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Fire Suppression and Landscape Change on Outer Cape Cod 1600-1994

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Technical Report NPS/NESO-RNR/NRTR/96-08

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Department of the Interior
National Park Service
New England System Support Office



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INTRODUCTION

Fire has been an important force shaping the vegetation on the Lower Cape for thousands of years. This conclusion has been drawn from a variety of studies, including evidence of past fires derived from pollen studies, fossil charcoal in sediment cores (Winkler, 1983), early accounts of Native American agricultural burning (Morton, Smith, Bradford, Pring), scars on trees, as well as inferences drawn from observed fire behavior in vegetation types that have been historically common in the region's forests. Three hundred years of written history show that fire was a landscape factor until after about 1940. At that time, fire-fighting technology (brush-breakers and pumper trucks, as well as hand tools) began to allow more effective suppression. In addition, efforts may have become more aggressive as increased development density and rising property values provided more risk from uncontrolled fire. Declines in ignition sources, particularly steam locomotives, may also have contributed to a lower incidence of extensive fires. Together, these relatively recent changes may be significantly altering fire regimes that have existed in the Cape Cod National Seashore for millennia.

This report is part of a larger effort to predict the impacts of a full fire suppression policy on the National Seashore's biotic communities (Patterson and Dunwiddie, 1991). The study design began from these hypotheses:

1. Fire suppression will lead to more uniform forest cover. Important questions include: how will diversity and rare species be impacted and what will the character of the resulting dominant forest will be?

2. Fire dependent communities, especially grasslands and heathlands, will diminish and disappear. An important research objective was to begin to define fire-dependent communities and determine if other non-fire disturbances such as human land use practices, storm events and insect depredation could sustain them.

3. Fire suppression will alter fuel loading. The accumulation of live and dead forest fuels will create a potential change in the frequency and intensity of fires.

In our portion of this study, we gathered data to address these hypotheses using several different approaches. These included:

- o written historical accounts of vegetation and fires,
- o historical maps of vegetation cover,
- o analyses of historical photographs matched with contemporary photographs from the same locations, and
- o analyses of fire events based on biological information, such as fire scars, tree ages, and forest composition.

Data were collected primarily from the outer Cape (Map 1), although where applicable, we drew upon material we had gathered from our other studies on Nantucket, Martha's Vineyard, and the Elizabeth Islands. From this material, we present an overview of the historical record documenting landscape changes on Cape cod with several specific purposes:

- -- To document fire frequency and extent as accurately as possible from available historical records.
- -- To document general vegetation types and coverage for each historical period through contemporary photographs, maps and descriptions.
- -- To summarize other land use influences on the landscape to help determine which vegetation changes result from fire.

-- To link specific fire events to present landscapes and the landscapes shown in past photographs and maps.
-- To establish a context for current vegetation monitoring and manipulation studies. These studies may help establish the effectiveness of management tools for specific forest management objectives in the future.

Similar analyses relating fire, land use history and vegetation change have been carried out in other regions. Notable examples that we modeled our work after include Hastings and Turner (1965), Rogers (1982), Foster (1992), and Dunwiddie (1992).

SOURCES

Land use and vegetation history information can be deduced from a variety of historical documents covering the last three hundred years of colonial history. These sources provide evidence of past vegetation and its response to documented events such as fire, agricultural practices and major storms. A variety of source material is available that offers evidence of Cape Cod's former landscapes and the forces that have influenced them.

Narratives. Historical documents were usually recorded for purposes other than accurate description of vegetation and landscape. Many are flavored with a kind of frontier boosterism, promoting settlement or enhancing the status of towns that were otherwise considered off the beaten track. Other accounts may have over-emphasized remoteness and desolation because of the psychological stresses of isolation, or simply because the view from the road came to represent the entire picture of the region's landscape.

The earliest descriptions come from 17th century explorers beginning with Gosnold's voyage of 1602. His chroniclers, Archer and Brereton, described the landscape and vegetation with an eye toward its economic potential. Their descriptions are full of superlatives, (such as "high-timbered oaks" and "soile fat and lustie ....") which contrast with descriptions of their contemporaries, most notably, Thomas Bradford and John Smith.

Later descriptions seem more realistic, but change proceeded so rapidly that by the beginning of the eighteenth century, the pre-settlement forest had probably disappeared, replaced by remnant woodlots and a working domestic landscape. Several travellers in the eighteenth century (see Collections of the Mass. Historical Society) give a landscape picture seen through the windows of a coach, with occasional vistas from Bay to Ocean. Later still in the 19th century, Thomas Dwight and Henry David Thoreau recorded careful landscape observations that can be linked to specific locations by retracing their journeys. These and other narratives give an overview of the landscape before photography and refer to some of the land use influences that dominated in each period.

Town records. Resolves and Actions of Proprietors, Town meeting records and later, annual town reports, also give landscape clues. Records of land grants and divisions chart the progress of forest consumption. Most land grants were eventually cleared of vegetation. Petitions and Resolves from each town draw attention to devegetation, soil erosion and resulting loss in land values in the 18th century. Deeds give limited information about early land use, such as one-word descriptions of property (e.g. "woods" or "meadow"). Unfortunately, much valuable material of this sort may have been lost in a fire in the 1830's, which destroyed many of Barnstable County's deeds.

Maps. In the early 19th century, Congress funded a mapping survey of coastal lands and waters for defense and navigation, a major public works project of the day which lasted more than thirty years (Shalowitz, 1974). The original hand-drawn field maps are still available from the U.S. Coast and Geodetic Survey (USCGS) archives. Fortunately, lower Cape Cod was mapped from shore-to-shore including surface features such as forest type, wetlands, field boundaries, and structures. The lower Cape maps, dated 1836-1858 with later updates, have been re-interpreted and entered into the Seashore's GRASS GIS map set. Another USCGS topographic series was published in the 1940's based on aerial photos and field sources. Vegetation is depicted using similar symbols to

the 1850's maps. The USCGS maps provide the most detailed landscape information from any source for the periods mapped and are invaluable to corroborate other sources.

U.S. Census. Federal Census figures were compiled where available from microfilm records in the Boston Public Library (see Appendix for complete tables). Total farm acres, acres in pasture and cultivation, and numbers of livestock were reported, although somewhat inconsistently. The accuracy of census figures is known to vary widely for small isolated localities like Cape Cod's towns. Some general trends can be identified from the century and a half of data that are available.

Photographs. Photographs became available beginning in the 1860's, offering us another window into past landscapes. This window is highly selective, giving repeated views of wonders (Provincetown Harbors' solid freeze), monuments (lighthouses, churches and the Pilgrim tower) and oddities (pilot whale strandings). Oftentimes, glimpses of the landscape were captured only inadvertently. Over the course of this study, nearly a thousand views were reviewed; about sixty of the most informative are presented here. The best photographs, in terms of vegetation detail, location, and composition, come from the U.S. Geologic Survey (Woodworth and Vaughan, 1916), originals from the era of quality post cards (1904-1911), published guidebooks and some amateur views. Many of these are in the collection of the Society for the Preservation of New England Antiquities (SPNEA). Those photos taken just after the turn of the century show a highly domesticated landscape of pastures, cottages and farms.

Geographical coverage of the photographs included in this report is not evenly distributed across the area. Many areas were rarely photographed. Others are relatively featureless, making relocation difficult or impossible. Others have changed extensively due to human modifications that preclude any inferences regarding fire effects on vegetation. For example, almost all views in Orleans and Eastham depict areas that are now residential neighborhoods. As a result, Truro, Wellfleet, and Provincetown receive more coverage in the photos selected for inclusion here. These outer Cape towns have extensive areas of open space remaining where views provide a meaningful record of vegetation change.

Newspapers. None of the sources mentioned so far give much more than oblique references to fires as a landscape influence, although the earliest accounts occasionally describe Native American use of fire. Cronin (1983) and other historians have noted that colonial methods of land clearing included cutting, girdling, and burning the woods. (For example, Acts of the Selectmen of the Town of Sandwich in 1754 include deputizing a committee to supervise the burning of its woods.)(Russell, 1982, p.94)

The earliest specific reports of wildfire come from local newspapers, reviewed for this study for the period from 1890 to the 1960's. Early news reporting seems somewhat erratic and focussed on publishing bases in Provincetown, Barnstable and for a time, Harwich/Orleans. Detailed news accounts have been gathered for Martha's Vineyard fires dating back to 1856. These records indicate frequent wildfires on Martha's Vineyard where conditions were similar but clearly not identical. Another information source on lower Cape fires is each town's yearly fire warden report available from the 1880's through the present. These vary in detail, occasionally giving dates of fires, but usually reporting only an annual forest fire-fighting expense for the town.

Personal Interviews. Interviews have been useful for anecdotal information about recent history (1935-the present) and general land use practices. According to one informant, many local volunteers were not familiar with fire history beyond a small area since vehicles and horses were scarce and fire-fighters travelled to the scene on foot.

Field work. Field observations confirm the age of existing trees, record evidence of fires in the form of fire scars, regenerating trees and shrubs, and uncover clues to past land use (old fence lines, road beds, etc.). Increment cores and cut wedges can be used to age trees and fire scars. Information on current vegetation can be a useful indicator of past cover and land use, (e.g., coppiced oaks, extensive huckleberry clones, grass understory in forests, non-native ornamental plantings).

TABLE I.
TEMPORAL RANGE OF HISTORICAL DOCUMENTS AND OTHER EVIDENCE ON CAPE COD

Descriptions of explorers and colonists. and published histories.	1602 -->
Maps and coastal survey charts.	1795 -->
Photographs: stereographs, postcards. professional and amateur views.	1860 -->
Newspapers.	1890 -->
Interviews with long-term residents.	1935 -->
Fire incident reports	
Local	1900±-->
State	1960 -->
Federal	1972 -->
Fire scars on trees.	1880 -->
Stand age structure	1880 -->
Fossil pollen and charcoal	<12,000 yr BP -->

TABLE II.
SOURCES OF HISTORICAL MATERIAL

The following collections and archives were searched to provide material for this study

INSTITUTION	LOCATION	SOURCE MATERIAL
FEDERAL:		
U.S. Geologic Survey photographic and field records collections.	Denver CO	photographs. field notes
U.S. Coast and Geodetic Survey	Rockville MD	coastal survey maps
Cape Cod National Seashore library and historical archives.	S. Wellfleet. Eastham MA	photographs. maps. books. manuscripts
Woods Hole Oceanographic Institute (NOS-NOAA)	Woods Hole MA	maps
STATE AND REGIONAL:		
Mass. Statehouse Library	Boston	Censuses. forestry & agricult. annuals. maps
Massachusetts State Archives (Columbia Pt.)	Boston MA	maps. photographs
Boston Public Library Prints. Fine Art and Microtext Collections	Boston MA	photographs. view books newspapers (microfilm)
New York Public Library Print Room	New York NY	photographs. view books
LOCAL GOVERNMENT:		
Wellfleet Town Clerk	Wellfleet MA	post cards
Provincetown Library	Provincetown MA	newspapers (microfilm)
Sturgis Library	Barnstable MA	newspapers (microfilm)

PRIVATE:

Massachusetts Historical Society	Boston MA	manuscripts. books. photographs
Society for the Preservation of New England Antiquities (SPNEA)	Boston MA	photographs. view books
Eastman House Photographic Collection	Rochester NY	photographs
Mystic Seaport Museum	Mystic CT	photographs
Metropolitan Museum of Art Photo collection	New York NY	photographs
Antiquarian Society	Worcester MA	photographs. books
Cape Cod Chamber of Commerce	Barnstable MA	photographs

LOCAL HISTORICAL SOCIETIES:

Truro Historical Society	Truro MA	photographs
Provincetown Heritage Museum and Pilgrim Monument Museum	Provincetown MA	
Wellfleet Historical Society	Wellfleet MA	photographs
Orleans Historical Society	Orleans	
Eastham Historical Society	Eastham	photographs

PRIVATE COLLECTIONS ON CAPE COD:

Clive Driver	Truro	photographs
Linda Barr and Robert Nye	Brewster	"
Carolyn Crowell	Sandwich	"
Robert Paine	S. Wellfleet	"
Diana Worthington	Wellfleet	"
Elaine Chase	Eastham	"
Lyle Butts	Wellfleet	"

METHODS

Photograph Selection. Photographs, maps and other references were catalogued in a computer data base. (See data sheets with each photo). Views were selected to show a representative cross section of landscapes in each town with an emphasis on National Seashore holdings. Sites in Truro and Wellfleet were favored since they are more representative of forested uplands of the Seashore. The Province Lands were not emphasized since mass movement of dune sands make relocation difficult and provide a unique kind of disturbance to vegetational succession. Fires in the dune lands would probably be discontinuous and difficult to map. Large fires (100-2000 acres) are reasonably well documented in Truro and Wellfleet, offering better opportunities for analysis of vegetation effects. Most sites in Orleans and Chatham were not selected since most upland areas of those towns lie outside the Seashore boundaries and are more extensively urbanized.

