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Olmsted Center
for Landscape Preservation

Condition Report for Fort Hill Rural Historic District

Cape Cod National seashore

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Cape Cod National Seashore
Eastham, Massachusetts

Introduction

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Treatment Recommendations

By Jan Haenraets
Landscape Architect
With Margie Coffin Brown
Historical Landscape Architect

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Olmsted Center for Landscape Preservation
Boston National Historical Park
Charlestown Navy Yard, Quarters C
Boston, MA 02129
www.nps.gov/oclp/

Cover Photo: Aerial photograph looking east with cows grazing in the open fields at Fort Hill in the 1940s. The top of Fort Hill is in the center of the image (Cape Cod National Seashore archives, courtesy of William Quinn).

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ACKNOWLEDGMENTS

The preparation of this condition report has been a collaboration between the Olmsted Center for Landscape Preservation and the Cape Cod National Seashore, with input from a multi-disciplinary team of cultural resource and natural resource managers and specialists, including a plant ecologist, wildlife ecologist, fire management specialist, ranger, interpreter, historian, curator, and park maintenance staff. The document was compiled by Landscape Architects Jan Haenraets and Margie Coffin Brown from the Olmsted Center for Landscape Preservation, with assistance from Michael Commisso, Gretchen Hilyard and Emily Donaldson. Director Bob Page provided overall project guidance.

At the Cape Cod National Seashore, Bill Burke, Park Historian and Compliance Coordinator for Section 106 of the Historic Preservation Act, served as Park Lead and coordinated meetings, draft report reviews and site visits. Additional staff members that participated in meetings and reviews included Superintendent George Price, Chief of Maintenance Ben Pearson, Maintenance Supervisor Dick Ramos, Chief of Interpretation and Cultural Resources Sue Moynihan, Curator Hope Morrill, GIS Specialist Mark Adams, Fire Management Officer David Crary, Ecologist Stephen M. Smith, Chief of Natural Resources Carrie Phillips, Chief Ranger Steve Prokop, and Wildlife Ecologist Robert Cook. This report was funded through the park's Recreation Fee Program.

The report builds upon the existing documentation of the cultural landscape at Fort Hill including the *Cultural Landscape Report for Fort Hill* (1995), "Site Plan and Environmental Assessment for Fort Hill" (1998), "Cape Cod National Seashore Prescribed Burn Plan for Fort Hill, 1999-2004" and the "National Register Nomination for Fort Hill Rural Historic District" (2001).

INTRODUCTION

This Condition Report for the Fort Hill Rural Historic District of Cape Cod National Seashore reviews previous documentation of the cultural landscape and provides an updated evaluation of the condition of the property as well as updated guidance for both day-to-day and long-term landscape management and interpretation. This report consists of a historical overview, an inventory of existing conditions, and a review of the significance of landscape characteristics and features. Based on this information, the report revisits previous treatment recommendations for the site and examines current issues and alternative solutions. With input from property stewards, the report provides updated treatment recommendations consistent with the *Secretary of Interior's Standards for the Treatment of Historic Properties* (1992).

Located in Eastham east of Route 6, the Fort Hill Rural Historic District provides expansive views of the Nauset Marsh and Atlantic Ocean (Figures 1 and 2). The 100-acre property includes Fort Hill rising 50 feet in elevation, Skiff Hill to the north rising 48 feet in elevation, Fort Hill Trail and Red Maple Swamp Trail. Notable features include the long stone walls, stone boundary markers, a sharpening rock used by Native Americans, and numerous archeological sites. The area was once two large farmsteads, which were owned by the Knowles family and their relatives by marriage, the Penniman family, from the 1740s through the 1940s. Much of the land was farmed up until the 1950s and acquired by the National Park Service in 1963.

The Fort Hill area contains three National Register listings and one National Landmark designation. The Captain Edward Penniman house and barn were listed in the National Register in 1976. A portion of the Fort Hill area was included in the Nauset Archeological District in 1991 and designated as part of a National Landmark in 1992. A 100-acre area was listed as the Fort Hill Rural Historic District in 2001.

The 100-acre area of the Fort Hill Rural Historic District roughly corresponds with the boundaries of the former Knowles and Penniman properties, extending to the edge of the marsh on the south and east boundaries, to Hemenway Road to the north, and the park boundary to the west. The district is significant in the areas of architecture, agriculture and community development during the period of 1786 to 1943. The district is located within Cape Cod National Seashore but also contains two privately-owned historic properties. The district contains four contributing buildings (three homes and a barn), one contributing archeological site, seven contributing structures (stone walls and foundations), and six contributing objects (property markers, landscape features, and the Native

American sharpening stone). Non-contributing resources in the district are primarily associated with Park Service visitor facilities, which date to the 1960s.

Maintenance of the open landscape has been an ongoing challenge for the Park Service. In 1995 the Olmsted Center for Landscape Preservation documented the site as part of the *Cultural Landscape Report for Fort Hill*. The report contains guidance to inform the park's General Management Plan and for the protection and long-term maintenance of the Fort Hill landscape. Specific recommendations relate to parking, removal of vegetation, additional plantings, and maintaining the open landscape. In 1998 the park prepared the Site Plan and Environmental Assessment for Fort Hill as well as the Cape Cod National Seashore Prescribed Burn Plan, Fort Hill 1999–2004. Both documents provide greater specificity for prescribed burn and mowing areas. Several years have elapsed since the park began implementing the recommendations from these reports. This Condition Report will evaluate the effectiveness of these recommendations and the existing historic character of the Fort Hill Rural Historic District.

OVERALL HISTORIC CHARACTER

The overall historic character of the property is the sum of all visual aspects, features, materials, and spaces associated with the history of Fort Hill. The overall character of Fort Hill is articulated in the National Register documentation form for the Fort Hill Rural Historic District as well as earlier National Register listings. Key points from the statement of significance are listed below.

- The area contains a nationally significant, multi-component prehistoric site dating from the Late Archaic to the Late Woodland period.
- One of the most important characteristics of the district is the juxtaposition of three diverse zones, the residential cluster, the spacious open fields, and the dark and enclosed red maple swamp.
- The field pattern, with land divided into rectangular fields of varying size, defined by stone walls, represents a distinctive regional method of agricultural land division of the late eighteenth and nineteenth century New England farm, characterized by clusters of extended families who jointly farmed adjacent parcels of individually held land.
- The stone walls are rare on Cape Cod.
- The Penniman buildings are outstanding examples of French Second Empire style architecture, the house is the only whaling captain's house in Eastham, and the landscape setting is intact.
- Both the historic buildings and landscapes remain relatively intact with limited modern intrusions, thereby retaining a high level of integrity of location, design, setting, materials, workmanship, and associations.

SCOPE AND METHODOLOGY

This Condition Report will build upon previous documentation for Fort Hill and take a fresh look at the condition of the landscape as well as current and projected management issues. In the spring of 2006, the Olmsted Center initiated the condition report in cooperation with the park. The report recaps the site history from previous documents, the *Cultural Landscape Report for Fort Hill* (1995), the *Cape Cod National Seashore General Management Plan* (1998), and the Fort Hill nomination for the National Register of Historic Places. Specifically, this report addresses the following objectives relative to documentation of Fort Hill:

- Determine whether the character-defining features still retain historic integrity.
- Evaluate whether preliminary treatment recommendations have been successfully implemented.
- Identify methods for achieving appropriate management practices, particularly for the management of the open fields.
- Provide documentation that supports park consultation responsibilities under Section 106 of the National Historic Preservation Act.

Following the general format of a Cultural Landscape Report as outlined in the National Park Service publication, *A Guide to Cultural Landscape Reports: Contents, Process and Techniques* (1998), this condition report is organized in three chapters, existing conditions, analysis and evaluation, and treatment.

EXISTING CONDITIONS

Narrative text and photographs describe and illustrate current boundaries, landscape condition, circulation, parking, and landscape characteristics and features. Contemporary site functions, visitor services, site operations, and maintenance are discussed to the degree that they influence the treatment of the landscape.

ANALYSIS AND EVALUATION

Using the National Register nomination for the Fort Hill Rural Historic District, this chapter expands the evaluation of integrity and character-defining features section of the *Cultural Landscape Report for Fort Hill* (1995) in order to provide more concise and detailed documentation on the significant characteristics of the Fort Hill landscape.

TREATMENT

This chapter reviews the Treatment and Management Recommendations in the *Cultural Landscape Report for Fort Hill* (1995), *Site Plan and Environmental Assessment for Fort Hill* (1998), and *Cape Cod National Seashore Prescribed Burn*

Plan, Fort Hill 1999–2004. For each landscape characteristic and feature, the narrative examines whether the character-defining features still retain historic integrity and determine whether the treatment recommendations have been successfully implemented. The desired appearance of the open landscape is defined in terms of edges of open fields, vegetation composition, and height during the growing season and in winter. The recommendations articulate alternative treatment scenarios for woody vegetation in field areas, and exotic species management. Key areas for grassland habitat are identified, as well as areas with accelerated erosion and encroaching vegetation. The chapter includes an open fields management plan.

RECOMMENDED TREATMENT ALTERNATIVE: REHABILITATION

Treatment alternatives were considered in the *Cultural Landscape Report for Fort Hill* resulting in the selection of **rehabilitation** as the recommended treatment for Fort Hill. General guidelines for rehabilitation are outlined in the report (CLR, 95-100).

HISTORICAL OVERVIEW

The history of the Fort Hill area is detailed in the *Cultural Landscape Report for Fort Hill* (hereafter, CLR). The following summary is extracted from the report (CLR, 1-56).

The name "Fort Hill" is the vernacular name of an area of salt marsh and elevated upland located in the Town of Eastham on the outer part of lower Cape Cod. Fort Hill has a long and rich history of settlement and use. In 1605 it was visited by the explorer Samuel de Champlain who reported that the land was partially cleared and inhabited by Native Americans. Fort Hill was part of an area in which there was long-term Native American occupation. Notable features include a sharpening rock used by Native Americans and numerous archeological sites.

In 1644 a group of 49 people left the Plymouth Colony to begin the settlement of Nauset. Amongst them was Governor Thomas Prence, a distinguished figure in the Colonial history of Cape Cod and Massachusetts, who owned a farm of 200 acres in Eastham, including land at Fort Hill. Samuel Treat (1648-1717) was the first European settler whose permanent residence at Fort Hill has been confirmed. He served as Eastham's minister for nearly 45 years and owned a substantial part of the southern portion of Fort Hill and appears to have been engaged in farming (CLR, 13).

The Knowles family was among the early settlers of Eastham. At some point after the death of Samuel Treat in 1716 or 1717, the Treat homestead came into the possession of the Knowles family. Willard Knowles owned most or all of what we

now know as Fort Hill, representing the first time that the area was unified under one owner. Willard Knowles's was a man of obvious prosperity, and was probably among the most affluent residents of Eastham. What most distinguishes Fort Hill is its uninterrupted ownership by members of the Knowles family for nearly two hundred years, from 1742-1940. During their long tenure at Fort Hill, the Knowles and Penniman families, who were relatives by marriage, made a substantial, though at times subtle, mark on this landscape. Following the death of Willard Knowles in 1786, his land on Fort Hill was divided between his youngest sons Seth (1753–1821) and William (1755–1830). As a result of this land division, the Fort Hill area entered into its fullest and most characteristic development as two separate Knowles family farms, a land use pattern that was sustained well into the twentieth century. Despite the continuity of ownership, the history of this property was characterized by a wide variety of constantly changing uses, as the Knowles farmers adjusted to changing markets and seized new opportunities. Throughout the nineteenth century at Fort Hill, the Knowles family replaced older buildings and erected new ones. The family's farming included a variety of activities over the years, including raising livestock and poultry, peat digging, salt-making, and cranberry and asparagus crops.

Through a fortunate series of circumstances, Fort Hill has experienced only minimal change since the end of the Knowles period in 1943. Charles A. Gunn offered to purchase the "Seth" Knowles farm in 1936 and he farmed the land until he sold it to James H. Leach in the 1950s. The Leaches sold the farm to the development company Mel-Con. The development company planned to divide the property into 33 lots, to be linked by a system of private roads with communal boat landings. This plan was halted by the creation of Cape Cod National Seashore in 1961. In contrast, the surrounding Town of Eastham and all of Cape Cod have experienced dramatic development and change during this period. The remarkable constancy of the Fort Hill area gives it special value, and makes its protection and stewardship of critical importance.

The Park Service acquired most of the land at Fort Hill between 1963 and 1965 and constructed parking lots, a road to the top of Fort Hill, trails, a boardwalk, a comfort station, a shelter and waysides. The open fields were periodically mowed to maintain the open appearance but there has been a gradual replacement of pasture grasses by coarser vegetation and the kettle hole wetlands have become drier due to natural processes of eutrophication.

Figure 1. Aerial photograph of Fort Hill Rural Historic District. The red rooftops of the Penniman house and barn are visible in the foreground. The open fields are at center and bisected by the road to the Fort Hill overlook. The red maple swamp is visible to the left and appears as a reddish gray mass of trees. The Skiff Hill overlook is obscured by a grove of evergreen eastern red cedars to the right of the red maple swamp (Spring 2006, courtesy Barbara Dougan).

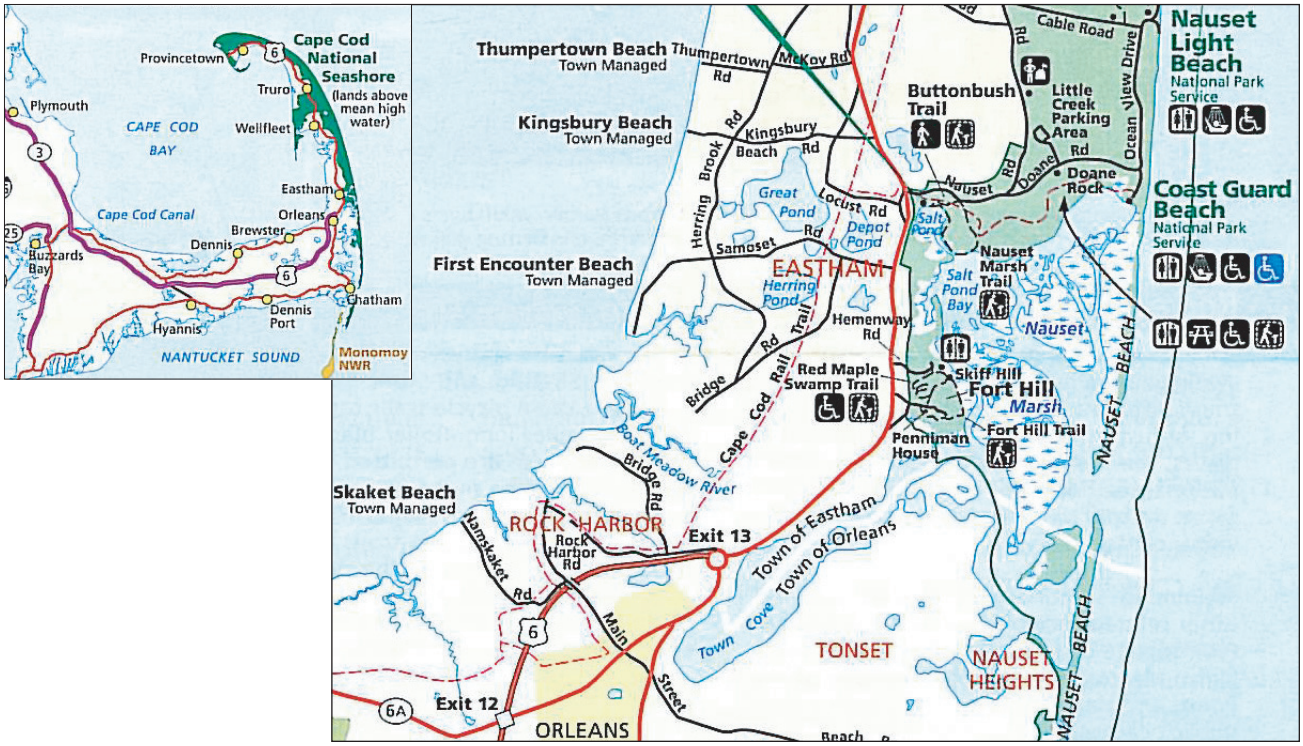


Figure 2. Location of Fort Hill Rural Historic District (Cape Cod NS brochure).

CHAPTER 1: EXISTING CONDITIONS (2007)

This chapter describes the appearance of the landscape of the Fort Hill Rural Historic District in 2007. The site is described according to the landscape characteristics defined in the National Park Service *Guide to Cultural Landscape Reports* (1998), which include natural systems and features, spatial organization, land use, circulation, buildings and structures, vegetation, views, small-scale features and archeological sites. Similar documentation of Fort Hill took place in 1993 as part of the *Cultural Landscape Report for Fort Hill* (CLR, 57-74). The Fort Hill Rural Historic District includes approximately 100 acres of field, forest, and salt marsh. It is located east of US Route 6 on the ocean side of lower Cape Cod in the Town of Eastham. The landscape of Fort Hill includes three distinct zones: the western end of Fort Hill Road, the Open Field or eastern portion of the site, and the Red Maple Swamp. These three distinct zones are linked by the Fort Hill Trail.

A. FORT HILL ROAD ZONE

The Fort Hill Road zone lies astride the main, western half of Fort Hill Road. This section of road begins at the intersection of Governor Prence Road, which provides access to the area from Route 6 and ends at the Burrill property line. The north boundary of the zone is the Red Maple Swamp and the south boundary is the creek flowing into Town Cove. The zone's primary features are a cluster of three historic houses and their outbuildings located along Fort Hill Road, and a National Park Service parking lot. The three houses are the Captain Edward Penniman house, the Avery (formerly Sylvanus Knowles) house, and the Burrill (formerly Seth Knowles) house.

The main entrance to Fort Hill from Route 6 is Governor Prence Road, which is marked by National Park Service signs. Governor Prence Road leads east to connect with the west end of Fort Hill Road. The road edges at the intersection of these two roads are moderately to heavily vegetated. With the exception of one line of declining Eastern red cedars planted six feet on center, this roadside vegetation is largely opportunistic.

The Penniman house is located on the south side of Fort Hill Road, east of its intersection with Governor Prence Road. The house is owned by the National Park Service and is open to public on a seasonal basis. In 1994, 8,176 persons entered the Penniman house for interpretive tours or open houses. In 2006, 2,919 persons entered the Penniman house. The French Second Empire-style Penniman house faces west high atop a terraced lawn, presenting an imposing facade to visitors arriving at Fort Hill (Figure 3). The west lawn is defined by a

semicircular, decorative wooden fence. Two sets of wooden stairs lead from the west side of the upper terrace, through a break in the fence and down to Fort Hill Road. The north side of the lawn slopes down to a stone retaining wall, broken on center by another set of stone steps leading down to the road. A distinctive whalebone gate is located at the eastern end of the retaining wall, through which one passes to an informal path leading up the north lawn. A row of former hitching posts stands ten feet on center in a line between Fort Hill Road and the north edge of the Penniman property. The terraced lawn on which the house and barn sit is free of formal plantings, though three of four terrace edges are currently overgrown with opportunistic vegetation. A flagpole base is located approximately 20 feet from the northwest corner of the house.

The lawn on the east side of the house slopes down to a gravel drive. The four cottonwood trees to the west of the drive were lost during a storm on 9 December 2005. Only two cottonwood trees remain to the east of the drive. Southeast of the house is a two-story barn which matches the Penniman house in style and appearance. Nearby is a small, depressed parking area that is surfaced with gravel. The parking area is bordered on the west by the exposed foundation of the Penniman house, on the north by a retaining wall, and on the south by the front of the barn. Wooden steps lead from the eastern terraced lawn down to the parking area.

The land south of the Penniman house slopes down to a creek that flows into Town Cove. A trailhead for the south loop of the Fort Hill Trail runs behind the barn and continues eastward. South of the trail is thickly overgrown vegetation. The land east of the Penniman property, extending to and south of the Burrill inholding, used to be equally overgrown. However, the National Park Service has cleared much of this area, leaving only a narrow buffer between the Penniman house and the Burrill inholding.

The Avery and Burrill houses are privately owned inholdings. The Avery house is on the north of Fort Hill Road, directly opposite the Penniman house. It is a white, two-story, clapboard house that now faces south (Figure 4). The earliest part of the house is a gable-roofed section that sits perpendicular to the Fort Hill Road, facing west. Another gable-roofed block was added to the rear (east) of this section, parallel to Fort Hill Road, facing south. A screened porch is appended to the east end of the house. The front of the house is planted with a variety of neatly trimmed, evergreen plants, both marking the foundation and dotted around the lawn. The front lawn is edged by a split-rail fence and buffered by additional evergreen shrubs. Two tall, conical evergreen trees mark the entrance to the property. The area to the west of the Avery driveway is heavily wooded, and a portion of a remnant stone wall, which perhaps marks the boundary of the

Avery property, is hidden in the woods. On the north side of the house, the rear lawn is enclosed for privacy by a dense buffer of red maples.

