604/D-154

Site Plan and Environmental Assessment

Fort Hill

Cape Cod

National Seashore • Massachusetts

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Site Plan and Environmental Assessment

August 1998

Fort Hill

Cape Cod

National Seashore • Massachusetts

United States Department of the Interior • National Park Service

SUMMARY

The Fort Hill area encompasses approximately 100 acres of grasslands, forest, and wetlands bordering Nauset Marsh in Eastham, Massachusetts. Fort Hill is one of the premier historic and scenic resources within Cape Cod National Seashore, and it is one of the most popular nonbeach destinations. The site contains historic structures such as the Penniman house and barn, stone walls, Skiff Hill, and the Fort Hill scenic overlook.

The National Park Service is considering improvements for public use at Fort Hill. This *Site Plan and Environmental Assessment* describes the proposed actions being considered, as well as a no-action alternative (or the continuation of existing conditions), plus actions considered but rejected. This assessment also describes the affected environment and the environmental consequences of these alternatives.

The site vision for the area, as stated in the *General Management Plan,* consists of the following direction:

- Preserve and maintain the character-defining features of the historic structures, landscape, and archeological resources, while protecting natural resources.

- Encourage pedestrian use of the site to support contemplative activities, public education, and the serenity of the environment.

The actions being considered include improving maintenance of and accessibility to the Penniman house, restoring additional cultural landscape features, focusing trail use at the Hemenway Landing area in cooperation with the town of Eastham, improving wayfinding and interpretive information, and reconfiguring parking.

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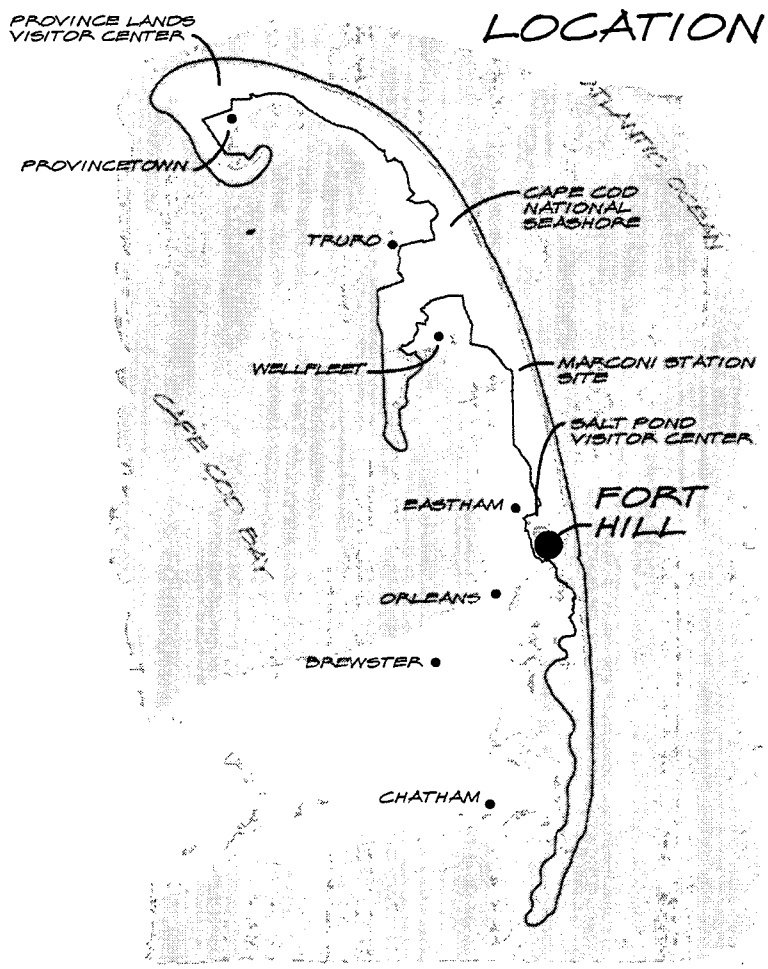
INTRODUCTION

Fort Hill is the common name for a 100-acre area of rolling upland within Cape Cod National Seashore and the town of Eastham, Massachusetts. The area is bordered on the northeast, east, and southeast by Nauset Marsh. To the south is a small stream that discharges into Nauset Marsh and Town Cove, to the north is Hemenway Road, and to the west is Governor Prence Road.

The eastern portion of the Fort Hill area has been designated a national historic landmark because of its rich history of settlement and use, and it is a nationally significant natural resource on Cape Cod. Archeological evidence of Native American settlement dates to several hundred years before European settlement. In 1605 the Fort Hill area was visited by the explorer Samuel de Champlain, who reported that the land was partially cleared and inhabited by Native Americans. A map drawn by Champlain shows fields and weatous (wigwams), suggesting that the area was used for farming by the native Nauset Indians. The Nauset Indians are a vanished subgroup of the present-day Wampanoag Tribe of Southern Massachusetts.

After the start of European settlement two distinguished figures in colonial history and local folklore — Governor Prence and Samuel Treat — owned land near Fort Hill. In 1742, members of the Knowles and the Penniman families bought land on Fort Hill, beginning a span of continuous ownership lasting almost 200 years. In the mid 1800s Edward Penniman (who was born in Eastham in 1831) married his neighbor, Betsy Augusta Knowles, uniting the two families. Penniman enjoyed great success as a whaling captain and in 1868 completed building the house that still graces Fort Hill. A French Second Empire style structure, this building was the most elaborate house in Eastham at that time. It is now listed on the National Register of Historic Places.



Over the years the open character of the Fort Hill landscape has been preserved, while residential development and forest regrowth have engulfed most other areas of the Outer Cape. Even after the Knowles family sold the property in the 1940s, the area was still used for agricultural purposes. In the early 1960s, however, the area was sold for development, the land was surveyed and subdivided, and perimeter and hilltop

roads were graded. In 1963 the undeveloped land was acquired by the National Park Service (NPS) and development was avoided. The farmhouses formerly owned by Seth Knowles and Sylvanus Knowles remain in private ownership. Based on a 1995 *Cultural Landscape Report for Fort Hill* (see page 6), the National Park Service considers this area eligible for the National Register of Historic Places as a historic district, and it is to be managed accordingly.

PURPOSE OF AND NEED FOR THE PLAN

The purpose of this document is to recommend appropriate management actions and facility support for improved public use and resource preservation of the Fort Hill area. The objectives are (1) to articulate how to restore and maintain the qualities of the cultural landscape that are associated with centuries-old agricultural uses, (2) to protect and maintain the significant historic structures that are on the site, and (3) to protect natural resources in the Fort Hill area.

A number of factors have contributed to a need for this plan. Fort Hill has become one of the more popular year-round destinations within Cape Cod National Seashore, both for visitors and local residents. Public use frequently exceeds the parking capacity. Maintaining adequate resource protection and public facilities for the area has been a challenge for national seashore managers. In recent years there has been a local movement to nominate the Fort Hill district to the National Register of Historic Places to properly recognize the site's importance and to ensure its preservation. The establishment of a local historic district under Massachusetts law could also be considered; this would allow the Eastham Historical Commission to review proposed changes in the appearance of the site.

Over the years the National Park Service has considered various planning options for Fort Hill. The seashore's first *Master Plan* in 1965 recommended the construction of a road to the top of Fort Hill, where a small parking lot would be constructed, with a 60-car parking lot to be developed at Hemenway Landing. Plans also recommended a road connection from Fort Hill Road to Hemenway Road. The road and a 12-car parking lot at the top of Fort Hill were constructed, but other development proposals were not implemented.

The 1970 *Master Plan* called for removing the road to the top of Fort Hill and a comprehensive restoration of the historical scene to the 1850–90 period, which would include a salt works, hay barge, and limited agricultural area. That *Master Plan* also proposed expanding the parking area by 15 cars to serve the Penniman house area, and it recommended a new parking lot south of the Penniman house. The restoration was never implemented, but a 14-car parking lot was developed adjacent to Fort Hill Road east of the Sylvanus Knowles house.

The goal of the National Park Service is to unify the planning and management direction for the Fort Hill area. In March 1997 an NPS workshop reviewed the site's current use characteristics, defined objectives for the site, and developed specific components for the preferred alternative. Several local and community groups, including the Eastham Board of Selectmen, residents, representatives of the Cape Cod Commission, the Eastham Historical Commission, the Wampanoag Tribal Council and the Wampanoag Tribe of Gay Head (Aquinnah), and NPS staff and specialists attended the meeting.

Site Vision

The 1998 *General Management Plan* for Cape Cod National Seashore articulates the following site vision for Fort Hill:

- Preserve and maintain the character-defining features of historic structures, landscape, and archeology and protect natural resources.
- Encourage pedestrian use of the site to support contemplative activities, public education, and the serenity of the environment.

OPPORTUNITIES, ISSUES, AND CONSTRAINTS ADDRESSED BY THE PLAN

Cultural Resources

The eastern portion of Fort Hill (as a part of the Nauset Archeological District) has been designated a national historic landmark, which confers highly protected resource management status. Although few specific archeological resources have been identified, the potential presence of such resources poses constraints on excavation and grading.

NPS funding limitations have reduced maintenance for the Penniman house, barn, and surrounding site, resulting in less than desired levels of preservation and appearance. Certain features, including landscape plantings and stone retaining walls around the Penniman house and rock walls throughout the open fields, are not being maintained and could be lost over time. Also, shrubs and trees continue to encroach on areas that have historically been open agricultural fields or grasslands.

While open to the public, the interior of the Penniman house is unfurnished and is not accessible to people with disabilities. People walking around the house and grounds, particularly those trying to look in the windows, have caused soil compaction. These conditions could lead to adverse impacts on the historic structure or its foundation.

While the Penniman house itself is listed on the National Register of Historic Places, local interest groups are working to prepare a new register nomination to recognize Fort Hill's cultural landscape, consisting of the 18th and 19th century agrarian landscape, the structures, and the adjacent grounds. If a local historic district was nominated under Massachusetts law, the National Park Service would provide technical support for the nomination process. The two former Knowles houses to the north and west of the Penniman house are privately owned and are significant contributions to the cultural landscape.

Natural Resources

There is some concern that auto-related runoff from the parking lot at Hemenway Landing may contribute to pollution in Nauset Marsh. Mitigation measures may be warranted since this is a very important shellfish area for the town of Eastham.

The intrusion of woody vegetation into grasslands is affecting the National Park Service's ability to keep the cultural landscape maintained as open fields. Maintenance actions such as mowing and burning have the potential to prevent natural succession to woodlands. Effects on other natural

resources need to be taken into account. Timing is also important to avoid grassland bird nesting. Freshwater wetland avoidance and impacts on the salt marsh are also a concern.

Public Use and Access

Present circulation and access patterns are in potential conflict with historical values and resource preservation. Access from the lower parking lot east of the Penniman house does not allow the public to enter the grounds or approach the building from its formal western access and entry facade. The house and grounds are not accessible to people in wheelchairs.

Many people who come to Fort Hill do not get any interpretation during their visits, possibly not fully appreciating the historical and natural resources of the site. There are few location signs and trail markings. Interpretive folders distributed onsite are not always available or convenient to the public.

The Native American presence onsite and the significance of the site to their culture is not interpreted. Also, the site's agricultural history and management efforts to preserve its historical character through vegetation management are inadequately communicated.

Access roads to Fort Hill (Hemenway Road from the north and Governor Prence Road from the south) intersect U.S. Route 6, where limited sight distance and the absence of turning or acceleration lanes cause hazardous situations for drivers turning off of or on to U.S. 6. The lack of signs at Hemenway Road contributes to access difficulty and safety problems.

The lack of parking at Fort Hill is particularly acute on shoulder season weekends when people come to enjoy views from the overlook, hike the trails, and participate in programs at the Penniman house. Cars park along road shoulders, causing resource damage, safety hazards, and traffic congestion.