Dating original photographs. Photographs can be approximately dated by the type of photographic or printing processes (stereographs, albumen prints, German printed post cards), by clothing or automobile styles, or by known man-made features (e.g., Wellfleet dike completed in 1908). If these clues are not present and the original is not dated, then the best estimate was used, often after consulting with knowledgeable local sources. Undated photos can still illuminate a process of vegetation change even if the exact time frame is not known. Sources of dates are noted in photo descriptions (see Reilly, 1986).

Relocation of camera sites for photo matches. Photographs were initially mapped through clues such as geographic references, topography and local informants. Relocation of camera sites in the field relied on existing and remnant features, such as houses, roads, fence lines and walls, vegetation and soil types, etc. Experience has shown that photographs were often taken from logical vantage points such as the crest of the nearest hill or near a road, since early camera equipment was difficult to transport. Sites for rephotography were confirmed through as many clues as possible, often through features that are now not visible from the same camera viewpoint due to vegetational succession. Season and time of day were considered in selecting a final matched photograph. Sometimes locations were adjusted horizontally or vertically to move the camera above treetops or around new obstructions. Climbing trees or ladders, and attaching extension poles to the camera, were variously used to gain elevational vantage points. When such repositioning was necessary to allow for the most informative match, it is noted in the descriptions accompanying each photograph. Some matches were taken without summer foliage to provide a better view of distant features. Photographic data, adjustments to positions, and additional vegetation data were recorded on each photo data record and entered into the data base.

Map Interpretation. USCGS maps were interpreted for vegetation types according to Shalowitz (1974). The following categories were used for labelling GRASS map layers.

-- mixed pine and oak forest
-- primarily oak forest
-- brush with scattered pine
-- orchards and small woodlot
-- sparse brush/ rough pasture
-- pasture/ grassland

Field data collection. Current vegetation was noted at each photograph retake location so that comparisons could be made with plants visible in original photographs. Vegetation was also noted at selected locations for comparison with details contained in historic maps or archival descriptions. Increment cores and trunk wedges from trees for fire history studies were returned to the lab and surfaced using progressively finer grades of sandpaper. Growth rings were then counted under a dissecting scope.

FINDINGS

Information collected in this study is in a variety of formats. Major pieces include a summary of historical narratives, a collection of paired then-and-now photographs, official US census data on land use, interpretation of vegetation and land use maps, summaries of field observations on vegetation composition and evidence of fire at selected locations, and derived maps compiling geographic information on fires, vegetation, photograph locations, and other field data. Narrative information is presented in this section; accompanying figures, tables, and maps follow in appendices. Photographs are compiled in a separate volume.

SUMMARY OF LANDSCAPE HISTORY

I. Pre-settlement Landscapes. The landforms of Cape Cod consists largely of massive deposits of sand, silt, and clay left by Pleistocene glaciers. The distinctive kettleholes and outwash plains directly reflect these influences. Subsequent modification by wind, waves, and water have reshaped many areas, especially along the coast, eroding bluffs, forming arcuate spits, creating sand dunes, etc. The configuration of Cape Cod probably began to assume its present form about 5,000 years ago with the flooding of Nantucket Sound, which separated Nantucket from the mainland.

Information about the early vegetation of Cape Cod is derived largely from studies of fossil pollen preserved in ponds and bogs (Patterson and O'Keefe, 1980; Winkler, 1983; Backman, 1984; Tzedakis, 1987; Motzkin et al. 1993). These records depict significant changes in the flora as climates warmed following the ice retreat. The biota reflects the dynamic interplay of many forces over the last 10,000 years. At the end of the Pleistocene, sea level was much lower than it is today, and both plants and animals dispersed more readily across corridors on the continental shelf that are flooded today. Some of the more adaptable northern plant species still exist here as mementoes of these early connections. By the early Holocene, forests of spruce and jack pine were being replaced by more temperate vegetation dominated by broadleaf trees, especially oaks. Over the ensuing millennia, many taxa migrated northwards from refugia in the south to become part of the Cape Cod flora.

A forest dominated by oak (black, white, scarlet) and pitch pine, with various other deciduous trees present (beech, tupelo, hickory, chestnut, grey birch) probably covered much of the landscape of southeastern New England when Europeans first arrived. However, historical reports also suggest that large open, grassy plains were also present, attributed to the native American practice of burning for agriculture (Quinn, 1983). Some fields had already been in cultivation for centuries. In the Cape and Islands region, the use of domesticated plants is associated with the Woodland Period (beginning 2,500 years before present (BP)) and is indicated by the first evidence of pottery in middens. Domesticated plants were first used about 1000 years BP (Richardson, 1983).

One of the most detailed depictions of prehistoric vegetation on the Outer Cape comes from the paleoecological studies of Winkler (1985), who documented changes in fossil pollen and charcoal over the last 12,000 years at Duck Pond, in Wellfleet. Results indicate that the present Pinus rigida - Quercus forest first dominated the lower Cape about 9,000 years ago. Moister conditions brought an increase in Pinus strobus about 3500 years B.P. Charcoal and herb pollen increased just before European settlement suggesting land disturbance in the Duck Pond, Wellfleet area. Another paleoecological study that sheds considerable light on the fire history of a site on the Outer Cape is that by Motzkin et al. (1993) of the Marconi Cedar Swamp. In this area, large-scale fires burned through upland pine/oak forests about every 50-200 years prior to European settlement. However, following settlement, only one other fire shows up as a significant charcoal peak in the sediment record.

Mello (1986) speculated on the prehistoric forest cover of Truro's Pamet River valley and generalized that dry uplands may have been dominated by a mixture of pitch pine and black/white oak similar to present cover in South Truro. He suggested that moister lowlands along drainages may have contained a more diverse mix of hardwood species Mello (1986).

Some general trends in forest and agricultural use in southeast New England (1644-1950):

1. Coastal clearing and settlement, woodland commons in the interior -- some upland field clearing and more active use of coastal salt meadows. Native American burning in decline (1640-1680).

2. Deforestation for lumber and fuelwood followed by intensive sheep grazing and soil erosion. The low point for forest cover. Burning by European colonists. Period of speculation and high turnover of ownership (1680-1820).

3. Decline of sheep, abandonment and reforestation of pasture and intensive small scale cultivation. The return of large wildfires. Pattern of large scale ownership and low land value (1820-1860).

4. The rise of tourism, roadcutting and modern residential subdivision and large scale abandonment of land to forest. Speculation and high turnover of ownership. The period of fire suppression beginning sometime after 1940 with increased property values at risk and new fire-fighting technology available (1840-->).

5. Forest succession. Forests begin to dominate the landscape after about 1950.

TABLE III.

SUMMARY OF LANDSCAPE HISTORY

PERIOD	DOCUMENTS	ACTIVITIES	LANDSCAPE
pre -1600	pollen analysis	Native American burning for agric. and hunting.	Widely forested, mixed oak, pine, beech, etc.; areas of open understory and scattered large clearings for corn fields.
1600-1700	narrative descriptions	Harvest of wood for fuel and materials; use of agricultural burning, grazing, road-building.	Forests held in commons; agricultural coastal meadows, expansion of cornfields; selected clearing for fuel and lumber.
1700-1840	narrative descriptions	Harvest of wood; agric. burning and grazing; wars and blockades; consolidation of settlement.	Division of forests for private use; widespread clearing for fuel and pasture; controlled burning by Towns; erosion and migration of sandy soils.
1840-1910	histories early photos postcards maps	Decline of sheep grazing; smaller farms with some fields abandoned; growth of railroads and related fires.	Increased accidental fires, railroad fires; gradual decline of agricultural fields and gradual regrowth of brush and woodland; some reforestation; smaller, more intensive vegetable farms.
1910-1960	photos maps newspapers journals interviews diaries	Market agriculture before WWII; tourism/ population growth; proliferation of roads; improved fire-fighting techniques and equip.	Regrowth of pine-oak brush and woodlands; expansion of villages, low-density residential use; decline of agricultural land. More effective fire suppression.

II. 1602-1644: European Contact
(SOURCES: Descriptions from voyages of Gosnold [Archer & Brereton], Champlain, Pring, John Smith and the Pilgrims [Mourt's Relation], Bradford's History of Plymouth Colony, pollen studies.)

The first written landscape descriptions of the Cape and Islands come from chroniclers of Bartholomew Gosnold's voyage of 1602. John Brereton's account published soon after was much less detailed about locations than Gabriel Archer's, not printed until 1625. (Present day locations for each log entry were taken from Lincoln Dexter, 1982, and Quinn and Quinn, 1983).

On excursions from Provincetown Harbor, they describe a shrub community dominated by huckleberry and a mixed forest that yielded diverse hardwoods taken for fuel:

> "The captain ... found the ground to be full of pease, strawberries, whortleberries [huckleberries], ...the firewood taken in was of cypress [Atlantic white cedar?], birch, witchhazel and beech. (Archer, May 15, 1602)

The next day near what is now known as the Nauset area in Eastham, they found mature forest with clearings: "... the land is full of goodly woods, but in some places plaine." (Brereton, May 16, 1602)

On May 21st, the description of what was likely Martha's Vineyard portrays a surprisingly diverse and dense forest:

> "chiefly ... beeches and cedars, the outward parts all overgrown with low bushie trees, 3 or 4 foot in height, which bear some kind of fruits ... raspberries, gooseberries, hurtleberries ... an incredible store of vines ... where they run upon every tree ... that we could not go for treading upon them." Also "...a great standing lake of fresh water, near the sea side, an English mile in compass, .. with springs running ... through the woody grounds .. which are very rocky." (Archer, May 21, 1602).

Four days later, possibly on Cuttyhunk, a much quoted description of rich forest seems calculated to please the voyage's backers in England:

> "This Island is full of high timbered oaks, their leaves thrice as broad as ours, cedars, straight and tall, beech elm, holly, walnut trees in abundance,... hazelnut trees, cherry trees the stalk beareth the blossomes or fruit thereof like a cluster of grapes, forty or fifty to a bunch; sassafras trees great plenty all the island over, also divers other fruit trees, some of them with strange barks, ... in the thickest parts of these woods you may see a furlong or more round about. [a park-like aspect with an open understory?] On the northwest side of this Island... is a standing lake of fresh water ... in the middest thereof stands a plot of woodie ground ... this lake is full of small tortoises and exceedingly frequented by all sort of fowles ... we took and eat at our pleasure... and almost in every part of every Island are great store of ground-nuts, some as big as hens egges ... also divers sorts of shellfish, as scallops, mussels and cockles, lobsters crabs, oysters and wilks [quahogs] ... But not to cloy you with particular rehearsal of such things as God and Nature hath bestowed on these places, in comparison whereof the most fertile part of all England is of itself but barren ..."
>
> [Quinn locates the following on the north shore of Buzzards Bay]: "we stood awhile like men ravished at the beautie and delicacie of this sweet soile... Meadowes very large and full of greene grasse; even the most woody places ... doe grow so distinct and apart, one tree from another, upon greene grassie ground, somewhat higher than the Plaines, as if Nature would shew her selfe above her power, artificial." (Brereton, May 25, 1602)

Gabriel Archer evokes a similarly verdant scene:

> [Cuttyhunk] "... is overgrown with wood and rubbish, viz. oaks, ashes, beech, walnut, witch-hazel, sassafras and cedars ... The rubbish is wild pease, young sassafras, cherry-trees, vines, eglantines, gooseberry bushes, hawthorne, ... strawberries, raspberries, ground-nuts, alexander, surrin, tansy, ..." (Archer, May 28, 1602)

Penikese Island, which remains quite barren today was described as "the little islet of cedars."(Archer, June 10, 1602).