The Burrill house is located at the eastern end of the residential cluster and faces west (Figure 5). It is situated largely in line with Fort Hill Road, which curves sharply around to the north of the house. This structure is a two and one-half-story frame house with both clapboard and shingle siding. It has a gable roof with a central chimney and a large center cross-gable. Evergreen shrubs create a foundation planting around the front of the house. The front west lawn is planted with grass and contains a large cottonwood tree and a single flowering hydrangea. The rear east lawn is largely open.

As explained previously, the Penniman tract southwest of the Burrill house was overgrown until cleared by the National Parks Service after storm damage. A grove of vegetation was left south of the Burrill property; the south loop of the Fort Hill Trail passes through it on its route eastward. The grove covers a long stone wall that runs south from the Burrill property line to the trail. This wall consists of three unmortared courses and is clearly visible only in the fall and winter.

The area on the north side of Fort Hill Road east of the Avery house is now a National Park Service parking lot that can accommodate a maximum of 16 standard-sized vehicles. Mature black locust trees and woody plants including multiflora rose and blackberry mark the property line between the parking lot and the Avery inholding. The black locust tree and multiflora rose are invasive exotic plants that are targeted for control at the Cape Cod National Seashore (NPS, 2003, 64-68). Park interpretive signage is located at the northeast corner of the parking lot, marking a trailhead for the north branch of the Fort Hill Trail (Figure 6). A single mature and declining horse-chestnut tree stands on the south side of Fort Hill Road directly opposite the entrance to the parking lot. It is possible that this tree is the sole survivor of a line of horse-chestnut trees that once existed along the south side of the Fort Hill Road between the Penniman house and the Burrill inholding.

B. OPEN FIELD ZONE

The open-field zone surrounds the east end of Fort Hill Road. It extends from the Fort Hill Road zone to the Nauset Marsh, and from the wooded edge of the Red Maple Swamp and Skiff Hill southward to Town Cove. Distinctive characteristics of this landscape include undulating folds of former pasture and abandoned fields divided by stone walls, kettle-hole wetlands, unobstructed views in every direction, and opportunistic vegetation presenting itself at every

edge. Geologist Robert Oldale describes the area as exhibiting classic collapsed ice age topography. Due to maintenance issues the fields at present appear overgrown with woody plants such as blackberry, multiflora rose, privet and locust. Features such as the stone walls, the capped barn foundation and the kettle-hole wetlands can no longer easily be distinguished within the landscape. They are now hardly recognizable within the overgrown appearance of the fields.

The east end of Fort Hill Road, which extends into the field area, terminates at a paved parking lot and overlook at the top of Fort Hill at an elevation of 50 feet (Figure 7). From this panoramic viewpoint, the land slopes away gently to the south, where it meets the creek and the marshy edge of Town Cove. Across the cove the residential development known as Smith Heights is visible. The view to the east looks over the Nauset Marsh to the Atlantic Ocean. To the northwest and west, the open fields extend to the woodland edge of the Red Maple Swamp, and to the wooded property lines of the three houses along Fort Hill Road. From the overlook, views north across the fields and features such as the stone walls are compromised by the overgrowth of woody plants (Figure 8).

The overlook is crossed by the Fort Hill Trail. As described previously, the south loop of the Fort Hill Trail runs eastward through the woods south of Penniman house and the Burrill inholding. When this path reaches the open field zone, it becomes grassy and is about six feet in width. The path then curves up to the Fort Hill overlook through the overgrown woody plants that have invaded the open field. The overlook also features the trailheads of two lesser paths. These are trampled-grass paths that lead south to the marshy edge of Town Cove.

East of the overlook, the south loop of the Fort Hill Trail continues eastward to the edge of the Nauset Marsh. Its construction reflects the fact that it is most heavily traveled of the four overlook paths: the middle of the mowed path consists of a bluestone gravel surface reinforced with split log checks. When it reaches the edge of Nauset Marsh, this path turns north and travels along the marsh to the edge of the woods south of Skiff Hill, where the path divides. One path continues north to the Skiff Hill Shelter and the other turns west to intersect the north branch of the Fort Hill Trail, which runs between Skiff Hill and the Fort Hill Road parking lot.

A scar that is visible from the air and on the ground thirty years later remains from the roadwork conducted as part of the subdivision layout circa 1960. The scar remains from the initial grading associated with a road and is a depressed area along the west and southern flanks of the property. The graded track is between twenty and thirty feet wide and, in some places, is as much as four feet lower than the surrounding field. Nevertheless, it is difficult to perceive the course of this abandoned roadbed from the overlook during the growing season,

now that the fields have been overgrown with invasive woody plants, including multiflora rose, blackberry, black locust and privet.

Historically, three kettle-hole wetlands stood out from the surrounding field setting, but are now hard to distinguish within the overgrown fields. Each wetland area is edged and partially filled with encroaching vegetation, which makes access and inspection difficult. However, surface water is visible within each of the three wetlands and wildlife is evident. In addition, debris such as oversized timbers can be found in the wetland areas. It is not clear whether this represents off-site dumping or storm stranding.

Three stone walls are located in the open-field zone (Figure 9). These are similar in size and appearance to the one south of the Burrill property line. All three walls run westward from Nauset Marsh. The northernmost of the three runs for 115 feet before reaching a gap. After that point, the line continues in the form of some isolated cobbles. The middle wall consists of two segments. The east segment is comprised of two to four courses of unmortared stone, and is 139 feet long. The west segment dwindles to one course, shows some gaps, and runs for 669 feet. The southernmost wall consists of two to four courses of unmortared stone and runs 718 feet (Mulholland, 1994, 28). On the south side of the western portion of this wall is an area of surface disturbance but it does not appear to have affected the stone wall. There was once a fourth stone wall in the open-field zone, which extended due east from the Burrill house to Nauset Marsh. No trace of this wall is visible today. The stone walls have been kept partially clear through the burning process but overall they are covered by vegetation. Where portions of the stone walls have collapsed stones are now laying within the surrounding vegetation.

Two other features are found north of Fort Hill Road across from the Burrill house. One is a capped foundation of mortared stone, measuring 15 foot by 16.5 feet, upon which part of the large Gunn dairy barn once stood. The capped barn foundation is barely visible in the overgrown fields (Figure 10). The other is a partially buried boulder that shows drill holes, and in which a fragment of metal remains lodged.

C. THE RED MAPLE SWAMP ZONE

The Red Maple Swamp zone comprises the northern portion of the site. It extends south from Hemenway Road to the open fields and east from the National Park Service property line to the Nauset Marsh. In addition to the Red Maple Swamp, the zone includes a public entrance from Hemenway Road, the elevation known as Skiff Hill, a public comfort station, an interpretive shelter,

and two overlooks. This whole portion of the site is wooded, predominantly with red cedar; and offers a very different experience from other parts of Fort Hill.

The public comfort station is sited near the Hemenway Road entrance. The structure is of concrete-block construction with concrete steps leading up to its entrance. An open lawn is maintained on the slope between the trail and the comfort station. The Skiff Hill interpretive shelter is farther south. The shelter is of open hexagonal design and contains a wayside exhibit that consists of four interpretive boards (Figure 11). Just east of the shelter is an overlook that features the Indian Rock (Figure 12). The rock is believed by some to have been used as a sharpening stone by native peoples of the region. The National Park Service moved the rock to its present location. Previous the rock was located in Nauset Marsh, where it had fallen due to cliff erosion. This erosion of the cliff also destroyed any archaeological deposits that may have existed in association with the rock in its original location. Therefore, its actual history and specific use cannot be determined. The wooden area east of the shelter and overlook was kept open in the past, providing an unobstructed view of Nauset Marsh and Salt Pond Bay. At present the wooded area surrounding the shelter is overgrown allowing only limited views to the marsh and ocean (Figure 13).

The Red Maple Swamp Trail and the Fort Hill Trail wind through the entire area. The Swamp Trail travels over a low 4-foot-wide boardwalk constructed partially of recycled material (Figure 14). It runs southwest from the Hemenway Road entrance, then serpentines eastward to join the Fort Hill Trail in the open field zone. From this main boardwalk trail another dead-end boardwalk trail diverts off east into the Red Maple Swamp as a alternative visitor route.

Likewise, the Fort Hill Trail along the edge of the open field zone divides south of the Skiff Hill shelter and overlook; it continues north past another overlook and to the Hemenway Road entrance. This part of the trail, from the shelter to the Hemenway Road entrance is surfaced in dark asphalt. The other leg turns west and travels along the edge of the Red Maple Swamp where it eventually intersects the north branch of the Fort Hill Trail. This completes the pedestrian circulation system around Fort Hill.

Figure 3. View looking east at west facade of Penniman house, perched on terraced lawn as seen from the south side of Fort Hill Road. A decorative fence surrounds the lawn (OCLP, January 2007).

Figure 4. View looking northeast at west and south sides of the Avery (formerly Sylvanus Knowles) house (at right) on north side of Fort Hill Road (OCLP, January 2007).

Figure 5. View looking east at west facade of the Burrill (formerly Seth Knowles) house and barn on south side of Fort Hill Road. The entrance to the National Park Service lower parking lot (OCLP, January 2007)

Figure 6. View looking north at trail entrance and sign near the National Park Service lower parking lot on Fort Hill Road (OCLP, January 2007).

Figure 7. View looking north from Fort Hill Overlook upper parking lot, which is bounded by split-rail fencing. The bluestone-covered walking path in the foreground leads east past a bench, visible on right, and downhill towards the Nauset Marsh, which is visible in the distance (OCLP, January 2007).

Figure 8. View looking north from the Fort Hill Overlook across the open fields toward Skiff Hill. Stone walls in the distance are partially obscured by tall vegetation. Fort Hill Road is in the foreground (OCLP, May 2007).

Figure 9. View looking northwest showing a stone wall obscured by multiflora rose on the north side of the open fields (OCLP, January 2007).

Figure 10. View looking southeast showing the capped foundation of the Gunn dairy barn at center of photo. The Burrill barn, Fort Hill Road and Fort Hill Overlook are visible in the background (OCLP, January 2007).

Figure 11. Skiff Hill shelter surrounded by encroaching vegetation with partial views of Nauset Marsh in the distance (OCLP, January 2007).

Figure 12. View looking east showing the Indian Rock used as a sharpening stone, with an interpretive sign in the foreground and Nauset Marsh in the distance (OCLP, January 2007).

Figure 13. View looking northeast showing the benches at the top of the slope overlooking the Nauset Marsh (OCLP, January 2007).

Figure 14. View of the Red Maple Swamp Trail boardwalk, constructed of partially recycled material, leading through the swamp (OCLP, January 2007).

CHAPTER 2: ANALYSIS OF SIGNIFICANCE AND EVALUATION OF LANDSCAPE CHARACTERISTICS

This chapter reviews the historical significance of the Fort Hill Rural Historic District and evaluates the condition and historical integrity of the landscape. The first section describes the significance of the area based on National Register criteria for the evaluation of historic properties. It includes a review of the National Register status, the period of significance, and areas of significance. The second section describes the historic character of the property and identifies landscape characteristics that contribute or do not contribute to the property's historical significance.

NATIONAL REGISTER STATUS

A National Register nomination was prepared for Fort Hill and was accepted on 6 April 2001 for inclusion as a Rural Historic District in the National Register of Historic Places. The nomination includes a statement of significance, a summary of the historical development, and an overview of the general configuration of the site, including topography, natural features, archeology, and landscape documentation.

The period of significance for the Fort Hill Rural Historic District extends from 1786 to 1943, with a significant date of 1868. The beginning of the period is marked by the death of Willard Knowles and the division of his land between his two sons, Seth and William, creating the two Knowles family farms at Fort Hill. These two farms remained in the family's ownership well into the twentieth century. In 1868 Captain Penniman, who married Betsey Augusta Knowles, constructed an impressive French Second Empire-style residence, which remains a prominent feature within the district. The end of the period of significance, 1943, is the year that the property was sold by the Knowles family.

The Fort Hill Rural Historic District is listed under Criteria A and C in the National Register of Historic Places and under Criteria D as part of the Nauset Archaeological district.

- Criterion A: Property is associated with events that have made a significant contribution to the broad patterns of our history.
- Criterion C: Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- Criterion D: Property has yielded, or is likely to yield information important

in prehistory or history.

The National Register documentation classifies the Fort Hill Rural Historic District under the following three areas of historic significance.

Architecture

- Three historic residences and their outbuildings are representative examples of Late Victorian (Second Empire), mid 19th century (Greek Revival), and Colonial (Georgian) architecture.
- The Captain Edward Penniman house and its barn are listed for their importance to the whaling industry on Cape Cod, as the only whaling captain's house and barn in Eastham, and as outstanding examples of French Second Empire-style architecture.

Agriculture

- The field pattern, with land divided into rectangular fields of varying size, and the use of stone walls, represent a distinctive regional method of agricultural land division characteristic of late 18th and 19th century New England farms.

Community Development

- The pattern of settlement and land division at Fort Hill is characteristic of farms on Cape Cod from approximately 1750 to 1900.
- The relatively intact buildings and landscape at Fort Hill represents a family farm of uninterrupted ownership by the Knowles family for nearly two hundred years.

The National Register documentation notes that the historic uses of the property included agricultural operations in the fields and outbuildings, and domestic functions including the single family dwellings and secondary structures. Current functions include recreation and cultural uses, including outdoor recreation trails and a museum within the Penniman house. Current domestic functions include continued use of structures as single family dwellings. Current agricultural functions include the continued use of the open space as agricultural fields.

HISTORIC LANDSCAPE CHARACTER AND FEATURES

As noted in the introduction, the overall historic character of the property represents the totality of the experience of the landscape. The landscape is made up of the four dominant landscape characteristics: the field patterns, stone walls, views across open agricultural fields to the water, and associated historic

buildings and outbuildings. It is the sum of these visual aspects, features, materials and spaces that shape the experience of visitors that come to Fort Hill. For many first time visitors to Cape Cod National Seashore, an initial stop at Fort Hill leaves a lasting impression of the Cape Cod landscape. The Fort Hill Rural Historic District possesses integrity of location, design, setting, materials, workmanship, and associations. Preserving the views and condition of the dominant landscape characteristics and the experience of moving through the open landscape is a key management and maintenance objective.

Based on the National Register nomination and the *Cultural Landscape Report for Fort Hill,* a summary of landscape characteristics and features has been prepared under Table 1.

Table 1. Landscape Characteristics and Features at Fort Hill

Feature Name	Evaluation Historic Period 1786-1943	Condition 1995	Condition 2007	Comments
Natural Systems and Features				
Geology, hydrology, flora and fauna	Contributing	Fair	Fair	Present during and after historic period with natural and man-made changes.
Kettle-hole wetlands	Contributing	Fair/Poor	Fair/Poor	Present during and after the historic period with natural and man-made changes. Conservation management has resulted in the kettle-hole wetlands being edged and partially filled with encroaching vegetation since the 1880s
Red maple swamp	Contributing	Good	Undeter-mined	Historic maps indicate a wooded swamp here as far back as the middle of the 18th century when peat was harvested from the swamp. Historically many of the swamps on Cape Cod were cedar swamps. The extent of the wooded area of the swamp increased after the period of significance as agricultural use of the fields decreased (NR, 7/14). An assessment of the ecological condition of the swamp and current draining practices would be helpful.
Topography				
Seaside bluff, gently-rolling, sandy hills and fields, and lower laying marsh land	Contributing	Good	Good	Present during and after historic period.
Spatial Organization				
Fort Hill Road zone	Contributing	Fair	Fair	Present during and after historic period.
Open Field zone	Contributing	Fair	Poor	Present during and after historic period.
Red Maple Swamp zone	Contributing	Good	Good	Present during and after historic period.
Land Use				
Recreation and Culture	Contributing	Good	Good	Outdoor recreational activities where introduced when NPS started managing the site since 1963. The Penniman house became a museum.
Agriculture	Contributing	Fair	Poor	Present during and after historic period, however there remains almost no agricultural use.

Feature Name	Evaluation Historic Period 1786-1943	Condition 1995	Condition 2007	Comments
Land Use (continued)				
Domestic	Contributing	Good	Good	Present during and after historic period. The Penniman house is no longer used for domestic purposes.
Circulation				
Fort Hill Road	Contributing	Good	Good	Fort Hill Road must have existed as a track since the 17th century. It was asphalted and extended by NPS to the top of Fort Hill in 1963 (CLR, 49).
Upper parking lot	Non-contributing	Good	Good	The upper parking lot on the summit of Fort Hill was constructed when the Fort Hill Road was extended in 1963 (CLR, 52).
Lower parking lot	Non-contributing	Fair/Good	Fair/Good	A temporary lower parking lot was provided in the rear of the Penniman house in 1967. It was replaced with the one at the present site at a later date. This lot was paved in 1984 (CLR, 52).
Fort Hill Trail	Contributing Gravel, grass and sand paths	Fair/Good	Fair/Good	Trails existed that were used by the owners, before NPS ownership. Trails for outdoor recreational activities were introduced when NPS started managing the site in 1963.
	Non-contributing Asphalt road	Fair	Fair/Poor	The trail from Hemenway landing to Skiff Hill already existed by 1965 (CLR, 51). Asphalt paving of the trail was part of the approved plan of 1966 (CLR, 51).
	Non-contributing Concrete around Skiff Hill shelter	Poor/Fair	Poor	NPS completed the Skiff Hill shelter at the Kattwinkel overlook and the paving in 1965 (CLR, 51).
	Non-contributing Concrete steps and paving at comfort station	Fair	Fair	The comfort station first appeared as part of the 1967 fiscal year construction program, and was nearing completion in May 1969 (CLR, 53).
Red Maple Swamp trail	Non-Contributing Wooden boardwalk and railings	Fair	Fair/Good	The trail was constructed by Job Corps personnel by July 1967 (CLR, 51). In ca. 2000 the boardwalk underwent major repairs. Some sections were completely replaced, while in others only the decking. A section of a loop was removed. Where the decking only was replaced, the condition is now poor as foundation posts are rotting and collapsing.
	Non-Contributing Gravel Paths	Fair	Fair	Sections of the paths have been improved by adding blue stone gravel. In certain sloping sections there are signs of erosion along the path.

Feature Name	Evaluation Historic Period 1786-1943	Condition 1995	Condition 2007	Comments
Circulation (continued)				
Driveway and path to Penniman house	Contributing Driveway	Fair	Fair	The dirt driveway to the Penniman house and Barn was most likely built in ca. 1868 around the time of construction of the house.
	Contributing Gravel path across the lawn	Poor	Poor	A gravel path from the Fort Hill Road to the Penniman house must have been built around 1868 when the house was built. It can be seen on historic photographs, but at present is barely evident.
Driveway to the Burrill house	Non applicable	-	-	In private ownership. An access road or path must have existed around the time that the house was constructed. A paved driveway leads now to a garage.
Driveway to the Avery house	Non applicable	-	-	In private ownership. An access road must have existed around the time of construction of the house. The driveway was paved at a later date. Early photographs show a curved driveway (NR, 8).
Buildings and Structures				
Penniman house and barn	Contributing	Good	Good	Built in ca. 1868 by Captain Edward and Betsey Augusta Penniman.
Retaining walls and steps at Penniman house	Contributing	Poor/Fair	Good	Walls appear to have been built in ca. 1868 around the time the Penniman house was constructed as they are visible on ca. 1880 photographs. The steps to the driveway from the upper lawn are now wood. The side steps from the road to the house are stone, and two series of wooden steps go down the west lawn, the original front entrance. Wooden steps with railings connect the west lawn to the Fort Hill Trail south of the house.
Burrill house and garage (Seth Knowles house)	Not applicable	Good	Good	In private ownership. Built ca. 1790 and also known as the Seth Knowles house. Charles A. Gunn acquired it in 1936 (CLR, 39). Around 1950 it was sold to James H. Leach, who sold it to the Mel-Con development company in 1960 (CLR, 45). Around 1961 it was sold to the Burrills, the present owners (CLR, 45)
Stone wall south of the Burrill property line.	Contributing	Fair	Poor	A wall consisting of three unmortared courses covered by encroaching vegetation.