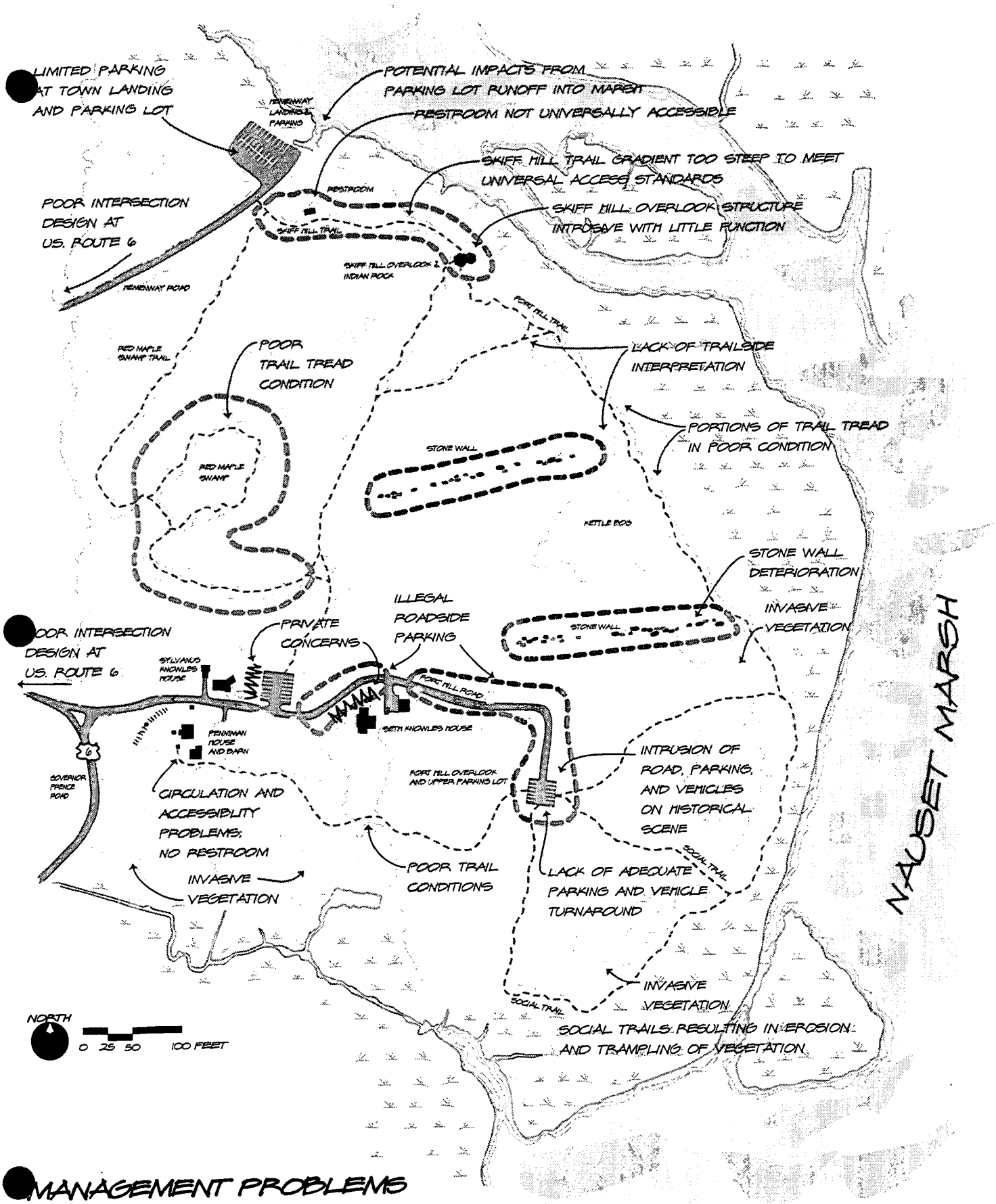
Vehicles trying to turn around when the upper Fort Hill parking lot is full also cause congestion. The Park Service provides facilities in the Hemenway Landing area (the red maple swamp trail, the Skiff Hill trail and overlook, and access to other Fort Hill trails), but the town parking area is mostly used by town residents.

There are no restroom facilities near the parking areas at Fort Hill. An NPS restroom facility along the Skiff Hill trail near Hemenway Landing is closed seasonally.

While trails in the area receive a great deal of use, many sections have poor tread condition, dilapidated steps, and inadequate drainage, or the trails are subject to erosion — conditions often intensified by poor alignments or excessive grades. Many trails could be made accessible to all people with minor improvements (such as removing steps or realigning segments). A lack of seating along trails and at minor viewpoints detracts from the experience of some trail users, particularly the elderly.

Local Community

There is a strong community interest in the Fort Hill area. The Penniman house and Nauset Marsh are highly prized town resources. The area is also appreciated for its walking trails, and there is a desire to have safe walking opportunities between Fort Hill and the visitor center to allow for access that does not depend on vehicles. Adjacent property owners often have interests that conflict with nearby public uses. Neighbors at Fort Hill are concerned about parking near their residences and visitor use on peak days when parking is not adequate to meet the demand, as well as nighttime activities.



MANAGEMENT PROBLEMS
FORT HILL

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National Seashore Management and Operations

Onsite staffing at Fort Hill is periodic. Interpretive staff are not available to regularly staff the Penniman house, and volunteers are largely responsible for conducting house tours during the summer and periodically in the spring and fall.

The use of prescribed burning to maintain the grasslands, which has been considered for several years, would require that a site-specific fire management plan be developed. No specific operating funds are allocated for the Fort Hill area.

RELATIONSHIP TO OTHER NATIONAL SEASHORE PLANNING EFFORTS

Cultural Landscape Report for Fort Hill

The 1995 *Cultural Landscape Report for Fort Hill* identifies significant cultural resource features that should be incorporated in any future nomination of the area to the National Register of Historic Places. In general, the present Fort Hill area retains a high level of historical integrity, still resembling to a great degree the appearance during the Knowles family period. The following are some of the significant character-defining features:

the Penniman house and barn, including the unique fence, landscape terracing, stone retaining wall, whalebone gate, and cottonwood trees lining the driveway

the historic Sylvanus Knowles and Seth Knowles residences

the open fields, with a distinctive pattern of small fields defined by stone walls

the red maple swamp

the perimeter Fort Hill trail

the Fort Hill Road to its original terminus at the Seth Knowles house

The *Cultural Landscape Report* recommends guidelines for preserving and managing these historic resources, as summarized below:

- Relieve traffic congestion at Fort Hill to improve the historical experience of the landscape.
- Lessen the impacts of paving and parking areas within the historic area.
- Preserve the historic portion of the Fort Hill Road and restore its plantings.
- Clear areas that were historically open fields and maintain them as such.
- Preserve historic features that have been degraded, such as stone walls and historic foundations.

General Management Plan

This *Site Plan and Environmental Assessment* provides site management and development implementation guidance that is consistent with the 1998 *General Management Plan,* and it is tiered on the *Final Environmental Impact Statement for the General Management Plan.* Actions recommended in this plan are also consistent with other NPS implementation plans, including the national seashore's *Resource Management Plan* and *Fire Management Plan.*

ALTERNATIVES

NO-ACTION ALTERNATIVE / EXISTING CONDITIONS

This alternative would continue existing management practices within the Fort Hill area. No substantive changes would be made to the management of cultural or natural resources or public amenities and facilities, including parking, trails, or interpretive exhibits. This alternative is also considered to be a minimum requirements alternative for the lowest cost safety improvements.

Cultural Resources

Present resource protection and management activities at Fort Hill would continue. The Penniman house and barn would be maintained to the extent possible with available funding and support; limited public access to the house would be provided. No concerted effort would be made to improve the historic landscape or to restore historic plantings. National seashore managers would depend on the cooperation of property owners, local zoning bylaws, and building codes to preserve the historic houses as privately owned structures.

Only a portion of the cultural landscape would be maintained by means of mowing areas periodically, conducting very limited prescribed burning, and clearing fallen trees. Historic landscape features, such as stone walls, would be stabilized as needed.

Public Use

Interpretation and Education. Periodic scheduled tours of the Penniman house would continue with the assistance of local volunteers, some of whom are also members of the Eastham Historical Commission. Existing wayside exhibits and trail brochures would provide some self-guided interpretive information.

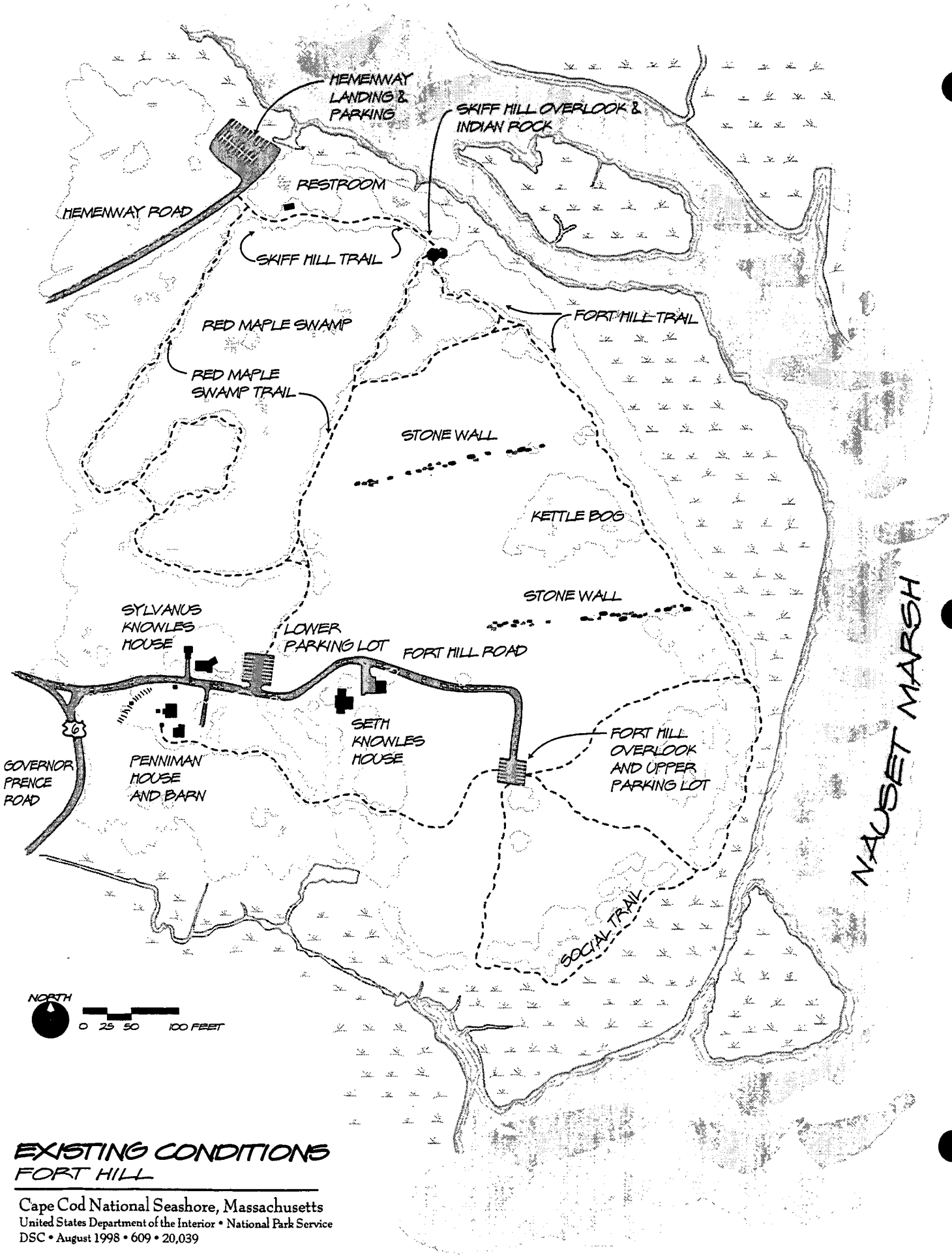
Access, Parking, and Support Facilities. The two major access routes to Fort Hill — Governor Prence Road and Hemenway Road — would remain as they are. Both roads are accessible from U.S. 6, and the Massachusetts Highway Department would be responsible for any planning efforts to improve these intersections.

No road or parking improvements within the national seashore would be made to address periodic traffic congestion and parking problems at Fort Hill. At peak use times a ranger would be stationed at Fort Hill to help direct traffic and enforce parking regulations, as needed.

No new restroom facilities would be developed in the immediate Fort Hill area under this alternative.

Parking would continue to be available at Fort Hill and Hemenway Landing.