David and Alison Quinn's comments on the Gosnold narratives are based on a thorough reading of landscape descriptions of the Gosnold voyage and other contemporary voyages. Their interpretation gives a decidedly domestic cast to the New England landscape of 1602:

> "What the visitors did not understand is that many of the features which attracted them were the work of generations of aboriginal life. The Native Americans ... had kept the shores cleared for their gathering and fishing; they had cleared great areas for their agriculture southwards from the Saco River, and the movement of their village agriculture ... had made inroads on the unbroken forest which the later settlers were to meet as they moved inland. Even where there was thick forest but the land itself was reasonably level, Indian burning of underbrush to facilitate their hunting had opened up the woodlands so that they could offer easier routes to exploitation than if they had been left undisturbed in their climax state. It was in some considerable part a man-made landscape the visitors saw and of which they had no inkling at the time." (Quinn, 1983, p.11).

Almost a generation after Gosnold, Bradford's History of Plymouth Colony describes the Pilgrims' first view of Cape Cod as ... "but a hideous and desolate wilderness, full of wild beasts and wild men"... "the whole country, full of woods and thickets, represented a wild and savage hue." Bradford describes the first shore party as "falling into such thickets as were ready to tear their clothes and armor in pieces." Near Village Pond, North Truro, they found "a good quantity of clear ground where the Indians had formerly set corn." (p.64) Most of Bradford's descriptions of the first few days take the landing parties into the woods as soon as they leave the beach, suggesting that most of the interior of the outer Cape was wooded. (Bradford, 1952)

Bradford describes a later ship, the Fortune, landing at Provincetown harbor and finding "nothing but a naked and barren place." (Bradford, 1952, p.92)

John Smith's (1616) history describes the Cape as "shrubbie pines, hurts [huckberry] and such trash." (Smith, 1910).

Generally, these sources depict a mixed and well-forested landscape, sometimes with an open park-like understory, with clearings made for native agriculture. One open field is described as being 50 acres; another is judged to be five miles long (near Plymouth). The latter account is scarcely believable, even in areas of modern mechanized agriculture, and introduces a note of caution in evaluating the veracity of historical descriptions. Russell (1983) has raised similar questions regarding other such descriptions of historic vegetation, fire, and land use. Another early account of the Plymouth settlement, "Mourt's Relation" (1963) describes open park-like forests with little understory where horses could easily pass, though a day later they fight their way through brush that "tore our very armor."

An explanation for this open character of the forests is offered by a trader and trapper named Thomas Morton, who provided this remarkably detailed description of the use of fire by Native Americans in the 18th century:

> "The Savages are accustomed to set fire of the country in all places where they come, and burn it twice a yeare, vixe, at the Spring, and at the fall of the leafe. The reason that moves them to do so is because it would be otherwise so overgrown with underweedes that it would be all a coppice wood and the people could not be able in any wise to passe thru the country out of the beaten path... the burning of

> the grasses destroys the underwoods. and so scorcheth the elder trees that it shrinks them. and hinders their growth very much: So that he that will look to find large trees and good timber must not depend upon the help of a wooden prospect to find them on the upland ground but must seek them in the lower grounds where the grounds are wet when the country is fired ... For when the fire is once kindled it dilates and spreads itself against as with the winds; burning continually night and day until a shower of rain falls to quench it. And this custom of firing the country is the means to make it passable ..."(Thomas Morton. 1637, also quoted in Altpeter. 1939).

Writing two centuries after the fact. Dwight (1821. v.1. p.103) notes that the "aborigines of New England customarily fired the forests. that they might pursue their hunting with advantage... The grounds. which were covered with oak. chestnut. etc. or with pitch pines. were selected for this purpose. because they alone were. in ordinary years. sufficiently dry. ...they were probably burned for more than 1000 years. The vegetable mould was of course destroyed."

III. 1644-1700: SETTLEMENT AT NAUSET
(SOURCES: Proprietors Records. Town Annals. Echeverria. 1991. McManamon. 1985.)

Beginning in 1644. Plymouth Colony proprietors authorized land purchases. grants and settlements at Eastham Town Cove and on Wellfleet Bay. The first permanent settlements on the Lower Cape were established. Some of the land grants were held for speculative purposes and not yet farmed. The first land grants were located in marshes and wet coastal meadows along Eastham's Town Cove. Nauset marsh. and Pochet. and Wellfleet's Blackfish Creek. Silver Spring. Duck Creek and Herring River (Fig. 1). Small adjacent sites were granted for habitation. Echeverria (1991) describes four-acre meadow allotments linked to four-acre upland sites for habitation. Most woodlands were kept in common land. The first large division of common lands occurred in 1659: 1308 acres of upland were divided among 40 Eastham proprietors. an average of 30 acres each. By the 1660's. open coastal meadows were mostly claimed and pressure mounted for additional agricultural sites. Some controls on woodcutting in common lands were already being considered. (Echeverria. 1991) (Town Records)

Division of uplands accelerated beginning in the 1670s. Pamet Proprietors began to assert independent control over lands that would become Truro; a boundary marker was set in 1691. Common woodlands remained the most important source for fuel. lumber and other needs. A vote of Town Meeting in 1670 prohibits cutting wood for use out of town. By 1695 all wood cutting on common lands was prohibited. In 1694 land grants became available to those outside the original Proprietors. (Echeverria. 1991) (Town Records)

By the early 1700's. Eastham had scattered small centers at Town Cove. Pochet (Orleans). Halfway Ponds and Great Neck. Conservative population estimates by Rubertone (1985) range from 209 in 1659 to 853 in 1700. If the number of households is estimated to be 20 to 30% of population size. an approximation of forest clearance rates can be made. based on an average fuel consumption of 20-40 cords per household per year (Russell. 1980). This amount of wood would require the cutting of more than one acre of woodland per year (Stilgoe. 1982). Thus the rate of forest clearing for domestic needs alone is estimated to be 40-50 acres per year in the 1650's to 160-240 acres per year by 1700 in Eastham. These estimates do not include agricultural and commercial uses.

Estimates of Native American population for the same period range from 264 to 500. dwelling within the common lands. though facing increasing restrictions as to which lands they could use for farming or foraging.

Collectively. this evidence suggests that the colonial period resulted in rapid and sweeping changes in the vegetation due to exploitation of forests and soils for development and industries. These changes probably exceeded. in both rate and extent. most alterations to the landscape that had occurred in the previous 8-10.000 years.

IV. 1700-1750: EASTHAM, TRURO (incorp. 1709), WELLFLEET (incorp. 1722), PROVINCETOWN

(SOURCES: Proprietors Records, Town Meeting Records)

The Town of Eastham petitioned the General Court to abate some of its taxes due to degradation of coastal lands "by the sea, fires, winds and sands destroying such great quantities of their meadow ground and land and firewood and fencing." (Eastham, Records of Town Meeting, 1706-1761: 128, 199). In the 1730's, the Nauset Beach area was closed to all livestock due to overgrazing by sheep; mowing for fodder continued.

Technically, all land on the Outer Cape fell under the control of Eastham proprietors until Truro was incorporated in 1709 and Billingsgate (Wellfleet) became a separate precinct in 1722. Land divisions of 1711 and 1715 had already put most common lands in private ownership, including most of the town's woodlands. Only 618 acres of pasture and 136 acres of woodland remained in commons in Wellfleet after 1715. (Echevarria, 1991) Much of the woodland throughout the town had already been heavily used. The decision to divide the commons may have resulted from the unchecked exploitation of woodlands and the pressure for more land for private use and speculation. Population was estimated to be about 1000. Lands in the northern part of present-day Wellfleet were the last to be divided. Pamet (Truro) was divided into ten Bay to Ocean grants to Proprietors soon after 1700; no common lands were retained. Settlement patterns were now becoming well established. Eastham had scattered small centers at Town Cove, Pochet (Orleans), Halfway Ponds and Great Neck. Wellfleet was centralized around the Bay, Duck Creek and the Herring Creek system. Truro settlements centered on the Pamet River, Pond Village, the Highlands and East Harbor/High Head.

A series of Town meeting resolutions indicate the decline of forest cover. Acts of 1725, 1727, 1741 and 1747 attempted to control erosion of cleared common land by restricting grazing. The Town of Eastham petitioned the General Court to abate some of its taxes due to degradation of coastal lands "by the sea, fires, winds and sands destroying such great quantities of their meadow ground and land and firewood and fencing." (Eastham, Records of Town Meeting, 1706-1761: 128, 199). Great Island's forests were consumed earliest since it was a convenient site for "trying" whales for oil, as well as for other marine uses and for grazing. In Truro, Proprietor's records show restrictions on taking wood enacted in 1701 and 1711. Firewood had become scarce by 1711 according to Shebnah Rich. (Rich, 1883, p.101) Still, prices indicated that land values stayed relatively high in Truro by 1724 (Rich, 1883, p.226) Grazing had already become intense; sand began to encroach on the town's meadows and fields and inhabitants were required to plant beach grass. (Hershey, 1962: 8). Legislation in 1745 forbade cutting within 160 poles of high water (p.232, Rich, 1883). As a measure of privilege, Truro established a ministerial woodlot in 1749, which still existed when Shebnah Rich wrote his history in 1883 (Rich, 1883, p.233). In Provincetown, measures were enacted to restrict grazing and to plant beach grass in 1744. (Rockmore, 1979). Hershey notes that Provincetown lost much of its population in the mid 1700's.

Demand for wood climbed continuously; colonial houses were being enlarged, fences proliferated, and fuel was needed for trying whales, boiling salt and for domestic use. According to Altpeter (1937), large trees for shipbuilding were imported to the Cape from Maine by the mid 18th century. Sheep were locally common.

Presumably, settlers used girdling and burning to clear new agricultural land, although eventually a combination of felling and burning was preferred (Cronin, 1983). Tree cover may have been used as an indicator of soil quality so that sites with mixed deciduous woodland were first to be cleared. (Stilgoe, 1982; Cronin, 1983).

V. 1750-1800: ORLEANS (split from EASTHAM in 1797)
(SOURCES: 1795 State-mandated boundary maps and Town Atlases, Mass. State Archives; Barnstable Co. Registry of Deeds; Mass. Historical Society Collections, 1794, 1802; Mass. Tax Valuations, 1791, Mass. Archives; Humane Society, Descriptions of Rescue Huts, 1802; Dwight, Travels in New York and New England, 1821. Pratt, History of Eastham, 1844.)

Few firsthand landscape descriptions survive from the period of settlement through the end of the eighteenth century, a time of rapid and massive landscape change. Many sources give clues to the rapid expansion of land use activities, land clearing, and environmental change. During the 18th century, landscape disturbance peaked;

resources had been exploited to their fullest by the technologies of the day. The Outer Cape was devastated (see Massachusetts Historical Society 1794, Freeman, 1802 and Thoreau's account, Cape Cod, 1914). Miles of forests had been cut, and in some areas in close proximity to the coast, moving sand dunes were overrunning grazing and agricultural land. A similar scenario had played out on Nantucket as well (Dunwiddie, 1992). By comparison, Martha's Vineyard and Naushon Island had some areas that retained a mixed assortment of second growth brush and stunted woodland and perhaps some stands of old growth forest. Maps produced by the U.S. Coast and Geodetic Survey between 1836 and 1880 (Map 2) show a striking contrast in forest cover between the barren Cape and the rather well-cloaked Vineyard.