Feature Name	Evaluation Historic Period 1786-1943	Condition 1995	Condition 2007	Comments
Buildings and Structures (continued)				
Avery house (Sylvanus Knowles house)	Not applicable	-	-	In private ownership. Built ca. 1864 and also known as the Sylvanus Knowles house. The Kattwinkels acquired it in 1943 (CLR, 39). At a later date, the Averys acquired the property. The barn survived until the mid 20th c. (NR, 7/8)
Capped barn foundation	Contributing	Fair	Fair/Poor	The capped barn foundation is north of Fort Hill Road across from the Burrill house. Part of the Gunn dairy barn stood on the foundation (CLR, 70). Because of vigorous vegetation growth around the barn foundation, it is no longer easily visible in the field.
Skiff Hill shelter	Non-contributing	Fair	Fair	The Skiff Hill shelter at the Kattwinkel overlook was completed in 1965 (CLR, 51).
Comfort station	Non-Contributing	Fair/Good	Fair/Good	The comfort station first appeared as part of the 1967 fiscal year construction program, and was near completion in May 1969 (CLR, 53).
Stone walls in open fields	Contributing	Fair/Good	Fair/Poor	The stone walls are indicated on an 1856 map. Only three walls running east-west remain. In 1965 parts of a fourth wall and some north to south walls were still extant (NR, 7/11). Encroaching vegetation is growing on and along the remaining walls.
Stone boundary marker	Contributing	-	-	A granite marker engraved with the letter "T" was the north west boundary marker for the Treat property in the late 17th and early 18th c. (NR, 7/12)
Vegetation				
Open fields	Contributing	Good/Fair	Poor	The fields were historically used for agricultural purposes, with the exception of wet areas which were used for peat harvesting (the kettle-hole wetlands). The fields are divided up by stone walls. Four historic aerial photographs of 1938, 1960, 1978 and 1987 show how the open fields evolved. The total area of open fields has considerably decreased. Since 1994 native and non-native woody shrubs and trees have grown up in the fields.
Native and non-native woody shrubs and trees	Non-contributing	Fair	Poor	Native and non-native woody shrubs and trees, including blackberry, multiflora rose and black locust, have grown up in areas of the open fields and changed the historic open agricultural character of the site.

Feature Name	Evaluation Historic Period 1786-1943	Condition 1995	Condition 2007	Comments
Vegetation (continued)				
Lupines	Non-contributing	Fair	Fair	Non-native lupines have established in the landscape. Further spreading will result in a poor condition assessment.
Red Maple Swamp	Contributing	Good	Good	Maps confirm that wooded swamp existed in the middle of the 18th century. (NR, 7/14). The swamp was used for peat harvesting. Historically swamps on Cape Cod were cedar swamps. Red-maples established at a later date. The extent of vegetation increased as the agricultural use of the fields decreased.
Woodland edge to kettle-hole wetlands and vegetation in kettle-hole wetlands	Non-contributing	Fair	Fair	Vegetation along the edges and within the wetlands now restricts views to the water surface. Historically the edges and water were open. Due to encroaching vegetation in the open fields the wetlands do no longer stand out from the surrounding field setting.
Line of cottonwood trees at Penniman house driveway	Contributing	Fair	Poor	A row of 7-8 cottonwood trees is visible on a photo of ca. 1880 (CLR, Fig 14, 36). Another photo of ca. 1880 (CLR, Fig 44, 89) also shows the driveway with four cottonwood trees to its west. These four trees came down in a 2005 wind storm.
Horse chestnut trees at Fort Hill road	Contributing	Fair/Poor	Fair/Poor	A ca. 1880 photo of the Penniman house (CLR, Fig. 14, 36) shows a row of trees east of the Penniman house drive. Another tree(s) is visible on the north side of the drive. Other ca. 1880 photos (CLR, Fig. 9, 24 and Fig. 44, 89) show trees here. The trees in these photos could be horse chestnut trees. It is also believed that two horse chestnut trees were lost during Hurricane Bob in 1991, leaving only one remaining horse chestnut.
Line of eastern red cedars	Contributing	Fair	Fair/Poor	A line of declining eastern red cedars is located along the entrance road.
Little bluestem grass	Non-Contributing	Fair	Fair	Bluestem grass established in parts of the open fields after the period of significance, as a result of the prescribed burning. The grass does not detract from the historic setting.
Vegetation edge at shoreline with Nauset Marsh	Non-Contributing	Poor	Poor	An aerial photograph of 1938 shows that there may have been limited vegetation along the slopes above the shoreline of Nauset Marsh (CLR, 83). After the period of significance the vegetation increased.

Feature Name	Evaluation Historic Period 1786-1943	Condition 1995	Condition 2007	Comments
Vegetation (continued)				
Foundation planting at Penniman house	Contributing	Poor	Poor	Historic photographs show limited vegetation planting on a trellis only on the east side of the Penniman house.
Tree at Burrill house	Not applicable	-	-	In private ownership.
Foundation planting at the Burrill house	Non applicable	-	-	In private ownership. A clipped hedge runs along the front of the Burrill house. It is not clear if it was planted after the period of significance.
Foundation planting at the Avery house	Non applicable	-	-	In private ownership.
Black locust trees at the lower parking lot	Non-contributing	Fair/Good	Fair/Good	Mature black locust trees mark the property line with the Avery property. They have been retained to limit the visual impact of the parking lot.
Views and Vistas				
Panoramic view of Nauset Marsh from the overlook at Skiff Hill	Contributing	Fair	Poor/Fair	The overlook provides views of the Nauset Marsh.
Panoramic view of Nauset Marsh and Town Cove from the summit of Fort Hill	Contributing	Good	Fair/Good	The parking lot at the summit of Fort Hill provides panoramic views of the Nauset Marsh and Town Cove.
Panoramic view of Nauset Marsh and Town Cove from Penniman house	Contributing	Poor	Poor	The terraced lawns at Penniman house provided unrestricted views over Nauset Marsh to Town Cove. Vegetation south of Penniman house now obscures views.
View of the entrance from Penniman house	Contributing	Poor	Poor	The terraced lawns at Penniman house provided views to and from Town Cove. Vegetation west of Penniman house obscures views. A row of eastern red cedar trees are a historic feature that frame the view.
Panoramic views over the open fields and stone walls	Contributing	Fair/Good	Poor	The panoramic views over the open fields from Fort Hill Road and trails are historic and would be open to Nauset Marsh and Town Cove. Encroaching vegetation in the open fields and along the stone walls is obscuring the views.

Feature Name	Evaluation Historic Period 1786-1943	Condition 1995	Condition 2007	Comments
Views and Vistas (continued)				
Views from the Fort Hill trails over the open fields to the kettle-hole wetlands.	Contributing	Fair/Good	Poor	The panoramic views over the open fields to the kettle-hole wetlands can be seen on historic photographs. Vegetation along the edges and within the wetlands now restricts views to the water surface. Historically the edges were open. Due to encroaching vegetation in the open fields the wetlands no longer stand out from the surrounding field setting.
View from Fort Hill road to Penniman house, Avery house and Burrill house	Contributing	Fair/Good	Fair	Views from the Fort Hill Road to these houses remain, but invasive woody vegetation between the lower parking lot and the Avery house blocks views.
Views from boardwalk to red maple swamp	Contributing	Good	Good	In ca. 2000, the boardwalk underwent major repairs and a section of the loop was removed, but views to the swamp remain.
View of the capped barn foundation	Contributing	Fair	Fair/Poor	Because of vigorous vegetation growth, the barn foundation is no longer easily visible in the field.
View from Fort Hill Trail to the comfort station	Non-contributing	Poor	Poor	Views of the comfort station and concrete steps detract from the setting.
Small-Scale Features				
Decorative wooden fence surrounding Penniman house front Lawn	Contributing	Fair	Good	The decorative painted wooden fence is visible on ca. 1880 photographs and is still present.
Wooden split rail fence at Penniman house	Non-contributing	Fair	Fair	A wooden split rail fence runs along the Fort Hill trail south of the Penniman property to the stables.
Flagpole at Penniman house	Gone	-	-	The flagpole socket remains in the West lawn but the flagpole is gone.
Whalebone gate at Penniman house	Contributing	Good	Good	The gate was first installed in 1868 with a set of sperm whale jawbones, but was removed in 1876. Shortly thereafter a second set of jawbones from a baleen whale was installed, which is visible in late 1800s photographs (CLR, Fig. 15, 36). The existing set, the third set used on the property, are from the jawbones of a Finback whale and were installed by the park in 1969.

Feature Name	Evaluation Historic Period 1786-1943	Condition 1995	Condition 2007	Comments
Small-scale Features (continued)				
Hitching posts at Penniman house	Contributing	Fair/Good	Fair/Good	The posts are visible in ca. 1880 photographs and must have been put in place shortly after the building of Penniman house in 1868 (CLR, Fig. 15, 36). It is unknown if these are the original posts.
Wooden split rail fence at Fort Hill parking lots	Non-Contributing	Good	Good	Installed as part of the parking lots.
Signage, waysides	Non-contributing	Poor/Fair	Poor/Fair	Installed after 1963 to provide interpretive information.
Seating on trails	Non-contributing	Fair/Good	Fair/Good	Installed after 1963.
Wooden split rail fence at Avery house	Non-applicable	-	-	In private ownership.
Flagpole at Burrill house	Non-applicable	-	-	In private ownership. The flagpole is located near the driveway and garage.
Archeological Features				
Indian Rock (Native American sharpening stone)	Contributing	Fair/Good	Fair/Good	It was moved from the marsh below in the mid 1960s by the NPS for display at the Skiff Hill shelter overlook (CLR, 53).
Archaeology	Contributing	Good	Good	Portions of the site were included in the Nauset Archaeological District in 1991 and designated a National Historic Landmark in 1993. This includes native settlement sites along Nauset Marsh associated with contact with the French explorer Samuel Champlain in 1605-6. (NR, 7/12).
Quarried Rock	Contributing	Good	Good	Located north of Fort Hill road and is partially buried and shows drill house in which a fragment of metal is lodged (NR, 7/12).
Rock with spike	Contributing	Good	Good	Located on the eastern slope of Fort Hill near the marsh edge on the Fort Hill Trail (NR, 7/12).
Avery house barn	Gone/not applicable	-	-	In private ownership. The barn survived until the mid 20th century and had a footprint significantly larger than the house (NR, 7/8).

Feature Name	Evaluation Historic Period 1786-1943	Condition 1995	Condition 2007	Comments
Archeological Features (continued)				
Former Thomas Knowles farmstead	Gone	-	-	It is presumed that Thomas Knowles' house and farmstead was situated south-east of the Penniman house and that it was obliterated by the building of the Penniman house and barn (CLR 34).
Penniman house greenhouse	Gone	-	-	The Pennimans had a greenhouse from at least the 1880s and later removed it and sold it to a cousin. It was destroyed by a hurricane in the 1920s. (CLR, 34). A photograph of ca. 1880 shows the greenhouse east of the house (CLR, Fig 13, 35).
Penniman boat house	Gone	-	-	From the mid 1880s until around 1900, the Pennimans had a boat house (CLR, 34).
Penniman house vegetable garden and hen house	Gone	-	-	Photos from the 1880s through the 1920s show a hen house and a vegetable garden (CLR, 34).
1960s development traces	Non-Contributing	Fair	Fair/Poor	The development company Mel-Con built subdivision roads for a development scheme on Fort Hill ca. 1960. The scheme was halted but road scars remain. They are overgrown and managed as open fields (CLR, 67).

CHAPTER 3: TREATMENT RECOMMENDATIONS

This chapter reviews treatment issues and recommendations from the *Cultural Landscape Report for Fort Hill* (1995) as well as more recent issues affecting the condition of the landscape. Guidance on the long term management of the cultural and natural landscape is intended to be both broad, encompassing the overall character of the landscape, as well as specific, relating to individual features. The information in this chapter will also guide future compliance with Section 106 of the National Historic Preservation Act. Recommendations are summarized on a treatment plan (Drawing 1) and illustrated by figures which are referenced throughout the chapter.

A. GUIDELINES FOR THE FORT HILL RURAL HISTORIC DISTRICT AS A WHOLE

Because the preservation of the historic character of the Fort Hill landscape is the sum of many landscape characteristics and features, a holistic approach is needed to guide management of the area. Based on a meeting with park staff, the project team developed a hierarchy of desired outcomes for the property.

SUMMARY OF DESIRED OUTCOMES

For management and maintenance of the Fort Hill Rural Historic District site the project team created a hierarchy of preservation objectives.

1. Archaeology
2. Cultural landscape
3. Natural resources

Preserve archaeological resources

Fort Hill is designated as part of Nauset Archeological National Landmark District because it contains a nationally significant, multi-component prehistoric site dating to the Late Archaic to the Late Woodland period. A key objective is to preserve these highly significant archaeological resources by minimizing disturbance and through interpretation of the significance of these resources.

Preserve cultural landscape

Preserving the historic character of the cultural landscape is seen as the second most important objective for the management and maintenance of Fort Hill. Key elements that contribute to the historic character of the Fort Hill include the agricultural use, architectural heritage and historic domestic functions. The National Register documentation states that “the most distinctive character-defining feature of this area is its pattern of small rectangular fields defined by stone walls” (NR, 7/11).

Preserve natural resources

Preserving the natural resources is seen as the third main objective for Fort Hill. Ecological functions should be preserved in the distinctive open, wooded, and wetland areas. A key element is to promote an open native grassland habitat for birds, insects, and animals with grasses such as little bluestem (*Schizachyrium scoparium*). The management of the open fields to achieve an "agricultural" field appearance by using native grassland species is an example of how preservation of natural resources can be integrated into the overarching management objectives.

OVERALL LANDSCAPE CHARACTERISTICS OF THE AGRICULTURAL LANDSCAPE

Preserve the rectangular field pattern and stone walls

The National Register Nomination states that "the most distinctive character-defining feature of this area is its pattern of small rectangular fields defined by stone walls" (NR, 7/11). The National Register nomination adds that:

> The field pattern at Fort Hill, with land divided into rectangular fields of varying size, represents a distinctive regional method of agricultural land division characteristic of late 18th and 19th century New England farms. New England's small fields reflected the gradual process by which land was cleared when first settled by Europeans. It also reflects the need to cultivate a wide variety of crops . . . Throughout the Knowles period the small fields were used to grow a diverse range of crops. At the end of the Knowles ownership in 1943, the various enclosed fields at Fort Hill were used for growing sweet corn, hay and turnips, and for pasturing approximately fifteen cows. Integral to the character of the small fields at Fort Hill are the stone walls that define them. Stone walls represent a type of field boundary demarcation common to the 18th and 19th century farms in New England. (NR, 8/2)

The National Register documentation notes that rocks from the fields were neatly assembled into stone walls. Stone walls were unusual on the lower Cape Cod, as the soil contained few stones.

> However, the area around Fort Hill was an exception to this, having a number of glacial boulders. Thus, the stone walls at Fort Hill – while characteristic of farms throughout the large New England region – are rare on Cape Cod. (NR, 8/3)

The survival of three stone walls on Fort Hill in an undeveloped open rural setting makes the property all the more notable, as many walls and open fields have been dissected by development or overgrown with woods in New England.

Fort Hill retains a high level of integrity to 1943 (NR, 8/3). The key characteristic that therefore should be conserved at Fort Hill is the undulating folds of pasture and abandoned field divided by unmortared fieldstone walls.

Preserve open views

The dramatic open landscape is a key characteristic. Expansive views over the fields to Nauset Marsh, the Atlantic Ocean, Town Cove, and the distant Nauset Coast Guard Station allow visitors to see a vast expanse of the Outer Cape landscape. Multiple elevated points, including the Fort Hill summit, Skiff Hill and the Penniman house yard provide varied vantage points (NR, 7/10).
Iardella's coastal map of Cape Cod of 1856 (see CLR, 28) shows the open fields and alignment of stone walls. Aerial photographs of 1938 and 1960 show how the open character of the fields and stone walls still had a high level of integrity in the early and mid-twentieth century (Figures 15 and 16). Aerial photographs of 1974 and 1987 show how succession has occurred around the edges of the open fields (Figures 17 and 18).

Old photographs of the 1880s (see CLR, 35-38) show the open character of the fields and panoramic views (Figures 19 and 20). Haying of the fields can be seen in one of the photographs (see CLR, Fig. 17, 38). More recent photographs taken in 1994 show the panoramic views and dramatic open character (see CLR, Fig. 29, 66 and Fig. 30, 60). The kettle-hole wetlands and stone walls still stand out from the surrounding field setting. The open agricultural character of the fields was retained through mowing until 1994 (see CLR, Fig. 31, 69). When mowing stopped, successional vegetation began growing in height, blocking views and altering the grassland habitat (Figures 21 and 22).

Control invasive vegetation

Opportunistic vegetation has been encroaching on the area from all sides. Aerial photographs of 1974 and 1987 (see CLR, 85-86) show how areas of open fields have decreased by the spread of woodland and how features such as the stone walls and kettle holes have been encroached upon by vegetation (see Figures 17 and 18). As a result, key unrestricted views have been lost, including views from Skiff Hill and from the Penniman house. Invasive native and non-native woody plants have also spread into the open fields. To retain the open agricultural character of the site, targeted control will be needed. Recommended actions will be discussed in greater detail in the next section.

B. GUIDELINES FOR THE FORT HILL ROAD ZONE

CIRCULATION

Use natural colored gravel for the Fort Hill trails

The current route, extent, and varied surface treatments of the existing Fort Hill trails should be maintained (see CLR, 103), but the appearance of the bluestone gravel as a top layer of the trails is not appropriate for the site.

Recommendation: The route, extent, and varied surface treatments of the Fort Hill trails have been maintained. Recently the park has used natural colored gravel instead of bluestone gravel for the trail surfaces to better harmonize with the natural setting (Figures 23 and 24). In the long-term all paths should have a natural colored gravel surface. Gravel should contain a natural mix of gravel and clay so that it remains in place once compacted.

Do not construct a trail spur from the lower parking to the Fort Hill Trail

Construction of a trail spur from the lower parking lot on Fort Hill Road to the trail from Penniman house to the top of Fort Hill was considered (see CLR, 103). The treatment plan in the CLR (see CLR, 101) depicted a trail spur that started opposite the lower parking west of the horse chestnut tree and running south to the trail from Penniman house to the top of Fort Hill. Park staff and volunteers, however, recommended not constructing this trail because it would create additional disturbance to archeological resources. The group felt that the existing trail system in this area was adequate.

Do not extend the Fort Hill Trail along the southerly edge of Fort Hill near the marsh

Extension of the Fort Hill Trail along the southerly edge of Fort Hill near the marsh to connect with the trail leading to the Penniman house was considered (see CLR, 103). Currently unofficial grass and dirt trails that run along the southerly edge of the site along Nauset Marsh and to the Fort Hill Trail and Fort Hill parking area. The Park Archeologist, however, is not in favor of this extension due to the significance of this area.

Improve access to Penniman house by the steps

Visitors walking to the Penniman house from Fort Hill Road, including those on guided tours, have to walk up the stone steps to the north lawn, or via the drive and up the wooden steps to the east lawn. The stone steps have no hand railing and are uneven (Figure 25). The wooden steps from the driveway are very steep, making both steps challenging for visitors with mobility or sight impairments (Figure 26).

Recommendation: Make adjustments to the steps to improve access. The first option would be to add a simple handrail to the stone steps to the front. Although a handrail on the stone steps is not historically-accurate, it would be more inviting from an ADA standpoint to bring visitors up these steps, rather than requiring people to come in the "back way."

The second option would be to replace the wooden steps that are to the east of the house and make them safer by decreasing their pitch. This would mean that the flight of steps would start about two feet away from the wall. A sign at the start of the drive could guide the public to the most accessible steps.

Improve access to Penniman house via the western entrance

The Cultural Landscape Report recommended that access to Penniman house via the western entrance should be improved (see CLR, 101).

Recommendation: Access to Penniman house via the western entrance is possible over the west lawn and two sets of wooden steps (see Figure 3). The access path to the lower set of steps from the road should be improved when clearing the woodland to the west to reinstate the view. The clearing of the woodland is discussed in more detail under the vegetation section.

Develop district wide parking scheme and alternative transportation

Alternatives for visitor access and parking as part of a district wide parking scheme should be developed. It is recommended that a complete range of other alternatives for visitor access and parking be identified. Alternatives include (see CLR, 102):

- Provide a shuttle-bus service from the Salt Pond Visitor Center to Fort Hill for special events at the Penniman house or during periods of peak visitation.
- Construct a new modest-sized parking lot in the western portion of Fort Hill to minimize the impact on the historic scene, and to direct Penniman house visitors to the front door, which faces west. Any new parking lot should have a minimal impact on historic features, minimize grading, and include adequate screening for adjacent properties. The park is not in favor of constructing additional parking lots.

The General Management Plan for the Cape Cod National Seashore (1998) referred to the capacity problems at Fort Hill (GMP, 135). Fort Hill is the third most popular non-beach site in the Cape Cod National Seashore. Its estimated peak public use capacity is limited by existing parking to about 700 people per day. Without parking as a limiting factor it is estimated that 1200 people per day could be accommodated. It is estimated that parking capacity is exceeded 40 to 60 times a year. The GMP recommends exploring alternative transportation,

additional parking spaces, and revising the scheduling of special tours to improve the situation (GMP, 135).

Provision of a shuttle-bus service from the Salt Pond Visitor Center to Fort Hill has not been further developed, but since the preparation of the CLR the Cape Cod Regional Transit Authority has launched the Flex bus as a year-round public transportation system for Cape Cod. Public transportation systems could provide opportunities for additional visitors, however, any action that may result in dramatic visitation increases needs to be vetted with Fort Hill neighbors, and needs to consider the possibility of resource damage caused by increased foot traffic, development of social trails, and the unintended consequences of having more people arriving by public transportation with no nearby restrooms.

The proposal to construct a new modest-sized parking lot in the western portion of Fort Hill has not been taken forward to date. Before this option is advanced, other alternatives should be fully explored.

