass mixes. The parking area at the Paul Revere site was also reconfigured to allow 15 cars (including a handicapped space) and 2 buses. The total number of parking spaces remains approximately the same.

MMNHP is one of the nation's 10 most heavily used parks in terms of bus traffic, with the three year average being 6,106 buses per year carrying 195,766 visitors. Fall is the busiest time of year for bus traffic. The typical bus route through the Park is to enter at the east end after visiting the Lexington Green, proceed to Fiske Hill, then to the MMVC. Most then head west into Concord making roadside stops at Meriam's Corner, The Wayside House and the Bullet Hole House before arriving at the North Bridge parking area where passengers de-bus and walk to the North Bridge and Visitor Center. Most buses exit the Park via other routes after leaving the North Bridge area.

Visitors access and move through the Park on approximately 8.5 miles of public roads. Nearly one-half of these are state-owned while the remainder belong to the towns of Concord, Lincoln and Lexington. Visitor circulation is accomplished predominately by private vehicle. Interstate 95 brings traffic from the north and south to State Route 2A which directly serves the east end of the Park. Route 2A carries east-west traffic through a major portion of the Battle Road Unit of the Park and follows nearly 4 miles of the Battle Road. The North Bridge Unit of the Park can be reached by continuing west from Route 2A on Lexington Road into Concord Center and north on Monument Street to Liberty Street.

Route 2A bisects the Battle Road Unit of the Park. The roadway is 24 to 26 feet wide with two travel lanes without shoulders. The steady stream of traffic, numerous intersections and limited lines-of-sight along Route 2A made travel hazardous, especially for Park visitors before the construction of the Safe Visitor Access Trail. Prior to construction of the Battle Road Trail, there were no bikeways or significant pedestrian trails along the road corridor to accommodate safe, non-motorized circulation. The trail now offers the anticipated 250,000 annual users a continuous route from Meriam's Corner to Fiske Hill, with the only exceptions being the Bluff at Fiske Hill (Phase III Trail Construction, 1999) and Hanscom Drive, which will be addressed in the near future through construction of the tunnel.

Traffic on Route 2A through the Park continues to be particularly congested during the morning and evening peak hours on weekdays and remains heavy during most of the day. Approximately 20,000 cars per day travel on the section of Route 2A at the east end of the Park. New office space at the east end of the Battle Road Unit, office and residential development north of Virginia Road, and potential development and operational changes at Hanscom Air Force Base are likely to generate additional traffic on Route 2A

The Park exercises jurisdictional authority over state and town owned roads. The regulations contained in the Park Compendium apply to all persons entering, using, visiting, or otherwise within the boundaries of Minute Man National Historical Park on federally owned lands and on less-than-fee-interest lands. Certain regulations, however, do not apply to non-NPS owned lands within the boundary.

Emergency and unusual situations occur in a variety of ways including: Structural and brush fires, extreme weather, impromptu VIP visits, First Amendment activities, demonstrations, traffic accidents

and major traffic congestion on Park roads. Protection rangers render varied assistance to the visitor, whether unlocking locked cars, providing emergency medical assistance, finding lost children, providing traffic directions, or acting as roving interpreters. Protection rangers also enforce state and federal laws and regulations. Since the Battle Road Trail opened, protection rangers have had to deal with an increase in park use violations, bicycle use, physical accidents and injuries. During FY '98, training and equipment was obtained to enforce speed limit compliance on park roads, and the protection staff was increased to deal with the additional work load.

Park staff include personnel involved in management, administration, interpretation, protection of natural/cultural resources, visitor protection, resource management and maintenance. During peak visitor use periods, seasonal employees are utilized. Current staffing levels are at 37 Full Time Equivalent (FTE) employees, plus summer seasonal staff of up to 19 persons which includes maintenance workers, interpretive specialists, protection rangers and resource assistants from the Student Conservation Association.

V. ENVIRONMENTAL ANALYSIS

A. IMPACTS ON CULTURAL FEATURES

1. EFFECTS ON HISTORIC STRUCTURES, CULTURAL LANDSCAPES, ARCHAEOLOGICAL RESOURCES AND ETHNOGRAPHIC RESOURCES

The Running Battle is the focal theme for the Battle Road Unit. The historic landscape and structures provide context for park visitors. The overriding characteristic of the historic scene is the agricultural setting. The house lots and farmsteads contain smaller features which help to define their individual character. This project is designed to rehabilitate the historic structures and historic landscapes to reflect their appearance at the time of the Running Battle. This work will provide historic context and enhance visitor's overall park experience.

This section describes the impacts to the historic structures, their associated cultural landscapes, other cultural landscapes separate from historic structures, archaeological resources and ethnographic resources in terms of the actual work proposed at each location. The actions set out in detail below are expected to have significant positive impacts on the affected resources.

The structures will be rehabilitated to their historic conditions, but will have modern safety and structural improvements. Drainage problems around the perimeters will be corrected and rotting wood and insect infestations will be rectified. Modern fire detection and suppression systems will either be installed or upgraded. Minor loss of historic fabric is expected during rehabilitation work and to facilitate the installation or improvement of fire detection and suppression systems.

The associated landscapes will be rehabilitated to reflect the approximate appearance of the area at the time of the Running Battle, in order to give the visitor an accurate experience of that time. The rehabilitation of the landscapes associated with the structures will involve clearing or reducing of existing vegetation, which in most cases has grown over existing fields. These fields are in a stage known as late field succession, and the NPS will be conducting deferred maintenance for approximately 25 acres of these fields in order to bring them back to the conditions in which they existed when the park was established in the late 1950's and 1960's. Those conditions also closely resemble the conditions that existed during the time of the Running Battle.

Archaeological research has given the NPS some information about historic house lot configurations. Where restoration work on a structure or landscape uncovers a previously unknown archaeological resource, that resource will be stabilized, documented and protected in accordance with NPS and state regulations, and the work will be altered as necessary to protect the resource. In order to ensure this, an archaeologist will be on site when work is occurring near known archaeological sites. In preparation for work near known or suspected archaeological resources, the NPS conducted extensive archaeological testing and is awaiting input on its report from the State's Historic Preservation Officer (See Appendix E).

While the Battle Road itself is the primary resource, the setting of the road defines its historic character. This setting is defined by the combination of the road and its surrounding features such as the agricultural fields, networks of stone walls, buildings and historic structures, circulation systems, and

views. Taken together, these features and the continuity of agriculture at several locations create the historic character of the Park. The rehabilitation and retention of these character-defining features while not interfering with modern agricultural operations is what allows the resource to maintain its integrity.

In terms of overall impacts to resources, we expect that as with the construction of the Safe Visitor Access Trail, as more visitors use the trail and are able to access the areas in and around the historic structures and landscapes, additional maintenance may be required and incidents of vandalism may increase or occur at new locations. Additional rangers and increased patrol frequencies will be implemented in order to address these possibilities.

The following section will set forth the physical actions to be undertaken at each of the four areas, as in Section IV.A above.

Preferred Alternative

Meriam's Corner

Meriam House

Topography: The existing topography varies greatly throughout the building site. Generally, the grade is at or above the grade of the building sill and does not drain adequately away from the building. This has caused rotting of the sill and lower clapboards or shingles. The perimeter of the building will be re-graded to provide six inches, minimum, between finished grade and the building sill. A perimeter drain will be installed to catch runoff from the roof and direct it away from the building.

Vegetation: Modern ornamental plantings (pachysandra, euonymus, juniper) are scattering around the building perimeter. All of these shrubs will be removed from the building perimeter. The intent in removing this vegetation is to return this landscape to the open landscape seen in turn of the century photographs. Trees on the front facade of the building, which detract from sightlines to the building, will be removed. The Green Ash tree on the southwest corner of the building which is thought to have been alive at the time of the Revolutionary War will be protected during all construction activities-no alternation will be allowed within the dripline of the tree, except for removing the juniper beneath it. The dense canopy and underbrush found north and east of the building will be selectively cleared to enhance views of the surrounding agricultural fields. All of the areas that will be cleared will be seeded with a native seed mix.

Site Improvements: Two brick terraces are found on the site, one on the front facade and one on the rear. Both are modern additions and will be removed as part of this project and replaced with lawn. The retaining wall on the southeast corner of the building is also a modern addition and will be removed. Re-grading in the retaining wall location will provide positive drainage away from the building and carriage doors. An abandoned wooden light post and exposed electrical wiring will be removed from the front entrance path. All of the areas that will be cleared will be seeded with a native seed mix.

Revolutionary Ridge

In Phase III of the trail project a 180 foot walking trail will be created from the crosswalk on Bedford Road to near the highest point on NPS property on Revolutionary Ridge. The trail is 30% at its steepest point and will not be an accessible path. A six foot wide corridor will be cleared to allow the Park to

access the trail with a mower to control growth of woody vegetation. The trail surface (four feet wide) will be amended compacted soil with erosion control (water bars). The high point of the trail will be an area for visitors to view the surrounding agricultural fields/ battlefield of April 19, 1775. Trees and shrubs will be selectively cleared to provide these views.

Brooks Farm Area

Samuel Brooks House

The grade immediately adjacent to the house, generally pitches sufficiently to direct water away from the building. On the south face or front facade, the stone shrub bed edging will be removed and the grade will be changed to direct water south. Since the gutters will be removed, a perimeter drain will be installed to direct rainwater away from the building. A lawn, using a native seed mix, will be seeded surrounding the house in all areas disturbed by re-grading.

Barn foundations: The Samuel Brooks barn foundation is a modern concrete foundation on top of fieldstone construction. The floor of the barn is very uneven due to heavy vegetation growth and displaced foundation stones. The Job Brooks barn foundation is a very large fieldstone constructed foundation. The walls range from three to twenty feet high. To stabilize the foundations, all vegetation will be removed from the barn interior and within six feet of the perimeter (to allow mowing). The debris within the barn interior will be removed and the stones moved to create an even subbase. Crushed stone will be placed until an even floor is established and then a weed barrier will be placed prior to the final backfilling of crushed stone. The floor elevation will be even with the existing thresholds seen on the foundation. Due to the grade changes (greater than 42") a barrier will be installed on most edges of the barn foundations. While this barrier is a necessary safety feature, it will have a limited negative impact on the historic scene.