By the second half of the 18th century, soil exhaustion and overgrazing were leading to widespread erosion, particularly of coastal lands. Islands, marshes and other coastal lands were preferred livestock areas due to easy access and protection from predators. Wellfleet Town Meeting actions to protect Great Island and the Bay shore are noted in 1764, 1788, 1801 and more frequently thereafter. Truro appealed to the General Court for a tax abatement in 1760 due to losses of productive land to windblown sand. (Rich, 1883, p.247)

The Revolutionary War jeopardized fishing, whaling and maritime trade. Agriculture was among the only alternative livelihoods. According to Pratt (1844), Provincetown was abandoned to the British during the Revolutionary War who kept warships harbored there. Locals who stayed did a profitable business (Pratt, 1844). At times, livestock were confiscated by the British for the use of their navy.

A 1781 aggregate valuation of Eastham listed 1769 acres of tilled land (Mass. State Archives, 1791: 470). Rubertone estimates that the town presently has 3713 acres of arable soils based on the soil survey; a quarter or a third were planted in grains by the end of the 18th century (Mass. Hist. Soc., 1802: 189). 200 acres of particularly fertile land on the eastern side of town are mentioned. Only 127 acres of tillable land and 58 acres of pasture were listed in Wellfleet. (Mass. State Archives, 1791: 473). Wellfleet was known primarily as a fishing town. Truro had 1594 tillable acres in 1781 (Mass. State Archives, 1791:474).
The 1781 tax valuation shows that grazing density ranged from 34 sheep/acre in Truro to 15 sheep/acre in Wellfleet and 14 cows/acre in Truro to 4 cows/acre in Wellfleet; swine, oxen and horses were also listed. (Mass. State Archives, 1791)

Orleans was split off from Eastham in 1797. Pratt (1844) noted that the town was almost entirely barren, with a small part covered with brushwood. A barren sandy tract extended from the north boundary of Eastham extending a half mile inland, almost to Town Cove. Eastham had reached a state of "defoliation," with once productive farmland near the coast now barren sand. (Mass. Hist. Soc., 1794) In 1786, the minister's salary included 15 cords of oak and 3 cords of pine per year. The parsonage, at Tashmuit on the west slope of the clay pounds at Highland Heights, was said to be some of the best land in town. (Perry, 1898, p.157-8). Salt-making had consumed vast amounts of firewood until the 1770's when a new system was introduced based on solar evaporation. (Rubertone, 1985:101)

Accounts published by the Massachusetts Historical Society (1794) and by Dwight (1821) depict large barren tracts by the early 1800's. "Almost all the original forests of this country having been long since cut down." (Dwight v.1, p.106). The shortage of trees for firewood forced many residents to begin using peat and driftwood for fuel by the end of the 18th century (Mass. Hist. Soc., 1794). Similar peat harvesting was occurring on Nantucket as well at this time (Dunwiddie, 1992).

Dwight's (1821) description of the landscape at this time is particularly graphic. "In Eastham the surface became a perfect plain; and the peninsula so narrow that we had a full view of Massachusetts Bay and the Atlantic at the same time. ... The soil was visibly more barren ... and large tracts were left unenclosed. ... at a distance of perhaps six miles from Orleans [extending into Wellfleet], we entered a forest, composed first of oaks, and afterwards of oaks and pines; still lower and leaner than any we had seen before. This forest lasts without intermission to Wellfleet, and with very little interruption to the borders of Truro." He describes a 200 ac tract on the east side of Eastham that is among the best land in the county for producing maize and rye. (Dwight,

1821. v.3 p.88) Stands of mixed oak were described on the north side of the upper Pamet valley and mostly pitch pine on the south side.

Northwest of East Harbor (toward Provincetown) sand extended from shore to shore. South of the Pamet River the land was described as unproductive, unfit for English hay (improved pasture) and "scarcely ... clad in verdure any time of year." In half of the towns, necessary produce was imported from Boston. The hilltops extended into an open plain with long views of the meetinghouse, a few windmills and "here and there a wood."

VI. 1800-1850 DECLINE OF AGRICULTURE
(SOURCES: Maps: 1836, Extremity of Cape Cod, U.S. Topographical Engineers, J.D.Graham. 1835, Town Atlas and Boundary Survey Maps, Mass. Archives. Other sources: Town Meeting Reports, Proprietors Records, Pratt, 1844, Dwight, 1821.)

A pamphlet published for shipwrecked sailors by the Humane Society (Freeman, 1802) describes discrete patches of brushy woodlands in hollows. The land between Fresh Brook Hollow and Plum Valley (south of Marconi Beach) is called table land with a few houses scattered over plain open country. A band of thick forest with "impenetrable" coastal brush extended from Brush Valley (Truro) to Newcomb's Hollow (near the Wellfleet Ponds) along the backshore. Remnant woodlands are noted in the backshore hollows: a small wood on the north side of Hardings Hollow (Longnook) -- the second one south of East Harbor on the back side of High Head. The route from Race Point into Provincetown was described as follows: "... after three miles of barren dunes, a thick, swampy tangled forest, impenetrable at night." (Freeman, Trustees of the Humane Society, 1802).

Thoreau quoted Freeman's Humane Society description in the 1850's and confirmed that little had changed except that "there is not much high wood left." (Thoreau, 1914: 106).

Kendall (1809) described "... lofty woods, and hollowed into verdant and well-watered vales" in Truro, but the vast Truro Highlands were open downs with some maize being grown on High Head. North of the Highland area the plains were consistently described as sand on both sides. (quoted in Freeman, 1862).

In the southern part of Eastham, a few miles north of Orleans on the Bay side, Dwight observed about a thousand acres of sandy eroded land without a living creature or a house, except tufts of "whortleberries" on a few hillocks. He noted that this area had been planted with beach grass but free-ranging cattle had again ruined it. (Dwight, 1821, v.3 p.101) In Wellfleet, the harbor islands of Griffin, Great, and Little Beach, were described as devoid of vegetation: "sand hills, ... all obtuse cones, smooth, regular and elegant ..." (Dwight, 1821, v. 3, p.100). The Town of Wellfleet acted to prevent coastal erosion due to grazing in 1810, 1816, 1833, 1834, 1838, 1841, 1850, 1865 and 1868. Great Island is usually mentioned as a critically stressed area.

Pratt (1844) described a tract of remnant forest along the Wellfleet - Eastham border; a third of Wellfleet was covered with young pines. Coastal areas such as the bay shore islands were mostly barren and subject to erosion, threatening Wellfleet harbor waterways; Town meeting actions attempted to limit grazing.

The War of 1812 and the embargo on overseas trade hampered fishing and marine commerce; again, agriculture was the only alternative. As soils were depleted, agricultural practices changed to smaller, more intensively farmed fields and a wider array of crops. Livestock were penned to collect manure for fertilizer. Agricultural acreage had declined but yield per acre increased with manuring of fields. (Palfrey, 1846; Rubertone, 1985, Thoreau, 1914). The 1855 State Census showed cereal crops in decline in Eastham and throughout the Lower Cape. Many larger cornfields were now abandoned or turned to pasture, although sheep were also declining. Numbers of cattle and horses remained steady. Livestock densities in 1850 ranged from 12 cows/acre in Eastham to 5 cows/acre in Provincetown. Sheep had all but disappeared from Federal agricultural censuses by 1840.

VII. 1850-1900 BEGINNINGS OF TOURISM
(SOURCES: Maps: U.S.Coastal Survey Maps, Truro-Wellfleet- Eastham and Orleans-Chatham east shore.
Other sources:
1860s -- First appearance of stereographs and photo-cards, mostly views of churches, town halls and lighthouses.
1890s -- Lower Cape professional photographers Snow, Cummings, Rosenthal, Smith and Stiff produce collections of glass negatives.
Narratives: Rich, History of Truro, 1874. Accounts of Thoreau, Freeman, Bartlett, Deyo, Perry; Town Reports.
Newspapers: Provincetown Advocate, Banner, Register [Yarmouth].)

In the early 1850's, Thoreau (Thoreau, 1914) walked the main road through Orleans over "bare swells of bleak and barren looking land." (p. 41) He noted that the scarcity of wood made the land look as if it were blown clean by the wind. (p.41). "The trees were, if possible, rarer than the houses ..." except for stunted orchards planted in hollows. (p. 41) Travellers navigated using meetinghouses and windmills as landmarks, "there being no tall trees." (p.41) "The barren aspect of the land would hardly be believed, if described." (p. 45) " The only wood in Eastham was on the edge of Wellfleet. The pitch pines were not commonly more than fifteen or eighteen feet high ... There is scarcely a white pine on the forearm of the Cape. ... In the northwest of Eastham near the Camp Ground, we saw ... small rustling groves of oaks and locusts and whispering pines." (p. 129) (Thoreau, 1914)

Thoreau observed that the east side of Eastham was bordered by a "beach" one half mile wide, consisting of 1700 acres "without a particle of vegetable mould, though it formerly produced wheat." (p.46) Crossing Eastham toward Nauset's Three Sisters lights about 2-3 miles away, Thoreau continues: "We at once found ourselves on an apparently boundless plain without tree or fence, or, with one or two exceptions, a house in sight." (p. 50) "A solitary traveller .. in the distance, loomed like a giant. ... Men and boys would have appeared alike at a little distance, there being no object by which to measure them." (p. 51) At the edge of the Eastham plain near Nauset lights, Thoreau reached a belt of brush including beach grass, bearberry, bayberry, shrub-oaks and beach plum. Later Thoreau described the Silver Spring area in southwest Wellfleet as a bare plain tract, turning into bushes on the way to the back shore to the east. (p. 259) (Thoreau, 1914)

Thoreau approached Wellfleet after walking north from Eastham on the Atlantic shore. The region of vegetation on the east side he describes as "a succession of small hills and valleys covered with shrubbery," with a view here and there all the way across the Cape to the bay. (p.63) Sailors referred to the east side of Wellfleet as the Table Lands of Eastham, stretching northward 2-3 miles "flat as a table ... without a particle of vegetation ... the prospect so extensive, and the country, for the most part destitute of trees, a house rarely visible." (p.63) "There were thin belts of wood in Wellfleet and Truro, a mile or more from the Atlantic, but for the most part, we could see the horizon through them ... if extensive, the trees were not large. ... Commonly, the oak woods twenty-five years old were a mere scraggly shrubbery, nine or ten feet high, and we could frequently reach to their topmost leaf. Much that is called "woods" was about half again as high as this, -- only patches of shrub oak, bayberry, beach plum and wild roses, overrun with woodbine. ...huckleberry bushes were very abundant ... this shrubbery swarmed with wood ticks... " (p. 129) Thoreau also notes that by local standards, a large tree, a "brave old oak" 100-200 years old, may have "a ridiculously dwarfish appearance. ... the largest and most venerable ... are not more than twenty to twenty five feet high." (Thoreau, 1914)

Somewhere between Ballston Beach and Highland Light, Thoreau turned inland again and faced "desolation" (probably inspired by the lack of habitations as much as by barrenness). "...With rarely a cultivated or cultivatable field in sight ... You would frequently think, from the character of the surface, the dwarfish trees, and the bearberries around that you were on the top of a mountain."

Thoreau was especially amused by the "Lilliputian old oaks in the south part of Truro." He noted that while large schooners and houses were built of local timber, Truro's houses now stood amidst barren heaths and poverty grass rather than forests. At the time of Thoreau's visits, houses were built of lumber from Maine and a considerable proportion of Truro's lumber and fuel wood arrived as driftwood. From the Pamet River to High

Head was "peculiar open country, with here and there a patch of shrubbery." A stranger gets the impression of being at sea -- and finds it impossible to estimate distances in any weather (Thoreau, 1914, p. 130).

Thoreau also described land reclamation including pine plantations in Truro and the conversion of swamps and bogs into small gardens in Eastham and Provincetown. Reforestation (mostly with pitch pine) was promoted by farmers as cheap means of stabilizing soils. Thoreau noted a pitch pine plantation of 20-30 acres between Pond Village and High Head on land that was valued at 25 cents an acre. "Some of which is not considered worth writing a deed for." These plantation trees were approaching a foot tall after 2-3 years. Thoreau noted that vegetable and fruit production could be successful in the sandy soils even without fertilizers. (Thoreau, 1914).