Preserve the width of the entrance roads

The current width and alignment of Fort Hill Road should be preserved and maintained (see CLR, 103).

Recommendation: Continue to comply with the above recommendation.

BUILDINGS AND STRUCTURES

Preserve the retaining walls along the north and east sides of the Penniman property

The retaining walls along the north and east sides of the Penniman property bordering Fort Hill Road should be stabilized and repaired or, if necessary, reconstructed. Regular whitewashing should be resumed as a part of preservation maintenance (see CLR, 104).

Recommendation: Repairs and whitewashing have been carried out on the north and east retaining walls, which are now in good condition. Regular whitewashing and preservation maintenance should continue as required (see Figures 25 and 26).

Preserve the stone wall south of the Burrill property

Vegetation covering and concealing the stone wall south of the Burrill property line should be removed, and kept off through prescribed burning in accordance with an approved prescribed burn plan (see CLR, 104).

Recommendation: Vegetation covering and concealing the stone wall has not yet been removed and must still be addressed. The wall should be repaired and stabilized and preservation maintenance should continue as required.

Rehabilitate the gravel and brick paths to the Penniman house

Historic photographs show a gravel path leading from the stone steps along Fort Hill Road to the backdoor, on the east side of the Penniman house. Photographs also show that near the backdoor there was a small brick paved area to the driveway steps and a wooden step to the door (Figures 27 through 31). Archaeological investigation would be needed to establish whether this path still remains in place underneath the existing lawn, and its precise location. The rehabilitation of the path, together with the rehabilitation of the flagpole, the line of cottonwood trees, the two trees in the east lawn, the foundation planting and the wooden fence between the barn and the house, would contribute towards the rehabilitation of the domestic character of the house that was evident up to the end of the period of significance. The gravel path would also improve visitor access.

VEGETATION

Replanting the line of horse chestnut trees

The planting of a line of horse chestnut trees along the southern edge of Fort Hill Road between the Penniman house and the Burrill inholding should be considered, if further research or photographic evidence can prove that a line of such trees existed in this location at the end of the historic period (1943) (see CLR, 103).

Recommendation: Research has not yet confirmed that there was a line of horse chestnut trees along Fort Hill Road. A photograph of the Penniman house from ca. 1880 (see H10-157, CLR, Fig. 14, 36) shows the Fort Hill Road with a row of two or three trees on its south side, just east of the Penniman house drive. A tree(s) is visible on the north side of the drive. Another photograph from ca. 1880 of the Fort Hill Road (see CLR, Fig. 9, 24) shows trees on the south and north side of the road. Another photograph of ca. 1880 (see CLR, Fig. 44, 89) shows the Penniman house drive looking north to the whalebone gate and shows the driveway lined with cottonwood trees, but also two trees along the Fort Hill Road, east of the drive. The trees in these photographs could be horse chestnut trees. It is also believed that two horse chestnut trees were lost during Hurricane Bob in 1991, leaving only one remaining horse chestnut. Planting of a row of horse chestnut trees should happen if further evidence confirms that they were present during the historic period (Figure 32).

Replant the cottonwood trees

Seedlings for the cottonwood trees along the driveway of the Penniman house should be cultivated in a nursery using root stock from the existing trees for future use. When it is necessary to replace these trees, they should all be replaced at the same time, so that their even-aged character is retained (see CLR, 103).

Recommendation: In 2005, four cottonwood trees to the west of the drive were lost during a wind storm. Only two cottonwood trees remain to the east of the drive (Figures 33 through 37). The Olmsted Center for Landscape Preservation coordinated the propagation of cuttings of the cottonwood trees in June 2007 for propagation at the Arnold Arboretum of Harvard University. If successful, the young saplings will be grown in the historic plant nursery managed by the Olmsted Center. When the trees reach the appropriate size for planting out, a decision should be made about the timing for felling the remaining two trees and the replanting of an agreed number of trees along the driveway with an aim to restore the even-aged character. A photograph of the Penniman house from ca. 1880 (see CLR, Fig. 14, 36) shows behind the Penniman house a row of seven to eight cottonwood trees just east of the Penniman house drive. Another photograph of ca. 1880 (see CLR, Fig. 44, 89) shows the Penniman house drive looking north to the whalebone gate and shows the driveway lined with cottonwood trees.

Identify trees and shrubs in the east lawn of Penniman house

Historic photographs show at least two trees near the backdoor of the Penniman house. The rehabilitation of the trees, together with the rehabilitation of the flagpole, the wooden fence between Penniman house and stables, the line of cottonwood trees, the foundation planting and the gravel path to Penniman house, would all contribute towards the rehabilitation of the domestic character of the house as it appeared in 1943, at the end of the period of significance. Further research is required to establish the type of trees that should be planted (Figures 38, 39 and 40).

Maintain open areas near Penniman house

Cleared areas south and west of the Penniman house should be kept open through haying and/or prescribed burning (see CLR, 103). Keeping these areas clear is an important step in restoring ocean vistas that the Pennimans enjoyed from their house (Figures 41 through 47).

Recommendation: As mentioned previously, the Penniman tract southwest of the Burrill house was overgrown until cleared by the National Park Service after storm damage. This area has been kept open, but a grove of vegetation was left to the west of the cleared area. As a result the main wooded areas south and west of the Penniman house that were recommended to be removed, have not yet been

cleared to open the views and remain woodland to date. These areas, part of what is known as Unit 6 within the open fields, should be cleared and kept open through mowing as will be detailed later in this chapter in the open fields management plan (Table 2.0). Vegetation should be cut at least one time a year and kept below knee height. The area is too small for prescribed burning.

Control new woody growth near the Burrill house

The opportunistic new woody growth reappearing between the Burrill inholding and the Penniman house on the north side of the Fort Hill Trail should continue to be controlled by park staff through mechanical methods or prescribed burning (see CLR, 104).

Recommendation: This area was cleared after the storm damage of Hurricane Bob in 1991 and has since been kept open through mowing that occurs once or twice a year. The area was scheduled for burning but this has not been implemented due to the proximity to the Burrill house and associated risks. Park staff will continue to control reappearing growth through mechanical methods or burning if conditions are deemed safe.

Thin the woodland area opposite the lower parking

The woodland area opposite the lower parking between the drive of the Penniman house and the area cleared after the storm damage to the west of Burrill house consists mainly of non-native species including Norway maple.

Recommendation: To improve the appearance of this woodland, additional clearing and thinning is recommended to reduce the number of non-native and non-historic species.

VIEWS AND VISTAS

Remove intrusive vegetation to re-establish historic sight-lines from Penniman house

The historic sight lines from the Penniman house to the Town Cove should be re-established, and the historically open condition of this area should be restored (see Figures 41 through 47). The CLR recommended that intrusive vegetation west and south of the Penniman house should be removed entirely through manual clearing followed by prescribed burning in accordance with the park's Prescribed Burn Plan. Furthermore, following the removal of vegetation, the soil should be stabilized by through natural colonization of local vegetation, seeding or other methods as soon as possible to avoid erosion and the possible consequential disruption of archeological resources (see CLR, 103).

Recommendation: The recommended clearing of both of these areas to re-establish the sightlines has not yet occurred but remains a priority for Fort Hill.

- Remove intrusive vegetation west of the Penniman house to open up a view of the house from Governor Prence Road upon arrival at the site.
- Remove the declining eastern red cedar trees and replaced in kind.
- Remove the intrusive vegetation, and in particular the phragmites, to the south also poses a fire risk for the Penniman house and barn due to its close proximity. It is recommended to remove the vegetation around the Penniman house within 100 feet. The vista line to Nauset Marsh should not be opened up completely in order to screen the visually intrusive housing developments at Town Cove.
- Clear a vista to the southeast of the Penniman house through the woodland to allow a view from the house to Nauset Marsh, which roughly follows the line of the Fort Hill Trail south of Penniman house and Burrill house.

Remove intrusive vegetation to maintain historic sight lines to Avery house

Vegetation growth between the lower parking and the Avery house partly blocks the historic open views to the house.

Recommendation: Maintenance staff wishes to keep the vegetation in this area under control to retain the views. However, because part of the vegetation grows on the Avery house private property, maintenance work in this area needs to be coordinated with the Avery house property owners. It is recommended that the park hold a meeting with the Avery house property owner to come to an agreement about the maintenance goals and procedures for this area.

SMALL-SCALE FEATURES

Preserve the wooden fence surrounding Penniman house front lawn

The wooden fence surrounding the Penniman front lawn should be preserved and maintained in accordance with the information included in the *Historic Structure Report for the Penniman House* (1989) (see CLR, 104).

A Preservation Maintenance Plan for the Penniman House and Barn (2006) prescribes a maintenance schedule for preservation of the wooden stairs and fence (see Figures 21 and 22).

Rehabilitate the wooden fence between the stables and Penniman house

Historic photographs show a painted wooden fence with vertical planks that connected the Penniman house and the stables, closing the space off. This fence is no longer present, and instead a small decorative wooden fence, in design similar to the decorative fence at the edge of the front lawn, but higher, is in the same location. This decorative fence appears to have been erected after the end of the period of significance. The decorative fence also only stands on top of the stone wall, and a gap remains between the wall and the stables. This gap was closed off when the original fence was in place. The rehabilitation of the painted wooden fence, together with the rehabilitation of the flagpole, the line of cottonwood trees, the two trees in the east lawn, the foundation planting and the gravel path to the back door, would contribute towards the rehabilitation of the domestic character of the house that was more prevalent up to the end of the period of significance in 1943. The fence would again enclose the stable courtyard, rehabilitating its historic character and appearance. On some historic photographs, plantings can be seen in front of the fence. This planting could be rehabilitated together with the planting at the east side of the house (Figures 48 through 51).

Direct visitors for approach to Penniman house

The CLR proposed installing signs or fencing to direct visitors during their approach to the Penniman house so as to not compact the soil around the foundation (see CLR, 104). The installation of "symbolic" fencing or signage requesting visitors to refrain from walking up to the foundation has been a low priority for the park and has not been implemented. Compaction of soil around the house is no longer seen as an issue.

Re-erect the Flag Pole

The flagpole should be erected on the Penniman lawn at the site of the existing flagpole base, in accordance with existing historic photographs (see CLR, 104).

Recommendation: The flagpole has not yet been erected. The reinstatement of the flagpole should be prioritized. Further research should assist in making a

decision about which flag would be appropriate for the site (Figure 52). In 1943 the flag had 48 stars.

Re-locate the wayside exhibit at the Penniman house

The location of the wayside exhibit for the Penniman house on the north lawn impacts the appearance and diminishes the setting. The CLR recommended re-locating the wayside exhibit (see CLR, 101).

Recommendation: The wayside exhibit has not yet been re-located but there is an agreement alternatives should be considered. Options for a new location for the wayside exhibit should be assessed to determine whether there is a better location:

- One alternative is to keep the sign in its existing location, recognizing that it does detract from the overall historic setting.
- A second alternative is to place the wayside near the entrance of the drive to Penniman house between the row of cottonwood trees west of the drive, once the cottonwood trees are replanted. Photographs of the Penniman house with the whale bones in the foreground are popular so to avoid intrusiveness the wayside should be placed about ten to fifteen feet to the east of the drive. When placed at this location the wayside could also include interpretive information about the cottonwood trees.
- A third alternative is to place a second wayside sign at the front entrance, at the bottom of the terraced lawn. A historic photograph shows a view of the house from this side.
- A fourth alternative considered, but not preferred, is to place the wayside at the bottom of the stone steps to the north of Penniman house. The proximity to the road has advantages, but also can be seen as visibly intrusive as the wayside would stand out so near to the road. This location could also pose a safety hazard to visitors while they are reading the sign.
- A fifth alternative considered, but also not preferred, is to place the wayside along the drive to Penniman house near the stone wall and wooden steps to the lawn. Views to the house from this point are not as good, but if the wooden steps were altered to improve accessibility, as proposed under circulation, the wayside would be along the main visitor route.

Use characteristic signage and waysides along the trails

Brown roadside signs are used along Fort Hill Road. For visibility roadside signs need to be sufficiently large but similar signs are also used for trail information and appear out of place within the park.

Recommendation: The National Park Service is at present phasing out the brown wayside signs. At Fort Hill, the new style signs are already being introduced.

More information about the new style signs can be found on the website of Harpers Ferry Center under the UniGuide sign standards at http://www.hfc.nps.gov/uniguide. At present the large brown signs are used at the lower parking at the start of the Fort Hill Trail ("Fort Hill Trails" sign) and at the entrance of the drive ("Authorized Vehicles Only" sign).

For information and interpretation signs and waysides along the trails, the park should use smaller signs than those placed along the entrance roads. The height and style of signs and waysides should not detract from the historic setting. The UniGuide sign standards website gives guidance on options for sign height and style. In the Red Maple Swamp area more appropriate materials have been used.

Interpret the 1960 development scheme

The interpretation of the Fort Hill zone should include information regarding the proposed development of the site circa 1960 (see CLR, 106).

Recommendation: Information about the proposed development of the site circa 1960 has not yet been prepared on site and the preparation of interpretation is still recommended.

Retain existing seating in the Fort Hill zone

Seating should be installed at appropriate viewpoints along the trails (see CLR, 103).

Recommendation: Since the preparation of the CLR in 1993 the park staff came to an agreement not to install any new seats along the Fort Hill trails due to the archeological sensitivity of the site. The general rule is to replace seating as required to retain the existing number of seats along the paths as replacements should not cause damage to archaeology as foundations are already in place.

C. GUIDELINES FOR THE OPEN FIELD ZONE

NATURAL SYSTEMS AND TOPOGRAPHY

Conserve the kettle-hole wetlands

The CLR set out that the preferred management strategy for the three ponds, or kettle-holes, is conservation accompanied by interpretation (see CLR, 106).

Recommendation: The three kettle-hole wetlands have been maintained as prescribed, by leaving them alone. This approach should be continued. The recommendations for the interpretation are mentioned under the signage and waysides section.

- The northern and largest kettle-hole has received no maintenance treatment. Mowing and burning around the pond has occurred as set out in the prescribed burn plan.
- The second largest, or middle kettle-hole, was created by cutting out peat and is almost filled and is overgrown with phragmites. In previous prescribed burns in this area, the burning ran through the pond and phragmites.
- The smallest and most southern kettle-hole is also almost filled with phragmites. Phragmites is on the list of invasive non-native species to be controlled in the park. The park should continue to monitor phragmites, but removal is at present a low priority. Staff are exploring a potential control method involving clipping the phragmites and applying an herbicide to clipped stems. This method has been successful in other areas of the seashore.

Further treatment recommendations for the woodland edge along the kettle-hole wetlands are given under vegetation.

CIRCULATION

Use natural color gravel for the trails in the open field area

The CLR prescribed that the current route, extent, and varied surface treatments of existing Fort Hill trails should be maintained (see CLR, 103).

Recommendation: The route, extent, and varied surface treatments have been maintained but it is recommended that the bluestone gravel top layer of the trails is replaced in a phased approach with compacted natural colored gravel. Volunteers are at present assisting the parks staff with this work. When the top layer is placed on trails that are eroding or where the existing bluestone top layer is replaced, care must be taken not to cut into the terrain in order to protect archaeological resources.

BUILDINGS AND STRUCTURES

Keep the stone walls clear and replace collapsed stones

The CLR recommends that stone walls should be kept clear through regular prescribed burning in accordance with an approved prescribed burn plan (see CLR pg. 106). The portions of the stone walls that have collapsed should be rebuilt by placing stones back onto the walls in the locations from which they probably fell (see CLR, 106). Collapsed stones will be lost or end up in the field and obstruct walkers, which could be a health and safety hazard.

Recommendation: The stone walls have been kept partially clear through the burning process but overall more clearing work is required so that damage caused by vegetation is avoided and the walls are more readable as significant landscape features in the Fort Hill landscape. A stone wall management program must be linked to the open field program, so that walls are repaired and stones do not disrupt mowing.

- The stone wall at the north end of the open field area on the edge of the woodland has not been kept clear, appears overgrown with shrubs, and is not easily readable as a landscape feature. Vegetation on the wall will need to be cleared through mechanical methods and the use of herbicides where appropriate. All vegetation between the wall and the path should also be cleared, leaving an edge of grass. The portions of the stone wall that have collapsed should be rebuilt by placing stones back onto the wall. Once the wall is cleared, park staff will need to continue to control reappearing growth through mechanical methods and the use of herbicides, and place any collapsed stones back. To improve its readability as a hard edge to the field, the grass edge between the path and the wall should be kept short through frequent mowing.
- The wall to the north of the northern kettle hole wetland has been kept most clear of all walls in the open field area as the burning of the field has been most frequent and successful in this area. The vegetation growth should be further reduced around this wall, and a grass edge of nine feet wide along the wall should be mowed, improving its visibility. Burning of vegetation should occur every two years as set out under the open fields management plan, as detailed in Table 2.0. The years that burning does not take place, the wall must be cleared through mechanical clearing and the use of herbicides so that every wall is cleared each year. Parts of the wall have collapsed and many stones are lying next to the wall. The portions of the stone wall that have collapsed should be rebuilt by placing stones back onto the wall.
- The most southerly wall runs to the south of the northern kettle-hole wetland. This wall is more overgrown with vegetation as the burning has been less successful in this area. Clearing through burning and mechanical

methods will be required and parts of the wall that have collapsed should be rebuilt by placing stones back onto the wall. A grass edge of nine feet wide along the wall should be mowed to improve its visibility. Burning of vegetation should occur every two years as set out under the open field management. When the field is not burned, the wall should be cleared using mechanical equipment and/or herbicides.

Keep the capped barn foundation clear

The capped foundation of the former Gunn dairy barn to the east of Avery house should be kept clear through regular prescribed burning in accordance with an approved prescribed burn plan (Figure 53 and see Figure 10).

Recommendation: Because of vigorous vegetation growth around the barn foundation, it is no longer easily visible in the field. The barn foundation should be kept clear to keep it visible as a historic feature. A grass edge of nine feet wide along the foundation should be mowed to improve visibility of the foundation. Maintenance of the stone walls and capping of the foundation should be resumed as a part of preservation maintenance. Burning of vegetation around the foundation should occur every two years as set out under the open fields management plan (Table 2.0). The years that burning does not occur, the vegetation around the foundation must be cleared with mechanical equipment and the use of herbicides.

Preserve the open fields

The CLR gave recommendations that were intended to allow for the successful production of hay while insuring the protection of significant cultural and natural resources to the greatest extent possible. The CLR included the following recommendations (see CLR, 105-106).

- The current configuration, size, and open character of the fields should be preserved and maintained.
- The fields should be initially cleared through prescribed burning in accordance with an approved prescribed burn plan to removed unwanted invasive woody plants.
- Lime should be applied to the soil following the burn to restore proper alkalinity in accordance with NPS Integrated Pest Management procedures. And as specified in a preservation maintenance plan, periodic soil testing would be done to determine the amount of lime needed.
- Hay production should be without tilling or seeding, by simply encouraging grasses already growing in the fields.
- Burning would occur between February and April; mowing of hay would occur in July.
- Hay production should be carefully planned, and some grassland areas

should be left uncut, to provide for ground-nesting birds such as bobolinks that use the open grassland areas at Fort Hill.

Background: From the 1980s until the mid 1990s the fields were mowed twice a year. In the mid-1990s the mowing decreased to once a year. When the fields were mowed twice a year, the first mow was in early spring (end April, early May), which was problematic, as this is a busy period for park staff and the mowing disturbed nesting birds. The second mow took place in late fall, after the first hard frost (mid to end October). This was an easier time for mowing because there were less requirements for mowing elsewhere in the park. The shift to one annual mowing (in October) related to limited resources, but also to avoid impact on nesting birds. With only one cycle of mowing in the fall, it was difficult to control the woody growth, because the plants were able to store energy for next year's growth. Woody plants soon became too tall for easy mowing. In 1998 the mowing stopped and burning was used instead. This was mainly an administrative decision as there were no resources and equipment to do the mowing.

A prescribed burn plan was approved for a five-year planning cycle from 1999 to 2004 to maintain the open fields, to clear the unwanted invasive woody plants and to accomplish hay production without tilling or seeding. The prescribed burn plan divided the field up into six management units and included treatment schedules for every unit. However, not every unit has received the same number of treatments and as a result, the conditions of the fields vary. Overall, the planned frequency of treatments has not been achieved. Prescribed burning of the units varies from three times to seven times since the inception of the prescribed burn plan in 1999, or the past eight years. In some units, mechanical treatments took place including the removal of some invasive locust seedlings. Herbicides have also been applied in restricted circumstances.

After several of years of implementation of the prescribed burn plan, the result has not been satisfactory. Both the General Management Plan for the Cape Cod National Seashore (1998) and the CLR (1995) identified the need to balance protection of landscape features in the open fields (field patterns, stone walls, trails, and ponds) with current maintenance, safety, and visitor needs (GMP, 165). The overall appearance of the fields is that they appear overgrown with invasive woody plants such as blackberry, multiflora rose, privet and locust.