Trails and Viewpoints. The trail system at Fort Hill would be maintained at current standards. Trail directional signs would be maintained, but no additional wayfinding aids would be provided. The top of Fort Hill and Skiff Hill would still be maintained as designated viewpoints.



EXISTING CONDITIONS
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PREFERRED ALTERNATIVE

The National Park Service would undertake an expanded and more intensive program to rehabilitate, maintain, and preserve cultural resources at Fort Hill. In addition, public facilities such as parking, restrooms, trails, and interpretive exhibits would be improved and expanded to better manage and serve existing levels of use.

Cultural Resources

In cooperation with local interest groups, the cultural resources of the Fort Hill area (including prehistoric and historic archeological resources) would be documented, and the structures and features found to be significant in the *Cultural Landscape Report for Fort Hill* (NPS 1995) would be proposed for listing as a historic district on the National Register of Historic Places.

Maintenance activities would be increased at the Penniman house and barn. Consistent with recommendations in the *Cultural Landscape Report,* the following rehabilitation measures would be taken.

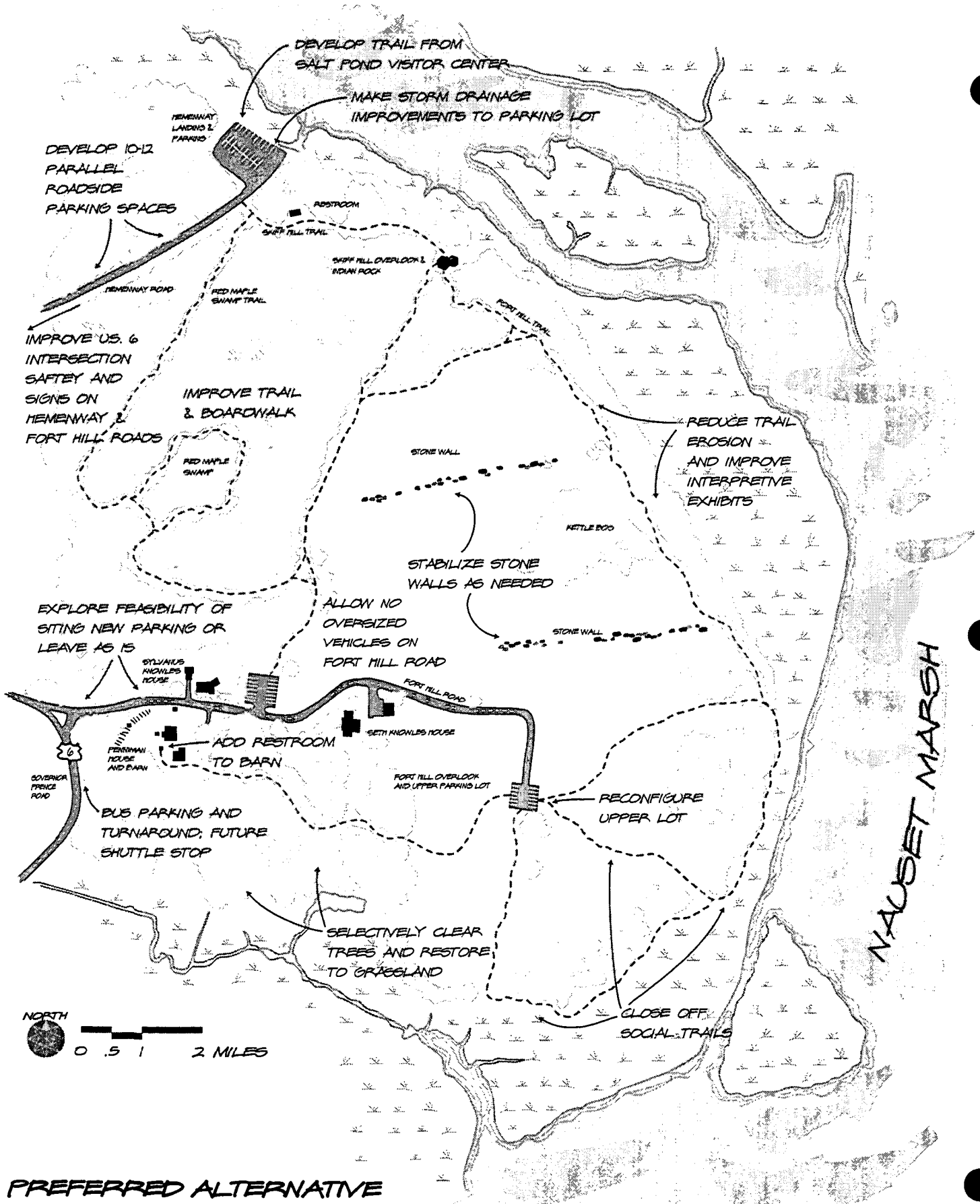
Maintenance and Access. Facilities would be improved while preserving the historic setting of the area. Public access to the Penniman house would be provided through the formal western entrance, with access for people with disabilities either through the west or east entry (any modifications would be architecturally compatible with the historic structure). Pedestrian circulation throughout the house and grounds would be designed to be barrier free.

To reduce soil compaction and to protect the foundation of the house, exterior pathways would be designated, and subtle walkway restraints would be implemented. Exterior pathways could include an approach across the west lawn and an approach up the rear driveway or a designated path across the north lawn.

Stone walls would be protected from damage by invasive vegetation and damage from foot traffic. Woody vegetation would be prevented from establishing itself by removing seedlings as well as using prescribed burning in specified areas. Foot traffic would be redirected, as necessary, when trail maintenance improvements were made.

To help restore the setting for the house, the historic cedar tree and cottonwood planting to the west would be restored, and the cottonwoods along the driveway would be replaced.

Cultural Landscape. The cultural landscape, including open fields, would be restored, while taking into consideration modern intrusions and impacts on natural resources. The cultural landscape would be managed to preserve the open quality of the historic agricultural fields consistent with those shown in 1938 aerial photographs. Actions would be in accordance with vegetation management treatment recommendations in the 1995 *Cultural Landscape Report,* which were developed by the National Park Service and the USDA Natural Resources Conservation Service. Today there are approximately 40 to 50 acres of open grassland at Fort Hill; up to 11 more acres of forest cover are proposed to be cleared to restore its appearance to 1938 conditions.



PREFERRED ALTERNATIVE
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Prescribed burning, fall mowing, and alternating periods of cultivation and dormancy would be used to maintain the open cultural landscape while preserving native plants and animals. Prescribed burns would be done in accordance with strict guidelines outlined below, the national seashore's *Fire Management Plan,* and other project clearance paperwork, such as the site-specific prescribed burn plan for the area. The prescribed burn plan outlines operational procedures for conducting burns. Specific burn objectives include (1) maintaining the open landscape, (2) documenting the effects of burning, if any, on vegetation composition, and (3) wildfire training for national seashore staff. The prescribed burn program would consist of the following actions:

Burn / Mow Units: Six burn / mow units would be delineated in the approximately 40–50 acres of open grassland surrounding Fort Hill. Burn unit boundaries would, to the extent possible, follow existing trails, roads, and stone walls. Five of the six units (or portions of one unit) would be burned annually or mowed either in the spring or fall, or both seasons. No more than 70% of the open grassland area (approximately 28–35 acres) would be burned in any calendar year. Each year one of the six units would be left fallow for a period of 12 months or more before being mowed or burned. (See the Prescribed Burn / Mow Units map.)

A prescribed burn boss certified by the National Wildfire Coordinating Group (NWCG) would supervise each prescribed burn. An NWCG-trained wildfire crew of five individuals (minimum) would conduct burning operations. No less than 1,000 gallons of water and two national seashore fire engines would be onsite during burning operations.

Prescribed burning would only be done during favorable weather conditions so as not to adversely affect nearby residents or vehicular traffic on U.S. 6; no burns would be done during June, July, or August.

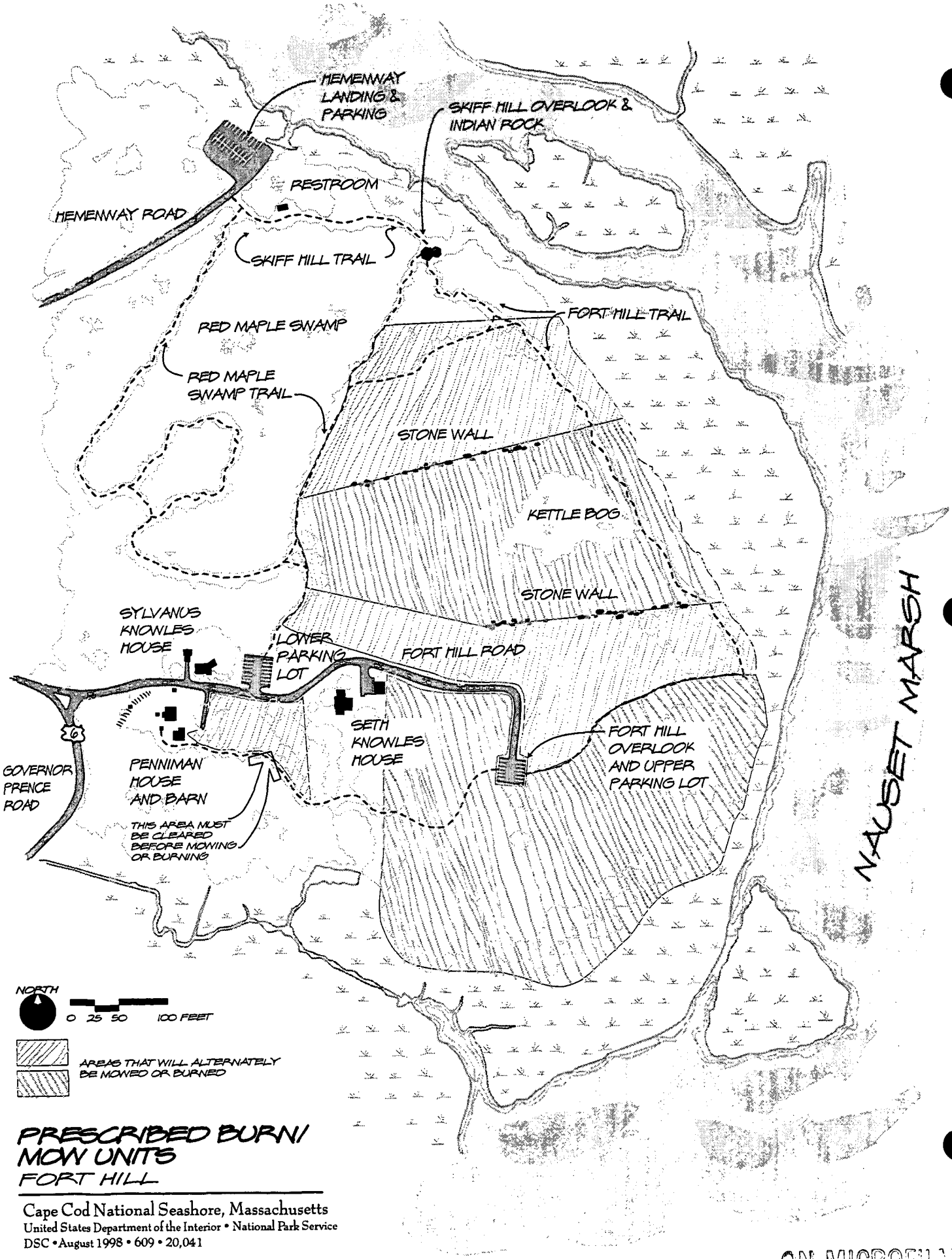
Units not burned or left fallow would be mowed annually by seashore maintenance personnel in the fall or by a contracted commercial hay operation company in the summer or fall.

Fuel: Fuels associated with the open fields are primarily grasses, herbs, brambles *(Rubus* spp.), or vines. Fuels are generally less than 30″ tall and are continuous on the ground. Fuel loading (the amount of wildland fuel available for sustaining the fire) is estimated between one and three tons per acre. Rates of spread and heat output from fires burning in this fuel model would be described in detail in the site-specific prescribed burn plan.

Weather: Prescribed burning would only be conducted during favorable weather and when smoke would be dispersed. Weather prescription parameters include wind speed and direction, relative humidity, fuel moisture, days since rain, and time of day. These would be described in detail in the site-specific prescribed burn plan.

Research/Monitoring: Permanent vegetation plots and transects would be established in each burn unit and periodically monitored to determine changes in vegetation species, height, and cover resulting from mowing and burning.