"A few years ago Truro was remarkable for the number of sheep raised in it." In 1855 sheep were rarely seen. Thoreau attributes the decline in part to the fact that formerly sheep were allowed free range on unfenced lands but now owners were asserting their rights, (probably due to the long history of overgrazing); fencing was too expensive, with cedar rails imported from Maine. (Thoreau, 1914, p. 137)

Returning south from Race Point to Truro, Thoreau saw "nothing but beach grass" and shrubby forest being buried by the advancing dune edge. "We scarcely saw anything high enough to be called a tree, except a little low wood at the east end of town. ... The greater part of the land was a perfect desert of yellow sand." (Thoreau, 1914, p. 222)

Returning from Race Point, Thoreau listed huckleberry, bayberry, small pitch pines, boxberry, beach plum, shrub oaks and a few birch, maple, and aspen in the wooded area (probably near present-day Beech Forest). Referring to the lush landscape descriptions in the Pilgrims` chronicle, "Mourt`s Relation," Thoreau speculates, "I cannot but think that we must make allowance for the greenness of the Pilgrims in these matters, which caused them to see green. We do not believe that the trees were large or that the soil was deep here. Their account may be true particularly, but it is generally false." (Thoreau, 1914, p. 222)

Thoreau describes the view from Mt. Ararat, at the northwest end of Pilgrim Lake: "on one side the desert ... and beyond, the Atlantic,... on the west side a few valleys and hills, densely clothed with a short ... growth of huckleberry, blueberry, bearberry, josh-pear, ... bayberry, rose, checkerberry and other bushes, and beyond, the Bay. All these bushes formed an even and dense covering to the sand hills." (Thoreau, 1914, p. 273)

Freeman`s History of Barnstable County seems to echo Pratt and Thoreau, noting a tract of woodland along the Eastham-Wellfleet border, and then vast barren areas of sand and drifting dunes throughout Eastham. Agriculture was still Eastham`s principle occupation, but maps of the time showed large uncultivated pastures. A barren sandy tract extended from the Orleans border northward to the Great Pond. Freeman estimated a total sandy area of 1700 acres in Eastham with 50 foot dune "drifts". (Freeman, 1869, p.355). "Peat has long since come into extensive use" as a fuel in Orleans, according to Freeman -- "since the arrival of Rev. Osborn." (Freeman, 1869, p.724)

In 1853, Bartlett (1853, p.190) described barren land on the north Pamet ridge. Freeman described Truro`s bayshore south of the Pamet ("the Hog`s Back") as composed of "bleak and lofty downs". "The land cannot be said to furnish spontaneous verdure at any season." The higher elevations form an empty plain broken only by a few windmillls and woodlots, and the Congregational meetinghouse. The plain from the Highlands to High Head was particularly empty. Some woodland remained in the south part of town, probably along Longnook and North Pamet Hollows. (Freeman, 1862, p.537). Salt meadows at Pilgrim Springs in Truro were well-used for cattle pasturage. (Freeman, 186, p.619). "Time was when much valuable ship-timber was cut here." (Freeman, 1869, p.538). Perhaps because of erosion due to devegetation, Truro`s harbor at the mouth of the Pamet was choked with sand in 1860. (Deyo, 1890).

In 1862, the Province Lands were more desolate than today, "in some places partially covered with tufts of grass, shrubs or scrub-wood; but little wood of any kind. A few pines, diminutive maples, beech and aspen are to be

seen, and some wild cherry trees, whortleberry bushes, beach plum and bay berry shrubs." (Freeman, 1869) The town itself was improved with imported soil to allow gardens. Cranberry plots were located along Shank Painter Pond.

Deyo (1890) describes a tract between the two lines of hills outside Provincetown, a mile and a half wide, covered with pines, wild cherries, beach plums and bayberries. (Not inconsistent with the forested edge of the Provincelands today except for the presence of pure oak stands.) "Negro Head" (the site of the Provincelands Visitor Center) is called a wooded summit (Deyo, 1890).

Reclamation of coastal dunelands was pursued by the Commonwealth through the Superintendent of the Province Lands, a Commonwealth appointee. Planting programs for the Province Lands are described in annual reports of the Harbor and Lands Commissioners. For example, plantings in 1898 included 300 black locust, 1200 silver poplars 33,000 pines (seaside, Scotch, Austrian and pitch) and areas of bayberry and scotch broom. Twenty acres were planted near Grand View (the Provincelands Visitor Center site) extending 1500 feet eastward, and ninety acres of beach grass. Reclamation efforts were planned to focus especially on northwesterly exposures which were "void of vegetation." Southeasterly exposures were targeted for combinations of cranberry, bayberry and beach grass stabilized by brush piles cut from road-building operations (Race Point Road was begun in the early 1890s).

The regional office of the Massachusetts Division of Forestry reports a program whereby the state took title to degraded lands, improved them through planting programs and offered to sell them back to the original title-holders for the cost of the improvements. This program was a precursor to the Chapter 61 woodland tax abatement program.

In 1898, Perry provided extensive descriptions of the Cape Cod landscape, and referred to the drifting sand of Eastham. "...some people here are ashamed of so much sand, and others ... are indeed ignorant of its conditions here." (p.126) As if to moderate his description, he also mentioned Governor Prince's "ancient farm of 200 acres as good soil as is anywhere found in the state. The farm is largely swale land .. and is well tilled to date. ... the apple trees are very tall and show their age, as do all the shade trees, pine cedar, ash and elm ..."

He continued: "A ride of a half a mile ... will bring us to the roads across the Nauset Plains to its three famous lights. ...this half mile ride shows us that Eastham farmers are busy raising asparagus ... On Nauset Plain, low red-colored sandhills, divided by a long narrow inlet of salt water, and far before us on their sand ridge, Nauset light houses, white, even under a gray sky... From here, and through Wellfleet and Truro, the dominant feature seems to be this: a wide middle plain between a low range of sand bluffs on either side keeping back the sea, these ranges of sand bluffs sloping gently to the plain, and covered with pitch pine trees, mottled by broad patches of sea sand which show like half healed scars against their green, while the valley or plain between, often miles in width, is sprinkled over with young pine trees above the ancient corn fields, while rarely seen indeed, are old farmhouses of the early settlers ... It is not like a prairie, though reasonably level, ... in minor features resembles the sea-bottom, perpetually formed and reformed ... The same little round hollows ... the same low, rounded hill tops, the same long narrow sand ridges, with narrow and shallow valleys between them. Only the plain has its sparse grass and low pine trees..." (Perry, 1898, p.130)

Perry quoted a "scribe" describing the Truro uplands: "Such fat, gracious, rounded hills, and so many of them, bald of scrub oaks and young pines, as is common to the lands in Eastham and elsewhere on the East Cape, thanks to the old husbandry ... the poverty grass (*Hudsonia ericoides*), with its yellow flowers, a bastard kind of heather, with its wide spreading roots to suck up moisture and to stand against the northeasters ..." (Perry, 1898: 165)

"There has been much loose talk about the pygmy height of the fruit trees in this Cape town, which is attributed to the scant soil. This is only partly true. .. the tyranny of the sea ... it smites down, with its salt air, both branch and trunk ... Certainly, in these hollows ... sheltered, the apple trees grow as tall as anywhere. (Perry

1898: 167)

Perry hits his stride in his search for meaning in the landscape of the late 19th century when he observes the Provincelands: "All the way down this Cape, we have been remarking on these two verities, ... Nature making no mistake and man making the supreme mistake of cutting down its woods, and thus letting in the sand. But here, Nature seems stripped for the final fray, ... tearing at and covering the land with sand ... It is very much the old story of the heathen Pompey, searching ... at Jerusalem for something and finding nothing but silence and vacancy, though the One, the All, was there ... as in these sand-bluffs and sea. ... behind the houses, north, ragged hills ... and behind them all trees still standing in ragged valleys and on hilltops in utter chaos; trees stunted to shrubs, while still beyond, an utter desert, made so by the greater desert of the sea..." (Perry, 1898, p.188) In the east end of Provincetown: "... patches of lowland under cultivation, more sand patches, covered over with brambles and branches to prevent drifting... until we were outside of the town and face-to-face again with Nature. ... Before us, but miles away, rose the Truro Bluffs, green in the sea haze, with forests of unwonted height, especially where the oaks and beeches grow close down to the marsh. But on the left of us, reaching back to Cape Race and its desert and forward ... toward the bluffs, was the wonder strand of the Norsemen, and its still more wonderful sea. Between us and that sea ... was a fresh-water pond where people cut ice in winter, [Bennett or Duck Pond?] walled in by marshes of coarse fresh grass, and rushes in which smaller birds build their nests. (Perry, 1898, p.189)

The arrival of railroads on Cape Cod in the mid-1800's resulted in a variety of changes, both direct and indirect, and short- and long-term. They reached Hyannis in 1854, Wellfleet by 1868, and Provincetown by 1873. In 1855 the East Harbor bridge was completed. The dike enclosing Pilgrim Lake was built in 1869, allowing the railroad to link with Provincetown in 1873. (Cape Cod Roads of the 17th-18th c. with reference to King's Highway, July 5, 1962, Hershey, William, typescript). As it made its way out the Cape, the railroad made the area much more accessible to goods and visitors. At the same time, trains became a regularly scheduled source of fire ignitions to Lower Cape forests from the 1870's up until 1938, when it ceased passenger operation. Steam engines were heavily stoked for acceleration and spewed a plume of burning cinders when climbing hills. The railroad brought the first steady stream of tourists as well, which quickly became another major ignition source.

In 1906 the Herring River in Wellfleet was diked, limiting tidal influence on hundreds of acres of former floodplain, some of which is now covered with upland shrub community. Coastal drainages were heavily manipulated with multiple railroad dikes, ditching and draining for pasture and mosquito control and other activities.

VIII. 1900-1950: RESIDENTIAL DEVELOPMENT

A. Vegetation and Landscape

(SOURCES: Maps: DEM Province Lands Map, ca1920, State House Library; U.S.Coastal Survey Topog.Mapping1943; 1938 aerial photos; McConnell Land Use Mapping, U. Mass, 1951.
Photos: Photo post cards appear about 1903, most early originals date before 1911, then quality declines. Amateur photo albums, especially at Pilgrim Monument Museum and local historical societies. Geology Monographs of Woodworth and Wigglesworth, and Wilson, published photos by Chamberlain.
Narrative sources:: Agnes Edwards, 1918;Mary Heaton Vorse,; 1990, Tom Kane; 1937, Altpeter; Collins, 1909; Cape Cod Times; 1962, Randall; Town Records; Peter Rich)

Written Descriptions
In 1911, botanist F. S. Collins described Eastham as primarily sand dunes on the western half and a network of small brooks and salt marsh covered with sand on its eastern half. "What vegetable matter there is" exists at the bottom of steep depressions (kettle holes), where he collected botanical specimens from distinct and isolated populations which differ from one depression to the next. Any other vegetation he described is linked to

domesticated sites: along roadsides, fencelines, gardens, and yards. Pitch pines are described as growing in dense stunted stands, most often in regular planted rows still detectable from plantations of 50-60 years previous. He noted that pitch pines had been steadily taking over fields abandoned over the last fifty years. Scrub oaks and locusts were fewer in number. Other common plants noted were beach plum, lupine, *Hudsonia*, bearberry, *Chrysopsis falcata*, and *Corema conradii*. (Collins, 1909)

He observed a general decline in fertility and productivity, recalling great fields of corn and rye during his boyhood, with no grain production at all by 1909. A similar trend was indicated 60 years earlier (Pratt, 1844), so grain production had peaked much earlier. Stunted pitch pine had overtaken much of the deforested areas described in 1844 as well as the abandoned agricultural areas. The remnant forest tract described by Pratt (1844) along the Wellfleet-Eastham border, extended from the Town line south nearly to Nauset Light, Bracket Rd and Campground Landing in 1911. Collins also found remnant stands in the old Camp Meeting grounds. Today, the area is largely suburbanized. Collins noted Truro's desolate character, with "sand cliffs and dunes unrelieved by any town, only scattered houses here and there." (Collins, 1909)

Collins made special note of the locomotive fires "killing trees over hundreds of acres" yearly as well as removing all "leaf mold and other vegetable matter that had accumulated." He also remarked that not even pitch pine would regenerate in these burned areas.