Historic appearance: An early photograph, circa 1890, shows a stone wall at Fort Hill (Figure 54). Four historic aerial photographs of 1938, 1960, 1974 and 1987 show how the open fields evolved (see Figures 15 through 18). The 1938 aerial shows open fields with the kettle-hole wetlands without any vegetation. Low altitude aerial photographs from the 1930s show cattle grazing in the open fields (Figures 55 and 56). On the 1960 aerial vegetation starts to appear in the fields on

Skiff Hill, to the south of Penniman house, and in the field west of the Red Maple Swamp area. From the 1974 aerial until the 1987 aerial the vegetation in these areas evolves until these areas are densely forested. By 1974 vegetation also appears along the kettle hole wetlands and at the shoreline. By 1987 the area of open fields has considerably decreased. Photographs of 1994 in the CLR (see CLR, 68-70) illustrate how the fields are still open and mown as hay fields. The kettle hole wetlands are edged and partially filled with encroaching vegetation but they still stand out from the surrounding field setting. The stone walls and capped barn foundation also still stand out from the surrounding field setting. Until 1994 the National Park Service was managing the open fields through periodically mowing. This appeared effective for the remaining open areas. The open appearance seems to have gradually evolved after 1994 and there has been a gradual replacement of pasture grasses by coarser vegetation. The management of the fields under the Prescribed Burn Plan since 1999 has not accomplished maintaining the character of the open fields.

Their character as open hay fields as can be seen on photographs of 1993 in the CLR has been lost (see CLR, 68-70). While features such as the stone walls, the capped barn foundation and the kettle-hole wetlands could be easily distinguished within the fields, they are now hardly recognizable within the overgrown state (Figures 57 through 64, also see Figure 9). Together with the historic use and appearance of the fields as hay fields, these features are key elements of the site. The stone walls and the mowing pattern are characteristic linear features in the landscape while the kettle-hole wetlands should stand out as fresh-water features. The open fields are the most prominent and visible feature of the site and given their changed appearance there is now an urgent need to evaluate the methods and review the Prescribed Burn Plan.

Identify desired outcomes associated with open fields

Resource specialists contributed the following desired outcomes for open field management according to the following resource types.

Archaeology

- Minimize ground disturbance.
- Minimize bare soil that would encourage pot hunting.
- Encourage visitors to stay on paths.

Cultural landscape

- Preserve historic character using a sustainable management approach.
- Enhance visitor experience through interpretation of the cultural and natural history of the area.
- Preserve stone walls and building remnants and keep them visible by maintaining vegetation below knee-height for most of the year.

- Reduce shrubby vegetation in the fields and increase grasses.
- Preserve views across the fields and to the bay and ocean.
- Preserve the hard edges to the former agricultural fields as would be characteristic of active agricultural fields. This edge would be recognizable along the shoreline, along the stone walls, and along the edge of the Red Maple Marsh woodland. A clearly defined edge should also define the kettle-hole wetland areas.

Natural resources

- As stated in the GMP, manage native biotic resources by allowing natural processes to continue unimpeded except where appropriate to selectively manage for native biological diversity or rare, threatened, or endangered species or communities.
- Use prescribed burning as a tool to simulate a fire-dependent ecosystem of grasses, such as little bluestem (Schizachyrium scoparium).
- Accommodate ecological functions: Manage open areas to minimize ecosystem impacts and to sustain natural processes including nesting and foraging habitats for open-habitat birds such as the Massachusetts threatened grasshopper sparrow, habitat for box turtle near the wetlands, habitat for woodchuck, and milkweed pods for migrating monarch butterflies.
- Use cultural practices that have the least impact on seasonal habitats. For example, the box turtle is a woodland and open habitat edge species that uses open habitats mostly in the spring and early summer for thermo-regulation and then for egg-laying. Mowing should take place in the second half of July and later so as not to disturb nests. Mower height should be set above six inches and the staff involved in mowing should watch for turtles.
- Achieve the "agricultural" field appearance with native species
- Eradicate invasive non-native species.

The desired appearance of the fields would be:

- Maintain 70 percent of the groundcover in little bluestem grass.
- Woody plants less than knee-height in 80 percent of the open fields as a minimum standard for each area of the fields.
- In the fringe area at the water edge, limit tree species blockage to 25 percent.

Develop and refine a schedule for management and maintenance for open fields

To develop and refine a schedule of management and maintenance, the park staff has explored multi-disciplinary approaches to achieve the desired outcomes. A schedule of adaptive management and maintenance will need to be phased and include contingency planning, response to desired outcomes and indicators, feedback, and documentation (Table 2). The management is planned by six field units (Drawing 2). The overarching objectives are:

- Units 1/2/3/4/5: Use fire and mowing on a two year cycle to keep vegetation below knee-height, though a one-year cycle may be necessary to initially eradicate the invasive woody shrubs
- Unit 6: Use annual mowing during the latter half of the growing season to keep vegetation below knee-height
- Eradicate non-native invasive plants, initially by herbicide, and then by cyclic burning and mowing.

Initiate a first phase of treatment to preserve open fields

Based on the current situation, a first phase is planed for 2007 and would work as a "blitz" phase. The treatment will be applied to not more than 50 percent of the open field area to avoid a high impact on potential rare insect species and nesting birds.

- Units 1/2/3: The fields will be burned in March-April, and treated with herbicides in July to eradicate the non-native woody plants and invasive species such as bindweed in Unit 2, but not blueberries and raspberries. This treatment should result in a field of plants back below knee-height.
- Units 4/5: These units will be sickle mowed in late July. Sickle mowers have been determined to be the least dangerous to turtles, notably in the Fort Hill area, the box turtle. The cut should be done above six inches in height to further protect turtles. In June and July plant material dries out, reducing the green fuels. The cut material will be let to dry for three to four weeks after which the field will be burned. This treatment will top-kill the plants that have sprouted-up again and recovered with fresh growth. This process could knock back 50-60 percent of the woody plants. This will also encourage little bluestem grass to come into these areas.
- Unit 6: This area is situated between the Burrill and Penniman houses and the close proximity to these buildings makes it difficult to burn there. Within this a small unit, a north-west wind is needed for burning, yet the prevailing wind is from the southwest. Burning therefore does not work here and the area will need to be mowed once during the growing season, between August and the first week of October. If the whole wooded area is cleared, brush could be stacked and burned. Immediately after clearing, the area should be seeded with native grasses, then mowed annually.
- Edges of paths and walls: The edges of paths and a nine-foot edge along the stone walls will require frequent mowing in the growing season to keep the grass short.

To maximize impact on the woody plants, it is better to mow once in August or September to reduce the vigor of the plan, rather than in October.

Herbicides are seen as the most effective way to eliminate invasive plants such as multiflora rose and should be used during this initial removal phase in

accordance with NPS Integrated Pest Management procedures. Prior to herbicide application, the plants should be cut down with a sickle mower. The herbicide is then sprayed on the regrowth to minimize the volume of spray and maximize its impact.

Implement a second phase of treatment to preserve open fields

After the first year alternate management treatments will occur on an annual basis in Units 1/2/3 and Units 4/5.

- Units 1/2/3: Mow the fields between August and the first week of October of every even year, and burn the fields in March or April of every odd year.
- Units 4/5: Mow the fields between August and the first week of October of every odd year, and burn the fields in March or April of every even year. Units 4/5 will also be treated by herbicides in July of the first year of Phase 2 to eradicate the non-native woody plants and invasive species such as multiflora rose, but not blueberries and raspberries.
- Unit 6 will need to be mowed once between August and the first week of October of every year. Units 6 will also be treated with herbicides in July of the first year of Phase 2 to eradicate the non-native woody plants and invasive species, but not blueberries and raspberries.
- Edges paths and walls: The edges of paths and a nine-foot edge along the stone walls will require frequent mowing in the growing season to keep the grass short.

Control exotic species in open fields

For the last ten years, the vegetation at Fort Hill has been managed by combinations of fire and mechanical cutting. While these efforts have largely succeeded in halting succession and maintaining a short-statured community to preserve the vista, the area is still infested with numerous exotic plant species. Thus, while management of vegetation structure has been relatively successful, its species composition can still be considered highly degraded.

In 2006 the National Park Service's Northeast Exotic Plant Management Team (NE EPMT) treated a subsection of Fort Hill with foliar-spraying of herbicide. This subsection included the southwest corner of Fort Hill—an area bound by the road, the footpath leading up to the Red Maple Swamp, and an old path running roughly NW to SE (Figure 65). The team focused on exotics that were present in this test area. The initial results were very encouraging in that the targeted species suffered rapid mortality, while natives flourished around them (Figures 66 and 67). In 2007 the Northeast Exotic Plant Management Team treated approximately half of the Fort Hill field area with Garlon 3A herbicide. Exotic and invasive plants were targeted, and there were very few losses of non-target species. The treatment appears to have been very effective on Oriental

bittersweet and variably effective on multiflora rose and black locust. It is recommended that the team continue to treat target species with herbicide.

Treatment objectives and methods: The ultimate objective is to restore the plant community at Fort Hill to a native shrub/grassland. An added benefit of exotic plant control in this area is the elimination of seed sources that can easily spread into other areas of the Seashore. Currently, the area is infested with a multitude of exotic species (many of which are highly invasive), including multiflora rose, oriental bittersweet, black locust, bristly locust, Japanese honeysuckle, Morrow's and Tartarian honeysuckle, and autumn olive. Some of the herbicide treatment could be done using a boom sprayer mounted on a tractor. The sprayer can be shut on and off depending of whether the boom passes over exotics or native vegetation. The system can be easily turned on and off to avoid desirable plants. The equipment also has a built-in spot spray wand for any missed targets. The advantage of using the boom sprayer is that a swath of vegetation eleven-feet wide can be treated. At Fort Hill, where there are large expanses of invasives with no native species mixed in, this would be a particularly effective method. However, the team would also have people with backpack sprayers to hit areas too dense to drive through with the tractor, or where the exotics are thinner and there are many natives to preserve. The areas near the wetlands may require some careful hand work.

The type of herbicide recommended by the NE EPMT for this project is Garlon 3A (2-3 percent), which affects only broadleaf plants and leaves grasses unscathed. It is taken up by plants through the leaves and then translocated through the plant via the vascular tissue. The herbicide controls target plants by mimicking the natural plant hormone auxin, but in a way that causes uncontrolled growth that eventually kills the plant.

Triclopyr, the active ingredient in Garlon 3A, has been classified by the EPA as "practically nontoxic" (the least toxic category used by EPA) to mammals, insects, freshwater fish and invertebrates. In fact, a number of Garlon products are labeled for use on aquatic plants. According to the NE EPMT, there is no evidence that the chemical can leach out of the roots of the plants on which it has been applied. The fate of any triclopyr that makes it to the ground surface is decomposition by soil microorganisms (fungi and bacteria) and sunlight. The final breakdown products are carbon dioxide, water and other innocuous organic compounds. Approximately 50 percent of the product is degraded within 30 to 45 days. Fortunately, Fort Hill is thickly vegetated with virtually no bare ground, which means that little to no herbicide should ever touch the ground during application since the chemical is sprayed directly onto the foliage. Additionally, the NE EPMT staff are licensed professionals who would be extremely careful not to impact anything but the target plants.

Ideally, this large scale herbicide treatment would be a one-time event, with much more limited use in the future to control any re-spouts and re-emergence. Controlled fire and mowing would be used to retard successional processes and thereby maintain vegetation structure.

Assistance from the fire crew: The fire crew would cut as much of the woody shrub vegetation as possible during the winter so that the NE EPMT has better access to target stands of exotics. Visible re-sprouts should be present by May and it is these identifiable re-sprouts that will be sprayed with herbicide. The ideal period for treatment is June 2007.

Develop a contingency plan for the desired outcome for management of open fields

The open fields management and maintenance is based on a multiple-year calendar and adaptive management approach. An adaptive management approach allows for adjustments based on monitoring of indicators and utilizes ongoing planning and evaluation to determine when management actions are needed.

- The multiple-year calendar includes reviews of the approach and documentation of the process. Two evaluation meetings should take place every year. A first meeting in January or February, and a second meeting in June, to examine the condition of the fields in the growing season. The meetings provide an opportunity for feedback on the desired outcomes listed above for archeological, cultural landscape and natural resources. Indicators and criteria must be developed for monitoring and documentation. For example, knee-high vegetation for most of the growing season is an important indicator for preserving views of the cultural landscape.
- The multiple-year calendar also provides contingency planning in case burning or mowing can not happen at the scheduled date, or if additional mowing is required.
- Adaptive planning may also mean that the herbicide treatment, burning, or sickle mowing of Phase 1 needs to be repeated in certain units at a later stage, if scheduled treatment does not have the desired effect.

Once the multi-year cycle is complete, two years of grass fuel may be necessary before burning again. Spring burning can take place from January 15 until May 15 (or until June 15 for little bluestem). If the woody species are eliminated, and bluestem has established, an 18-month sequence of burning would be sufficient.

Protecting archeological resources, preserving the historic character of the open agricultural fields, and enhancing natural processes are priorities that can all be achieved with adaptive management and routine evaluation meetings. The

treatment goal should be to manage the fields in their traditional appearance of hay fields as still can be seen on the 1993 photographs (see CLR, 68-70). Some grassland areas should be left uncut, to provide for ground-nesting birds. Field edges along trails should be more frequently mowed as specified below. Field edges along the woodland and along the stone walls should also be maintained as specified. Vegetation can remain along the edges of the kettle-hole wetlands as mentioned under the kettle-hole wetland recommendations. To achieve these objectives it is essential that sufficient funds are allocated to the maintenance of the open fields.

Table 2. Open Fields Management Plan

Six Management Units (see Drawing 2):

- Unit 1: The northernmost field, south of Skiff Hill woodland, from stone wall 1, to stone wall 2.
- Unit 2: The field between stone wall 2 and stone wall 3. Running from the Nauset Marsh up to the Red Maple Marsh woodland
- Unit 3: The field between the stone wall 3, Fort Hill Road, and trail from the Fort Hill overlook to the Nauset Marsh shoreline.
- Unit 4: The fields to the south of Fort Hill overlook, and the trail from the Fort Hill overlook to the Nauset Marsh shoreline.
- Unit 5: The field east of the Burrill house, within the bend of Fort Hill road to the Fort Hill overlook.
- Unit 6: The small field between the Penniman house and Burrill house, south of the lower car park.

Objectives:

- Units 1/2/3/4/5: Use fire and mowing on a two year cycle to keep vegetation below knee-height
- Unit 6: Use mowing to keep vegetation below knee-height
- Eradicate non-native invasive plants, initially by herbicide, and then by cyclic burning and mowing.
- Mow edges of fields and nine feet alongside the stone walls once a year to prevent growth of woody shrubs.
- Mow edges of paths three to four times a year to allow visitors a walking corridor.
- Reduce mass of invasive plants with sickle mowing, then treat regrowth with herbicide. Use a sickle mower and cut at a height of six inches to minimize harm to turtles, most notably the box turtle in the Fort Hill area.
- Conduct two evaluation meetings per year, one to discuss overall schedule for the coming year, the second during the growing season to evaluate the site conditions and desired outcomes.

Year 1 – 2007

Unit	January	February	March	April	May	June
1, 2, 3		Evaluation Meeting 1	Burn			Evaluation Meeting 2
4, 5						Do not Sickle Mow until July to protect bird and turtle nesting habitat
6					Do not mow because of bird and turtle nesting habitat	
Paths & walls				Mow field edges and along walls 1 time a year to control shrubs, mow path edges 3-4 times a year		

Unit	July	August	September	October	November	December
1, 2, 3	Herbicide	Mow once (Aug. until 1st wk Oct.)				
4, 5	Sicke Mow in last half of July	Burn (four weeks after Sickle Mow)				
6	Mow once (July 15th until 1st wk Oct.)					
Paths & walls						

Year 2 – 2008

Unit	January	February	March	April	May	June
1, 2, 3	Evaluation Meeting 1					Evaluation Meeting 2
4, 5			Burn			
6						
Paths & walls				Mow field edges and along walls 1 time a year to control shrubs, mow path edges 3-4 times a year		

Unit	July	August	September	October	November	December
1, 2, 3		Mow once		Mow once (If mowing did not happen yet this year)		
4, 5	Herbicide	Mow once				
6		Mow once		Mow once (If mowing did not happen yet this year)		
Paths & walls						

Year 3 – 2009

Unit	January	February	March	April	May	June
1, 2, 3	Evaluation Meeting 1		Burn			Evaluation Meeting 2
4, 5						
6						
Paths & walls				Mow field edges and along walls 1 time a year to control shrubs, mow path edges 3-4 times a year		

Unit	July	August	September	October	November	December
1, 2, 3	Only if required, repeat Sickle mow, Herbicide and Burn (June – August). Burning cannot be done in July unless the unit is sickle mowed	Mow once if mowing required (Aug. until 1st wk Oct.)				
4, 5		Mow once		Mow once (If mowing did not happen yet this year)		
6		Mow once				
Paths & walls						

Year 4 – 2010

Unit	January	February	March	April	May	June
1	Evaluation Meeting – Major Review to determine whether can move to late spring burn (June) if enough warm season grasses become established					Evaluation Meeting 2
2						
3						
4			Burn, move to June if feasible & warm season grasses established			
5						
6						
Paths & walls				Mow field edges and along walls 1 time a year to		

Unit	July	August	September	October	November	December
1		Mow once		Mow once (If mowing did not happen yet this year)		
2						
3						
4		Mow once if required, or repeat Sickle mow and Burn				
5						
6		Mow once				
Paths & walls	control shrubs, mow path edges 3-4 times a year					

Year 5 – 2011						
Unit	January	February	March	April	May	June
1, 2, 3	Evaluation Meeting 1		Burn, move to June if feasible & warm season grasses established			Evalutaion Meeting 2
4, 5						
6						
Paths & walls				Mow field edges and along walls 1 time a year to		
Unit	July	August	September	October	November	December
1, 2, 3		Mow once if mowing is required (Aug. until 1st wk Oct.)				
4, 5		Mow once				
6		Mow once				
Paths & walls	control shrubs, mow path edges 3-4 times a year					
Odd years – Repeat Program Year 4; Even years – Repeat Program Year 5						

Keep trail edges mowed

The CLR prescribed that areas along trails, parking lots, paved roads, and woodland edges will require mowing on an as-needed basis, typically three to four times a year (see CLR, 106).

Recommendation: The edges have been mowed frequently but not three to four times a year. It is recommended to retain a mowing frequency of three to four times a year.

Maintain 1960 development roads as open fields

The CLR recommended that road scrapes south and west of the overlook parking lot remaining from the circa-1960 subdivision roads should be mowed, burned, and hayed like the rest of the field area. No special effort needs to be made to maintain or remove them. However, interpretation of the Fort Hill area should include information regarding the proposed development of the site circa 1960 (see CLR, 106).

Recommendation: The 1960 development area has been maintained in a similar way as the open fields under the prescribed burn plan. Maintenance will need to be adjusted to achieve the same results as recommended under the open fields management plan (Table 2.0).

Retain a peripheral grass border at the Nauset Marsh edge

The CLR recommends retaining a strip of grass along the edges of fields that border Nauset Marsh to prevent bank erosion, and to filter any run-off going into the marsh. The CLR also recommends that this buffer area be mowed on an as-needed basis and not receive applications of lime (see CLR, 106).

Recommendation: Based on the open fields management plan, mowing could be carried out at the same time edges of the fields and along stone walls are mowed, once a year between May and the first week of October. Mowing once a year during the active growing season is needed to keep woody vegetation below knee height.

Control the spread of non-native lupines

Non-native lupines have established in the fields to the east of the Fort Hill Road parking.

Recommendation: Non-native lupines have been allowed to establish in the landscape and at present cause no problem. However, the lupines should be monitored to avoid their uncontrolled spread throughout the landscape. These are a non-native species and if they do spread, they would significantly alter the landscape character.

Limit the woodland edge along the kettle-hole wetlands

The existing "donut" of woody vegetation around the ponds should be limited to its current extent through prescribed burning and mechanical treatment (see CLR, 106).

Recommendation: The preferred management strategy for the kettle holes is conservation. The Prescribed Burn Plan recommends that the woodland edge be maintained and in the past years, burning and mechanical treatment has occurred. It appears that since 1993 the woody vegetation around the ponds has increased. Four historic aerial photographs of 1938, 1960, 1974 and 1987 show how the kettle-hole wetlands evolved (see CLR, 83-86). The 1938 and 1960 aerials show the kettle holes without any vegetation along their edges and with open water. By 1974, after over 10 years of National Park Service management, vegetation encroached into the open fields and around the edges of the kettle-hole wetlands. The area of open fields had already decreased considerably. By 1987 the three kettle-hole wetlands were edged and partially filled with encroaching vegetation. Photographs of 1994 in the CLR show how the three kettle-hole wetlands are edged and partially filled with encroaching vegetation but still stand out from the surrounding field setting (see CLR, 66-68). Until 1994 the National Park Service was managing the open fields through periodic mowing to maintain the open appearance. However, there has been a gradual

replacement of pasture grasses by coarser vegetation and the kettle-hole wetlands have become drier due to increased plant growth in and around the wetland. After 1999 the open fields were managed under the Prescribed Burn Plan and the open fields became more woody. As a result the kettle-hole wetlands no longer stand out from the surrounding field setting.