Adjacent field and orchard: Surrounding the parking area (to be constructed in Minute Man Access Trail, Phase 3) the existing vegetation will be cleared and grubbed to provide a hay field. The intent is to save specimen trees including existing apple trees. The parking area entrance will be centered on the existing break in the stone wall along Route 2A. The orientation of the parking area will be west to east, which will reduce the parking area visible from Route 2A. Further east near the Job Brooks House, the existing vegetation will be cleared and grubbed for use as a hay field. The clearing will include removal of vegetation in and around the barn foundation at the Job Brooks House.

Noah Brooks Tavern

Topography: The area immediately adjacent to the house and barn, generally, is graded to direct or detain water near the foundations. These areas will be re-graded to provide positive drainage. A perimeter drain will be installed to catch rainwater no longer being caught by gutters.

The slope of the section of driveway from the house to the barn is in excess of 20%, which is a maintenance and safety problem. This portion of driveway will be removed, since sufficient parking can be accommodated within the remaining driveway.

On the western side of the buildings, the grade is very flat, which does not allow water to drain away from the buildings. A drainage swale will be created to catch rainwater and distribute it to the catch basin on Route 2A.

Vegetation: The existing windbreak or screening surrounding the house will be selectively cleared of evergreen trees and understory growth while retaining specimen deciduous trees. This will allow mowing undesirable shrub and tree growth.

Ornamental shrubs growing next to the one story wing of the tavern will be removed to allow the sill replacement and for re-grading. The groundcover in the front lawn will be removed to simplify the front façade, ease maintenance and return the area to its historic appearance.

Site Improvements: The existing parking bay at the northeast corner of the Tavern is not deep enough to allow vehicles to park on the pavement without encroaching on the traveled way. Ten feet of pavement will be added to the parking bay to correct this condition.

Fields: Additional clearing will expand the existing hay fields, but that clearing will not extend so far as to encroach on wetland resource areas. Vegetation will be cleared and grubbed. Large stones moved to allow cultivation will be placed on adjacent stone walls.

Stone wall repair and reconstruction will include removal of scrub brush and trees (which either obscure the wall or are dislodging stones) in addition to reconstruction of the wall. Trees will be cut and chemically treated to prevent stump sprouting.

Joshua Brooks House

Topography: The building is cut into a north facing slope with no swale to prevent water from draining against the south wall. The grade will be lowered by six inches below the garage sill to create a swale to direct this water away from the structure. Similarly, in the front facade of the house, re-grading is necessary to insure positive drainage away from the building is attained. A perimeter drain will be installed to distribute rainwater no longer being caught by gutters. All areas disturbed in the grading operations will be re-seeded for lawn using a native seed mix.

Site Improvements: The existing terrace will be stabilized to allow continued use. Peastone (which is an unstable paving material) will be removed and replaced with stonedust over filter fabric. Perennial plants, which are found in the peastone, will be transplanted north of the terrace. The top stone of the fieldstone step into the terrace is loose and will be re-mortared.

Bloody Angle

Fields: The existing woods on Old Bedford Road will be rehabilitated into a wooded pasture by clearing the understory and removing selected trees and invasive species. All remaining trees will be limbed to 6' to allow for mowing and grazing.

To facilitate the leasing of this land for grazing, as part of the parks historic leasing program electric fencing will be installed around these fields. Water supply will be provided to these fields by connecting to the existing water main gate valve in Old Bedford Road.

The remaining overgrown fields will be cleared for meadow seeding. Large projecting boulders will remain but projecting stumps will be ground flush to allow mowing.

Vegetative Screening: Screening is needed to block the view of the office parking lot north of the intersection of Old Bedford and Virginia Roads. The screening will be mainly evergreen with some deciduous planting to soften the screen edges. The screening will be staggered and random to give a natural appearance.

Mason House Site: It will be important for the trail user to identify the building footprint from the Battle Road. The use of ground plane elements (edging and crushed stone) in addition to vertical elements at corners will allow the visitor to imagine the scale of the building and make the connection with the house marker to be installed at the trail edge in Minute Man Access Trail, Phase 3.

McHugh Barn/ Hartwell Tavern

Orchard: An orchard of approximately 170 apple trees will be planted in the open area adjacent to Hartwell Tavern. Apple varieties that were popular in 1775 will be utilized. The intent is to provide an orchard which will produce fruit appropriate for cider making, cooking, and storage. Appendix B and Appendix C include a descriptions of the apple varieties, their culture, and the historic context.

Field: Electric fencing will be installed around the grazing area north of the orchard. The system will be the same as that proposed for Bloody Angle. The loop trail that currently passes through this field will be re-aligned to the north of the existing stone wall. The fields have been cleared, but require re-grading, stump grinding, and stone removal. A stake and rider fence will be installed on the stone wall immediately west of Hartwell Tavern.

William Smith House

Orchard: The orchard will be planted on the western side of the house. The orientation will focus the trail user's view toward the house. The treatment of this orchard will be as described for Hartwell Tavern.

Solid Waste Removal: Before NPS ownership the area northeast of the house was used as a dump site for household trash, tires, auto parts and rusted barrels. Core soil samples were taken to a depth of 18 inches to 2 feet and verified the presence of elevated levels of arsenic. The waste extends into the subsurface and will require excavation. Additional solid waste removal to the southeast of the Smith House will be accomplished as well.

Field Clearing: The area east and south of the house will be cleared and grubbed for hay field seeding. The clearing will be bounded on the eastern edge by the 100' setback required by the Town of Lincoln for vernal pools

Screening: Evergreen and deciduous screening will be placed on the slope facing Hanscom Drive. The screening will limit the views from the trail and Smith House area of Hanscom AFB. Small trees will be installed because of the steepness of the slope and limited access for construction equipment.

Nelson Farm Area

Jacob Whittemore House

Vernal Pool: Views to the farm pond will be selectively cleared from Battle Road. Selective

clearing will be limited to invasive species (Buckthorn) within the vernal pool area. To avoid wetland disturbance, grubbing will not be performed, only flush cutting. All buckthorn regrowth will be controlled by periodic recutting or application of systemic herbicide to the cut stumps according to an Order of Conditions issued by the Lexington Conservation Commission.

Field Clearing: Existing vegetation will be cleared and grubbed to return the land to hay field. West of the neighboring driveway, a patch of Tree-of-Heaven is growing in a very dense thicket. In order to ensure complete removal of this highly invasive tree, the trees will be cut down, then immediately treated with a herbicide to kill the trees (a blue dye will be included in the herbicide to monitor the application), and finally grubbed after the herbicide has been absorbed.

Alternative 2

Implementation of this alternative, while improving the conditions of either the historic structures or their associated landscapes, will provide for improvement of only one of the two elements (structures or landscape). The other element (structures or landscape) gradually decline. Therefore, significant adverse impacts will occur to the element not addressed by this alternative, and the impacts described in the sections above will only occur to that element chosen for action under this alternative.

Alternative 3

Implementation of this alternative will continue existing maintenance programs for historic structures and associated landscapes. These programs involve periodic mowing of open fields and ongoing structural stabilization projects such as patching leaking roofs and combating active insect infestations. However, the historic structures will continue to deteriorate and eventually reach the point where they can not be rehabilitated, and may in fact, be destroyed by fire, water damage or insect infestation. The associated landscapes will pass beyond a point where field or scene reclamation/rehabilitation is practicable. The eventual result will be the total loss of the principle resources for which the park was established.

B. IMPACTS ON NATURAL FEATURES

1. EFFECTS ON VEGETATION

Preferred Alternative

This alternative involves an effort by the NPS to rehabilitate much of the natural and 18th century character within the park that existed during the time of the Running Battle. Massachusetts currently has more forested areas than existed in colonial times. This project will increase the amount of fields and grassland habitat, increasing rare habitat for nesting grassland birds and rare butterflies. Fields that once supported haying will be returned to active hay cultivation. Other fields that will be cleared will not be stumped and grubbed due to archaeological concerns. These other fields will be seeded to create open meadow and periodically mowed to control woody vegetation. Historic orchards will be rehabilitated as closely as possible to their historic conditions.

The total amount of areas to be selectively or fully cleared will be approximately 25.5 acres. Of that, 11.4 acres will be seeded with meadow grasses, 13.25 acres will be converted back into hayfields, and .9 acres will be planted with fruit trees of the same or similar varieties from those of colonial times. (See Appendix B which details planting methodologies and historic orchard information, labeled "Land Use Descriptions" and "Apple Orchards.") Approximately 4 acres of lawn will be cleared and replanted with natural seed.

Alternative 2

Impacts to vegetation under this alternative will be similar to those under the preferred alternative. The primary difference is that if only the structures element were undertaken, there will be little impact to vegetation as that work is focused close to the structures. However, if the landscape restoration element is undertaken, impacts to vegetation will be the same as those under the preferred alternative.

Alternative 3

Under this alternative, no adverse impacts to vegetation will result, however, succession of overgrown fields will continue.

2. EFFECTS ON WILDLIFE

Preferred Alternative

There will be a change from existing wildlife habitat (scrub and wooded areas) to meadow, hayfield, or orchard within the areas to be cleared. Some direct losses and displacement of fauna will occur from clearing activities. There will also be short term displacement of wildlife from adjacent areas due to noise and construction related activities.

Following clearing and restoration work, there will be a period of habituation, during which different wildlife species will adapt to the newly reopened fields and new edge environments. While reductions in forest cover may result in fewer stopovers of some migratory birds within the park, this is not expected to be a significant impact as abundant forest cover will still exist within the park, on adjacent conservation lands, and throughout the region.