Natural Resources: Burn unit boundaries and interiors would be inspected before burning for nesting birds, turtles, or other animals. Animals would be moved, burn unit boundaries or fire methods would be changed, or burns would be canceled to protect native animals.



PRESCRIBED BURN/ MOW UNITS
FORT HILL

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Access: Roads to the Fort Hill area are accessible by two-wheel-drive vehicles and most burn unit boundaries are accessible by four-wheel-drive fire engines. Where burn units were not accessible by fire engines, fire hoses would be used to ensure the fire did not escape to adjacent areas. Four-wheel-drive vehicles could access the interior of burn units, if necessary.

Notifications: The Eastham and Orleans Fire Departments would be notified about each burn day, and approval for each burn day would be obtained from the Eastham Fire Department. Required permits would be obtained from the Massachusetts Department of Environmental Protection. The Eastham Conservation Commission would be contacted, and in accordance with the Massachusetts Wetlands Protection Act, national seashore managers would notify the appropriate agencies of burning that would occur in wetland or wetland buffer areas.

Private Property Owner Involvement. The owners of the two historic Knowles houses and the Eastham Historical Commission would be involved in decisions to (1) acquire permanent deed restrictions, such as facade easements, to preserve the historic qualities of the structures and surrounding landscapes, (2) include the properties within a local historic district, or (3) include the properties within a National Register of Historic Places district nomination.

Public Use

Interpretation and Education. The public experience in the Fort Hill area would be enhanced, and ongoing resource management actions would be more widely supported. Site interpretation and education would be emphasized. Additional interpretive topics for the Fort Hill area that would be considered include the following:

Native American traditional land uses and spiritual connections with Fort Hill

agrarian land uses and features from the Knowles era

the near loss of the historic landscape as a result of the 1960s subdivision plan and extant road traces

contemporary vegetation management actions (burning, mowing, cultivation, etc.) to preserve the historic landscape

wildlife of the open grasslands and agricultural fields

shellfishing in Nauset Marsh

forest ecology of wetland maple swamps

These topics could be presented in waysides and brochures, or by interpretive specialists. Additional wayside exhibits to interpret natural and cultural resources would be provided along the Fort Hill trail and the red maple swamp trail.

Access, Parking, and Support Facilities. To address access and parking problems at Fort Hill, proposed actions would seek to improve access, selectively increase parking, and upgrade support facilities to serve appropriate levels of public use. More efficient use would be made of existing parking, and alternative means of access and transportation to the site would be encouraged. Over the long term, additional parking would be provided. The cost of implementing this alternative are presented in appendix A.

The following short-term actions are proposed:

Wayfinding: Improve signs on U.S. 6 for the Salt Pond visitor center, the Penniman house, and the red maple swamp trail in cooperation with the Massachusetts Highway Department. Place signs at the Fort Hill parking areas and on U.S. 6 to direct the public using the red maple swamp trail and the Skiff Hill trail to the expanded Hemenway Road parking area.

Fort Hill Access: To facilitate safer, more efficient access to the Fort Hill area for vehicles, bicycles, and pedestrians, undertake the following actions:

Improve safety by means of realignments for better sight distance and revised signing along U.S. 6 at Governor Prence and Hemenway Roads in cooperation with the Massachusetts Highway Department and the town of Eastham. Work with the town, the Cape Cod Commission, and the Highway Department to determine whether a traffic signal at the Governor Prence Road intersection would help control traffic and allow for safe turning.

To increase parking availability during peak periods, develop designated roadside (parallel) parking for 10 to 12 cars on the north side of Hemenway Road for people taking the red maple swamp trail or the Skiff Hill trail. Also, work with the town of Eastham to better manage stormwater in the Hemenway Landing parking lot to mitigate conditions that may be affecting Nauset Marsh.

Designate the upper lot at Fort Hill as overlook parking for no more than 20 minutes, not for people using trails.

Reduce illegal roadside parking along Fort Hill Road by methods such as barrier (fencing or stones) placement and additional law enforcement actions.

Improve trail signs between the lower parking lot, the Penniman house, and the upper parking lot to encourage more use of the existing trail spur.

Provide bicycle racks at several trail and historic structure staging areas.

Expand the hours of operation at the Penniman house and add site tours.

Institute an on-demand shuttle for scheduled tours of the Penniman house from the parking lot at the Salt Pond visitor center, with consideration of peak public use periods at the visitor center.

Bus parking: Prohibit buses and oversized vehicles from Fort Hill Road. Provide signs, a drop-off area, and a limited bus parking area on Governor Prence Road to accommodate these vehicles.

Restrooms: Build a replacement restroom or rehabilitate the existing restroom facilities at Skiff Hill to use waterless, composting toilets; make them accessible to people with disabilities.

Develop an architecturally compatible, universally accessible small restroom facility, preferably a waterless composting system, possibly within or adjacent to the Penniman barn.

In addition to the short-term actions above, the following long-term actions are proposed:

Parking: Consider providing additional parking at the end of Hemenway Road in conjunction with the town parking lot, such as a new lot on NPS property west of the existing lot and north of the road, pending wetlands and archeological clearances. Mitigate potential impacts to the marsh by installing parking lot drainage controls, such as catch basins with hoods.

Alternative additional parking solutions at Fort Hill: Consider the following actions (1) reconfigure the upper lot at Fort Hill to accommodate vehicle turn-around movements while maintaining the east-facing overlook for vehicles; (2) either leave the lower lot in its current condition, or (subject to archeological and wetlands clearances) develop a new parking area for approximately 15 cars on the west side of the Sylvanus Knowles house that could replace the existing lower lot and serve primarily as parking for the Penniman house, if feasible.

A trail link between Fort Hill and the Salt Pond visitor center: In collaboration with six intervening property owners, develop a 2-mile trail from the Salt Pond visitor center to the Hemenway Road parking area. The purpose of this trail would be to increase access options for walkers and bicyclists and to allow parking at the visitor center to be used by Fort Hill visitors. Trail easements would be sought to cross the six intervening private properties so as not to intrude on the owners' privacy or disturb natural features. Discussions regarding easements would be needed to determine the best trail alignment to accomplish this.

Trails and Viewpoints. To improve the experience for trail users, trails would be evaluated with respect to their alignment, grade, and desirable improvements. The Fort Hill trail, the red maple swamp trail, and the Skiff Hill trail would be improved to meet accessibility standards if possible, such as redesigning them with appropriate grades. For the trail surface, stabilized earth, gravel, or shells would be used; asphalt paving would be avoided as an incompatible material from an aesthetic and historical standpoint.

The Skiff Hill area and views: Improve interpretive waysides in the Skiff Hill area and reestablish views by trimming vegetation to be more consistent with the cultural landscape. Either improve the Skiff Hill kiosk/interpretive shelter or remove the structure and install additional wayside panels.

The Hemenway area: (1) Improve trail signs in cooperation with the town to orient the public and guide them from parking areas to various trail loops; and (2) connect a trail spur from the lower parking lot to the trail from Penniman house to the top of Fort Hill.

ACTIONS CONSIDERED BUT REJECTED

No Landscape Restoration — Allowing the traditionally open historic landscape to be overtaken by forest succession was not considered reasonable because it would significantly alter the current appearance of the area. Even though no formal management designation recognizes the cultural resource value of the landscape, this document supports the finding of the *Cultural Landscape Report* that the area is eligible for nomination to the National Register of Historic Places as a district.

New Parking Lot East of Penniman House — Developing a new parking lot south of Fort Hill Road and east of the Penniman house was proposed but was not recommended because of (1) the potential

impacts on the historic landscape and Nauset Archeological District National Historic Landmark, (2) its impacts on the viewshed between the Penniman house and Fort Hill, and (3) resistance from an adjacent private property owner. Enlarging the lower lot was rejected for similar reasons.

New Road to the Fort Hill Overlook — A new road up the west side of Fort Hill was proposed to provide a one-way loop for motorists to access the overlook. While this proposal would address the traffic congestion experienced at the upper lot, it was not recommended because of the major grading impacts associated with road construction on a steep hill.

Close Road up to the Fort Hill Overlook — The extension of Fort Hill Road past the Seth Knowles house to the overlook is recognized by the *Cultural Landscape Report* as an intrusion on the original historical setting. There was a proposal to close this extension to automobile traffic (either permanently or seasonally) and to remove the pavement in order to restore the historical scene. This action is not recommended in the *Cultural Landscape Report* or in this document because of the popularity of automobile accessibility to the overlook and its importance to the local community. Closing the road could also require that an alternate trail to the overlook be developed that would be accessible to persons with disabilities; such a trail would also substantially alter the hillside.

Remove All Parking — Moving all parking lots from the Fort Hill area to the west of the proposed historic district was considered and rejected because of the density of adjacent private development and the lack of available public lands in this area.

AFFECTED ENVIRONMENT

CULTURAL RESOURCES

Historically, development has been limited throughout the Fort Hill area. Traces of the Native American presence and structures reported by Champlain in 1605 have been identified. The 19th century salt works at the water's edge have vanished. Three of the original four 19th century residences and numerous stone walls used to divide farm plots are still evident.

Archeological Resources

In 1993 the Nauset Archeological District, which includes Fort Hill and five other sites, was designated a national historic landmark for "yielding or possessing the potential to yield nationally significant information on Historic Contact in the Northeast." This designation of the eastern portion of Fort Hill reflects the national significance of the Native American presence and early European contact. Although few specific archeological resources have been identified, the potential presence of such resources poses constraints on excavation and grading.

A large boulder that was possibly used as a sharpening or grinding stone by early inhabitants was found near Nauset Marsh and relocated to Skiff Hill in the early days of the national seashore. However, since the archeological context of this stone had already been lost to erosion, its exact use and real context will always be open to conjecture.

Historic Structures and Cultural Landscape

Historic residences include the Penniman house and barn (listed on the National Register of Historic Places), the Sylvanus Knowles house, and the Seth Knowles house. The Penniman house, an impressive French Second Empire style residence built in 1868, is a significant local landmark. The National Park Service owns the Penniman house, barn, and surrounding site. Funding limitations have reduced maintenance, resulting in less than desired levels of preservation and appearance.

The remarkable consistency of Fort Hill's agrarian landscape, the significance of the site to the Native American cultures, and its present qualities as a natural and scenic resource all give this area its special value as a cultural landscape and make it a prime attraction for public use and education. The Fort Hill area is considered by the National Park Service as eligible for the National Register of Historic Places as a historic district and is to be managed accordingly.

Ethnographic Resources

The Fort Hill area is important to Native Americans, represented by the Wampanoag Tribal Council, because of its notable prehistoric and historic uses. This is one of the most significant Native American sites on the Outer Cape. Fort Hill is part of an area with a long-term Native American presence. When Champlain visited Nauset Harbor in 1605, he described the harbor as "entirely surrounded by little houses, around each one of which there was as much land as the occupant needed for his support." According to the Nauset Archeological District nomination form, the overall

distribution of the landmark "roughly corresponded to the dispersed pattern of individual wigwams and cornfields depicted by Samuel de Champlain on his 1605 map." In 1620 a small expedition of Pilgrims also noted the presence of permanent Native American settlements around Nauset Harbor.

NATURAL RESOURCES

The entire Outer Cape is within the Massachusetts Coastal Management Zone. Nauset Marsh is bounded on the east by a barrier beach on the Atlantic Ocean. Fort Hill directly abuts Nauset Marsh.

Soils

The soils information for the Fort Hill area was collected from the USDA Natural Resources Conservation Service and from U.S. Geological Survey mapping for the area. The geology is generally characterized as being post-glacial Eastham Plain deposits, with some marsh and beach deposits.

The following are the predominant soil types:

> *Freetown and Swansea mucks* — Very gentle (0% – 1%) slopes, with very deep and very poorly drained soils on outwash plains and moraines. These soils occur in areas of glacial lake deposits and are poorly suited to woodlands because they are generally wet. Red maples commonly occur in these soil types.
>
> *Ipswich, Pawcatuck and Matunuck peats* — Very gentle (0% – 1%) slopes, with very deep and poorly drained soils that occur in tidal areas subject to daily saltwater inundation. These soils support tolerant grasses and wetland wildlife habitat.
>
> *Carver coarse sand* — Gently sloping (3% – 15%) soils that are excessively drained and generally located on the top of knobs and on outwash plains. These soils are poorly suited to pasture or cultivation. Common tree communities supported by Carver sands are pitch pine, scrub oak, and white oak.