Burning and mechanical treatment as recommended under the open fields management plan (Table 2.0) should aim to reduce the vegetation around the kettle holes to its appearance at the time of the 1994 photographs (see CLR, 66 and 68). Future maintenance should retain vegetation to that size.

Phragmites has established in the kettle ponds and is identified on the list of invasive species to be controlled in Cape Cod National Seashore. This is not a high priorty at this time but should be monitored.

VIEWS AND VISTAS

Re-establish the open character of the fields

Native and non-native woody plants have grown up in the open fields and along the stone walls, altering the overall character of the open hay fields and reducing views across the fields.

Recommendation: Re-establishing the open character of the hay fields as recommended under open fields management plan will also improve views (Table 2.0). The vegetation in the fields should again be lower and walls must be kept clear.

Keep the views to Nauset Marsh from the open fields open

The views of Nauset Marsh from the open fields are partially blocked as a result of invasive woody plants that have established on the sloping bank between the trail and the edge of Nauset Marsh.

Recommendation: Woody vegetation on the bank presently blocks about 40-60 percent of the views to Nauset Marsh. The amount of woody vegetation should be reduced to about 25 percent. After clearing is complete by burning or cutting, views should be kept clear through mechanical treatment.

SMALL-SCALE FEATURES

Characteristic signage and waysides along the trails

Brown roadside signs are used along Fort Hill Road. For visibility, roadside signs are sufficiently large, but similar signs are also used for trail information and appear out of place within the park.

Recommendation: For trail information and interpretation signs and waysides it is recommended to use smaller signs than those used along the entrance road. Recommendations for signage and waysides are as described under signage in the Fort Hill zone of this treatment chapter.

Develop interpretation for the kettle-hole wetlands

The management strategy for the three kettle-hole wetlands includes interpretation to explain how they were utilized during the site's earlier agricultural era and likely by native peoples (see CLR, 106).

Recommendation: An interpretive wayside has not been installed to interpret the history of the kettle-hole wetlands, but is still recommended. The placement of waysides needs to consider the archeological sensitivity of the area.

Retain existing seating along the Fort Hill Trail

The CLR made a recommendation for the installation of seating at appropriate viewpoints along the trails (see CLR, 103).

Recommendation: Since the preparation of the CLR in 1993 the park decided not to install any new seats along the Fort Hill trails due to the archeological sensitivity of the area. The park's approach is to replace seating as required to retain the existing number of seats along the paths as replacements should not cause damage to archaeology.

D. GUIDELINES FOR RED MAPLE SWAMP ZONE

CIRCULATION

Maintain the Red Maple Swamp boardwalk

Maintain the boardwalk as necessary.

Recommendation: The boardwalk is situated in a humid and shaded area and as a result, requires frequent maintenance and repairs. In about 2000 the wooden boardwalk underwent major repairs. Some sections of the boardwalk were completely replaced, while in other sections only the decking was replaced. A section of a second loop was removed to avoid disturbance of turtle habitat. As a result one branch of the boardwalk is now a dead end and the public must retrace their steps to the main path. To increase the lifespan of the boardwalk, composite decking made from a combination of reclaimed wood and plastic was used. The advantage of this material is that there is no insect damage, rotting or splintering. The composite decking has weathered well and now has a natural appearance. The following recommendations should be noted.

- The texture of the composite decking that was used is a smooth texture. In the future when replacement is required, the natural wood grain texture should also be taken into consideration as an alternative. The wood grain texture would add even more of a natural feel to the boardwalk.
- At present the boardwalk decking consists of two types of composite material. In the long-term the aim should be to use the most natural looking material consistently.
- As the material appears to bend in this shaded and humid environment it should not be used for long thin pieces such as the edging of the boardwalk or railings. Where bending occurs it detracts from the overall appearance. To avoid this, real wood should be used for such pieces (Figure 68).
- To enhance the overall character of the boardwalk, seating should also be constructed with real wood.
- Because the requirement of a safety edge on the decking, leaves and dirt collect along the edges. To maintain the appearance and avoid slippery surfaces, accumulated dirt should be removed frequently. More spacing between the decking pieces would also allow dirt and leaves to wash away. Another disadvantage of narrow spacing is that no light passes through the boardwalk, which means nothing grows underneath. Advice from a natural resource perspective should be sought on this issue.
- In several sections the decking was recently replaced but the wooden foundation posts were retained. The posts are now detereiorating, requiring the recently installed decking to be lifted. When decking is replaced the posts should also be replaced (Figure 69).

Remove dark asphalt as a surface material for trails

Black asphalt was used as a surface treatment on the path from the Hemenway Road entrance to the Skiff Hill shelter. The urban character of the asphalt surface detracts from the natural character of the site and repair and replacement of the asphalt surface will be required in the future (Figures 70 and 71).

Recommendation: Instead of retaining a top coat of asphalt, an evaluation of alternative surface materials is recommended. An option would be to use a top coat of a natural color chip seal aggregate on top of the asphalt where a solid surface is required. Natural colored gravel could be used in areas where the asphalt is not required. The aim should be to not use dark asphalt for the park trails, but instead use materials that harmonize with the natural setting for the roads, trails, and parking areas. In addition, an aim is to minimize hard surfaces. The width of the road should also be evaluated and reduced where possible to achieve this aim. The fact that the path is on a slope and that it provides access for events on the site, such as weddings, must be taken into consideration when deciding upon the preferred surface treatment and width of the path. Alternatives should also be evaluated within the context of the recommended re-landscaping of the Skiff Hill shelter area.

Use natural colored gravel for the Red Maple Swamp trails

The current route, extent, and varied surface treatments of existing trails should be maintained (see CLR, 103), but the appearance of the bluestone gravel as a top layer of the trails does not harmonize with the natural setting.

The current route and extent of the Red Maple Swamp trails should been maintained but the bluestone surface treatment should be replaced in a phased approach with a compacted natural colored gravel, similar to ongoing work to the Fort Hill trails (Figure 72). Volunteers are assisting the parks staff with this work for the Fort Hill trails and could at later stages assist with the Red Maple Swamp trails. Where the top layer is placed on trails that are eroding or where the existing bluestone top layer is replaced, care must be taken not to cut into the terrain to protect archeological features. In the long-term, all paths should have a natural colored gravel surface which harmonizes with the color of the native soil.

Repair erosion of the gravel trails

Erosion is occurring in certain sections of the gravel trails in the Red Maple Swamp.

Recommendation: Trail repairs are needed to halt erosion as soon as possible before it detracts from the appearance and exposes archeological resources (Figure 73).

Develop a district wide parking scheme

The CLR recommended two alternatives for visitor access and parking as part of a district wide parking scheme:

- Pursue town approval to use the Town Landing parking for hikers and to consider allowing some parallel parking along Hemenway Road (see CLR, 101 and 102).
- Extending the Fort Hill Trail north to the Salt Pond Visitor Center, so that hikers could park at Salt Pond (see CLR, 102).

Recommendation: The following recommendations should be developed as part of the district wide parking scheme which also includes recommendations under the Fort Hill Area.

- With the approval of the Town of Eastham, parallel parking has been allowed along Hemenway Road since 2002, but the Town does not allow the public to park in the Hemenway Landing parking lot during the peak summer season. However, the Town has approved the use of the Hemenway Landing parking lot as a wheelchair access parking site. In addition, the use of the Flex bus as an alternative for a Park & Ride system should be explored as recommended under circulation in the Fort Hill zone of this treatment chapter.
- Extending the Fort Hill Trail north to the Salt Pond Visitor Center: This is seen as a long-term option that would be difficult to implement because the trail extension would have to pass through private property.

BUILDINGS AND STRUCTURES

Rehabilitate the Skiff Hill Shelter area

The Skiff Hill shelter is the main viewpoint over the Nauset Marsh and was developed with interpretation of the Nauset Marsh and the Native American sharpening stone. When it was developed, the shelter sat in an open area, but at present the shelter is surrounded by trees and woody vegetation, which block views to the Nauset Marsh. The shelter area paving, signs and surrounding vegetation are in poor condition (Figures 74 and 75). The concrete paving around the sharpening stone is aesthetically unpleasing and feels inappropriate given the significance of the stone. The positioning of the four waysides is ad-hoc and does not enhance the area. The asphalt path connects to the concrete paving in an awkward way, which creates a patchwork appearance of paving surfaces. The hexagonal shapes of the Mission 66 era shelter and concrete surfaces are interesting architectural shapes but given the present condition of the shelter area they do not harmonize with the setting.

Recommendation: The Skiff Hill shelter area should be an attractive feature and re-development alternatives should be explored to optimize its potential. Re-development alternatives should look at paving surfaces, interpretation, surrounding vegetation, and views. A pleasant, aesthetically pleasing and architecturally interesting environment should be created so that visitors like to spend a moment to enjoy the scenery and learn about the history of the sharpening stone. Re-development of the shelter area should make optimal use of the interesting Mission 66 era hexagonal shapes of the shelter and ground surfaces, though removal of concrete around the sharpening stone should be considered. This is the only place where visitors find cover from the weather, which adds to its importance. Views to the surroundings from the shelter should be restored to allow a wide panoramic view of Nauset Marsh.

Evaluate access to the public comfort station

When the National Park Service constructed the public comfort station near Skiff Hill, the intention was that the parking at the town landing would be acquired (Figure 76). When this plan was not realized, the Fort Hill Road became the main entrance point to Fort Hill. As a result, the restrooms are located in a remote and inconvenient area of the park near the Hemenway Road entrance. Disabled access up the steps is also not ideal, but their proximity near the events area is useful.

Recommendation: Access to the public comfort station should be evaluated and it may be recommended that an access ramp be installed, or the long-term, restroom facilities are made available near the lower Fort Hill Road parking area with optimal disabled access.

VEGETATION

Maintain vegetation around the Skiff Hill shelter

When the Skiff Hill shelter was developed, the area was open, while at present it is surrounded by trees and invasive woody plants. The views to the Nauset Marsh from the shelter are partially blocked and the surrounding vegetation crowds and shades the structure.

Recommendation: Based on the 1938 aerial photograph, it is clear that Skiff Hill was still completely open at the end of the period of significance. The Skiff Hill shelter appears to have been designed to be in an open field, with views to Nauset Marsh and the other open fields. The vegetation around the Skiff Hill shelter should be thinned and again opened up as part of the rehabilitation of the shelter area. One alternative would be to only retain the well-rounded cedar trees or clumps of trees and reinstate grass around the shelter.

If only half of the woodland around the shelter is removed, the area will be difficult to maintain. The whole area should be cleared at one time, removing 90 percent of the vegetation and leaving small clumps of cedar trees. The cleared area should be restored as an open field. Immediately after the removal of the woody plants the area should be seeded with native grasses.

From an ecological perspective, rehabilitation of the Skiff Hill area to an open landscape would also be desirable for grassland-dependent wildlife as well. For many bird species, the size of the habitat patch is very important in terms of how many nesting pairs it can support and whether it is large enough to attract any at all. Maximizing the amount of open field habitat at Fort Hill increases the probability it would be re-colonized by species such as the grassland sparrow and provide more foraging habitat for the Massachusetts threatened northern harrier, a species often observed in the Skiff Hill area.

When the Skiff Hill shelter area is studied for rehabilitation, the whole area, including the possible opening of the woodland, should be studied in greater detail.

Maintain the Red Maple Swamp woodland

The current size, configuration, and density of the red maple swamp woodland should be maintained (see CLR, 107).

Recommendation: Fortunately, the red maple swamp is a climax forest, and so is largely self-maintaining (see CLR, 107). It does appear however that no red maples are seeding as they require more sunlight to become established. This might eventually lead to the disappearance of the red maples from the area. This should be monitored and if required a plan should be developed to address the change in species. Invasive woody plants, such as Japanese knotweed and locust, should be removed.

Park Wildlife Ecologist Robert Cook notes that the red maple swamp is extensively ditched and an unknown quantity of water drains out of the swamp via a ditch on the southwest corner of the swamp. Currently there is a lot of upland vegetation developing in central portions of the swamp. Three factors, anthropogenic draining, lack of red maple regeneration, and possible expansion of upland vegetation indicate that further assessment of the condition of the swamp and the effects of current draining practices would be useful.

Prevent encroachment of vegetation into the fields

The encroachment of woody vegetation from the red maple swamp into the adjacent open fields should be prevented through routine maintenance (see CLR, 107).

Recommendation: Invasive woody plants such as blackberry, locust, and multiflora rose have established in the open-field zone and at the edges of the woodland. To retain the hard edges to the fields and prevent encroachment of vegetation into the fields, the woody plants along the edge of the woodland should be removed through mechanical treatments. Woody plants should be cut, stacked and burned. Thereafter, the edges should be maintained by mowing once a year to preserve a clearly defined edge to the historic agricultural fields, keep woody vegetation at knee height, and preserve views of the stone walls. When burning does not occur in Units 1 and 2, it is likely that mechanical clearing (mowing) will be necessary each year to prevent the encroachment of woody vegetation from the red maple swamp zone into the adjacent open fields.

VIEWS AND VISTAS

Keep the views to Nauset Harbor and Marsh from Skiff Hill viewpoints open

The views of Nauset Harbor from the Skiff Hill overlook and the Fort Hill Trail overlook should continue to be kept open through appropriate pruning and cutting by park staff (see CLR, 107).

Recommendation: There are at present two viewpoints from Skiff Hill, one at the Skiff Hill shelter and another one along the path towards the restroom facilities. Views at these points have been kept partially open, but views from the shelter should be opened further. Pruning and cutting should occur annually to keep views open.

- At the Skiff Hill shelter 25 to 50 percent reduction of vegetation blocking views to Nauset Marsh is a desired outcome.
- At the lower (east) viewpoint and along the path, a 25 percent reduction of vegetation blocking views to Nauset Marsh is the desired outcome.

SMALL-SCALE FEATURES

Improve the interpretation at the Skiff Hill pavilion and sharpening rock

The Skiff Hill shelter is the main viewpoint over the Nauset Marsh and was developed with interpretation of the Nauset Marsh and the Native American sharpening stone.

Recommendation: The positioning of the four waysides at the shelter is ad-hoc and the concrete paving around the sharpening stone is aesthetically unpleasing and inappropriate given the significance of the stone (see Figures 12, 74 and 75). Interpretation should be evaluated and improved as part of the rehabilitation of the Skiff Hill shelter area.

Use characteristic signage and waysides along Red Maple Swamp trails

Brown roadside signs are used along Fort Hill Road and in the red maple swamp. For visibility, roadside signs need to be sufficiently large but signs with trail information should be smaller.

Recommendation: Trail information and interpretation signs and waysides should be smaller and different in style than road signs (Figures 76 through 79). Recommendations for signage and waysides were described under signage in the Fort Hill Road zone of this treatment chapter. More information about the new style signs can be found on the website of the Harpers Ferry Center under the Uniguide sign standards at http://www.hfc.nps.gov/uniguide.

Retain existing seating along the Red Maple Swamp Trail

The CLR recommended installing seats at appropriate viewpoints along the trails (see CLR, 103).

Recommendation: Seats were installed as part of the replacement of the boardwalk along the Red Maple Swamp Trail. These seats are placed on the boardwalk where there is no risk of damage to archeological resources. In the future seats will be replaced as required to retain the existing number of seats along the trail.

E. PREPARATION OF OTHER DOCUMENTS

As noted in the Cultural Landscape Report (see CLR, 107-108), several documents are needed for the Fort Hill Landscape. Some of these documents are complete while others are still needed.

Preservation Maintenance Guide

Maintenance staff have been following the Prescribed Burn Plan (PBP) as a guide for the maintenance of the fields. The Condition Report will give recommendations towards an update of the Prescribed Burn Plan. The preservation maintenance guide should refer to this plan but must also cover all other aspects of maintenance at Fort Hill including roads, trails, structures, stone walls, and vegetation.

Site Development Concept Plan

The General Management Plan for the Cape Cod National Seashore (1998) stated the importance of the CLR for Fort Hill to provide information for the preparation of a site plan for Fort Hill in association with the General Management Plan (GMP, 165 and 169). The General Management Plan also states that to ensure that the strategies of the General Management Plan for the Cape Cod National Seashore (1998) are implemented, site development concept plans and environmental assessments need to be completed for Fort Hill as part of the GMP's Phase 1 plan implementation (GMP, 143 and 169). A Site Plan and Environmental Assessment for Fort Hill was completed in 1998. An accurate base map for the proposed Fort Hill Historic District should be prepared by a licensed surveyor.

Paleolimnologist core sampling and analysis.

If additional information on the sedimentary history of the kettle-hole ponds is desired, a paleolimnologist should be contracted to conduct core sampling and analysis.

Planning for Prescribed Burning: Environmental Assessment, Fire Management, and Written Treatment Plans

The *Cape Cod National Seashore Prescribed Burn Plan, Fort Hill 1999-2004* was completed in 1998, and revised in 1999. The *General Management Plan for the Cape Cod National Seashore* was completed in 1998 and stated again that the site development concept plans and environmental assessments must be completed for Fort Hill as part of the GMP's Phase 1 plan implementation (GMP, 143 and 169). The *Cape Cod National Seashore Fire Management Plan Environmental Assessment* was prepared in September 2004. The Environmental Assessment stipulates that for every proposed area of burning, a Written Treatment Plan is

needed (EA, 15). The Prescribed Burn Plan should be updated to include the recommendations of this Condition Report.

Integrated Pest Management Plan

Herbicides have been used at Fort Hill to control non-native, invasive species. Ideally an integrated pest management (IPM) plan should be developed which incorporates the recommendations for the open fields management plan (Table 2.0).

Invasive Plant Species Control

Fort Hill is infested with numerous invasive native and non-native plant species and control is needed. A *Management Plan and Environmental Assessment for Invasive Plant Species Control at Cape Cod National Seashore* was prepared in 2003. It includes a list for exotic plants targeted for control at Cape Cod National Seashore. At Fort Hill the following exotic plants are being targeted for control: multiflora rose, oriental bittersweet, black locust, bristly locust, Japanese honeysuckle, Morrow's honeysuckle, Tartarian honeysuckle, and autumn olive. In 2006 the Northeast Exotic Plant Management Team conducted spot-spraying of herbicide. Blackberry and privet are native plants that have also been invasive in certain areas. Phragmites has invaded the kettle-hole wetlands and can also be found on the list for exotic plants targeted for control at Cape Cod National Seashore. A plan for targeted control of all invasive species should be developed for Fort Hill.

Figure 15. Aerial photograph of the Fort Hill area, November 21, 1938. Agricultural fields are clearly delineated and three wetland areas are visible as dark spots in the fields (Cape Cod NS archives).

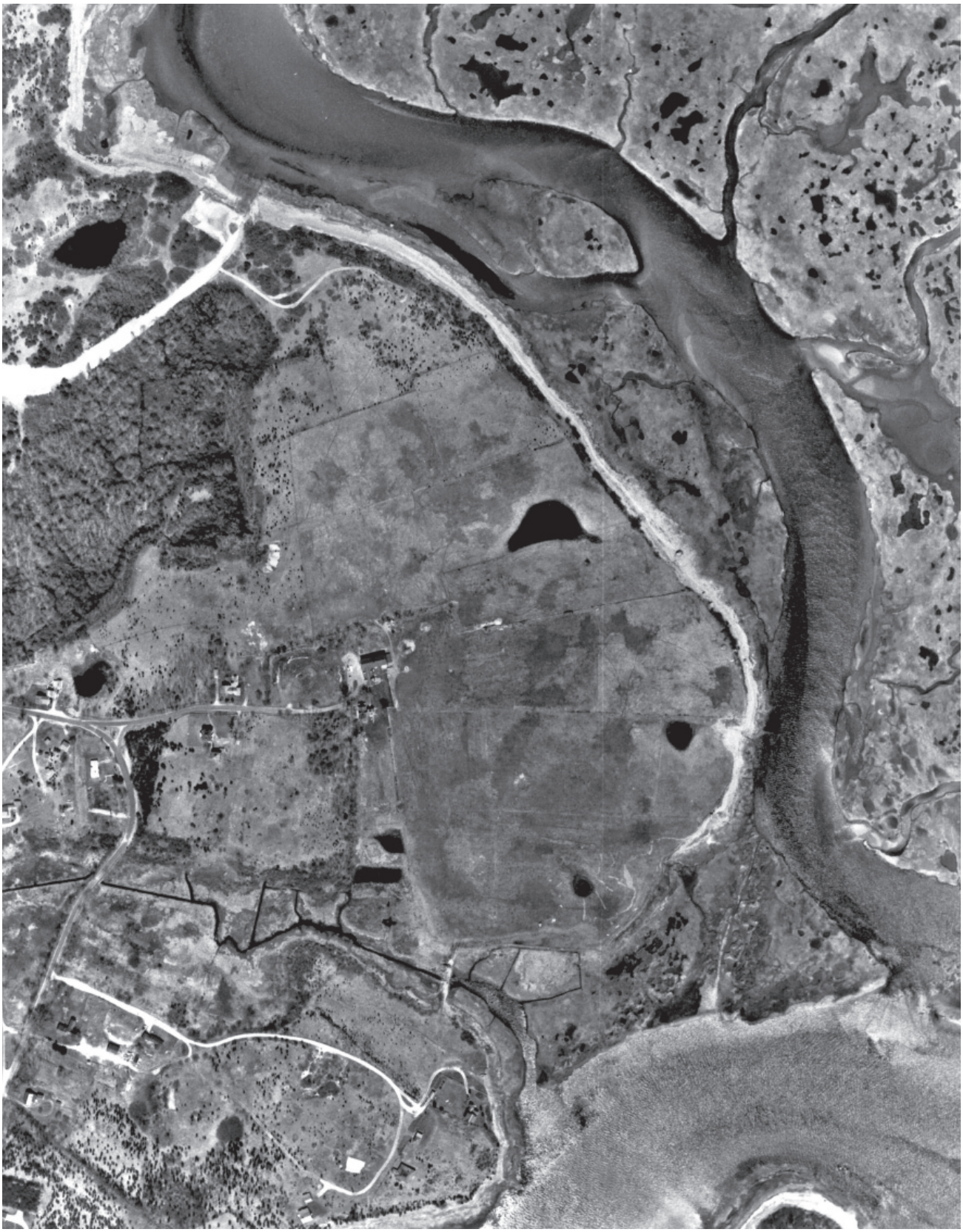


Figure 16. Aerial photograph of the Fort Hill area, April 20, 1960. Most agricultural fields are clearly delineated, though young cedar trees are visible on Skiff Hill as well as to the north and south of the Avery and Penniman houses. Three wetland areas are visible as dark spots in the fields (Cape Cod NS archives).