Edwards (1918) described a landscape of "desolation, ... gently rolling pastures, bare of anything but the thinnest hay" (p.117). Throughout the region, of all the formerly forested areas, "Naushon alone attests to the noble forests of the past (p.143). The Cape towns now have "small farms of 5 to 15 acres growing strawberries, asparagus, turnips and orchards." Landmarks like the Marconi towers were still visible for miles around.

In 1918, "Small fruits are being profitably grown at Truro." (Edwards, 1918, p.137). Truro is "half desolate ... If you wish to view mile after mile of wild barrens, where the vegetation is chiefly moss and where the sand ... drifts over the heads of submerged bushes ... then go to Truro." (Edwards, 1918, p.141).

Reforestation was now occurring throughout the Cape region. "Down through Falmouth and Sandwich there are fertile farms and forests: more of both than there were 75 years ago. The increase in forest land on the Cape comes about in this way: ... a tract of [tilled] land is abandoned ... it becomes covered by grass by the end of a year or two. The year after, miniature pitch pines have sprung up, in another year, bushes..." (Edwards, 1918, p.140). Reports of the State Forester in 1910 show 1000 pitch pines planted in Truro. In the 1930's, State Forestry officials used a pine plantation in Orleans as an example of successful reforestation undertaken by town government. The plantation was almost entirely levelled by the 1938 hurricane.

Personal Interviews

Peter Rich (pers. com.) noted that the woodlots along Old County Road were still in use in his memory, though some as garden plots or picnic grounds for families with houses nearer the town center.

According to Peter Rich, many Wellfleet residents kept woodlots on the Eastern side of town south of the ponds. Many people had 5 acre plots with perhaps one acre for a garden and the rest for wood. Some erected small garden sheds or bog houses. He remembers Paradise and Lombard Hollows, and the Pamet Point area as being checkered with clearings.

Florence Rich recalled a time in the 1950's when her husband remarked on the small red cedars just beginning to encroach on the former Cedar Banks golf course. Earl Rich stated at the time that soon the fields would be taken over by woodland.

Provincetown's building inspector and Deputy Fire Chief, Warren Alexander recalls in his youth in the 1940's there was no hunting in Provincetown since the forests were so stunted and sparse. Now there are "plenty of deer." Randall (1962) dates one tree from the Beech Forest as 115 years old. Black oaks along Snail Rd. were

identified by Randall (1962) as the largest trees (about 24 inches dbh) within the Seashore at that time.

Bob Deschamps recalls that in 1939, there was an unobstructed view from his rooftop on Bridge Road in Eastham extending to the Bay and the Eastham Town Hall. The area was surrounded by asparagus fields. Trees did not begin to take over until after 1940, perhaps as late as 1955. His neighbor's field was abandoned from farming in 1941. Deschamps has a recollection of the view from a ladder (setting up the baseball backstop) in 1950 with no tall trees in sight.

Vegetation in Photographs

The selection of photographs available for analysis of vegetation and landscape changes is limited by the whims of early photographers, the vagaries of photograph preservation, and the uncertainties of relocatable features occurring in original views. This has left us with a decidedly non-random depiction of the landscape 50-100 years ago. Areas around towns and prominent landmarks are over-represented, whereas general views of the plains away from settlements are infrequent. The images of the landscape that emerge are in many respects remarkably varied. Areas of forest, as well as treeless plains of grassland, heathland, and stunted woodland all occurred in the early photographs. While we cannot interpret the proportions of these different vegetation types in the photographs as necessarily reflecting their actually abundance on the landscape, it would be misleading to assume that the remarkable desolation described by Thoreau, Freeman, and others in the area around Orleans and Eastham applied to large areas of the Outer Cape.

Few photos directly confront starkest, treeless plains, perhaps largely for aesthetic reasons; without a center of interest, the featureless open landscape would attracted a photographer's eye. Sites with buildings and planted trees were visually more appealing, but may give a distorted view of the actual appearance of the landscape as a whole. Careful scrutiny of the distant background in many of the photos reveals this contrast. Excellent examples that suggest the open landscape outside of many towns include the views of Bound Brook Island in Wellfleet (Plate 20), and many of the photos in Truro (Plates 30,33,34,37,39,47).

Most of the old photographs from the Cape post-date the period of extreme devegetation. By the late 1800's when the first views were taken, regrowth of trees and shrubs had already begun in many areas. The most aggressive period of fuelwood cutting, pasture and field clearing, grazing, and agriculture, had passed. Few capture However, barren, open plains persisted in some places, especially where they were most exposed to salt-laden winds off the ocean. Examples include views of the Three Sisters at Nauset (Plate 3), the Marconi Site (Plate 4), the Herring River dike in Wellfleet (Plates 9-12), and the Highlands Light in Truro (Plate 48).

Captions for each photo-pair describe vegetation visible in each view. The following summary comparing the changes that occurred between these views will begin to provide greater precision in interpreting changes in the flora during the twentieth century.

In the vast majority of views, the major changes describe an increase in pitch pine across the landscape. This has occurred at different rates and to varying extents in different areas. Generally, pines appeared earliest away from the coast and in the southern towns, with coastal locations and areas near Provincetown only recently becoming wooded. In some places, particularly where reforestation began early in the century, oaks and other broadleaf trees are mixed with the pines. The view of Doane Rock in Eastham (Plate 2) illustrates this pattern. In many places, however, forests of pure pitch pine, or occasionally with Japanese black pine, predominate. Inspection of the old photos, and examination of the present understory of these stands indicates that the pines were often invading heathland assemblages that were dominated by bearberry, false heather, broom crowberry, wintergreen, and other ericoids. Many of these species still persist, but are disappearing as the canopies closes. This is especially clear in views of Pleasant Point (Plate 6), the panorama from General's Hill (Plates 23,24,25) in Wellfleet, North Truro (Plate 47), and Small's Swamp in Truro (Plate 50).

The Griffin Island area (Plates 10-14) shows this succession in its early stages, with good photo comparisons depicting pines coming in just during the last 30-40 years. Bound Brook Island (Plate 18) illustrates this process

a little further along, with pines coming in beginning since the 1920's. In both cases, the bearberry, broom crowberry, and other such heath species can still be commonly found in the understory. In other locations, such as General's Hill (Plates 23-25), this process is even further developed, with older, taller pines, and the heath species often largely gone from the understory. Hairgrass and Pennsylvania sedge are often found in the understory of pine forests, and may have been common in pastures when they were still open and grazed. They appear to be able to persist longer than the heath species, perhaps by suppressing regeneration of pine seedlings.

Stands of black locust trees are commonplace on the Cape today, and are conspicuous features in many of the contemporary photographs (Plates 12,16,17,20,29,33,39). They appear to have been widely planted around farms, and even where no buildings exist today, the presence of locust trees almost always attests to the past presence of a farm. The farms were often built in protected sites with good soils in the valleys and hollows, a pattern that matches the present distribution of locust stands.

The history of stands consisting of nearly pure oak (black and white) is of particular interest. The trees generally are coppiced and short, with an understory dominated by black huckleberry, completely different from the wintergreen, bearberry, or hairgrass understory in most of the pine forests. One such stand is visible in the view of Merrick Island on the Herring River in Wellfleet (Plate 17). In several places along the Old King's Highway, boundaries between pine and oak forests are exceedingly sharp, with very little intergrading. The edges are quite straight in some areas, suggesting old land-use boundaries. Data from the early USCGS maps (Fig. 2) suggest that at least some of the oak forests were also oak forest in the same locations >100 years ago. These observations suggest that oaks predominate more in areas that have not been cleared for agriculture or pasture, although they were probably maintained as woodlots. Pine forests, on the other hand, are succeeding into old fields, pastures, and heathlands. Mixed stands may reflect a more mixed history of disturbance, whereby oaks were either not entirely removed, or in which they were able to become re-established.

In an effort get some measure of the extent of reforestation that is visible in these photographs, we estimated the apparent cover of different general vegetation types in the foreground and background of each photo pair. Vegetation was classified as grassland, grass/shrub, heathland, shrubland, woodland, mixed pine/oak forest, pine forest, or oak forest. Areas of wetland vegetation and urban landscapes were not included, and some photos were excluded due to lack of sufficient detail. Fifty of the 60 photos in the Appendix were included in this analysis.

We have summarized these results by combining the vegetation types into two general groups - non-arboreal communities dominated by grasses and shrubs, and arboreal types typically dominated by pines and oaks. Data from the foregrounds and backgrounds of the photo pairs are tallied separately. However, both areas of the photographs depict a similar trend. Non-arboreal vegetation occurred in 50-72% of the original photos, where it averaged 87-97% cover. In the same views today, both the frequency and cover values have dropped by about half their original values. In contrast, measures of arboreal vegetation have increased greatly, with the frequency and cover values all rising by about 30 percent in the modern photos. While the figures derived using this approach are admittedly rough, they clearly depict the increase in forest cover as grasslands and heathlands become overgrown by trees.

TABLE IV.

Summary of vegetation composition in the foreground and background of paired photographs

Original	% Cover	% Frequency
Foreground		
Grass/Heath/Shrub	97	50
Woodland/Forest	59	16

	Background		
	Grass/Heath/Shrub	87	72
	Woodland/Forest	53	54
Today			
	Foreground		
	Grass/Heath/Shrub	62	28
	Woodland/Forest	84	46
	Background		
	Grass/Heath/Shrub	47	38
	Woodland/Forest	83	82

1900-1950:
B. Agriculture
The twentieth century saw the increasing rise of tourism and the decline of agriculture. By the end of the 19th century, many agricultural fields were abandoned, sheep had all but disappeared, and cattle were penned. Smaller, more intensively cultivated fields were the norm and large fields became overgrown.

By the turn of the century, agriculture had a very modest presence on the Outer Cape. The 1905 Massachusetts State Census ranks Barnstable County eleventh out of the fourteen counties in acreage of cultivated land. (Dukes County and Nantucket County rank twelfth and fourteenth respectively). These counties get the same low ranking in acreage of forest land. Numbers of sheep are at the end of a long decline, with only 630 pounds of wool produced in Barnstable County. (At 1.5 to 2 pounds per sheep, the total herd would have numbered between 300 and 500). The 1905 census also shows negligible grain production for the Cape. The main agricultural products were cabbage (Truro produced more than any other Cape town), green corn, pumpkins, squash and turnips. Total cultivated acres by town in 1905 (including hay, crops and market gardens): 1960 ac. in Eastham, 834 ac. in Orleans, 316 ac. in Provincetown, 738 ac. in Truro and 577 in Wellfleet. Pasture lands total 1537 acres in Eastham, 2485 acres in Orleans, 155 acres in Provincetown, 2692 acres in Truro and 833 acres in Wellfleet. Woodland totals by town are reported as 822 acres in Eastham (plus 46 acres in woodlots), 1221 acres in Orleans (plus 834 acres in woodlots), 1036 acres in Provincetown (1007 acres in woodlots), 1361 acres in Truro (312 ac. in woodlots), and 1200 acres in Wellfleet (318 ac. in woodlots). Total woodland on the Outer Cape amounts to 5640 acres, but only 1270 acres are more than 30 years old. Only 25 sheep are reported by the 1905 census, all of them in Orleans. 583 cows are also reported. (Massachusetts Census of Agriculture, 1905)

Massachusetts Crop and Livestock statistics for 1923 show Barnstable county's agricultural uses totalling 3558 acres of hay, 570 acres of corn, 3136 acres of cranberries and 483 acres of other crops, for a grand total of 7,747 acres in agriculture. The Massachusetts Department of Agriculture Crop and Livestock Review for June of 1929 reports only 30 sheep and 540 head of cattle for all of Barnstable County. (Massachusetts Crops and Livestock, Agricultural Census, 1923).

Art Benner's father ran the George Brackett farm in Eastham from 1925 to 1936, and continued to farm elsewhere until about 1945. They grew asparagus, turnips, carrots, and cranberries. The original house and barn are across Rte. 6 near the railroad and the eating place. Farmers organized under the Eastham Farming Association had a Nauset Brand. (Benner, pers. com.)