The mucks and peats are characteristic of saltwater and freshwater marsh areas. They pose challenges for trail maintenance. The upland sandy soils are easily eroded and easily developed.

Air Quality

Cape Cod National Seashore has been designated a class II area under the Clean Air Act. The state may permit a moderate amount of air pollution as long as neither national ambient air quality standards nor the maximum allowed increase over established baseline concentrations is exceeded. The major air pollutants originating in the seashore are vehicle emissions (primary hydrocarbons, carbon monoxide, and nitrogen oxide), most of which are generated during periods of high visitation.

Ozone monitoring has been conducted annually on Cape Cod since 1997 in cooperation with the Massachusetts Department of Environmental Protection and the Environmental Protection Agency. The national ambient air quality standard for maximum hourly concentrations of ozone is 0.12 part per million (ppm). At the seashore monitoring station this level is exceeded more often than at any

other Massachusetts site, and ozone concentrations at the seashore have been among the highest reported in any national park system area (NPS 1992). Some national park system areas post health warnings for visitors on nonattainment days.

Evidence suggests that reduced growth and increased mortality of some sensitive species are occurring in heavily polluted national park system areas, perhaps decreasing species diversity. Ozone as low as 0.06 ppm is believed to cause foliar damage to plants. Other pollutants known to cause foliar injury are sulfur dioxide, hydrogen fluoride, and nitrogen dioxide (NPS 1992). Little is known about the potential impacts of existing air pollutants on natural resources.

Vegetation

The Fort Hill area contains at least seven plant communities, including open grassland and herbaceous cover, shrublands, hardwood forest, cedar/pitch pine forest, and freshwater and saltwater wetlands. Grassland encompasses much of the southeastern half of the area, with pockets of encroaching shrublands, mixed cedar, and pines on the eastern and southern banks of Fort Hill near Nauset Marsh. The hardwood forest, including the red maple swamp, covers much of the northwestern area of the site. The approximate area of these plant communities was estimated from a 1991 aerial photograph of Fort Hill:

Community Type	Area (Acres)
Mixed Grass	30.8
Cordgrass (salt marsh)	45.2
Reed (freshwater)	10.0
Red Maple	21.7
Shrub	13.7
Pitch Pine	11.3
Black Locust	9.2
Mixed Pine/Oak	4.0
Developed	5.3

The park has annually mowed the grassland portions of Fort Hill to maintain the open appearance. This mowing has limited the encroachment of shrubs and trees. Prescribed burns reportedly took place in this grassland area prior to 1975 and again during 1977–78. An area of encroaching forest growth on the west side of Fort Hill was cleared in the early 1990s after many trees were downed by a strong winter storm.

There are no known federal or state listed threatened or endangered plant species on the property (see appendix B).

Water Quality

Nauset Marsh is an extensive saltwater marsh bordering Fort Hill. Water quality is very good, and the marsh is a prime fishing and shellfishing area.

Potable water quality at Skiff Hill, where the restrooms are, is potentially affected by the proximity to Nauset Marsh. The groundwater may be shallow in relation to nearby underlying saltwater. Also, current state requirements call for chlorination of all public water supplies.

Wetlands

The Fort Hill area has three freshwater wetlands in the open field area and a large red maple swamp. It is also flanked by estuarine, intertidal, and subtidal wetlands that make up Nauset Marsh on its eastern and southern borders. The red maple swamp exists in the northwestern sector, and an upland wetland is in the northeastern sector of the property.

Floodplains

Based on flood insurance rate maps from the Federal Emergency Management Agency, the 100-year floodplain appears to coincide with the present shoreline at the perimeter of Fort Hill and the Hemenway Landing parking area. The 500-year floodplain encompasses the red maple swamp area and the low-lying areas between the swamp and Hemenway Landing, including the parking area. There is also a small area on the east side of Fort Hill and contiguous with Nauset Marsh that is within the 500-year floodplain.

Wildlife

The animal populations at Fort Hill include white-tailed deer and small mammals such as fox, coyote, field mice, skunk, and possum. Songbirds are abundant, including nesting bobolinks — an uncommon species requiring grassland areas for nesting habitat. Fort Hill is frequented by many species of hawks that feed on abundant rodent populations. Invertebrates are abundant, with species including migrating monarch butterflies, damselflies, and moths. Amphibians and reptiles may also be present or occur in transient populations, including salamanders, frogs, box turtles, and rat snakes. No formal inventory has been completed for the area to document all species and their abundance.

In a letter dated July 28, 1997, the U.S. Fish and Wildlife Service said that no federally listed or proposed threatened or endangered species are known in the project area except for occasional transient bald eagles *(Haliaeetus leucocephalus)* or peregrine falcons *(Falco peregrinus)*. The letter also stated that neither a biological assessment nor further consultation under section 7 of the act will be required (see appendix B).

According to the Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program, the only state-listed rare wildlife species in the Fort Hill area (in the vicinity of the red maple swamp) is the spotted turtle *(Clemmys guttata;* see appendix B). This species is protected under the Massachusetts Endangered Species Act.

PUBLIC USE AND ACCESS

Interpretation and Education

The Penniman house and barn are open to the public three to five days per week during the spring and fall, with two tours daily. Organized ranger-led walks are scheduled occasionally during the summer season. Volunteer interpreters also contribute substantially to the interpretive program.

Fort Hill and the red maple swamp are interpreted by pamphlets available onsite and at public contact centers. There are also wayside panels at the Penniman house and Skiff Hill. An informational map is

posted at the upper parking lot. Trail markers along the Fort Hill and red maple swamp trails identify specific plant species. Posted information about Native Americans, land use, and the appearance of the landscape in the Penniman and Knowles times is limited. There are no wayside exhibits in the area other than the one at the Penniman house.

Access, Parking, and Support Facilities

Fort Hill is served from the north by Hemenway Road and from the south by Governor Prence Road and its extension, which is known as Fort Hill Road. The main entrance at Governor Prence/Fort Hill Road is signed on U.S. 6 and provides direct access to both the Penniman house and the Fort Hill overlook. The Eastham information booth is at the intersection of U.S. 6 and Fort Hill Road. Fort Hill Road leads past the Penniman house and a lower parking lot with 14 spaces. The road continues 0.25 mile to the top of Fort Hill and another lot with 12 spaces. Fort Hill's access and 26 parking spaces are generally adequate but are undersized for peak use conditions.

Hemenway Road is a town-owned road serving a town landing on Nauset Marsh, with a boat ramp and a 40-car parking lot primarily used by Eastham residents. This road is not signed for public access along U.S. 6. Although there is a trail access point near Hemenway Landing for the national seashore's red maple swamp trail, the Skiff Hill overlook, and other Fort Hill trails, there is no designated trailhead parking.

The only restroom facility is an NPS-built and maintained facility along the Skiff Hill trail near the Hemenway Landing access. This comfort station, which is open seasonally, is almost 0.3 mile from parking lots on Fort Hill Road, with no signs or directions for the public; it is used mostly by Eastham residents coming from Hemenway Landing.

Trails and Viewpoints

The Fort Hill/Skiff Hill area has a total of about 1.75 miles of hiking trail, including:

- the red maple swamp trail (including a boardwalk) — 0.5 mile
- the Fort Hill trail (Fort Hill / Skiff Hill / Penniman house loop) — 1 mile
- the Skiff Hill trail (asphalt paved) — 0.15 mile
- a loop trail along the marsh along the southeastern part of the site that has been created by repeated use, is causing erosion, and crosses through patches of poison ivy

Trails vary from 3′ to 6′ wide, with no special surface treatment. Some more heavily used trail sections are surfaced with gravel, crushed shells, or wood chips; lesser used trails may have grass. Trail access is from the upper and lower Fort Hill parking lots and Hemenway Landing. The Skiff Hill trail and approximately 400′ of the red maple swamp trail are accessible to people with disabilities, with access from Hemenway Landing. The gradient on the Skiff Hill trail, however, exceeds accessibility standards because of topography and the present alignment.

The Fort Hill summit is only 40′ above sea level, but it offers an outstanding panorama of the open fields, Nauset Marsh, surrounding uplands, and the Atlantic Ocean beyond. This viewpoint from the upper Fort Hill parking lot is extremely popular, due in part because people can drive there. The Skiff Hill viewing area offers a framed viewpoint of Salt Pond Bay and was developed with an overhead

shelter built on a concrete pad. This viewpoint is accessed by the Skiff Hill trail from Hemenway Landing.

Public Use

In 1992 Fort Hill was the third most popular nonbeach site in Cape Cod National Seashore, with almost 325,000 visits. By comparison, the Salt Pond visitor center had 632,000 visits, the Province Lands visitor center 355,300 visits, and the Marconi site 168,000 visits. Visitation to the Fort Hill area, unlike that at most other national seashore facilities, is distributed throughout the year. More than 30% of the Fort Hill visits are in the off-season (November through April), compared to only about 20% of the visits during the off-season at other nonbeach sites.

A 1994 public use survey determined that driving scenic roads and viewing scenery were the two most popular activities for people visiting the national seashore (Manning). This finding accounts for the substantial number of people coming to the Fort Hill area. The survey also found that about 50% of all visitors and local residents hike within the seashore every year, and more than 25% visit historic features or houses. Of those surveyed, 20% of visitors and 40% of local residents visit the Fort Hill area annually. The Fort Hill trail is the most popular, and the red maple swamp trail is the fifth most popular of 11 nature trails identified by the public within the seashore.

Traffic on Governor Prence Road to Fort Hill has been monitored in August (the peak season) at 70–115 cars/hour and 500–700 cars per day, and in May at 30–35 cars/hour and 200–300 cars/day. Buses and oversized vehicles are not permitted on Fort Hill Road, so they are not factored into the vehicle counts. Traffic on Hemenway Road has been monitored at about 50 vehicles per hour during August (380–420 vehicles per day) and about 20 vehicles per hour in May (130–140 vehicles per day).

The National Park Service has estimated two capacity use levels for Fort Hill based on parking and facility capacities, while still preserving the historical setting and public experience. If peak capacity is based on existing parking, approximately 65 people could be accommodated at one time or about 700 per day, as shown below. However, if peak capacity is based on the existing facilities, then approximately 170 people could be accommodated, or 1,530 people per day.

Area	Visitor Capacity Based on Existing Parking	Visitor Capacity Based on Existing Facilities
Trail use (1.75 miles of trails)	40	115
Fort Hill overlook	15	30
Skiff Hill overlook	5	10
Penniman house	5	15
Total Use at One Time	65	170
Total Daily Use	700	1,530

The public use counts suggest that the relatively high use in terms of numbers of vehicles indicates that many, if not most, of the visits are short duration automobile trips for people to see the Penniman house and the Fort Hill overlook. Parking capacity is exceeded 40–60 days per year, so parking would need to be increased to 60 spaces total to meet the potential capacity of public use facilities, or additional means of getting to the area would need to be provided.

LOCAL COMMUNITY

The educational and recreational opportunities in the Fort Hill area are used by both residents and tourists to Eastham and the Outer Cape. The economic impacts of public use specifically at Fort Hill have not been assessed, although the continued availability of these opportunities clearly would have a beneficial impact on the local and regional economy given the sales and employment benefits associated with the national seashore.

Local residents also value the public use opportunities that the Fort Hill area offers.

Adjacent Town Facilities

The Hemenway Landing and parking lot, which are owned and managed by the town of Eastham, are heavily used in summer for small boat access and shellfishing. One terminus of the red maple swamp trail leads to this parking area. The town has agreed that some additional parking for general trail use at Fort Hill is appropriate. In 1995 the Eastham Conservation Commission approved 10 to 12 additional spaces for this purpose. There is some concern that auto-related runoff from the parking lot may contribute to pollution of the marsh; mitigation measures may be warranted.

Private Properties

Private homes and land abut the national seashore boundary to the west; two private improved properties are within the Fort Hill area. Six private properties within the national seashore boundary lie between Fort Hill and the Salt Pond visitor center. Property owners often have interests that conflict with adjacent public uses. Privacy and resource protection issues are acknowledged interests of Penniman house neighbors that are addressed in public use and development recommendations.