Figure 17. Aerial photograph of the Fort Hill area, February 21, 1974. Agricultural fields are delinated on the eastern half of the property while cedar trees and other vegetation cover Skiff Hill and to the north and south of the Avery and Penniman houses. Three wetland areas are visible as dark spots surrounded by vegetation in the fields (Cape Cod NS archives).

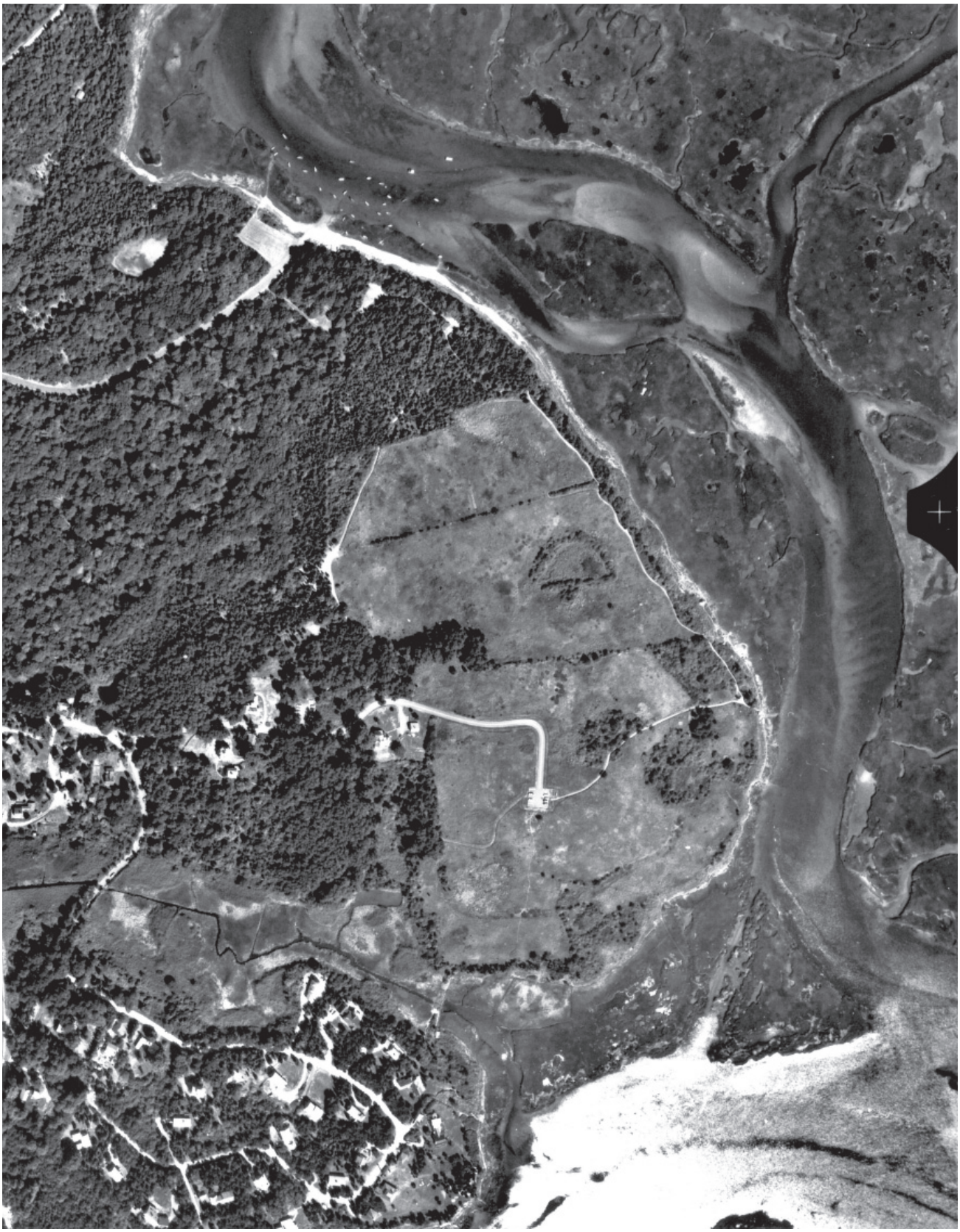


Figure 18. Aerial photograph of the Fort Hill area, September 6, 1987. Agricultural fields on the eastern side of the property are surrounded by trees and shrubs and delinated by recreational paths. Three wetland areas are surrounded by taller vegetation (Cape Cod NS archives).

Figure 19. Historic photograph of Captain Penniman driving the plow, which illustrates the open agricultural character of the Fort Hill area in the late nineteenth and early twentieth centuries (Cape Cod NS archives, H10-030).

Figure 20. Historic photograph looking out from the front lawn of the Penniman house illustrating the open agricultural landscape (Cape Cod NS archives, H10-025).

Figure 21. Historic photograph showing the view to the northwest across the open fields from the Penniman house lawn. Mrs. Edward Penniman stands on the left and neighboring farms can be seen in the distance (Cape Cod NS archives, H10-096).

Figure 22. Recent photograph looking west across the Penniman house lawn, taken from a vantage point similar to the photograph above. Note the fence posts and the growth of vegetation which block the view (OCLP, January 2007).

Figure 23. Photograph showing the existing bluestone gravel surface of the Fort Hill Trail. The surface material for these paths will be changed to a native colored gravel to harmonize with the natural setting (OCLP, January 2007).

Figure 24. Example of the more natural-colored gravel surface of a path at the Salt Pond Visitor Center (OCLP, 2007).

Figure 25. Granite steps on the north side of the Penniman house along Fort Hill Road. The addition of a simple, unobtrusive hand rail would aid visitors with mobility or sight impairments (OCLP, January 2007).

Figure 26, Steep wooden steps on the east side of the Penniman house, which connect the driveway and barn yard. The steps could be rebuilt with a gentler pitch by extending them out from the wall towards the driveway (OCLP, January 2007).

Figure 27. Photograph from 1918 of Augusta Penniman and her grand daughter Irma showing gravel walkway from Fort Hill Road on the north side of the Penniman house, as it leads to the back door on the east side of the building. Note the multi-stemmed shrubs along the roadway above the stone wall (Cape Cod NS archives, H10-359).

Figure 28. Photograph of Bessie Penniman and her friend on September 4, 1948 standing on the gravel walkway, which leads from Fort Hill Road on north side of Penniman house to the back door on the east side of the building. Note that the tall multi-stemmed shrubs visible along the roadway in the photograph above are gone (Cape Cod NS archives, H10-247).

Figure 29. Historic photograph of rooster and cat by back doorstep on the east side of the Penniman house, circa 1880. The brick walkway leading to barn and the gravel walkway leading to Fort Hill Road on the north side of the Penniman house are both visible. Note the Avery (or Sylvanus Knowles) house behind the trees and the Gunn dairy barn beyond the whale bones, as well as the open winter view over the Nauset Marsh (Cape Cod NS archives, H10-094).

Figures 30 and 31. Photographs of a child by the back doorstep on east side of the Penniman house, 1963. The brick walkway leading to the barn is visible. (Cape Cod NS archives, H10-364 and H10-365).

Figure 32. Photograph of the view east towards the Burrill (or Seth Knowles) house, showing the trees along Fort Hill Road, circa 1880. The trees on the right side of the road are perhaps horse chestnut trees (Cape Cod NS archives, H10-085).

Figure 33. Photograph of Lida Brackett walking in the Penniman house driveway looking north, with cottonwood trees along its west side and unidentified species on its east side. (Cape Cod NS archives, H10-143).

Figure 34. Photograph looking east showing the cottonwood trees along the Penniman house driveway, circa 1880. Young pine trees are also visible to the west of the front entrance to the Penniman house (Cape Cod NS archives, H10-173).

Figure 35. View of the whale bones, cottonwood trees, and the Penniman barn looking south, circa 1880. (Cape Cod NS archives, H10-360).

Figure 36. View looking southwest at the cottonwood trees, whale bones, and the Penniman house and barn, circa 1880 (Cape Cod NS archives, H10-348).

Figure 37. Fallen cottonwood trees after a winter wind storm in 2005 (Cape Cod NS Cultural Resource files).

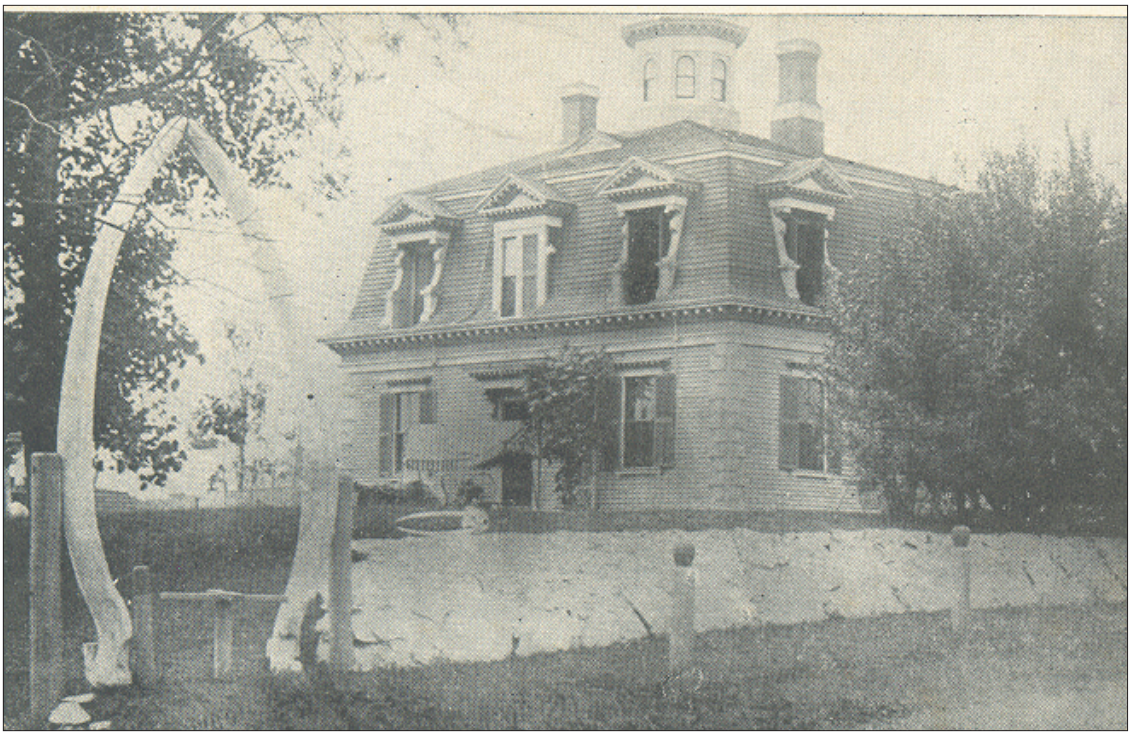


Figure 38. Photograph of the east, or back, facade of the Penniman house, circa 1880. Vegetation visible in the photograph includes a cottonwood tree on the left, near the whale bones, a bushy vine on the trellis by the back door, and a hedge row of tall shrubs across the north boundary of the property above the stone wall. This hedge of tall shrubs was subsequently removed during the historic period of significance (Cape Cod NS archives, H10-335).

Figure 39. Photograph of a mock wedding between Bessie (left) and Olive (right) taken by the northeast corner of the Penniman house, circa 1897. Note the trellis with vine, most likely a rose, on the east side of the house, as well as the small shrub to the right of the trellis (Cape Cod NS archives, H10-237).

Figure 40. Photograph of the niece of Mrs. Penniman, Olive Brackett and her husband Sam Highley in a hammock hanging in the trees on the east lawn of the Penniman house by the back door. At least two trees existed here and added to the domestic character. The trellis and a bench are visible in the background (Cape Cod NS archives H10-038).

Figure 41. East side of the Penniman house, date unknown. Foundation plantings include a trellis with vine and two low shrubs. Note the open views to the west, and small-scale features on the lawn including a swing, rocking seat, and croquet wickets (Cape Cod NS archives, H10-361).

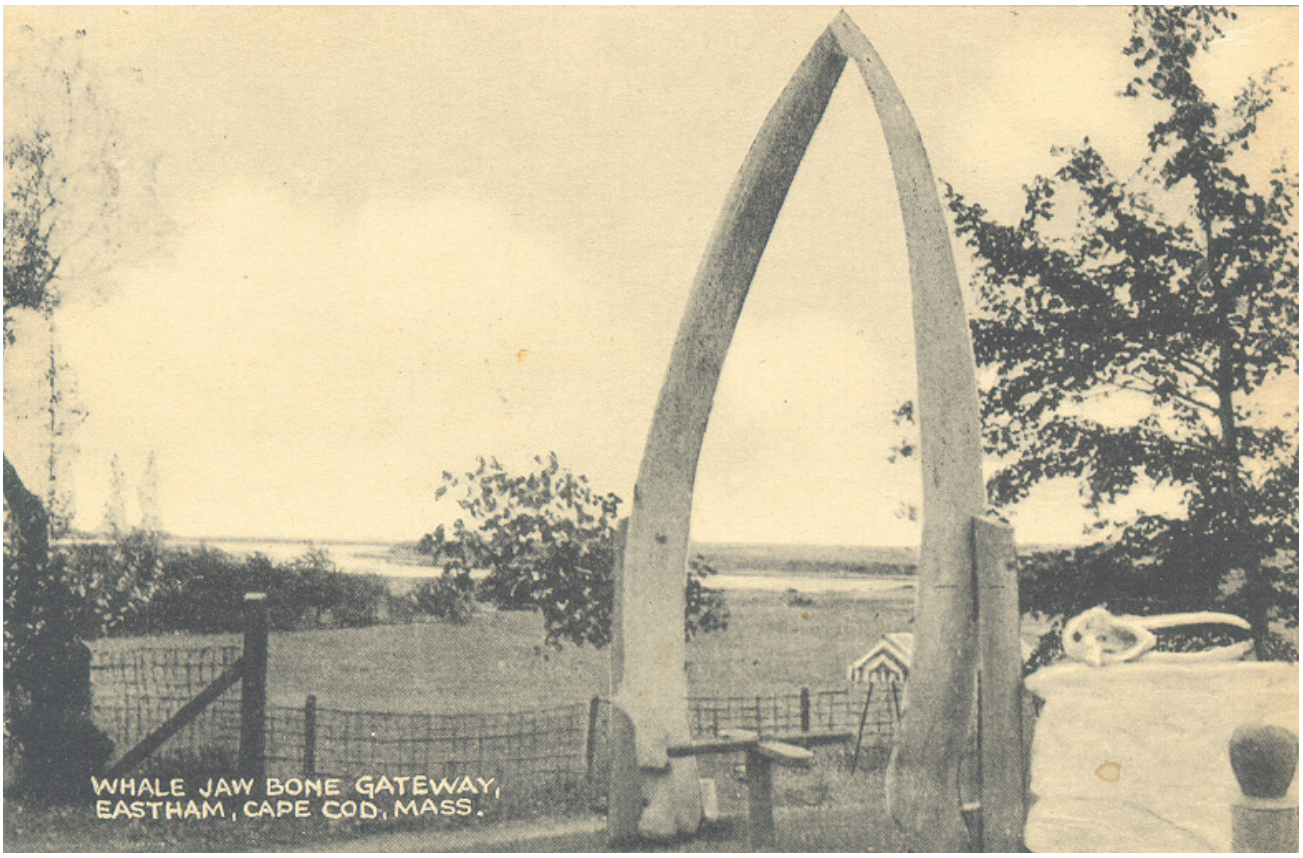


Figure 42. Open views to the southeast from Fort Hill Road, date unknown (Cape Cod NS archives, H10-339).

Figure 43. Photograph showing the open fields around the Penniman House, which allowed for expansive views of Nauset Marsh, 1898. This view is from the field to the east of the driveway, looking toward the Penniman House and stables. This field was used to keep chickens. Note the picket fences and glasshouse in the courtyard near the stables (Cape Cod NS archives, H10-068).

Figure 44. View from the field to the south of the Penniman house, looking toward the Penniman house and stables, date unknown, possibly the 1970s (Cape Cod NS archives, H10-178).

Figure 45. View south from the Penniman house front lawn, looking toward Nauset Marsh. The young pine trees shown in Figure 44 have matured and now block views to the Town Cove and Nauset Marsh (OCLP, January 2007).

Figure 46. View of the Penniman house from the entrance road, circa 1888. On bicycles in the foreground are probably Ned and Eugene Penniman. Note the open landscape surrounding the house and barn (Cape Cod NS archives, H10-016).

Figure 47. View of the Penniman house from the entrance road, September 1978. Note the shade trees surrounding the house (Cape Cod NS archives, H10-342).

Figure 48. The wooden fence between the Penniman house and barn is visible on the right side of the photograph, 1963. Note the clothesline pole on the left side of the left photo, and the open view to the south beyond the barn (Cape Cod NS archives, H10-364).

Figure 49. The wooden fence between the Penniman house and barn shown above, has now been replaced by the decorative wooden fence shown here. The courtyard is now longer enclosed (OCLP, January 2007).

Figure 50. Photograph from the Historic American Buildings Survey (HABS) of the Penniman barn, 1962. The wooden fence between the Penniman house and barnis visible at right with a foundation planting. The courtyard is enclosed, and the passage between the building and stone wall is blocked (Cape Cod NS archives, H10-211).

Figure 51. The wooden fence between the Penniman house and barn. The foundation plants are now gone and a decorative wooden fence has been installed above the stone wall. The courtyard is no longer enclosed and a narrow passage leads between the building and stone wall (OCLP, January 2007).

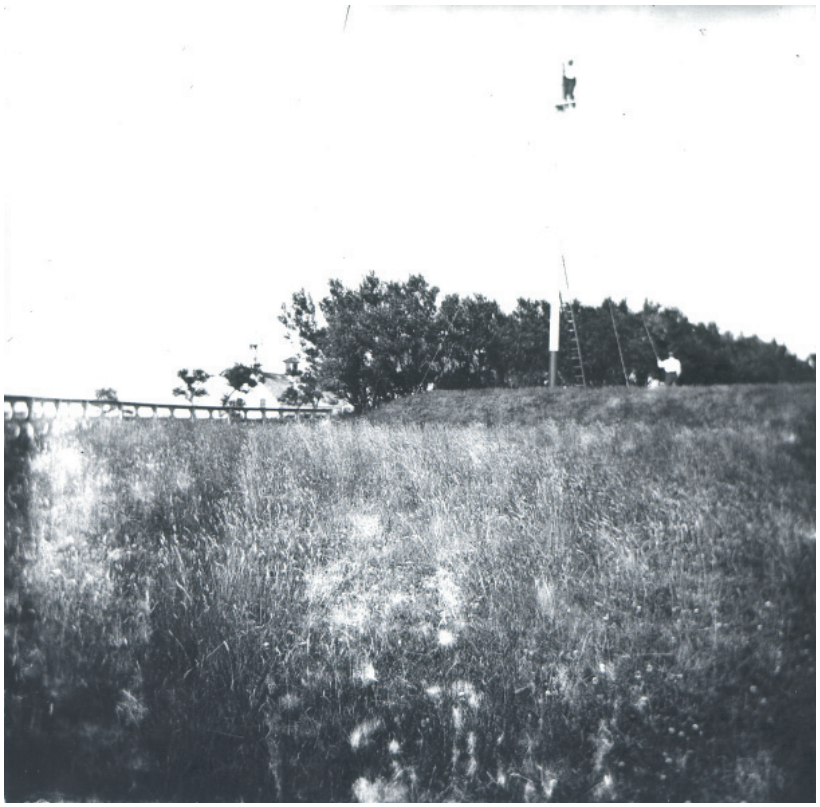


Figure 52. Circa 1889 photograph of the flagpole located to the east of the Penniman house (Cape Cod NS archives, H10-062).