The new fields, orchards, and edge habitat created by this project will be utilized by many migratory and resident birds. Sensitive species including Eastern Meadowlark and Bobolink are expected to increase as a result of this work. Orioles, Wild Turkey, and White-tailed Deer are expected to increase in the orchards.

Wildlife travel corridors may be temporarily disturbed by clearing activities, but this work may increase the available pool of locations for certain types of wildlife to pause on migration routes.

Alternative 2

Impacts on wildlife under this alternative will be similar to those that will occur through implementation of the Preferred Alternative. The primary difference is that if only the structures element

were undertaken, there will be little impact to wildlife as that work is focused close to the structures. However, if the landscape restoration element were undertaken, impacts to wildlife will be that same as those under the preferred alternative.

Alternative 3

The No Action Alternative may result in the loss of some additional grassland acreage/grassland bird-nesting habitat to forest succession. Because of the small area involved, implementation of the No Action Alternative will not result in significant adverse impacts on wildlife.

3. EFFECTS ON THREATENED & ENDANGERED SPECIES

Preferred Alternative

There are no resident threatened or endangered species known from Minute Man National Historical Park. No adverse impacts to threatened or endangered species are expected from the Preferred Alternative.

Alternative 2

There are no resident threatened or endangered species known from Minute Man National Historical Park. No adverse impacts to threatened or endangered species are expected from Alternative 2.

Alternative 3

There are no resident threatened or endangered species known from Minute Man National Historical Park. No adverse impacts to threatened or endangered species are expected from the No Action Alternative.

4. EFFECTS ON AGRICULTURAL LANDS/SOILS

Preferred Alternative

The removal of houses, other structures, driveways, and solid waste will restore a significant area of land and soil to agricultural use. The proposed action will result in the return to active cultivation of 13.25 acres of hayfields, and will involve the restoration of another 12.3 acres of former fields that are currently in a late field succession stage, with .9 of those acres being returned to orchards, and 11.9 acres being utilized for livestock grazing.

Alternative 2

If the landscape restoration component of this alternative were undertaken, the impacts will be the same as those under the preferred alternative. If the structures component is undertaken, there will be no change to existing agricultural lands and soils, with the result, as with Alternative 3 below, that the fields will continue into late succession and may reach the point where they are not reclaimable due to the costs

involved.

Alternative 3

Under the No Action Alternative impacts to agricultural lands and soils will include:

Prime agricultural lands and soils will remain covered by modern structures, pavement, and solid waste dump sites.

Soils may be contaminated by undetected hazardous materials in the solid waste sites.

Additional field area may be lost through forest succession.

5. EFFECTS ON WATER RESOURCES & WATER QUALITY

Preferred Alternative

Sedimentation may occur during restoration and clearing activities, but in order to minimize such impacts, siltation barriers will be installed prior to ground disturbing activities under the direction of Park natural resource management staff and Conservation Commissions as per Orders of Conditions. Cleared areas, will be reseeded or put under active cultivation as soon as feasible. Water quality will not be adversely affected by restoration activity or clearing, with the possible exception of an accidental fuel spill. Construction personnel will be required to carry spill containment and absorption materials at all times when working in proximity to water bodies.

In locations where structures are to be removed, any associated underground fuel storage tanks or existing septic systems will be either removed or capped as appropriate. Septic systems will be installed at the Samuel Brooks House and a shared system will be installed for the Noah Brooks and Joshua Brooks Houses. The Whittemore House will be hooked up to the town sewer. Significant reductions in environmental impacts from removing underground storage tanks, removing solid waste dumps, remediation of any hazardous waste found in the solid waste dumps, and replacing failing septic systems are expected under the preferred alternative.

Alternative 2

If either component of this alternative were undertaken individually, the impacts will be the same as those under the preferred alternative

Alternative 3

The No Action Alternative may result in environmental impacts from underground storage tanks, solid waste dumps, hazardous waste potentially located in the solid waste dumps, and failing septic systems.

6. EFFECTS ON WETLANDS & FLOODPLAINS

Preferred Alternative

Implementation of the Preferred Alternative will result in the alteration of bordering vegetated wetlands and buffer zone. Mitigation for wetlands losses, wetlands replication and habitat impacts will be developed through the permitting process pursuant to federal, state and local wetlands laws, regulation and policies. All mitigation and protection measures contained in the Orders of Conditions to be issued by the Conservation Commissions in the Towns of Lincoln and Lexington will be implemented. Wetland dependent wildlife and flora will be affected by clearing, but these impacts will be minimized in accordance with the conditions contained in the Order of Conditions for this project.¹

Occasionally visitors will leave marked trails and may trample sensitive areas or litter. Park staff will patrol the trail and signs will be present to advise visitors about the ecologically sensitive nature of wetland resource areas. Additional measures will be implemented as necessary.

Alternative 2

If either component of this alternative were undertaken individually, the impacts to wetlands and floodplains will be the same as those under the preferred alternative

Alternative 3

There will be no adverse impacts to wetlands or floodplains from implementing the No Action Alternative.

7. EFFECTS ON AIR QUALITY AND CLIMATE

Preferred Alternative

During construction, the use of mechanized equipment may result in minor temporary emission of airborne pollutants. Dust will be controlled as needed by watering the surface or other appropriate technique.

After the construction is completed, airborne dust and soil erosion will be controlled by seeding and promoting a vigorous vegetative cover. Other methods of dust control will be used as needed.

Alternative 2

Impacts on air quality and climate under either the structure or landscape element will result in impacts similar to those under the Preferred Alternative.

¹ See Appendix J. The Wildlife Habitat Evaluations prepared for the trail project Environmental Assessment covered similar habitat and vegetation types as those to be affected by this project, but did not cover the same locations, but in many cases cover adjacent areas. Given that no Threatened and Endangered Species will be affected by this project (See Appendix F) the Wildlife Habitat Evaluations prepared for the trail project adequately address potential impacts to flora and fauna types that may be impacted by this project.

Alternative 3

There will be no adverse impacts on air quality or climate from implementing the No Action Alternative.

8. **EFFECTS ON TOPOGRAPHY & GEOLOGY**

Preferred Alternative

Minor topographic changes will occur, mostly associated with grading changes around the structures, but will be insignificant. No adverse impacts on geologic formations will occur. Clearing, grubbing and stone removal activities will result in minor topographic changes.

Alternative 2

Impacts on topography and geology under the structures element will be similar to those that will occur through implementation of the Preferred Alternative. The landscape element will not result in any topographic changes.

Alternative 3

Implementation of the No Action Alternative will not result in any adverse impacts on topography or geology.

C. **IMPACTS ON SOCIOECONOMICS**

1. **EFFECTS ON NOISE & TRAFFIC**

Preferred Alternative

The opening of the Safe Visitor Access Trail has alleviated a significant amount of vehicular and dangerous pedestrian and bicycle traffic on roads within the park. (See Section V.C.I.) As this project does not involve any parking lot or trail construction, there are not expected to be any impacts on traffic and only minor temporary impacts on noise due to construction activities. Implementation of the landscape element will involve noises associated with mechanized clearing and may result in minor changes in traffic sounds from some areas during the winter months due to the loss of vegetative screening.

Alternative 2

Impacts associated with implementation of the structures element will have no impact except for temporary construction noises. Implementation of the landscape element will involve noises associated with mechanized clearing and may result in minor changes in traffic sounds from some areas during the winter months due to loss of existing vegetation.

Alternative 3

If the No Action Alternative were implemented, noise levels and traffic conditions will remain at levels achieved upon completion of the trail project.

2. EFFECTS ON LAND USE

PREFERRED ALTERNATIVE

Implementation of the Preferred Alternative will not change general land use patterns, however, a number of site specific actions will result in the conversion of forest, scrub and residential sites into agricultural or recreational use. This work is described in detail in section V.A.I. above. As term reservations, life tenancies and other agreements expire, some structures will be rehabilitated or removed. During the remaining years of occupancy of these residences, appropriate vegetative screening will be planted and maintained. The primary changes will be where wooded or unmaintained areas are converted to active agricultural or pasture fields.

Alternative 2

Effects associated with implementation of either of the elements of the preferred alternative will result in impacts similar to those that will occur through implementation of the Preferred Alternative, only to the lesser degree that only one element is being affected, either landscape or structures and areas immediately adjacent to them.

Alternative 3

Implementation of the No Action alternative will not result in any changes to land use in the Battle Road Unit.

3. EFFECTS ON COMMUNITY RELATIONS

Preferred Alternative

Implementation of the Preferred Alternative is expected to improve the Park's relationship with adjacent communities, as well as generate beneficial economic activities (Appendix K). These communities and surrounding towns had long advocated for the Safe Visitor Access Trail and these additional but closely integrated elements were also contemplated during the time of initial Park acquisitions, especially the restoration of agriculture and the preservation of open space. As more visitors use the trail and move between, in and around the historic structures and landscapes, they will get a better understanding of the historic scene and the lives of the people who lived in the area during the time of the Running Battle. Other commemorative events will be allowed to occur at or closer to the actual locations. Educational opportunities will be enhanced by providing a safer experience for school groups to visit historic and cultural sites, as well as natural features.

Alternative 2

Effects associated with implementation of either of the elements of the preferred alternative will result in impacts similar to those that will occur through implementation of the Preferred Alternative, however only to the lesser degree that one element is being affected, either landscape or structures and areas immediately adjacent to them.

Alternative 3

Without the proposed restoration of historic structures and landscapes, it is expected that relations between the Park and surrounding communities will continue to improve. However, without improvement to the historic structures and landscapes, visitor crowding into existing available features will continue to worsen and pressure to accomplish the original plans for the Park (as outlined in the Enabling Legislation and 1989 GMP) will continue to increase. A continued lack of constituency and public value will make long term protection of Park resources difficult in the face of increasing threats.