NATIONAL SEASHORE MANAGEMENT AND OPERATIONS

NPS law enforcement patrols and waste removal are routine. Interpretive staff are not available for regularly staffing of the Penniman house. Volunteers are largely responsible for conducting house tours during the summer and periodically in the spring and fall.

NPS staff routinely mow the trails and fields, and they periodically clear trees and shrubs to restore portions of the open cultural landscape. While a program to alternately mow and use prescribed burns has been considered for several years, it has not been implemented. The use of prescribed burning would require that a site-specific fire-management action plan be developed. The national seashore's fire equipment is adequate to support prescribed burn operations. The seashore maintains a fire cache system that includes:

- 4 four-wheel-drive fire engines (capacities: 1,000 gallons, 500 gallons, and two 100 gallons)
- a 3,000′ wildland fire hose
- 5 portable pumps
- 5 portable water tanks (capacities: 1,000 gallons, two 600 gallons, and two 75 gallons)

The Massachusetts Department of Public Health requires that potable water be available at public restrooms, although exceptions have been made for composting toilets. The nearest NPS restroom is at Skiff Hill, and it is closed seasonally. This facility is on a public water system, and there are no current well or septic problems. The water pipes are aging, and the septic system is between the restroom building and the red maple swamp.

ENVIRONMENTAL CONSEQUENCES

NO-ACTION ALTERNATIVE / EXISTING CONDITIONS

Impacts on Cultural Resources

Analysis. Continuing current programs to preserve, manage, and maintain cultural resources would not be sufficient to stop the gradual deterioration of historic structures and the cultural landscape. Without a significant increase in maintenance efforts and preservation funds, the overall condition of the property would continue to decline over the long term. Insufficient funding to rehabilitate historic landscape features, like stone walls, would ultimately lead to their loss. Over the long term progressive forest succession would alter the historical scene.

Archeological resources would not be subject to potential damage as a result of construction activities.

Conclusion. Historic structures and the cultural landscape at Fort Hill would continue to gradually deteriorate without programs and funding to maintain them and ensure their preservation. Forest succession would gradually alter the significant aspects of the cultural landscape.

Impacts on Natural Resources

Analysis. Open fields and trail areas would continue to be mowed. Mowing can have detrimental impacts to bird species, especially without coordination and planning around certain breeding and nesting seasons. Bobolinks and woodcocks, both uncommon ground-nesting species, are known to use Fort Hill's grasslands. Mowing causes severe impacts to these populations if done early in the season, which can occur due to the need to schedule workloads. Other species affected include field sparrows, killdeer, meadowlark, and song sparrow.

Mowing can also eliminate habitat for a variety of invertebrates using Fort Hill's open fields and associated habitats, such as monarch butterflies in late summer that use milkweed species and numerous dragonflies, including some that are very uncommon. Current mowing practices, while keeping woody plants low and under control, actually encourage and maintain the presence of trees and shrubs and eliminate annual and perennial herbaceous plants, which provide better food and shelter for invertebrates and small mammals.

Mowing adversely impacts species diversity by not allowing for certain nonnatives to be eliminated. Mowing also prevents seed and soil treatment, resulting in lower species diversity and encouraging more woody material than is found in areas that are burned, mowed, and allowed to lie fallow in rotation. Without this rotation, a single treatment decreases, rather than fosters, species richness and diversity.

Mowing is a means to quickly maintain the cultural landscape, requiring only a few days labor. However, this does not continually meet all the open field management guidelines outlined in the *Cultural Landscape Report* for Fort Hill.

Stormwater runoff from the Hemenway Landing parking area into the adjacent Nauset Marsh would continue, with potential silt and hydrocarbon impacts on the marsh. Because there are no drainage structures, there would be no means for managing a fuel spill at the parking lot if one occurred.

There could be adverse impacts to the red maple swamp if the existing septic system at Skiff Hill failed. There are no other known impacts on water resources under this alternative. Water quality and quantity in freshwater and estuarine wetland environments would be the same as current conditions. There are no known impacts on floodplains under this alternative.

Conclusion. Current mowing practices (without rotational burn and fallow periods) can have detrimental effects on habitat and species diversity. Stormwater runoff from the Hemenway Landing parking area could be impacting Nauset Marsh, and the lack of drainage structures at the parking area would not provide any means for managing a fuel spill. There are no known impacts to water resources or floodplains.

Impacts on Public Use and Access

Analysis. The two major access routes to Fort Hill (Governor Prence Road and Hemenway Road) would remain, and congestion would still occur at the existing parking areas during peak periods. Safety issues on U.S. 6 would be the responsibility of the Massachusetts Highway Department. Public parking would continue to be available at Fort Hill and Hemenway Landing. Because people would still rely on private vehicles for access to Fort Hill, parking would continue to be inadequate on 40–60 days per year.

Public access to the Penniman house would be limited by the availability of volunteers or NPS staff, consequently, an unknown number of people would be unable to tour this historic structure and learn its significance to the history of Fort Hill and this part of the Cape.

Interpreting the site's Native American story at the wayside exhibit at the Skiff Hill overlook would give people a limited understanding of their way of life and contributions to the present-day way of life on the Cape.

Wayside exhibits and trail brochures would provide limited self-guided interpretive information, not conveying all of the important stories associated with Fort Hill.

Current trail problems, including poor tread conditions, dilapidated steps, inadequate drainage, and erosion potential, would continue to adversely affect the experiences of users. Poor alignments or excessive grades often intensify these conditions. Maintaining the trail system at current standards would prevent people with disabilities from enjoying other perspectives of the Fort Hill landscape. A lack of seating along trails and at minor viewpoints detracts from the experience of some trail users, particularly the elderly.

The overlook would still provide panoramic views of Nauset Marsh for the public, although insufficient parking for trail users at other locations could result in overlook parking spaces being used for long periods by hikers. No new public restroom facilities would be developed in the immediate area, affecting the quality of the experience for some people.

Conclusion. Access to Fort Hill would remain confusing for nonresidents; U.S. 6 intersections would remain potential safety hazards for vehicles entering and leaving the Fort Hill area. With primary

access by private vehicle, parking would continue to be inadequate 40–60 days per year. Public access to the Penniman house would depend on when volunteers were available, limiting opportunities for the public to fully see and appreciate this historic structure. Interpretive programs would not fully convey the various stories associated with the site. Inadequate trail conditions would limit use by some visitors and present unpleasant conditions for other visitors.

Impacts on the Surrounding Community

Analysis. Public access to the site would continue to cause traffic congestion at peak times, particularly on the 40–60 days per year when parking spaces are filled, creating annoyances for the private owners of the two Knowles houses. No additional beneficial or adverse impacts are anticipated on the surrounding community.

Conclusion. Private owners of the Knowles houses would continue to be affected by traffic congestion and parking during peak use times.

Impacts on National Seashore Management and Operations

Analysis. The site would be managed at existing levels, and no new staff or funding commitments would be made. Rangers would be periodically placed at Fort Hill during peak times to control traffic. Tours of the Penniman house and barn would continue to be conducted by volunteers.

Conclusion. National seashore management and operations would not be changed.

PREFERRED ALTERNATIVE

Impacts on Cultural Resources

Analysis. For any facility development in the Fort Hill area, strict archeological and landscape preservation guidelines would be followed. The use of previously disturbed areas would be emphasized, and new parking or support facilities would be located outside sensitive cultural resource areas. Archeological survey work would precede any construction activities and would help to determine how facilities would be designed. Some project elements could be eliminated if their effects could not be mitigated and archeological information could be irretrievably lost.

The condition of the Penniman house and barn would be improved through an active and prescriptive management program focused on protecting the house foundation and improving pedestrian circulation through the grounds.

Rehabilitating the cultural landscape and maintaining 40–50 acres of historic agricultural fields through mowing, prescribed burning, and alternating periods of cultivation and dormancy would protect the historical scene. Preserving historic stone walls would further contribute to the site's historical authenticity.

The archeological resources of Fort Hill would continue to be protected, with monitoring for signs of disturbance, in accordance with the Archeological Resources Protection Act. It is anticipated that several parking improvement activities would involve grading or ground disturbance that could

threaten or impact these resources. These include the reconfiguration of the upper lot, the possible construction of an alternative lot at the Knowles house, and possibly the bus and vehicle parking areas at Hemenway Landing. Protective measures in advance of or during construction would help ensure the protection of Native American and early European archeological resources.

Rehabilitating the Penniman house, barn, and surrounding structures, such as the retaining walls, along with protecting the house and barn from public use impacts by designating walks and pathways around the site, would help ensure the long-term preservation of these historic resources.

No cultural resources are expected to be adversely affected by the prescribed burn program, and no physical or visual adverse effects on stone walls are expected. For instance, prescribed burns on Naushon Island in Buzzards Bay, Massachusetts, during 1994 and 1996 did not blacken or crack stone walls. Heat effects on coarse soils and buried artifacts are minimal when grassland fuels are burned.

Conclusion. The cultural resources and landscape of the Fort Hill area would benefit over the long term as a result of actions to rehabilitate and preserve the historic structures and to maintain the appearance of the landscape to resemble historical conditions. Maintaining 40–50 acres of grassland through mowing, prescribed burns, and alternating periods of cultivation and dormancy would help maintain the historical scene.

Impacts on Natural Resources

Analysis. Approximately 40–50 acres of grasslands would be maintained by alternately using prescribed burns, mowing, and allowing fields to go dormant. A mow and burn rotation allows the fields to lie fallow in different increments, supporting the diversity of habitat for invertebrates, small mammals, ground-nesting birds, reptiles, and amphibians by leaving areas open and intact over the course of seasonal rotation. The fallow areas would provide escape cover for small mammals, leading to increased populations and benefiting migrating and resident raptors (such as hawks and owls) that use Fort Hill for hunting. Habitat for songbirds such as bobolinks, vesper sparrows, and grasshopper sparrows would be enhanced. Monarchs and many other butterflies and insects are attracted to the common milkweed plants that are abundant at Fort Hill during the late summer. Leaving some areas fallow while other management units were mowed or burned seasonally would accommodate these species throughout their breeding season. Also, scheduling mowing before July and after September would reduce adverse effects on these species.

The rotational burning of annual and perennial herbaceous species would result in increased wildlife habitat and plant community diversity in the Fort Hill landscape. Fire would also enhance soil nutrients and reduce woody and weedy species, allowing for native plant diversity hardiness in burned areas. In addition, burned areas would offer short-term benefits to coyotes, foxes, hawks, and other predators, with increased hunting opportunities in areas cleared of vegetation.

Some reptiles and amphibians in the area, such as turtles, frogs, and salamanders, could be negatively affected by fire. Small mammals such as mice and moles might also be affected during fire treatments. To alleviate this concern, park personnel, including biologists, would sweep the field units before a burn and move any animals found before ignition. This impact is short term and minor when compared to the increased habitat that would be created from a rotation management system, ultimately increasing species of plants and animals in the field area.

Up to 11 acres of forest cover would be cleared to further reestablish the open fields present during the historical period. This would change an area forested with locust, black cherry, and red cedar trees to an open grassland area. This would not constitute a major loss of wildlife habitat. No impacts to wetlands or floodplains are anticipated from this clearing.

Prescribed burns would be conducted in accordance with the national seashore's *Fire Management Plan* and the proposed site-specific burn plan described beginning on page 11. An air-quality exemption permit from the Massachusetts Department of Environmental Management would be obtained for each prescribed burn, and pre- and post-fire monitoring of plant and animal species would be conducted to determine any effects. Short-term adverse impacts on air quality and visibility are anticipated from prescribed burns. To avoid these effects, burns would only be conducted when atmospheric conditions were favorable.

In addition, the burn plans would accommodate a buffer of vegetation around all wetlands and the edge of the area adjoining Nauset Marsh. This vegetation buffer would provide escape habitat and maintain a natural filter for short-term runoff into wet areas after burning or mowing. No major short- or long-term wetlands impacts from burning are anticipated, although there would be some effect within the state-designated 100-foot wetland buffer area. To mitigate potential impacts, the fire line would be established outside the buffer area to maintain vegetative cover for filtering runoff and to provide escape cover for wildlife. No wetlands would be altered or manipulated in any management unit.