1900-1950:
C. Historical Records of Fires
It is difficult to estimate the size or frequency of fires much before 1900. Other than fires that destroyed buildings, individual fires that burned across the open plains and in the woodlands were rarely reported or

documented. However, as the number and density of settlements increased, as people frequented the Cape in increasing numbers, and as railroads brought frequent and conspicuous points of ignition, documentation of fires improved.

Increasing numbers of summer houses created a need to fight fires further away from town centers. Altpeter (1937) noted that popular recreation areas such as the pond shores were dangerous places to build due to frequent fires caused by careless tourists. New roads were constructed as the Cape's population increased; these served as fire breaks, and probably helped keep fires smaller than in previous decades.

Town reports from 1900-1930 show yearly payments to the Towns from the railroad to pay the costs of extinguishing fires. Some of these fires are described in yearly reports of Town fire engineers. Marshall (1983) seems to suggest that lands along the right-of-way were more valuable because payments for fire damage from the railroad were a steady source of income. Payments to Towns stopped in the 1930's. Almost all fires reported by Town fire departments between 1890 and 1950 were human caused (cigarettes, incinerators, children playing with matches, arson). Altpeter (1937) suggested that fires were intentionally set to provide off-season employment for the years before unemployment compensation. Peak years for fire fighting expense to the towns occurred in 1927 (Truro) and 1930 (Provincetown).

A 1927 report of the Cape Cod Reforestation Committee noted that the cost to towns for fire suppression was ten cents per acre, while many acres of previously burned or cleared land was now waste land and was not worth taxing. The report refers to many square miles of fire-killed trees and recommends that each town acquire and maintain town forests. (Cape Cod Reforestation Committee, 1927)

Recollections from various residents add detail to this picture of fire on the Cape. Art Benner remembers a 1937 fire in South Truro and Wellfleet that reached the ocean and doubled back with a wind change. Rusty Rowell of Wellfleet recalls a similar fire about the same time. Benner also recalls spotty railroad fires, mostly on the east side of the right or way, sometimes 3-4 per year, some years none. (Rowell, pers. com.)

Bob Deschamps worked for the Eastham Fire Department many years. He reported that prior to 1946 they had no truck, and shovels and brooms were their main equipment. A moth spraying rig was sometimes used as a portable pump and Orleans sometimes sent assistance. Wildfires were not much of a possibility since houses in the Eastham area were widely spaced and surrounded by fields. He estimates 10-12 wildfire calls per year, mostly in the spring. Train fires occurred but there was little fuel to burn along the right of way. (Deschamps, pers. com.)

In 1958 Barnstable County was 65% forested according to the Massachusetts Forest Industries Committee (Mass Forest Facts, Mass. Forest Industries Committee, 1958-59). The same source shows statewide forest fire activity from 1930 to 1950. 72,910 acres burned in Massachusetts in 1930, dropping sharply to only 17,910 acres in 1935. After 1940, total acres burned stays under 10,000 acres per year, though the number of fire incidents per year nearly triples in the 1950's. The largest single cause of fires is debris burning (44% of all fires; 7.8% are attributed to arson, 1.5% to the railroad).

1890-1994:
D. Dendrochronological Record of Fires
We selected the forests of Wellfleet and Truro to investigate the twentieth century fire history more closely for several reasons. The date and extent of several fires are reasonably well known for this area (Table x, Fig. 6), and we wanted to see whether field evidence could be gathered that would reflect these events. Much of this area is not yet suburbanized to the extent that has occurred further south, making it easier to collect cross-sections and cores from trees. Finally, the forests in this area include frequent large pitch pines. This species is known to be resistant to fire, and we expected that evidence in the form of fire scars would be present on trees that had survived past burns.

Increment cores were collected from about 35 trees in this area. However, dates of fire scars could not be precisely determined from cores alone, and permission was obtained from the National Seashore to cut wedges from a sample of trees to provide material more suitable dating fire scars. The locations of sampled trees, and dates determined from fire scars, are reported below.

TABLE V.
FIRE SCARS ON PITCH PINES IN WELLFLEET AND TRURO

(see map VII. for precise locations). Scar dates are based on ring counts, not cross-dated sequences, yielding a probable 1-2 year potential error on most dates. ± dates indicate uncertainties due to vague or microscopic rings, or problems exactly locating a scar.

ID	Site	Scars
BLR-1	S of Bio Lab Rd.	1938, 1898
WHH-1	SW slope of Warehouse Hill	1930±2
KHP-1	King's Highway Path	1935
N(CC09)-1	North of CCO9 on King's Hiway	1937
N(CCO9)-2	" " " " "	1929, 1963?
CRW-1	Collins Road West side	1949?,1932,1905,1899?
PVU-1	Prince Valley uplands	1933±
PVU-2	" " "	<1935?
PVS-1	Prince Valley Rd., S side	1940±3
PVS-2	" " " "	1938±
LVS-1	Lombard Valley South side	1908
LVN-1	Lombard Valley North side	1952
GPW-1	Gull Pond West side	1929, 1904
Great Pond -1		1915, 1903
Great Pond-2	(Scrub Oak)	1946±5
Great Pond-13		1943, <1926
GHS-1	Gross Hill Rd. South	1960

We discovered that we could readily find fire scarred pines, in some cases on 50 percent or more of the trees, but almost exclusively under rather particular conditions. The scarred pines occur primarily on slopes (±10° or more), or occasionally on leaning trees, and then only if they are growing in areas with a shrub understory. This was almost invariably a huckleberry understory, which occurs mostly in the oak and oak-pine forests. Presumably, the scars are produced by fires which are especially hot to begin with because of the taller, volatile shrub fuels, and where the heat is concentrated on the trunks because of the slopes or a lean to the tree. We found virtually no scars on level ground, or in pines that did not have this huckleberry understory. Based on these observations, it appears that fire scars can only be used to date and locate fires in certain pine-oak habitats; in areas with shorter or sparser surface fuels, level terrain, and areas without older pine trees that could have survived a burn, past fires may have burned without leaving any sign of a fire scar.

The oaks in these stands are essentially all coppiced, and in the areas where we were examined scarred pines, the oak trunks generally were of a size suggesting that they resprouted following fires that scarred the pines. We confirmed this in a few cases by counting rings on oak stumps that we found cut in the same vicinity; these often were in the 40-65 year range. The scarred pines, on the other hand, were often 80-115 years (such as in the Prince Valley area). Thus it appears that the fires frequently resulted in topkilling (and subsequent resprouting) of oaks, but only scarred the pines.

The following analyses of the fire-scarred tree data (Table IV) and the historical fire record (Table V, Map VI.) present a detailed picture of fire events in the forests near Wellfleet and Truro.

Great Pond

The only historically documented fire in the area south of the pond was in 1933. There is no evidence of this fire based on the three tree sections. However, there is evidence of at least 3 other fires in the area during the 1900's. Great Pond #1 is an extremely slow-growing pine (center <1880) with at least 2 very clear fire scars on it (1915, 1903). The wedge from #13 does not appear to reach the beginning of a large fire scar that produced overgrowth, which is <1926. Thus it could date to either of the fires recorded in #1. However, it contains a small scar, probably a fire, dating to 1943. Great Pond #2 is a scrub oak stem with no scars, but which probably resprouted following a fire. Its slow growth leaves the pith date at ca.1946, probably the same fire recorded by #13 (1943).

Gull Pond

A historical fire was recorded here sometime in the 1930's. Several pines in the area west of Gull Pond have multiple scars on the northeast side. #1 has two clearly dated scars at 1929 and 1904. As with Great Pond, the historical fire appears not to have left a scar, but at least two other fires occurred in the 1900's here. A wedge from a nearby site (Gross Hill Rd-1) recorded a single fire in 1960.

Paradise-Lombard and east

A historical fire occurred here in 1938. A clear, large scar, probably from this fire, occurs on the south side of BLR-1. A second fire, about 1898, also resulted in suppressed growth of this tree for about a decade thereafter. Two scarred trees in the Lombard Hollow suggest additional fires occurred as well, although few scarred trees were found. A single clear scar, with none others evident, is visible on the east side of LVS-1 in 1908. On LVN-1, a single scar on the NE side dated to about 1952. Field notes suggest that this latter fire came down Lombard Hollow from the N or E. No scars were observed in Paradise Hollow.

Warehouse Hill/King's Highway/CCO9

A single clear scar on the southeast side followed by suppressed growth dates a fire to about 1930 on WHH-1. The face of this scar was charred, indicating a second, later (but undated) fire also occurred. Many other trees in this area were also scarred; one was noted to contain 3 fire scars. It is possible that the earlier fire was the extensive Truro fire reported from historical records in 1927. A wedge collected from along King's Highway, also in the supposed path of this fire, exhibits only a single scar that dates fairly close to 1935, and apparently records a different fire. Two wedges from trees slightly further north may corroborate these same two fires. NCCO9-1 has one scar dating from 1937. NCCO9-2 has a single clear scar in 1929, and a possible scar in 1963. Given some uncertainties in dating, these data may collectively record the historical 1927 fire and a second, unrecorded fire in 1935-7.

Wedges from the Prince Valley area, to the west, would be expected to record either or both of these fires. Surprisingly, none clearly points to the 1927 fire, which would have been expected to come through at least some of these trees. Instead, they date events around 1933, and around 1938-40. Given the uncertainties of these dates, it is not clear whether either of these correspond with the 1935-7 burn noted at the sites to the east across Route 6.

A wedge from a final site, Collins Road, is remarkable in that it clearly records two fire events, about 1905 and 1932, and suggests two others as well (1899 and 1949). Only one of these (1932) may correspond with other nearby sites (PVU-1 - 1933). Most pines at this site had at least one visible scar, and one was observed to have at least 3.

These data indicate that fires occurred virtually throughout this area from Wellfleet and Truro during the 1900's. This is evidenced by the presence of fire scars on at least some pitch pines at most sites. The lack of correspondence of dates among scarred trees at nearby sites suggests that individual fires were not especially widespread. Furthermore, the lack of correspondence with many historically recorded fires might also indicate that fires were relatively small, with many possibly going unrecorded.

At many sites, multiple fire scars recorded at least 2 fires in the last century. Several trees were noted with 3 or more. Most scars date from the 1920's and 1930's, with virtually none since about 1950. This may reflect a higher frequency of fire in this area earlier in this century. However, since young pines are more likely to be scarred by fires than thick-barked older trees, this pattern may also be due to the increasing age of pitch pines in the forest. However, trees with exposed scars from previous fires are also more susceptible to scarring from subsequent fires than unscarred trees of the same size. The fact that many of our samples have exposed scars that show no evidence of other fires after 1950 suggest a real decrease in fire events.

SUMMARY DISCUSSION AND CONCLUSIONS

To address questions regarding the effects of fire suppression on the vegetation of Cape Cod, we gathered data using several different approaches, including written historical accounts of vegetation and fires, historical maps of vegetation cover, analyses of historical photographs matched with contemporary photographs from the same locations, and analyses of fire events based on biological information, such as fire scars, tree ages, and forest composition. By relating these diverse pieces of information, we sought to reconstruct major changes in the vegetation that have occurred in the past on Cape Cod, identify which factors contributed the most to the patterns observed over time and space, and especially focus on the role of fire as a dynamic influence on vegetation succession, composition, and structure.

Prior to European settlement, the upland vegetation of much of the Outer Cape consisted primarily of forests of oak, pitch pine, and other deciduous hardwoods. Grasslands, heathlands, and other low shrublands probably occurred primarily in areas close to the coast, where salt spray may have limited tree growth. Grasses, forbs, and low heath species may also have survived in temporary forest openings created by particularly severe fires, and during the last millennia, in agricultural clearings created by Native Americans. We have little evidence, either from the paleoecological record, or from other research we have conducted on the effects of prescribed burns in various fuel types, that suggest that prehistoric fires would have resulted in the elimination of forest communities and the creation of extensive open grasslands and heathlands. Rather, prehistoric fire regimes in the oak and pine forests of Cape Cod probably maintained a relatively open understory, but allowed the trees to persist and regenerate successfully.