4. EFFECTS ON UTILITIES

Preferred Alternative

All septic systems, tanks and associated leaching fields will be constructed in accordance with state and local regulations. All new service connections will be placed underground wherever possible, thus minimizing visual impacts to historic resources. Lighting will be constructed so as to minimize glare on adjacent residences. In locations where archaeological resources are present, such services will be located after an appropriate evaluation of resource values has been completed. In addition, fire codes and police regulations require certain lines to be immediately accessible, and these requirements will be adhered to.

Alternative 2

Effects associated with implementation of either of the elements of the preferred alternative will result in impacts similar to those that will occur through implementation of the Preferred Alternative, however only to the lesser degree that one element is being affected, either landscape or structures and areas immediately adjacent to them.

Alternative 3

As various life tenancies, reservations and leases expire, the septic systems associated with some of these structures and underground storage tanks, will need to be addressed. Without the funding associated with this project, it is likely that stabilizing or removing potential problems will not occur in the foreseeable future, therefore allowing adverse impacts to natural resources to continue. As residences are vacated, utilities will be disconnected and abandoned in place. Septic tanks will be pumped and filled with sand or crushed. Leach fields will be abandoned in place. Gas, electric, water, telephone and cable will be cut or capped. Underground storage tanks will be removed as funding

becomes available.

5. EFFECTS ON VISITOR EXPERIENCE & ACTIVITIES

Preferred Alternative

Implementation of the Preferred Alternative will have a positive impact on the overall visitor experience and will provide for additional activities of a higher quality than are currently available. As a result of this project visitors driving through the park and utilizing the Battle Road Trail will be able to access a far greater number of historic and cultural sites as well as experience more of the Park's natural resources without causing adverse impacts. By allowing safe access to the rehabilitated historic structures and cultural landscapes, throughout the Battle Road Unit visitors will get to more closely immerse themselves in a colonial experience. Visitors will be able to cycle or walk through the Park, either to experience the Park's historic resources or as a fitness activity. Even those using the trail for exercising will be able to do so in a historic setting, which will lead to more appreciation of the park's historic resources. The increased number of area cyclists and hikers now utilizing the park will now have access to the park's historic structures and experience more closely the associated landscapes.

Alternative 2

Effects associated with implementation of either of the elements of the preferred alternative will result in impacts similar to those that will occur through implementation of the Preferred Alternative, however only to the lesser degree that one element is being affected, either landscape or structures and areas immediately adjacent to them.

Alternative 3

Implementation of the No Action Alternative, combined with increased access by visitors to the park's historic sites as a result of using the new trail, will provide for an incomplete experience. Visitor's will only be able to tour those historic structures that are currently open to visitors, but will not be able to tour the structures which are in deteriorated condition, and the associated landscapes will not have been returned to their historic condition, further skewing the overall experience. However, as Park visitation increases, crowding of existing facilities and adverse impacts on Park resources will continue to increase.

6. EFFECTS ON PARK OPERATIONS

Preferred Alternative

Significant effects from implementation of the Preferred Alternative will be experienced by Park staff, who will have additional visitor use facilities to maintain, patrol and operate. These facilities include the structures to be rehabilitated as well as the associated landscapes. Rehabilitated fields and orchards will also require additional maintenance, although several of the fields will be leased to area farmers. Park staff will also experience increased work associated with additional use of existing resources. A reduction in annual maintenance on the structures now deteriorating will lessen the aggregate workload to some extent. However, certain other maintenance functions associated with

maintaining a rehabilitated structure will result in other types of maintenance functions being increased.

The NPS was successful in 1999 in securing a base operating increase of \$250,000 to obtain additional Full Time Employees (FTE) and operational funding to meet additional visitor protection, maintenance, visitor services, and resource management responsibilities associated with these improvements and the implementation of the Battle Road Trail. Concerns about staffing and funding have been raised by the towns and community groups. Additional measures are being developed with other national parks in the area, and options are being explored with regional conservation groups and volunteer organizations.

The Park has several ongoing programs that effectively stretch resources. Among them is the Park Watch Program which is a neighborhood stewardship program. Another program is the Volunteers in Parks Program (VIP), which will be enhanced to allow participants to assist visitors, perform maintenance tasks and report emergencies to rangers. In addition, relationships with local police and fire departments involve periodic briefings as to Park and community issues.

Alternative 2

Effects associated with implementation of either of the elements of the preferred alternative will result in impacts similar to those that will occur through implementation of the Preferred Alternative, however only to the lesser degree that one element is being affected, either landscape or structures and areas immediately adjacent to them.

Alternative 3

Implementation of the No Action Alternative will not result in any discernible impacts on Park operations. However, as visitor use rises as a result of the new trail, Park staff will face an increasingly difficult job of accommodating visitors and ensuring their safety around the deteriorating historic structures.

VI. UNAVOIDABLE ADVERSE IMPACTS

This section outlines the primary unavoidable adverse environmental impacts which are likely to result from implementation of the Preferred Alternative, Alternative 2 or the No Action Alternative. Where possible, mitigating measures which offset these impacts to varying degrees, are presented. A number of mitigating measures are described in detail in previous sections or related appendices.

Impacts Resulting From the Preferred Alternative

Cultural Features

Impacts to the historic structures caused by the rehabilitation work will be primarily positive, however some loss of historic fabric is inevitable during rehabilitation and installation or upgrading of fire detection and fire suppression systems. These impacts will be evaluated and minimized in accordance with applicable NPS policies and regulations as outlined in Section VII.B. below.

Additional public access to historic structures may result in increased vandalism, however, increased NPS presence will be instituted, and a comprehensive trail protection and security plan is being developed. All field protection rangers have received formal bike patrol training, uniforms and equipment. Summer bike patrols will occur seven days a week and during daylight hours in the off season.

Some visitors will leave prescribed trails, resulting in compaction of vegetation and landscaping around the structures and additional litter. Visitors will be encouraged through brochures and with signs to remain on the designated trail and to respect the historic structures themselves. Access to new pastures and cleared meadows will be prevented by placement of stone walls and fencing where appropriate, however, it is inevitable that some visitors will impact agricultural operations to a minor degree.

Modern elements may become visible as areas of the cultural landscape are opened. A contemporary feature (the trail itself) will be visible from certain locations

An archaeologist will be present when construction occurs near known or suspected archaeological sites or where ground disturbing activities warrant the presence of an on site archaeologist. In the event that a site is uncovered or disturbed, it will be stabilized, catalogued and protected in accordance with applicable NPS policies as outlined in Section VII. B. below. Archeological resources may be inadvertently disturbed or destroyed during landscape rehabilitation, pre-construction archeological surveys and monitoring by archeologists will minimize the possibility of inadvertent impacts. As more visitors come into contact with known sites, some disturbances may occur, either through litter or removing of features. Some construction will involve the removal or relocation of historic stone walls, but the landscape work around the structures and the clearing activities has been designed in order to minimize this impact.

Due to the nature of long deferred maintenance on old fields, a number of occupied structures may be more visible to and from roads and from the new trail.

Clearing of vegetation and planting of new orchards will result in additional agricultural operations. The primary focus of this project is the rehabilitation of hayfields and meadows. This agricultural use requires minimal use of fertilizer and typically uses no pesticides. Environmental impacts are expected to be minimal or positive (restored grassland bird nesting habitat). The orchards are expected to be operated by the park for landscape purposes (not commercial fruit production). Very few negative environmental impacts associated with orchard operations are expected. Current and potential farmers will be consulted.

Natural Features

The primary impacts from this alternative will be due to clearing activity. This will result in temporary noise impacts and loss of wildlife habitat, but is expected to be offset by creation of new grassland, orchard, and edge habitat. Any materials cut will be removed and properly disposed of off-site. Although bordering vegetated wetlands and land within the buffer zone will be impacted by the clearing activities, these activities will be guided by the local Conservation Commission's Orders of Condition in order to keep these impacts to a minimum, while providing for a quality visitor experience.

During restoration and clearing activities, Park resource management staff will be present to advise and direct contractors on mitigation measures including placement and maintenance of siltation barriers, protection of specific trees and vegetation, movement and storage of equipment and soils and other aspects of site work that have the potential to adversely impact natural resources.

The least intrusive techniques will be employed in environmentally sensitive areas, and wherever possible, work will be done by hand with portable power tools. Site clearing will be done so as to minimize the impacts to wetlands, wildlife, and other natural resources in accordance NPS Management Policies and with local Orders of Conditions, when issued.

The degree of the above described impacts and corresponding mitigation, construction methodologies and level of on-site supervision has been found to be acceptable by the local authorities responsible for evaluating impacts to wetland resources during construction of the new trail, and those same authorities and methodologies will be employed during actions associated with this project.

Impacts Resulting From Alternative 2

The two options under Alternative 2 will result in the same impacts as the landscape or structural work described in the Preferred Alternative.

Impacts Resulting From the No Action Alternative

Physical impacts of the No Action Alternative include continued deterioration of elements of the historic landscape (stone walls, historic roads and field patterns, levees, irrigation ditches, etc.), and historic structures. This deterioration may irreversibly damage historic resources associated with the beginning of the American Revolutionary War.

VII. ENVIRONMENTAL COMPLIANCE

The NPS will comply with all applicable Federal Executive Orders, federal, state and local laws, regulations and policies in implementing the Preferred Alternative. Strict adherence to all permit requirements will be maintained.

A. THE NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321) as amended, does not contain specific time requirements for public review of an Environmental Assessment (EA), nor do the Council on Environmental Quality's (CEQ) NEPA regulations found at 40 CFR 1501 et seq. 516 DM Section 3 outlines the procedures for EA's, but also does not provide specific time requirements or public review guidance. However, 516 DM Section 3.3 A. and B. allow for, but do not require, the Scoping process for an Environmental Impact Statement (EIS) (as contained in 40 CFR Section 1501.7) to be applied to an EA and also allow for public involvement in the EA process (as contained in 40 CFR Section 1506.6). This EA meets the informational requirements of NEPA, and the NPS has and will continue to provide for public review and input as further described in Section VIII.A. of this document.