Long-term impacts of rotational management include increased diversity of open field plant habitats that benefit wildlife species and native plant diversity. Fire would release soil nutrients and reduce weeds, thus eliminating the need to use artificial fertilizers, herbicides, and other potential treatments, including adding lime near a sensitive coastal marsh system.

Constructing a 2-mile trail from the Salt Pond visitor center to Fort Hill would impact up to 1 acre of natural habitat. This would include the loss of some trees in a pitch pine and oak forest and the loss of some understory grass and shrub species such as inkberry, bayberry, highbush blueberry, and beardgrass along the corridor. Soils would be compacted immediately along the trail corridor, increasing runoff and erosion potential and possibly requiring water bars and other designs to reduce damage to nearby vegetation. No major loss of wildlife habitat would occur. Mitigation would include fencing and signs in areas to reduce increased social trail use or other impacts to adjacent habitat next to the trail as necessary. No impacts to wetlands or floodplains are anticipated.

Installing new composting toilets at the Skiff Hill restroom would remove the potential for adverse impacts on the red maple swamp if the present septic system failed.

No known state or federal rare, threatened, or endangered plants or animals would be affected if spotted turtles were not found to be in the areas subject to prescribed burning.

Prescribed burns and any construction activities within wetland resource areas would be conducted in accordance with the Massachusetts Wetlands Protection Act and in coordination with the Eastham Conservation Commission. No additional facilities except for an unpaved parking area for buses would be constructed in the 100-year floodplain. Trail upgrades in the 100-year and 500-year floodplains would not affect the flood storage capacity at Fort Hill. About 1,600 square feet of vegetation and soils would be disturbed in the wetland buffer zone as a result of constructing additional parking at Hemenway Landing.

Drainage improvements at the Hemenway Landing parking area, consisting of grading, paving, and installing curbs and catch basins with hoods, would effectively manage stormwater runoff into Nauset Marsh. Catch basins for runoff would remove silt and prevent the release of any fuel- or oil-contaminated runoff. This drainage system would also provide a means for preventing uncontrolled discharges into the marsh resulting from a potential fuel spill in the parking area.

Conclusion. Maintaining 40–50 acres of grassland through a rotational program of mowing, prescribed burns, and periods of cultivation and dormancy would ensure that vegetative communities at Fort Hill would persist approximately as they are now and would result in increased wildlife habitat and plant community diversity. Fire would also enhance soil nutrients and reduce woody and weedy species, allowing for native plant diversity hardiness in burned areas. Short-term adverse air quality impacts during prescribed burns would be avoided by conducting burns only under favorable atmospheric conditions. Maintaining a vegetation buffer around all wetlands and the edge of the area adjoining Nauset Marsh would provide escape habitat and maintain a natural filter for short-term runoff. No major short- or long-term wetlands impacts are anticipated. Constructing a trail from the Salt Pond visitor center to Fort Hill would not have any major effects on wildlife, vegetation, or wetlands. Constructing an unpaved bus parking area and upgrading trails would not adversely affect the 100-year or 500-year floodplain. Drainage improvements at the Hemenway Landing parking area would mitigate the effects of silt and fuel- or oil-contaminated runoff from entering Nauset Marsh.

Impacts on Public Use and Access

Analysis. Better directional signs along U.S. 6 would make it easier for the public to find their way to the site. Improving signs and the Governor Prence Road and Hemenway Road intersections on U.S. 6, in cooperation with the Massachusetts Highway Department, would reduce safety hazards.

Offering an on-demand shuttle service from the Salt Pond visitor center for scheduled tours and events at Fort Hill, along with developing a walking trail from the visitor center, would help reduce demand for private vehicle parking spaces at Fort Hill. Adding 10–12 parking spaces along Hemenway Road for trail users would help alleviate congestion during peak use periods at the town landing; however, additional parking could also increase overall traffic. Limiting bus parking to the designated area on Governor Prence Road and not allowing bus access onto Fort Hill Road would minimize traffic congestion at Fort Hill.

Interpretation at Fort Hill would be enhanced, particularly with respect to Native American culture and early European stories. Native American stories would be developed in consultation with the Mashpee Wampanoag Tribal Council.

Improved trail maps and markings would make it easier for people to learn about and enjoy the site. Trail use would be focused to begin and end in the Hemenway area. Rehabilitating or constructing restroom facilities not requiring water at the Hemenway area would meet a public need and would be in conformance with Massachusetts water laws. Providing a restroom inside or near the Penniman barn that would be universally accessible would make experiences at the site more pleasant.

Improving the alignments and grades of the Fort Hill trail, the red maple swamp trail, and the Skiff Hill trail would make them easier and more enjoyable for people to use. Improving views at the Skiff Hill area would offer pleasant opportunities for people to enjoy Nauset Marsh and the Fort Hill cultural landscape.

Conclusion. Public use and access would be enhanced as a result of better directional signs, intersection improvements on U.S. 6, alternative means of access, expanded interpretive programs, realigned trails, and restroom facilities. People with disabilities would be able to tour the Penniman house and take advantage of short trail sections that would provide panoramic views of Nauset Marsh and the Fort Hill landscape.

Impacts on the Surrounding Community

Analysis. Providing additional parking along Hemenway Road would help alleviate congestion at both Fort Hill and Hemenway Landing during peak periods, reducing traffic and parking impacts on private property owners. Hemenway Road and Landing are town-owned, therefore town lands would be used to develop the parking areas under an agreement with the town of Eastham. Also providing a shuttle service and trail from the Salt Pond visitor center could further help reduce vehicle traffic on Hemenway Road and Governor Prence Road and would provide a guided visit of limited time, therefore minimizing adverse effects on residents.

A new trail connection between the Salt Pond visitor center and Fort Hill would cross several property owners' land, and trail easements would be needed; efforts to mitigate any potential adverse effects would be made, such as a trail alignment away from residences, clear trail delineations, trail markings, and posting of no trespassing signs. Modest public use increases would be expected due to the trail connection.

The trail connection between the visitor center and Hemenway Landing would be over 2 miles; therefore, only modest use would be expected. Impacts on neighbors could include a perceived loss of privacy and possible trespass away from the defined trail alignment.

Conducting prescribed burns only under favorable wind and weather conditions and not during the summer would minimize adverse effects from smoke on nearby residents and vehicular traffic on U.S. 6.

Conclusion. Providing additional parking on Hemenway Road and alternative means of access to Fort Hill would alleviate traffic impacts on local residents. Conducting burns only at certain times and under favorable weather conditions would minimize adverse effects on nearby residents. Developing a trail from the Salt Pond visitor center to Fort Hill would affect several property owners and require trail easements.

Impacts on National Seashore Management and Operations

Analysis. Providing consistent maintenance for the Fort Hill structures and landscape would require the commitment of additional NPS financial and staff resources (see appendix A). This would either require special project funding or a reassignment of national seashore priorities, with the possibility that other seashore resources could be adversely affected if maintenance, ranger, or other personnel were redirected to the Fort Hill area.

Prescribed burning operations (ignition, burning, and mop-up) at Fort Hill could be accomplished by using regularly scheduled and specially programmed personnel, with little to no additional personnel costs. However, additional funding to cover full program management costs might be necessary.

Conclusion. Additional NPS financial and staff resources would have to be directed to the Fort Hill area in order to provide ongoing visitor services and the maintenance of historic structures and the cultural landscape.

Cumulative Impacts

Preserving and interpreting the cultural landscape at Fort Hill, in combination with other cultural resource management actions proposed by the *General Management Plan* and historic preservation programs underway in local communities, would have a beneficial cumulative impact on preserving cultural heritage on the Outer Cape.

Eliminating the need to use artificial fertilizers as a result of prescribed burns would have a minor positive cumulative impact on park and coastal water quality as the herbaceous layer would also decrease runoff into wetlands and marshes.

Trail improvements, in conjunction with the Cape Cod Pathways program, would minimally increase walking opportunities on the Cape.

CONSULTATION AND COORDINATION

SUMMARY OF PUBLIC INVOLVEMENT

The residents of Eastham and the outer Cape Cod were involved in the process of analyzing site issues and evaluating potential management alternatives beginning with informal discussions in 1993 and continuing with the preparation of the *Cultural Landscape Report* in 1994.

In February 1997 a preliminary site plan was circulated to a group of adjacent landowners, local residents, special interest groups, and agency representatives. A public workshop was held March 12, 1997, with this group and representative national seashore staff to critique this preliminary site plan and brainstorm alternative actions. Comments and suggestions from that workshop have been incorporated into this document.

This *Site Plan and Environmental Assessment* will be distributed to adjacent property owners and other interested parties for a 30-day review period. Public meetings about the site plan will be announced in press releases to local and regional newspapers and radio stations, and in letters to interested parties.

AGENCY AND ORGANIZATION CONSULTATION

The following agencies and organizations were consulted during the development of this draft site plan or will be contacted during the plan's public review period:

Federal Agencies
- Advisory Council on Historic Preservation
- U.S. Department of Agriculture, Natural Resources Conservation Service
- U.S. Department of the Interior, U.S. Fish and Wildlife Service

Mashpee Wampanoag Tribal Council and Wampanoag Tribe of Gay Head (Aquinnah)

State Agencies
- Massachusetts Coastal Zone Management
- Massachusetts Natural Heritage and Endangered Species Program
- Massachusetts State Historic Preservation Office

Local Agencies and Organizations
- Association for the Preservation of Cape Cod
- Cape Cod Commission
- Eastham, Town of
- Eastham Historical Commission
- Eastham Historical Society
- Eastham Forum
- Eastham Chamber of Commerce
- Orleans Historical Society

COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS

In developing this document the National Park Service has complied with all applicable laws and executive orders, including those listed below. The implementation of an approved plan will also be done in compliance with these laws and regulations.

GENERAL LEGISLATION

National Environmental Policy Act of 1969 — The National Environmental Policy Act requires the consideration of the environmental effects of proposed federal actions. The act also ensures that environmental information is available to public officials and members of the public before decisions are made and before actions are taken.

This *Site Plan and Environmental Assessment* describes the preferred alternative for the Fort Hill area, as well as the no-action alternative, and it considers potential environmental consequences of the alternatives.

Americans with Disabilities Act of 1990 — The Americans with Disabilities Act establishes federal guidelines that define requirements for disabled access to parking facilities, pathways, and buildings. The act would apply to the implementation of some aspects of this project. All new structures and facilities at Fort Hill would be in full compliance with the act.

NATURAL RESOURCES

Clean Air Act, as Amended (42 USC 7401 et seq.) — Cape Cod National Seashore is designated a class II clean air area. Maximum allowable increases of sulfur dioxide, particulate matter, and nitrogen dioxides beyond baseline concentrations established for class II areas cannot be exceeded. Class II increments allow modest industrial activities in the vicinity of a park. Section 118 of the act requires all federal facilities to comply with federal, state, and local air pollution control laws and regulations. Cape Cod National Seashore would work with the Massachusetts Department of Environmental Protection to ensure that all activities in the national seashore met the requirements of the state's air quality implementation plan.

One or two smoke episodes associated with annual prescribed burns are not expected to have a significant impact on regional air quality based on known modeling techniques. Therefore, the alternatives are compatible with the requirements of the Clean Air Act.

Coastal Zone Management Act of 1972 and Coastal Barrier Resources Act (1982), Both as Amended in 1990 — All of Cape Cod lies within the Massachusetts coastal zone; however, all federal activities related to marine resources must be consistent with Massachusetts coastal zone management policies. These policies recognize the ecological significance of coastal waters and strive to protect both the water quality and the integrity of significant resource areas. A consistency determination request will be submitted to the Cape and Islands coordinator for Massachusetts coastal zone

management concurrent with the issuance of this *Site Plan and Environmental Assessment* for public review.

Endangered Species Act of 1973 — Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of any listed species or critical habitat for listed species. The letter of July 28, 1997, documenting the agency's determination about threatened or endangered species, is reprinted in appendix B.

No adverse effects as a result of this plan on any federally listed or proposed threatened or endangered species or critical habitat have been identified.

Federal Water Pollution Control Act, as amended, Clean Water Act of 1977, and Water Quality Act of 1987 (33 USC 1251–1376) — Proposed actions would have little if any negative effect on water quality. Any construction would comply with the requirements of sections 401 and 404 of the Clean Water Act and other applicable federal, state, and local regulations. Permits to comply with these sections are not anticipated. State and local reviews of any projects with potential wetland impacts would continue. Any actions proposed within the wetland buffer zone protected under the Massachusetts Wetlands Protection Act, such as parking lot construction and prescribed burning, would be cleared with the Town Conservation Commission.