Figure 53. The capped foundation of the former Gunn dairy barn to the east of the Avery house is clearly visible in 1993. As shown, there is no encroaching vegetation and the surrounding field is cut grass (Fort Hill CLR, 1995, 70).

Figure 54. Photograph of four women and a child by the marsh, including Eliza Turner, the Penniman's maid (at the far left), circa 1890. A stone wall extends to the water's edge (Cape Cod NS archives, H10-097).

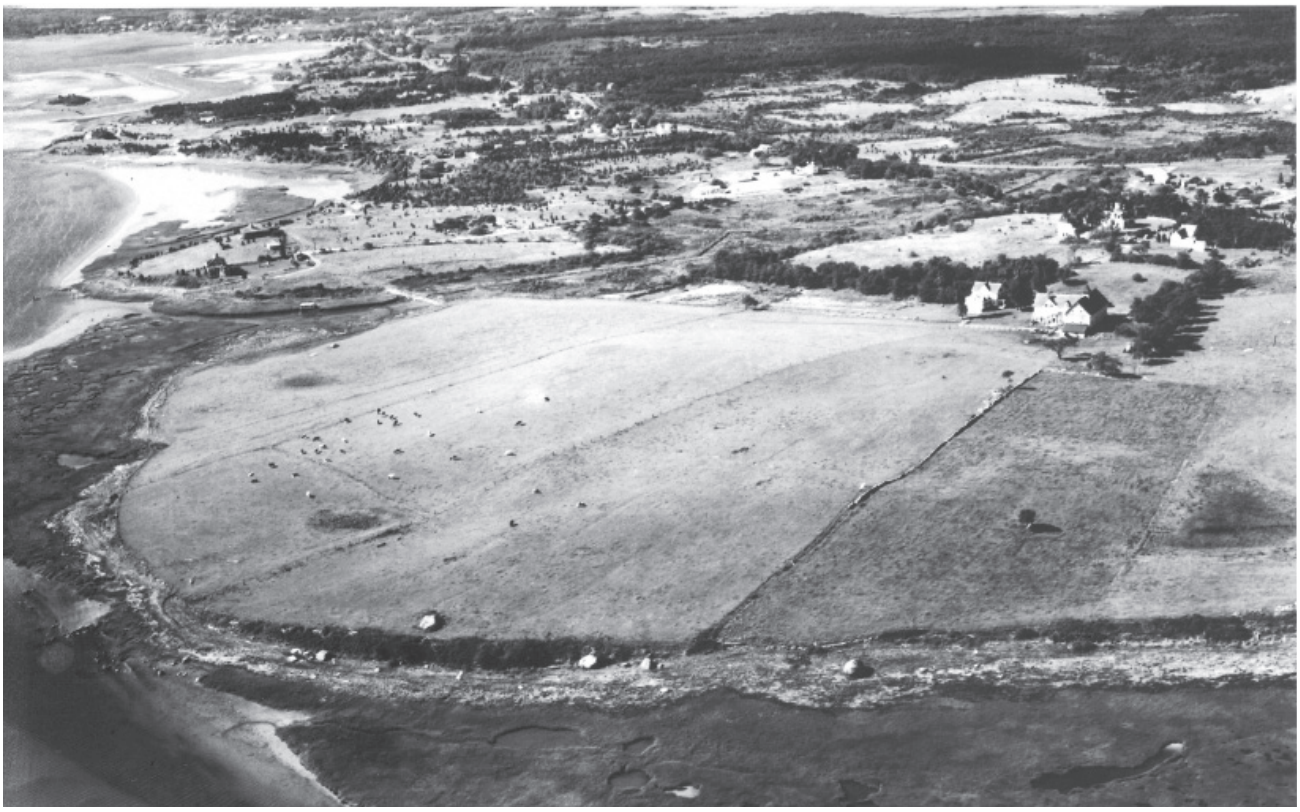


Figure 55. Aerial photograph looking southwest and showing cows grazing in the open fields at Fort Hill in the 1940s (Cape Cod NS archives, courtesy of William Quinn).

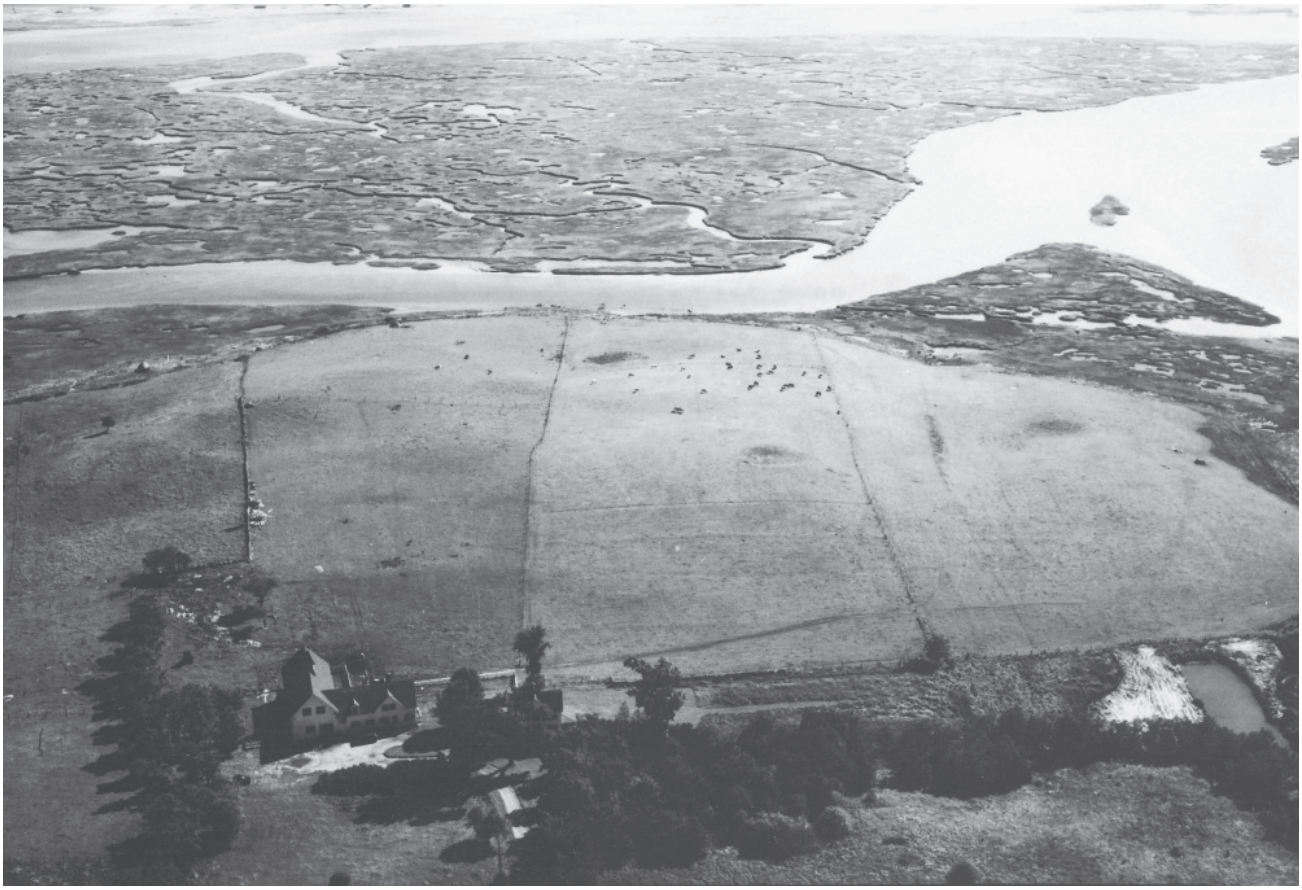


Figure 56. Aerial photograph looking east and showing cows grazing in the open fields at Fort Hill in the 1940s. The top of Fort Hill is in the center of the image (Cape Cod NS archives, courtesy of William Quinn).

Figure 57. View of a stone wall at Fort Hill, 1993. At this time the fields were mowed twice a year (Fort Hill CLR, 1995, cover).

Figure 58. View from Fort Hill Road in 1993 of a stone wall, looking out over view to Nauset Marsh, 1993. At this time the fields were mowed twice a year (Fort Hill CLR, 1995, 69).

Figure 59. Photograph of a stone wall at Fort Hill, looking west toward the Burrill and Avery houses, 1993. At this time the fields were mowed twice a year (Fort Hill CLR, 1995, 69).

Figure 60. Photograph looking north and showing a stone wall, in the foreground, and kettle-hole wetland in the distance, which is ringed with shrubby vegetation, at Fort Hill in 1993. This is the largest of the three wetlands in the open fields at Fort Hill (Fort Hill CLR, 1995, 68).

Figure 61. Photograph looking north at a stone wall on the northern edge of the open fields, also referred to as wall #1, 1993. The wall is still clearly visible as a hard edge to the field (Fort Hill CLR, 1995, 69).

Figure 62. Photograph looking west at the stone wall referred to as wall#1, which is obscured by shrubs at northern edge of the open field. The wall is to the right of the path, below the cedar trees (OCLP, January 2007).

Figure 63. Photograph looking north over the open fields at Fort Hill, from the Fort Hill Overlook upper parking lot. Stone walls are obscured by multiflora rose and other woody shrubs (OCLP, April 2006).

Figure 64. Photograph looking southeast at the largest of the three kettle-hole wetlands, in the open fields of Fort Hill. The wetland is hardly distinguishable due to shrub growth. A section of stone wall referred to as wall #2 is visible in the foreground (OCLP, January 2007).

Figure 65. Aerial photograph showing area treated with foliar herbicide to eliminate exotic invasive species in 2006 (Northeast Exotic Plant Management Team, 2006).

Figures 66 and 67. Photograph of the Northeast Exotic Plant Management Team treating invasive exotic plants and photograph taken after treatment showing dead exotics and untouched native plant species (Northeast Exotic Plant Management Team, 2006).

Figure 68. Photograph of the boardwalk on the Red Maple Swamp Trail. The thin pieces of recycled wood used for edging have expanded, causing the boardwalk to have a warped, wavy appearance (OCLP, January 2007).

Figure 69. Photograph of the boardwalk on the Red Maple Swamp Trail, over standing water. In the foreground the old posts under the new boardwalk have rotted, causing the decking to collapse (OCLP, January 2007).

Figure 70. Photograph of the asphalt path at the Hemenway Road entrance. This surface could be replaced with gravel, narrowed, or chip-sealed and top-coated with bound gravel (OCLP, January 2007). The photograph below shows an example of a chip-sealed surface.

Figure 71. Photograph of the asphalt Highland Road with a chip-seal coating, an example of how asphalt paths can harmonize with the natural surroundings (OCLP, 2006).

Figure 72. Photograph looking northeast along the Fort Hill Trail showing the natural color of the soil. Note how the view of Nauset Marsh is blocked by shoreline vegetation (OCLP, January 2007).

Figure 73. Photograph of the erosion along the gravel trails in the Red Maple Swamp (OCLP, January 2007).

Figure 74. Photograph looking northwest showing the Skiff Hill shelter area with Indian Rock in the foreground. There are multiple surface treatments, a mixture of signs, and views are restricted by the surrounding vegetation (OCLP, January 2007).

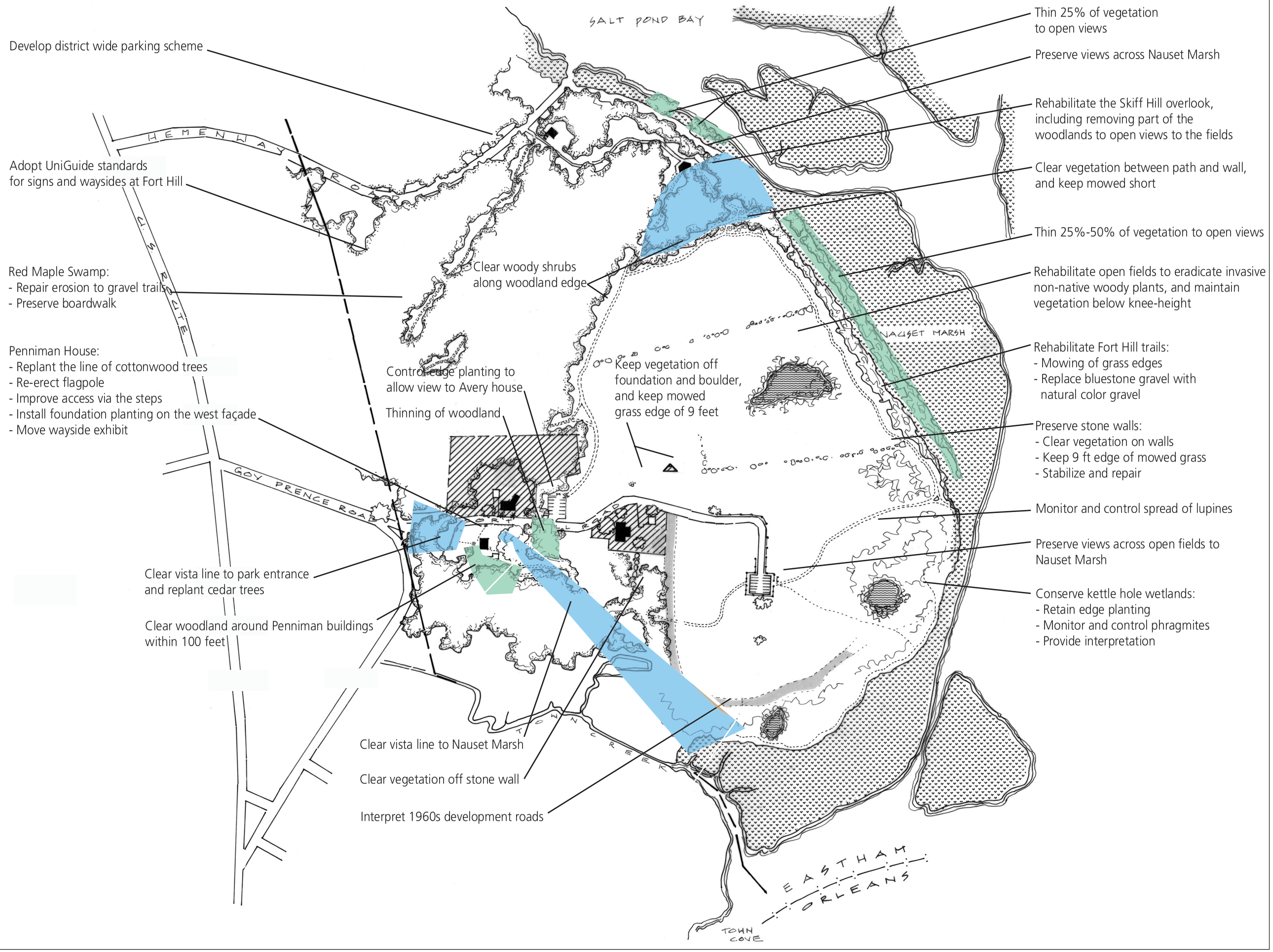
Figure 75. Photograph looking east from the Skiff Hill shelter. Signs dominate the viewshed, which is also partially obscured by surrounding vegetation (OCLP, January 2007).

Figure 76. Photograph showing the comfort station at Skiff Hill, near the Hemenway Road entrance (OCLP, January 2007).

Figure 77. Photograph of a brown National Park Service directional sign, at the edge of the open field at Fort Hill (OCLP, January 2007).

Figure 78. Photograph of an informational sign along the Red Maple Swamp Trail, which is in character with, and in proper scale for the surrounding natural environment (OCLP, January 2007).

Figure 79. Photograph of multiple sign types at a Fort Hill trailhead (OCLP, January 2007).



Condition Report

Fort Hill Rural Historic District

Cape Cod National Seashore
Massachusetts

Treatment Plan

National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES

CLR 1995, Existing Conditions Plan, completed by OCLP.

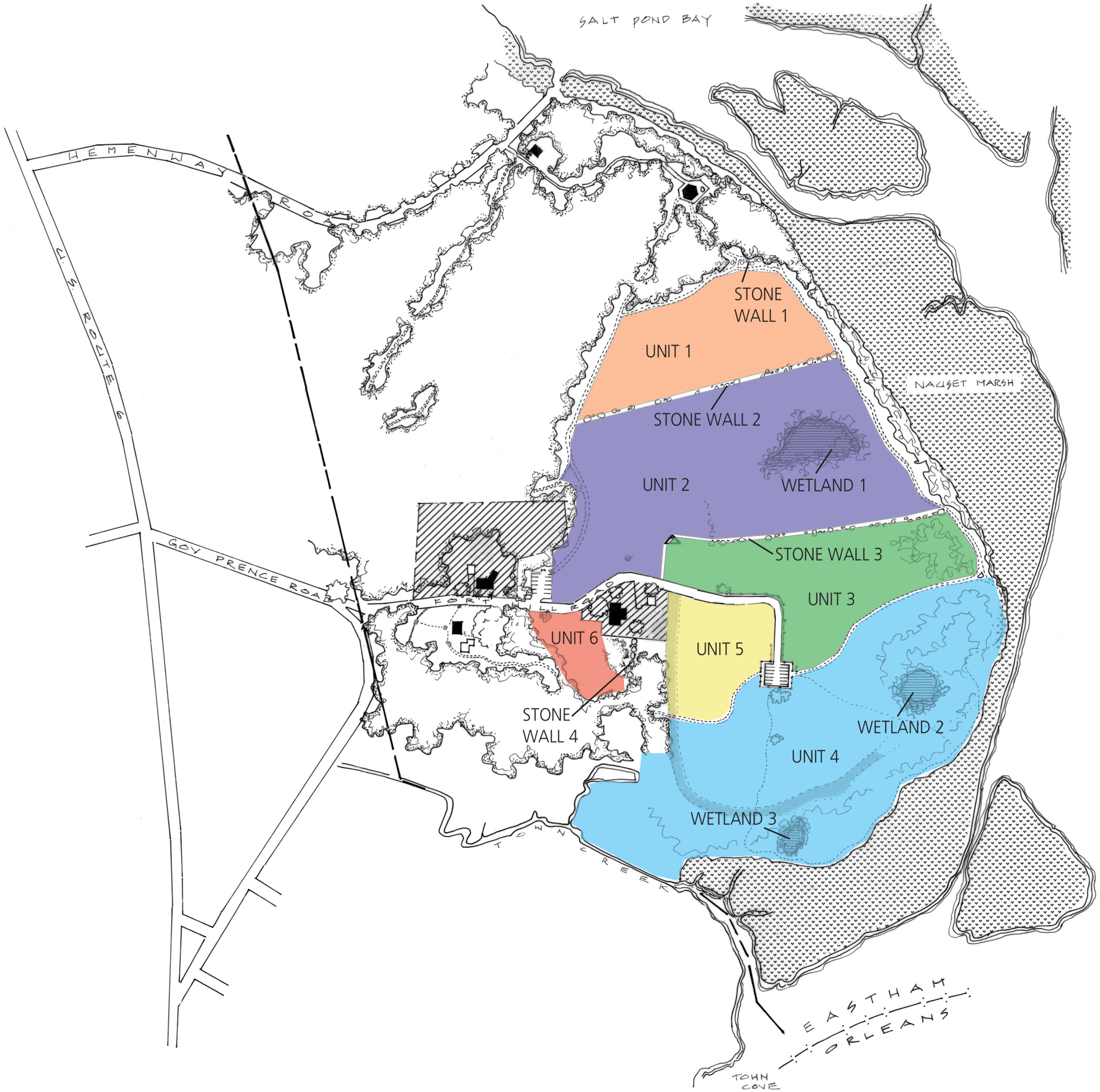
DRAWN BY

Jan Haenraets, Olmsted Center for Landscape Preservation, February 2007.

LEGEND

- Road scar
- Kettle hole wetland
- Salt Marsh
- Vegetation cover
- Partially burried boulder
- Fort Hill Trail
- Red Maple Swamp Trail
- Stone Wall
- Property lines: Town of Eastham
- National Park Service

0 100 200 400



Condition Report

Fort Hill Rural Historic District

Cape Cod National Seashore
Massachusetts

Field Management Units

National Park Service
Olmsted Center for Landscape Preservation
www.nps.gov/oclp

SOURCES
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National Park Service
U.S. Department of the Interior

Olmsted Center for Landscape Preservation
email: FRLA_olmsted_center@nps.gov
web: www.nps.gov/oclp/