B. LAWS RELATED TO CULTURAL ISSUES

One of the NPS's mandates is to preserve and protect its cultural resources through the NPS' organic act of August 25, 1916, that established the NPS, and through specific legislation such as the Antiquities Act of 1906, NEPA, and the National Historic Preservation Act (described below). Cultural resources at MMNHP have and will continue to be managed in accordance with these acts and in accordance with Chapter 5 of NPS Management Policies, the Cultural Resource Management Guideline (NPS-28), the Secretary of the Interior's Standards for the Treatment of Historic Properties, the Secretary of the Interior's Standards for Rehabilitation, Guidelines for the Rehabilitation of Historic Buildings, the Secretary of the Interior's Standards for Archeology and Historic Preservation, and other relevant policy directives.

As part of its cultural resources management responsibilities, the NPS surveys and evaluates all cultural resources on lands under its jurisdiction. Cultural resources are evaluated by applying the criteria for the National Register of Historic Places.

In accordance with the Americans with Disabilities Act of 1990 (PL 101-336), the Architectural Barriers Act of 1968 (42 USC 4151 et seq.), the Rehabilitation Act of 1973 (29 USC 701 et seq.), and Uniform Federal Accessibility Standards, the rehabilitated historic structures will be made accessible to disabled persons to the maximum extent feasible without adversely impacting the historic fabric.

Section 106 of the National Historic Preservation Act of 1966, (16 U.S.C. 470) as amended, Executive Order 11593 and the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470(a)) establish the obligations of the Federal government regarding activities proposed in or affecting properties on or eligible for listing in the National Register of Historic Places. Federal agencies are required to take into account the potential effects of their activities on protected resources and to allow the Advisory Council on Historic Preservation (ACHP) and appropriate state authorities an opportunity to comment. Toward that end, the NPS is working with the Commonwealth of Massachusetts State

Historic Preservation Officer (SHPO) and the ACHP to meet the requirements of the August 1990 programmatic agreement among the National Conference of State Historic Preservation Officers, the ACHP, and the NPS. The programmatic agreement requires the NPS to work closely with the SHPO and the ACHP in planning new and existing areas, and in developments to existing units.

Internally, the NPS will complete a Section 106 form (Assessment of Actions Having an Effect on Cultural Resources) prior to implementing any proposed actions. The Section 106 form documents any project effects, outlines actions proposed to mitigate such effects, and documents that the proposed action flows from the Site Management Plan. Boston Support Office cultural resource specialists specified in NPS-28 will use the Section 106 form to review and certify all proposed actions affecting cultural resources. This form and the accompanying archaeology report are in the process of being completed. All necessary consultation with above referenced entities will be conducted and recommendations and conditions will be adhered to.

All ground-disturbing actions will be preceded by an archeological evaluation to determine the level of archeological investigation required before construction can begin. As described in sections IV.A. and V.A., significant archeological sites have been studied in the unit, and the clearing and landscape work to be done adjacent to the structures has been located to avoid any adverse impacts on these resources. Should any unknown resources be identified during the work, the SHPO and the NPS will evaluate their potential for inclusion on the National Register of Historic Places; if eligible, appropriate measures will be undertaken to preserve them. Archeological surveying and testing will be carried out prior to, or in conjunction with, construction activities.

C. LAWS RELATED TO NATURAL ISSUES

Federal Laws and Executive Orders

Section 404 of the Clean Water Act (33 U.S.C. 1344) requires that any activity involving dredging or filling in a water of the US or in a federally protected wetland must obtain a permit from the US Army Corps of Engineers (ACOE) prior to commencing the activity. The activities proposed do not involve any waters of the U.S. or any federally protected wetlands, therefore, section 404 is not applicable.

Section 401 of the Clean Water Act is triggered by the filling of 5,000 square feet or more of wetlands and requires a Water Quality Certification by the Massachusetts Department of Environmental Protection (MDEP). The filing of our Notices of Intent (NOI) pursuant to the Massachusetts Wetlands Protection Act (MWPA) (discussed below) for the project will constitute the NPS' application for this certification. The NPS expects to receive notification from the MDEP indicating that the work proposed does not require an individual 401 permit due to the 5,000 square foot threshold not having been passed, and that the Orders of Condition will constitute the 401 permit for the project.

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) requires a permit from the ACOE for any activity in a navigable waterway occurring below the spring high tide. As the work proposed does not occur within a tidal zone, Section 10 is not applicable.

Executive Order 11988 ("Floodplain Management") requires that all federal agencies avoid construction within the hundred-year floodplain unless no other practicable alternative exists. None of

the areas to be cleared are within the 100-year floodplain.

Executive Order 11990 ("Protection of Wetlands") requires that all federal agencies avoid, wherever possible, impacts on wetlands. The NPS has and will continue to work with the ACOE, the USFWS, the EPA and the MDEP to minimize any impacts to wetlands.

MMNHP is located twenty miles northwest of downtown Boston. The immediate area is characterized by rapidly spreading industrial, commercial and residential development. Sources of air pollution include industrial and motor vehicle emissions, Hanscom Airfield and Air Force Base (bordering the Park to the north) and generalized smog brought in from urban centers south and west of Massachusetts. In general, air quality at MMNHP is good. The U.S. Environmental Protection Agency monitors six air quality indices in eastern Massachusetts: sulfur dioxide, ambient particulate matter, carbon monoxide, ozone, nitrogen dioxide and lead. These findings are reported on an annual basis, with only ozone exceeding Federal standards on a few occasions.

During any construction or restoration activities, the NPS will take all practical measures to limit fugitive dust and noise. Section 118 of the Clean Air Act requires all federal facilities to comply with existing federal, state, and local air pollution control laws and regulations. The NPS will work with the Commonwealth of Massachusetts to ensure that all site activities meet the requirements of the state air quality implementation plan.

Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.) requires all federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat for such species. The NPS consulted with the USFWS pursuant to Section 7 of the ESA and received correspondence from that agency to the effect that our proposed actions will not jeopardize the habitat or the continued existence of any listed threatened or endangered species, due to the overlapping areas of this project and the Safe Visitor Access Trail (Appendix F).

The Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901) and the implementing rules promulgated by EPA establish performance standards for generators, transporters and disposers of hazardous waste. Any such wastes generated or removed from the site will be disposed of through NPS procedures which are compatible with the Act's requirements. At an areas approximately 100 feet northeast of the William Smith House preliminary tests have indicated the presence of arsenic. Additional testing and monitoring will be conducted, and removal of materials will be conducted in accordance with applicable laws and regulations.

State Permitting Requirements

During the design and construction permitting process, the NPS will contact the Massachusetts Highway Department to determine application procedures for all work associated with roads, intersections, curbs and utility siting, to determine what approvals are necessary either from the state or the municipalities where the work will be located.

Massachusetts Wetlands Protection Act, M.G.L.c 131, Section 40A (MWPA) and local wetlands bylaws

The MWPA requires that for any alteration of a wetland or the area within 100 feet of a wetland, a permit, known as an Order of Conditions (OC) must be obtained from the Conservation Commission (CC) for the municipality in which the work is to occur. In addition to this state requirement, the towns of Lexington and Lincoln have local wetlands bylaws which contain additional requirements for work affecting wetlands. The form on which the MWPA permit and ACOE 404 permit is applied for also constitutes the application form for the local wetlands by-laws permits for Lexington and Lincoln.

The NPS has worked extensively with the Conservation Commissions from Lexington and Lincoln prior to filing wetlands permit applications to determine what is required under both the state and local wetlands laws and to ensure minimum impact to wetland values. The NPS will be filing separate Notices of Intent with the Towns of Lincoln and Lexington. Upon receiving the Orders of Conditions from Lincoln and Lexington under the MWPA and local wetlands bylaws, all conditions in the OC's will be adhered to.

Local Ordinances

The NPS will work with the Towns of Concord, Lincoln and Lexington to determine how local rules and ordinances may apply to any proposed activities. All applicable requirements will be complied with.

VIII. CONSULTATION & COORDINATION

A. PUBLIC INVOLVEMENT

Representatives of local town boards and interested members of the public have been invited to participate on numerous walks through and around the affected structures and areas to be cleared and have provided input on a range of issues including wetlands and other environmental factors, safety, visitor use and community impacts.

Specific public involvement has included the following:

The NPS has held two open public forums to discuss this project (See Appendix L). In the future, the NPS expects to work with the local communities to formally establish a partnership for the operation and upkeep of these historic structures and landscapes.

Contacts with numerous abutters to gain their feedback:

The information necessary for formulating the Save Historic Structures and Cultural Landscapes Project alternatives was gathered through a series of meetings with interested organizations, private citizens, and federal, state, and local governments. Additional information was acquired through site analysis, literature search, case studies in other national, state, and local park areas, and private programs. Several site visits were held with representatives of federal, state and local governments, members of local community organizations, and interested residents of the surrounding towns. Additional site visits with various entities, the SHPO and local conservation commissions were also conducted.

Additional site visits will be held for interest groups as the need arises. All who attended the site visits and meetings were encouraged to actively participate in the exchange of ideas and concerns regarding the development of the project to save the historic structures and landscapes. This Environmental Assessment incorporates the data collected during the planning process.

For a list of formal and informal public meetings, see Appendix M.