Executive Orders 11988 ("Floodplain Management") and 11990 ("Protection of Wetlands") — Executive Order 11988 directs federal agencies to avoid construction within the 100-year floodplain unless no other practical alternative exists. Executive Order 11990 requires federal agencies to avoid, where possible, impacts on wetlands. All of the alternatives are compatible with these executive orders. As previously stated, compliance with the Massachusetts Wetlands Protection Act would satisfy compliance with these executive orders. Work is anticipated in the 100-foot wetland buffer zone only.

Massachusetts Natural Heritage and Endangered Species Program — As required by NPS *Management Policies,* the National Park Service will cooperate with the state to ensure that state-listed species within the national seashore are protected. In a letter dated July 30, 1997, the Natural Heritage and Endangered Species Program of the Massachusetts Division of Fisheries provided a listing of state listed or proposed threatened and endangered species in the project area (see appendix B).

CULTURAL RESOURCES

National Historic Preservation Act of 1966, as Amended — As part of its cultural resource management responsibilities under section 110 of the National Historic Preservation Act (16 USC 470), as amended, the National Park Service inventories and evaluates all cultural resources on lands under its jurisdiction or that may be affected by agency actions. Cultural resources are evaluated by applying the criteria for inclusion on the National Register of Historic Places.

Section 106 of the act establishes the obligations of the federal government regarding activities proposed for or affecting properties on or eligible for listing on the national register. 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 and the state historic preservation officer an

opportunity to comment. The Nauset Archeological District National Historic Landmark, of which the Fort Hill area is a part, is subject to special agency requirements under 36 CFR 800.10. Also, section 110 of the act requires the National Park Service to "undertake such planning and actions as may be necessary to minimize harm to any NHL that may be directly or adversely affected by an undertaking." The Advisory Council on Historic Preservation and the state historic preservation officer will receive copies of this plan as their opportunity to comment.

All ground-disturbing actions will be preceded by an archeological evaluation to determine the level of archeological investigation required before any construction can begin. If any such resources are identified, the state historic preservation officer and the National Park Service will evaluate their potential for inclusion on the National Register of Historic Places. If any resources are determined eligible for listing, appropriate measures will be undertaken to preserve them. Archeological evaluation will be carried out before, or in conjunction with, construction.

Archeological Resources Protection Act of 1979 — The National Park Service has identified archeological resources in the project area. The Archeological Resources Protection Act requires that archeological resources be identified and that proper permits be obtained prior to excavating any resources.

Native American Graves Protection and Repatriation Act of 1990 — The Native American Graves Protection and Repatriation Act of 1990 requires consultation with certain Native American communities if circumstances regarding human remains, associated artifacts, or objects of cultural patrimony arise.

The significance of the Fort Hill area to the history and spiritual beliefs of the Native American culture on Cape Cod needs further attention and discussion with relevant tribes. Representatives of the Wampanoag Tribal Council have participated in this planning process and will continue to be consulted pursuant to federal Native American Graves Protection and Repatriation Act requirements.

APPENDIX A: ESTIMATED COSTS

The following estimates are based on the "Class C Estimating Guide" prepared by the Denver Service Center's Engineering Services Division. Shown are gross construction costs that include materials, labor, overhead, profit, planning, design, supervision and contingencies. These estimates are presented for general guidance and long-range budgeting only. Use of day-labor crews and local materials could substantially lower these estimates.

Preservation treatments for the Penniman house and barn have been identified, and funds will be requested to continue ongoing work. These costs are not reflected in the following table.

TABLE A-1: ESTIMATED COSTS FOR THE PREFERRED ALTERNATIVE

Description	Gross Construction Cost	Construction Planning Cost	Total
Historic Structures and Landscape Features			
Cultural Landscape Restoration			
Clear and grub forested area	97,350	8,250	105,600
	97,350	8,250	105,600
Barn Restroom / Composting Toilet			
Structurally reinforce barn foundation and floor	35,400	3,000	38,400
Rehabilitate barn interior for restroom	9,450	800	10,250
Install composting toilet, chamber, and vent	23,600	2,000	25,600
	68,450	5,800	74,250
Penniman House Access / Landscape			
Build 3′ wide stabilized accessible walk along Fort Hill Road	850	50	900
Construct accessible ramp to east entrance of Penniman house	5,650	500	6,150
Build 3′ wide pedestrian walk along Fort Hill Road between driveway and retaining wall	650	50	700
Build 3′ wide pedestrian walk from retaining wall steps to west entry and from west fence to west building entry	1,250	100	1,350
Stabilize 3′ high masonry retaining wall	7,100	600	7,700
Plant three trees in historic locations on west side of house	1,750	150	1,900
	17,250	1,450	18,700
Subtotal	183,050	15,500	198,550
Interpretation and Education			
Waysides and Wayfinding			
Install three wayside exhibits for Fort Hill trail and three for the red maple swamp trail	35,400	3,000	38,400
Install wayfinding markers on 4 x 4 posts	850	50	900
Subtotal	36,250	3,050	39,300
Access, Parking, and Support Facilities (Short-Term Actions)			
Hemenway Road Landing			
Grade and gravel Hemenway Road shoulder for parking	4,700	400	5,100
Stripe road and install two parking signs	850	50	900
Install split rail fencing	3,550	300	3,850
Install bike racks	2,350	200	2,550
Install new composting toilets for Skiff Hill restroom; demolish existing building and utilities	38,950	3,300	42,250
Subtotal	50,400	4,250	54,650
Access, Parking, and Support Facilities (Long-Term Actions)			
Hemenway Road Landing			
Install drainage diversion curbing and catch basin	8,250	700	8,950
Fort Hill Area			
Grade and resurface upper parking lot for vehicle turnaround	19,450	1,650	21,100
Archeological clearances (by others)	5,900	500	6,400
Develop parallel shuttle stop/bus parking along Gov. Prence Road (grade and gravel surface)	5,900	500	6,400

Description	Gross Construction Cost	Construction Planning Cost	Total
Fort Hill Area (cont.)			
Construct 3′ wide pedestrian walk from shuttle stop/parking to west entry of Penniman house	2,050	150	2,200
Construct 4′ wide trail from Salt Pond visitor center to Hemenway Landing	8,250	700	8,950
	41,550	3,500	45,050
Subtotal	49,800	4,200	54,000
Trails and Overlooks			
Construct a new 3′ wide trail from lower parking area	1,250	100	1,350
Install bike racks (one at each lot)	2,350	200	2,550
Regrade and resurface (shells or soil binder) 4′ wide trail; make minor erosion and trail surface corrections	8,250	700	8,950
Subtotal	11,850	1,000	12,850
TOTAL	**331,350**	**28,000**	**359,350**

Option: Construct Parking Lot West of Sylvanus Knowles House			
Archeological clearances (by others)	5,900	500	6,400
Clear and grub area	3,550	300	3,850
Grade area	7,900	650	8,550
Gravel surface	17,700	1,500	19,200
Asphalt surface and stripe pavement (alternative)	35,400	3,000	38,400
Remove lot east of house and restore site	9,450	800	10,250
Option Subtotal	79,900	6,750	86,650

Additional Operations Costs

Some additional funding may be necessary to implement the prescribed burning activities at Fort Hill. One or two burn days per year are anticipated. Costs are estimated for overtime at 8 hours per day. Additional regular or overtime funding to cover full program management during prescribed burning includes:

Function	Number of Staff	Cost per Day
Law Enforcement Ranger — traffic control, area closure enforcement	One ranger per burn day	$ 200
Resource Management Personnel — pre- and post-burn area surveys and monitoring	One or two resource personnel per burn day and two personnel for two-day monitoring post-fire effects	300
Interpretation — provide onlookers with information	One interpretive ranger per burn day	200
Regional Fire Personnel — regional overhead fire support and assistance	Up to three individuals per burn day	200 (travel only)

APPENDIX B: COMPLIANCE CORRESPONDENCE

United States Department of the Interior

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

July 28, 1997

Maria Burks
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

Dear Ms. Burks:

This responds to your June 23, 1997 letters requesting information on the presence of federally-listed and proposed endangered or threatened species in relation to site plans for 2 projects within Cape Cod National Seashore in Massachusetts: 1) Pamet Cranberry Bog in Truro, and 2) Fort Hill in Eastham.

Based on information currently available to us, no federally-listed or proposed threatened and endangered species under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project areas, with the exception of occasional transient bald eagles (*Haliaeetus leucocephalus*) or peregrine falcons (*Falco peregrinus*).

Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required. Should project plans change, or additional information on listed or proposed species becomes available, this determination may be reconsidered.

A list of federally-designated endangered and threatened species in Massachusetts is included for your information. Thank you for your cooperation and please contact Susi von Oettingen of this office at (603) 225-1411 if we can be of further assistance.

Sincerely yours,

Michael J. Bartlett
Supervisor
New England Field Office

Enclosure

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

RECEIVED
AUG -4 1997

Wayne F. MacCallum, *Director*

30 July 1997

	INIT.	INFO	ACT.
SUPT.		✓	
ASST. SUPT			
MGT ASST		✓	
ADMIN			
INTERP			
MAINT			
NAT RES		✓	
PLANNER			
R&VP			
SAFETY			
PERSONNEL			
PURCHASING			
BUDGET			

Maria Burks
National Park Service
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667

Re: Fort Hill area
Eastham, MA
NHESP File: 97-2222

Dear Ms. Burks,

Thank you for contacting the Natural Heritage and Endangered Species Program for information regarding state-listed rare species in the vicinity of the above referenced site. I have reviewed the site and would like to offer the following comments.

The Spotted Turtle (Clemmys guttata) is known to occur in the Fort Hill area. This species is protected under both the Massachusetts Endangered Species Act (MGL 131A) and its implementing regulations (321 CMR 10.00). If a Notice of Intent is required for the proposed site improvements, please submit a copy of the NOI for our review at the same time it is submitted to the Conservation Commission.

This evaluation is based on the most recent information available in the Natural Heritage database, which is constantly being expanded and updated through ongoing research and inventory. Should your site plans change, or new rare species information become available, this evaluation may be reconsidered.

Please do not hesitate to call me at (508)792-7270 x.154 if you have any questions.

Sincerely,

Andrea Arnold
Environmental Review Assistant

Natural Heritage & Endangered Species Program
Route 135, Westborough, MA 01581 Tel: (508) 792-7270 x 200 Fax: (508) 792-7275
An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement
http://www.state.ma.us/dfwele

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PROJECT TEAM AND CONSULTANTS

PROJECT TEAM

National Park Service

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- Lauren McKean, AICP, Management Assistant/Park Planner
- Frank Ackerman, Chief, Interpretation and Cultural Resources
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- Maurice Miller, Transportation Planner
- Greg Sorensen, Quality Leader, Writing/Editing
- Mark Tabor, Landscape Architect

Northeast Region/Boston Support Office
- Ellen Levin-Carlson, Community Planner

Environmental Partners Group, Inc., Hingham, Massachusetts

Mark White, Principal

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- Maria Burks, Superintendent
- Jessica Dooley, Community Planning Technician
- Steve Gazzano, South District Ranger
- Harrison Gruman, South District Park Ranger
- Katy Lacy, former NPS Cultural Landscape Specialist
- Hope Morrill, Museum Curator
- John Portnoy, Ecologist
- Ben Pearson, Chief of Maintenance
- Mike Whatley, Supervisory Interpretive Ranger

Denver Service Center

Manny Sais, Contracting Services

Agencies and Organizations

- Cape Cod Commission, Sarah Korjeff
- Cape Cod National Seashore Advisory Commission, Eastham Representative, Edward C. Sabin
- Environmental Partners Group, Inc., Paul Gabriel, Principal
- Eastham Historical Commission, George Abbott
- Eastham Board of Selectmen, Kenelm Collins
- Eastham Historical Society, Edmond Harnett
- USDA Natural Resources Conservation Service, Don Liptak and Steve Spear
- Mashpee Wampanoag Tribal Council and Wampanoag Tribe of Gay Head (Aquinnah), Ramona Peters

Individuals

- Jean Avery, Neighbor
- Sarah Burrill, Neighbor

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

NPS D-154 / August 1998