B. LIST OF AGENCIES AND ORGANIZATIONS TO RECEIVE COPIES OF THIS ENVIRONMENTAL ASSESSMENT

Town of Concord, Massachusetts
Town of Lincoln, Massachusetts
Town of Lexington, Massachusetts
Town of Bedford, Massachusetts
Massachusetts Department of Environmental Protection, Woburn, MA
Massachusetts Highway Department
Massachusetts Historic Preservation Officer
National Advisory Council on Historic Preservation
MASSPORT
United States Army Corps of Engineers, Concord, Massachusetts

United States Fish and Wildlife Service, Hadley and Sudbury, Massachusetts
United States Environmental Protection Agency, Region I, Boston, Massachusetts
United States Air Force, Hanscom Air Base, Massachusetts
Metropolitan Area Planning Council, Boston Massachusetts
Lincoln Guide Service, Lincoln, Massachusetts
Appalachian Mountain Club, Boston, Massachusetts
Lexington Friends of the Bikeway, Lexington, Massachusetts
Minute Man National Park Association
Battle Road Farm Association

IX. LIST OF PREPARERS

NPS Planning Team

Dan Dattilio, Assistant Superintendent/Chef Ranger, MMNHP

Blaise Davi, Chief of Maintenance, MMNHP

William Fuchs, Natural Resource Management Specialist, MMNHP

Bob Holzheimer, Director of Urban Projects, NPS-NEFA

Kevin Mendik, Environmental Compliance, NPS-BSO

Nancy Nelson, Superintendent, MMNHP

Lou Sideris, Chief of Interpretation, MMNHP

John Tauscher, Landscape Architect, NPS-BSO

Teresa Wallace, Park Curator, MMNHP

NPS Boston Support Office Consultants

Katy Lacy, Senior Historic Landscape Architect, Olmsted Center for Landscape Preservation

Nora Mitchell, Program Manager, Cultural Landscapes, OCLP

Charlie Pepper, Senior Preservationist Horticulturist, OCLP

Steven Pendery, Chief Archeologist, Archeology Branch

NPS Consultants

Bargmann Hendrie + Archetype, Inc.

Jeffrey Meese, Project Manager

Carol R. Johnson & Associates, Inc.

Kyle Zick, Project Manager

SAR Engineering, Inc.

Aberjona Engineering, Inc.

Hoyle, Tanner & Associates, Inc., Civil Engineering

Prospectus, Inc.

X. REFERENCES

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Butaney, G., Callan, S.J., Foxman, E., and Thomas, J., March 28, 1995, "Economic Impact Analysis and Visitor Profile", Departments of Economics and Marketing, Bentley College, Waltham, Massachusetts, 93 pp.

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"Interpretive Prospectus for Minute Man National Historical Park", 1990, USDOl, National Park Service, 18 pp.

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Thompson, E. and J. Jenkins, 1992, "Summary of Field Data From Minute Man National Park Plant Communities Study", Massachusetts Natural Heritage & Endangered Species Program for the National Park Service, 44 pp.

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XI. APPENDICES

*Appendix A: Landscape Plans, Battle Road Trail, Minute Man National Historical Park, Concord, Lincoln, Lexington, Massachusetts, Dated March 6, 1996, Sheets: EC 1-27, LG 1-27, LM 1-27, LD 1-7.²

*Appendix B: Save Historic Structures, Minute Man National Historical Park, Concord, Lincoln & Lexington, MA. Task Order #21, Additional Title I Services, September 12, 1997. Sections I - IV and Sheets L1.1 - E12B.

*Appendix C: Save Cultural Landscape, Minute Man National Historical Park, Concord, Lincoln, and Lexington, Massachusetts. Title II Documentation, dated January 5, 1999. Sheets K1 - LD3. (Includes SPECIFICATIONS, dated January 13, 1999.)

*Appendix D: Save Historic Structures: Repairs, Systems and Upgrades, Minute Man National Historical Park, Concord, Lincoln, and Lexington, Massachusetts, Title II Documentation, dated April, 1999. Sheets 0 - A6 4. (Includes SPECIFICATIONS.)

*Appendix E: Report On Archeological Testing For Package 170A: Historic Structures and Cultural Landscapes, (Tree and Stump Removal), Visitor Access Trail Project, Minute Man National Historical Park, March 5, 1999.

Appendix F: Letter from Susanna L. von Oettingen of the United States Fish & Wildlife Service to Bill Fuchs of the NPS, dated January 13, 1999.

*Appendix G: Environmental Assessment for Safe Visitor Access Trail, Minute Man National Historical Park, May, 1996.

*Appendix H: Notices of Intent, Towns of Lexington and Lincoln, Massachusetts, Filed February 2, 1999, and February 3, 1999, respectively.

*Appendix I: Minute Man National Historical Park Traffic Study Report, prepared by Hoyle, Tanner & Associates, Inc., dated December 14, 1995.

*Appendix J: Wildlife Habitat Evaluations, prepared by Jennifer Brown-Ellington, contained in the Notices of Intent for the Towns of Concord and Lincoln.

Appendix K: Economic Impact Analysis prepared by Gul Butaney, PhD. et al., Departments of Economics and Marketing, Bentley College, dated March 28, 1995.

*** These items are available for review at park headquarters, 174 Liberty Street, Concord, MA, 8:30 A.M. to 4:30 P.M., Monday through Friday. Phone (978) 369-6993 for more information.**

² The original complete plans for the Battle Road Trail - BATTLE ROAD ACCESS TRAIL, Minute Man National Historical Park, Concord, Lincoln & Lexington, Massachusetts, Dated 10/30/96 - were subsequently divided into four phases, with a separate set of plans prepared for each phase. Complete plans for Phases I, II, and III are available for review at Minute Man NHP Headquarters.

Appendix L: Letter regarding Community Open Forums for Historic Structures and Historic Landscapes Rehabilitation Public Involvement, Minute Man National Historical Park, prepared by Dan Dattilio, dated May 28, 1998.

Appendix M: Statement of Public Involvement, prepared by Dan Dattilio, dated October 9, 1998.



Appendix F
United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Field Office
22 Bridge Street, Unit #1
Concord, New Hampshire 03301-4986

RE: Minute Man National Historic Park
Rehabilitation/Restoration
Lexington, Lincoln, and Concord, Massachusetts

January 13, 1999

Bill Fuchs
Minute Man National Historical Park
174 Liberty Street.
Concord, Massachusetts 01742

Dear Mr. Fuchs:

I have reviewed your request for information on endangered and threatened species and their habitats for the above referenced project. Based on the project description and location, it appears that no impacts to federally-listed species will occur.

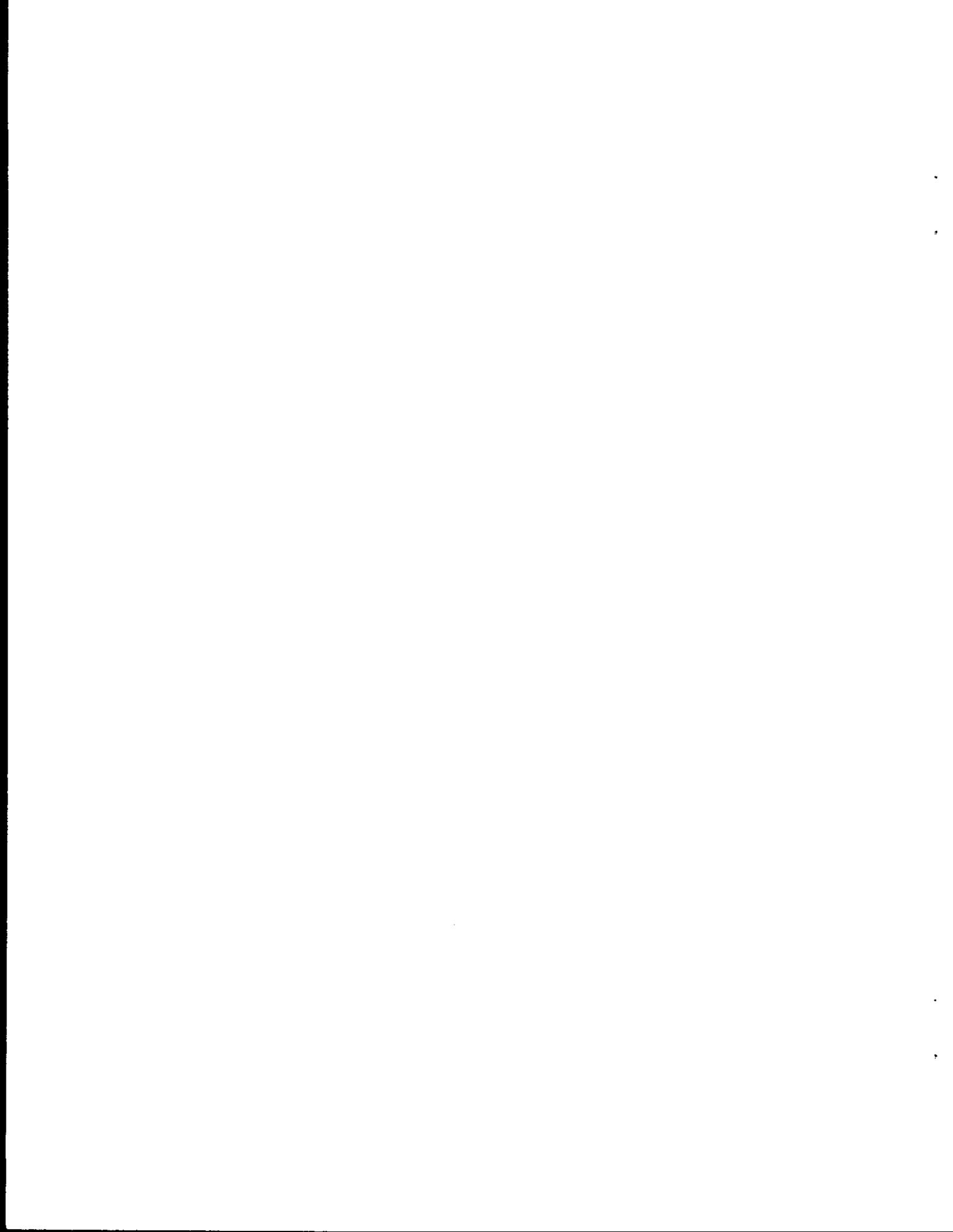
However, it appears that estimated habitat of rare wetlands wildlife occurs within the project area, as indicated by the Massachusetts Natural Heritage Atlas (1997 - 98 ed.). We suggest that you contact Hanni Dinkeloo of the Natural Heritage and Endangered Species Program, 1 Rabbit Hill Road, Westborough, MA 01581-3337 (508) 792-7270 for information on state-listed species that may be present.

Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

Thank you for your cooperation and please call me at 603-225-1411 if I can be of further assistance.

Sincerely yours,

Susanna L. von Oettingen
Endangered Species Specialist
New England Field Office



Appendix K

Excerpts from:

PART B.

VISITOR PROFILE

Concord Museum, Lexington Historical Society, Museum of Our National Heritage, Minuteman National Historical Park, and Orchard House

Final Report

Presented To

The Lexington-Concord Area Visitors Collaborative

**Submitted by:
Ellen R. Foxman, Ph.D.
Gul Butaney, Ph.D.
Department of Marketing
Bentley College
Waltham, MA 02154**

March 28, 1995

MINUTEMAN NATIONAL HISTORICAL PARK VISITOR PROFILE

About This Visit: (survey questions 1 through 7)

A first visit for most -- but not December visitors. About sixty percent of July and October respondents indicated that this was their first visit to the Lexington-Concord area. In December, however, only about a third (37%) described this as their first trip to the area. More than three-quarters of respondents in all months stated that this was a day trip for them.

A vacation or a visit. Sixty percent of July visitors, and 68% of October visitors, stated their visit was part of a vacation; this dropped to twenty-seven percent in December. The percentage visiting friends or relatives was nineteen July and fourteen in October. One-third of December respondents gave visits as a reason for their trip. The percentage of respondents answering "other" when asked the primary purpose of their visit remained relatively steady over the three months.

A two-day stay. For the quarter of respondents who were on a multi-day trip, their stay in the Lexington-Concord area averaged 2.0 days in July, a somewhat shorter 1.5 days in October, and 1.8 days in December. These stays were part of an average total trip length ranging from almost twenty days in July down to under two weeks (12.5 days) in December.

Stay with friends or family. In July and October, about a quarter of respondents on a multi-day trip indicated that they were not staying in the Lexington-Concord area. In December, however, nearly all (except for 8%) were staying in the area. In all three months, staying with friends or family was the lodging option most commonly indicated by respondents - 27% in July, 41% in October, and 75% in December. Hotels or motels were chosen by about a quarter of respondents in July, and smaller percentages in the other two months. Average room charges rose steadily over the months surveyed -- from \$77 in July, to \$81 in October, to \$115 in December.

Visitors and Minuteman National Historical Park: (survey questions 9 through 12)

The American Revolution Brings them. When visitors were asked their reasons for visiting Minuteman, "interest in the American Revolution" was by far the most frequently checked response (at least double the next most frequently checked reason in all months surveyed. "Interest in

American culture" was the second most frequently checked response in all months. "Interest in American literary heritage" was the third most frequently mentioned reason for visiting in July and October, but this was displaced by "interest in outdoor activities" in December.

What admission fee? About two-thirds of respondents in July and October, and over ninety percent in December identified admission to Minuteman as free of charge. Almost half in July and a third in October identified admission fees as "about right" or "low." These findings make sense, given that Minuteman operates multiple sites, one of which (The Wayside) charges admission and is not open in December.

Word-of-mouth is most important. When respondents were asked how they had heard about Minuteman, word-of-mouth was the most frequently mentioned source in all months. The second most frequently mentioned source was the AAA tourbook in July, "other" in October, and "newspaper article or ad" in December. In July and October, respondents didn't hear about Minuteman at their hotel or from newspaper articles or ads

Good directions to the Park. Most respondents had no trouble finding the Park. Asked to rate directions to Minuteman, 92%-96% over the three months indicated that directions given were either "adequate" or "extremely clear and easy to follow."

This Visit As Part of a Longer Trip: (survey questions 13 through 18)

The largest group are from MA. To get some idea of where trips originated, respondents were asked where they lived. Approximately ninety percent were from the U.S. in all months surveyed. Looking at patterns across the three months, Massachusetts was the most frequently mentioned state of residence, followed by California. Few visitors came from the other New England states.

Travel by own car or a rental. Between eighty and ninety percent of the respondents in all months traveled to the Lexington-Concord area in their own car or a rental car. The Lexington-Concord area was the trip destination for about forty percent of the respondents in July and October, and almost seventy percent in December. Few respondents were traveling with a bus tour (3% in July, 8% in October, and 3% in December).

Largest travel parties in December. The average party size was 5.6 in July, 4.4 in October, and 5.9 in December. Considering the age and sex mix of individuals in visitor parties, adult males were a little more likely

to predominate in October, and adult women were a bit more likely to predominate in December. The number of children in visitor parties averaged about two in all months.

Following the Battle Road. Respondents were asked whether they had seen or planned to see other area attractions during this trip. In July, the attractions most frequently mentioned were Boston, Lexington Green, Concord Museum, Plymouth, and Salem. The two sites most strongly associated with a visit to Minuteman were Boston and the Lexington Green. A similar pattern of responses was observed in the other months.

Minuteman Visitors are: (survey questions 19 through 25)

Middle-aged and well-educated. The average age of July respondents was 45; in October, the average age was 48, and in December, 38. There was an approximately even split between male and female respondents in all three months. Individuals completing the survey were very well educated: in all the months surveyed, approximately two-thirds had a four-year college degree or postgraduate study.

Part of a family household. In July and October, about two-thirds of respondents described their household as consisting of either a husband and wife only or a husband, wife, and children under 18. In December, just over half placed their households in these categories. Ten to fifteen percent of respondents in July and October indicated that they lived alone; the percentage in this category was considerably larger (36%) in December. Respondents who visited in October and December had more children under 18 in their households than those who visited in July.

Employed full-time. Over half of respondents in all months described themselves as employed full-time. A significant minority, particularly in October and December, described themselves as retired. Very few respondents stated they were students. Finally, respondents were fairly prosperous: more than sixty percent in all three months reported annual incomes of \$40,000 or more. Twenty percent of those responding to this question in July had annual household incomes greater than \$70,000, as did almost a quarter of those in October and nearly a third in December.

Question #13, continued. Where do they live?

Minuteman National Historical Park

(a) State

	<u>July</u>	<u>October</u>	<u>December</u>	<u>All Months</u>	<u>Grand Totals</u>
Massachusetts	48 (34%)	31 (22%)	13 (48%)	92 (30%)	434 (37%)
Connecticut	2 (1%)	4 (3%)	1 (4%)	7 (2%)	22 (2%)
Maine	0 (0%)	1 (1%)	1 (4%)	2 (1%)	11 (1%)
New Hampshire	1 (1%)	2 (1%)	0 (0%)	3 (1%)	23 (2%)
Rhode Island	1 (1%)	2 (1%)	0 (0%)	3 (1%)	11 (3%)
Vermont	0 (0%)	1 (1%)	0 (0%)	1 (0%)	3 (0%)
California	9 (6%)	20 (14%)	4 (15%)	33 (11%)	132 (11%)
All other	80 (57%)	78 (56%)	8 (29%)	166 (54%)	532 (46%)

(b) Country

United States	143 (89%)	134(93%)	26 (87%)	303 (91%)	1151 (93%)
All other	17 (11%)	10(7%)	4 (13%)	31 (9%)	90 (7%)

Note: Percentages may not sum to 100 due to rounding.

Table 4M
Minuteman National Park

TOTAL DIRECT VISITOR EXPENDITURES

	TOTAL	AVERAGE PER TRIP
Day	\$ 4,680,369	\$ 18.21
Multiday	\$16,808,266	\$108.84
Total	\$21,488,635	

EXPENDITURE DISTRIBUTION BY TYPE OF VISITOR AND BY COMMODITY

EXPENDITURE CATEGORY	DAY		MULTIDAY	
	AMOUNT	PERCENT	AMOUNT	PERCENT
Souvenirs	\$899,382	19.0	\$733,836	4.0
Arts/Crafts	513,933	11.0	765,957	5.0
Groceries	316,266	7.0	926,561	6.0
Gasoline	394,097	8.0	1,457,790	9.0
Meals	1,512,148	32.0	4,632,806	28.0
Retail shopping	720,247	15.0	1,729,581	10.0
Entertainment	324,296	7.0	469,458	3.0
Lodging	—	0.0	6,092,277	36.0

Appendix L: LETTER REGARDING COMMUNITY OPEN FORUMS FOR HISTORIC STRUCTURES AND CULTURAL LANDSCAPES REHABILITATION

D2217 (MIMA)

May 28, 1998

Dear Neighbor:

A recent evaluation at Minute Man National Historical Park by park staff and other preservation professionals identified 7 significant historic structures and approximately 60 acres of historic landscape in need of rehabilitation. The evaluation recommends work on the historic structures including structural repairs and stabilization, interior and exterior finish work, upgrading utilities to meet building codes, adding fire detection and suppression systems, upgrading septic systems, and radon and lead paint mitigation. Recommended work on the historic landscapes includes rehabilitating historic fields, orchards, stone walls and other landscape features, removing park-owned modern buildings, and removing solid waste (farming debris, auto parts, etc.). We would like to give you the opportunity to review and comment on the proposed plans.

On Saturday, June 13, 1998, National Park Service staff will be hosting three site visits to review the proposed work. Each of these site visits will review the proposed work in one area of the park and examine representative historic structures and landscapes within the area. The time and location of these site visits are as follows:

- | | | |
|------------|--|--|
| 8:00 a.m. | Meriam's Corner Parking Area (Concord) | Will include Meriam's Corner, Brook's Historic Area and other sites. |
| 9:30 a.m. | Hartwell Tavern Parking Area (Lincoln) | Will include Bloody Angles, Hartwell Historic Area, and other sites. |
| 11:00 a.m. | Minute Man Visitor Center (Lexington) | Will include Whittemore House and other sites. |

To provide an additional opportunity to review the proposed work and provide input, National Park Staff will also host a presentation on the proposed work on Thursday, June 18, 1998 at 7:30 p.m. at the Minute Man Visitor Center (Rte 2A, Lexington). This meeting will review all proposed work. For additional information or directions to meeting sites please call Minute Man National Historical Park at 978 369-6993, ext. 22.

Sincerely,

Nancy A. Nelson
Superintendent

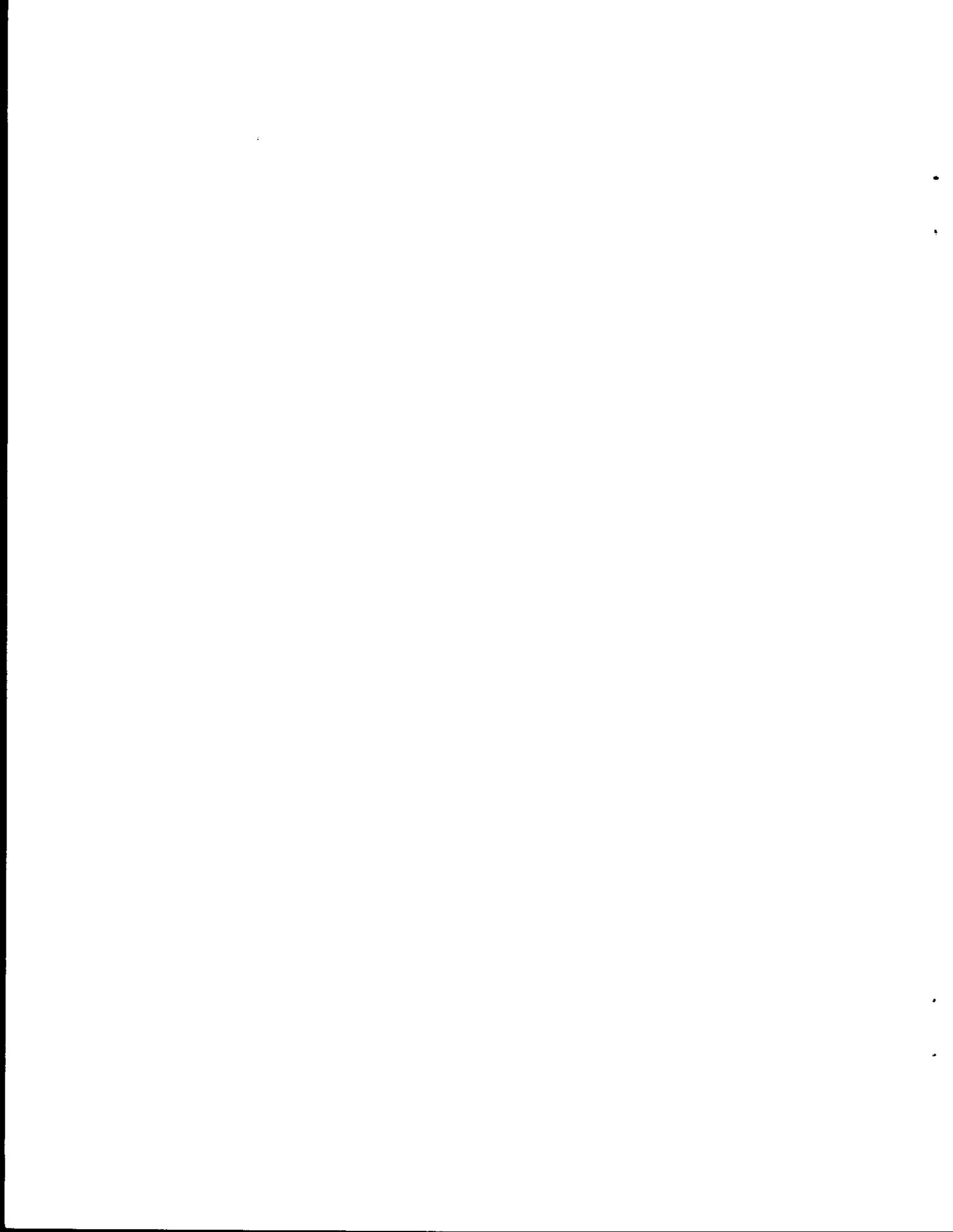


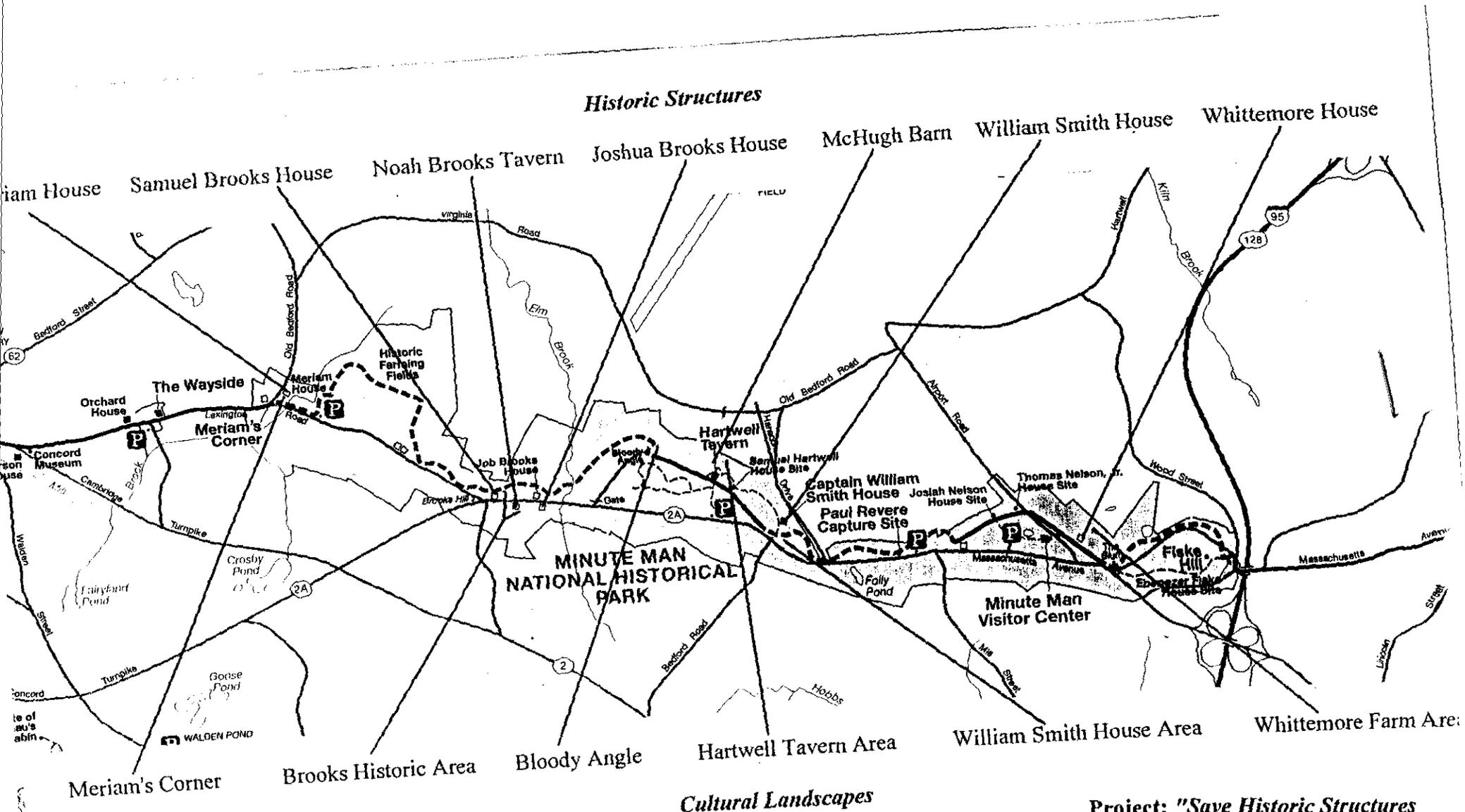
Appendix M. PUBLIC INVOLVEMENT

The general public and public officials in the surrounding communities were invited to learn about the project and ask questions at two formal open forum meetings. The first of these occurred on Saturday, June 13, 1998, and took place at each of the proposed work sites in the park, within the towns of Concord, Lexington and Lincoln. A second opportunity was provided on Thursday, June 18, 1998, and was held at the Minute Man Visitor Center in Lexington, MA. Notification about the meetings was forwarded in advance to over 100 park neighbors, interested parties, and the Board of Selectmen, Conservation Commissions, Planning Administrators, Historic District Commissions, and neighboring conservation agencies in each of the three towns. Also notified were the Massachusetts Congressional Delegation, State representatives, Massport and Hanscom Air Force Base.

The notification information informed all parties of recent evaluations at Minute Man National Historical Park by park staff and other preservation professionals who identified 7 significant historic structures and approximately 60 acres of historic landscape in need of rehabilitation. The information explained that the evaluation recommended work on the historic structures including structural repairs and stabilization, interior and exterior finish work, upgrading utilities to meet building codes, adding fire detection and suppression systems, upgrading septic systems, and radon and lead paint mitigation. Also recommended, work on the historic landscapes including rehabilitating historic fields, orchards, stone walls and other landscape features, removing park-owned modern buildings, and removing solid waste (farming debris, auto parts, etc.). All parties were notified in writing about the Park's desire to provide the public the opportunity to review and comment on the proposed plans.

At the first of the open forums, on Saturday, June 13, 1998, National Park Service staff hosted three site visits to review the proposed work. At each of these site visits staff reviewed the proposed work in that area of the park and showed representative historic structures and landscapes within the area and other sites. To provide an additional opportunity to review the proposed work and provide input, National Park Staff also hosted a presentation on the proposed work on Thursday, June 18, 1998 at 7:30 p.m. at the Minute Man Visitor Center. This meeting reviewed all proposed work. Each of these meetings was attended by members of the public.





Project: "Save Historic Structures And Cultural Landscapes"

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