Dramatic changes in the vegetation followed European settlement, when clearing of forests and grazing of livestock resulted in widespread denudation of the landscape. Native grasses and heath species spread across the open expanses of exposed plains, but were kept sparse and stunted in the impoverished soils by grazing animals and harsh winds. Trees were scarce over extensive areas around Eastham and Orleans; around Provincetown, widespread devegetation resulted in drifting sand and moving dunes. Deforestation appears to have been less complete around Wellfleet and Truro, where oak and pine woods and brush thickets persisted throughout the historic period. Only in the late 1800's, when agriculture declined in importance, did trees become widespread again in many of these areas.

Fires arising from accidental ignitions probably burned across the plains largely unchecked during this period. Few roads served as firebreaks, and few houses existed to warrant aggressive suppression efforts. Any attempts to fight fires would have been confined primarily to town areas, and would have been of limited effectiveness elsewhere, given the lack of sophisticated equipment and techniques. We can only conjecture at the extent or frequency of fires during the eighteenth and nineteenth centuries; the evidence to reconstruct this is lacking. No trees have been found on the Cape that pre-date the mid-1800's. Trees were scarce in many areas, and those that may have been scarred and would thereby provide some evidence for historic fire frequencies, have either been cut for fuel, toppled by storms, succumbed to disease, or destroyed by subsequent fires. Historical accounts are also sparse. Fires that burned across the open landscape away from towns probably attracted little attention, and went unrecorded. Most individual fires probably resulted in little long-term changes to the vegetation. Species in the heathlands, grasslands, and what forests and woodlots remained at that time are well-adapted to fires. Most resprout quickly, or require fire to prepare seedbeds and stimulate germination. Occasional fires burning during times of extreme summer drought may have had more lasting effects on the vegetation, as soil humus

layers were consumed, roots killed, and seedbanks destroyed. The cumulative effects of repeated fires, especially where frequencies were high (i.e., every 5 years or so), may have resulted in slowing the spread of trees back into areas that had been cleared, and in maintaining scrub oak barrens in some areas.

In the twentieth century, abandonment of agriculture and livestock grazing resulted in forests expanding back over much of the Outer Cape. The last areas to grow back were those that were particularly exposed, areas that were especially denuded, and sites that were kept in agriculture longest. Pitch pines spread abundantly in the abandoned pastures, fields, barrens, and heathlands. Around farmhouses in protected locations, and perhaps where liming and soil augmentation increased fertility levels, black locusts and other planted trees became well-established locally. Oaks and other deciduous trees were most extensive where they had survived in protected woodlots. These stands may have served as seed sources from which they re-established elsewhere, but they generally did not spread as rapidly as the pines.

The absence of large oaks in nearly all the Cape forests is striking, and contrasts markedly with the forests of Martha's Vineyard. The few seen in this study were impressive because of their rarity (e.g. by the homestead at Gull Pond). These may represent particularly fast-growing individuals in protected, favorable locations, or they may be older trees that survived due to their proximity to a home site. We noted only one stand of larger oaks (but still of a smaller diameter than the "homestead" oaks), in Lombard Hollow. They appeared to have escaped fires that burned in this area perhaps because of the greater moisture in the valley bottom. This overall scarcity of large trees suggests that either 1) most areas were burned sometime in the last century, and that virtually all the oaks were topkilled by the fires, 2) in those areas where fires did not topkill the oaks, any oaks that reached a significant size were cut, or 3) most oaks are not able to reach large sizes on the Outer Cape due to adverse growing conditions. The first two explanations are most likely.

Historical records and scarred trees in the forests of Truro and Wellfleet provide evidence for only the last 80-90 years regarding the size and frequency of fire events. Since the turn of the century, two or three fires burned through many stands up until about 1950, as suggested by multiple fire scars found on some pines. If, as seems likely, some fires failed to leave scars, it is possible that as many as 5 or 6 burns may have occurred during the last century in many areas. This may have been especially true near sources of frequent ignition, such as the railroad. Most fires appear to have been rather small - generally less than 2000 acres. The Martha's Vineyard fire record stands in marked contrast to this, where fires exceeding 8-10,000 acres were reported in the late 1800's and early 1900's (Dunwiddie and Adams, 1994). The narrow, north-south orientation of the Cape Cod landform may have resulted in smaller areas being burned, as well as the irregular, rolling terrain; differences in fuels may have contributed as well.

The changes in vegetation cover of the Outer Cape recorded in the photo pairs in this study document several different patterns. Dramatic reforestation occurred in many areas, primarily reflecting the development of pitch pine forests in abandoned fields and pastures. Some of this regeneration may have been facilitated by fire, since the seed germinates well in exposed mineral soil. Less change is evident in areas that were forested at the turn of the century. In particular, areas that are presently oak forest in many cases appear to have persisted for centuries, perhaps being cut for firewood, but never being cleared entirely for agriculture. Forestation has also been slow in the most exposed, unstable areas, such as in the shifting sands near Provincetown, and in other sites immediately along the ocean shore.

The composition and structure of oak-dominated forests in the Wellfleet and Truro area may not have changed dramatically during the twentieth century - coppiced oak forests with trunks <8-10" in diameter, with a few scattered larger pines throughout. These oak forests also are probably very similar to those that have been typical of much of the Outer Cape for millennia (Backman, 1984). We found little evidence suggesting significant changes in composition of these forests following repeated fires. Oaks were either top-killed and resprouted, or merely scarred. The scattered pines that occur in these forests appeared to survive the fires early in this century easily, even when they were quite small at the time of the fire. Some fires may have produced an increase in pine regeneration, but many locations exhibited no clearly defined cohort that dated from a fire event.

We have found no evidence, from Cape Cod, Martha's Vineyard, Nantucket, or the Elizabeth Islands, to suggest that fires during the last century created significant openings of grassland or heathland within the forest. On the other hand, scrub oak and mixed oak/pine barrens may have been sustained in areas where relatively frequent and intense fires limit growth and regeneration of arboreal oaks and pine forests. Many modern day examples of such barrens at Camp Edwards, Myles Standish State Forest, and Manuel Correlus State Forest on Martha's Vineyard, and Saul's Hills on Nantucket can be attributed to a combination of fire, frost, insects, and a land use history that involved little cultivation of the soils.

TABLE VI.

Outer Cape Fire Chronology - Summary

Source in parentheses: (TR=Town Reports, BP=Barnstable Patriot, PA=Provincetown Advocate, HI=Harwich Independent).
Note: Only mapped fires are numbered.

MAP NO.	YR	TOWN/LOCATION/SOURCE
1.	1897	Eastham: Old Orchard fire (TR)
	1900 5/2	Eastham: 200+ac. woods fire (BP)
2.	1908 8/20	Truro: 500 ac., 1/2 mi. wide, N to NW gale; starting from Highland-to-Truro road, south of north cemetery; second day wind shift SW sent it E to Lombard Hollow; restarted in pines east of cemetary, crossing road through woods to pasture S of Highland House; crowned in woods 100yds S of Highland House; burned to ocean. (PA, BP)
	1909 4/12	Orleans: 1000 ac. 1/2 mi. wide; from Seth Nickerson place across to shore of Pleasant Bay; threatened E. Harwich. Hurricane winds. (HI)
	1909 4/22	Provincetown: fire caused by incoming Sunday train
4.	c1914	Wellfleet: 200-300 ac. from Long Pond Rd near present Fire Station, between Long Pond and Gull Pond Rds, to the ocean. (Rusty Rowell)
5.	1915 4/5	Truro: North Truro fire across moors from pumping station to within 1/2 mi of houses on RR Ave. Flames up to 50 ft; through pines on SW of Sparrow's fields, stopping near where fish weir nets drying (BP)
	1917 6/7	Truro: South of N. Truro RR Depot; "quite a tract" including Paula Stevens henhouse. (PA)
6.	1920s	Truro: intentional burning of Pamet marshes by Town Fire Warden. (Tom Kane: My Pamet)
7.	1927 4/19-21	Truro: 2000 ac.; from near Cobb/S. Truro Post Office NE through pine forest in Prince Valley, to Red Sand Hill, across highway to Ballston Beach, wind shift sent fire to edge of Great Pond and into other side valleys south; extinguished at origin. Consumed Laura Rich Barn and Freeman cottage. (BP)
8.	1930 3/27	Provincetown: forest and town fire consumes 20 homes and the high school. (BP)
9.	1931	Provincetown: fire bug active, sets numerous fires between town and ponds; town enveloped in smoke for days. One fire closed Race Point Road and burned to the ocean; wind from the east. Hilltop flames visible from Monument Hill; another burned fields near Shank Painter Pond. (Mary Heaton Vorse: Time and the Town)
	1933 4/24	Truro: 15 ac. brush/woods fire in Longnook Hollow. (BP)
10.	1933 5/19-21	Wellfleet: 100-200 ac. RR fire in S. of town. Extinguished near Cahoon Hollow

Life Saving Station. (BP, TR)

c1935 Wellfleet: woods fire burns several days, west of Ocean View Dr. (Richmond Bell)

1937 Truro: 9+ grass and brush fires of indeterminate size in spring, fall, and winter. Fire bug? (TR)

11. 1938 4/5 Truro: 2500 ac,
from behind cemetary through dense underbrush, backfires failed, fire ran unchecked >1 mile to Longnook Rd.; several separate ignitions, arson; no buildings burned; snow the next day.

12. 1938 4/19 Wellfleet: 52 ac grass fire at Duck Harbor near Griffin Is; did not reach woodland. (PA) 4/21 Wellfleet cemetary burned to clear emerging vegetation. (PA)

13. 1938 5/18, 7/7, 8/23 Provincetown: various locations near west end and Clamp's Pond. (TR)

1939 4/30, 6/3, 8/25 Provincetown: numerous fires. (TR) 5/4 brush fire at Bradford, Holland and Itchiness-Mayo Sats.; 5/20 North Truro: intentional grass fire escapes near Prov. water works/pumping station. 7/6 grass fire at Mayflower Hts. (PA)

14. 1938 South Truro: estimated 2000 ac. from bay side of Paradise
Hollow across South Truro Ponds to the backshore (Rusty Rowell)

1940 5/20 Truro: 5 ac. fire on S. Pamet near little-travelled road far from hwy. (PA, Wellf. TR)

1940 8/22 Truro: numerous small arson fires at N. Truro, Corn Hill, Truro; total 5 ac. (PA)

1941 10/30 Provincetown: brush and woods fire behind Moors in West End. Knath and Thompson houses threatened. (PA)

1942 7/14 Eastham: RR fire (Wellf. TR)

15. 1942 8/5 Provincetown: scrub pine and brush fire near Truro line and backshore; roads impassable. (PA)

16. 1949 8/9 Provincetown: 400 sf Grand View Hill fire (present Visitor's Center)

1951 Wellfleet: 25 ac? "big forest fire, south part of town" near Trout Brook (TR)

17. 1954 5/1 Wellfleet: 140 ac. peat and marsh fire near Rt 6/Herring River crossing. Controlled burn escaped, fed by kerosene used for mosquito control (Irving Bronsden, Town Fire Records)

c1960 Eastham: NE of Salt Pond near Richardson House (Don Sparrow).

1962 Eastham: 3 ac. spring fire in pitch stand south of Doane Road. (?)

TABLE VII.
HURRICANES

Hurricanes (SOURCE: Coastal Flooding in Barnstable County Mass. Mass. Water Resources Commission. 3/63 Donald Crane. Consultant. (CACO LIBRARY)

8/15/1635
8/3/1638
NORTHEASTER 2/24/1722
6/30/1757
10/24/1761
8/1773
"SEPTEMBER GALE" 8/1815
8/1821
8/7/1827
NORTHEASTER 4/16/1851
9/8/1869
10/18-24/1878
8/16-20/1879
NORTHEASTER 11/27/1898
NORTHEASTER 12/26/1909
WESTERN MASS 9/21/1938 $156,000 DAMAGE TO CAPE RR EMBANKMENTS

NORHTEASTER 2/1940 MOST DAMAGE TO SANDWICH
NORTHEASTER 4/20-22/1940 DAMAGE TO 25 SUMMER HOMES ON CAPE. VALUE $3000
PROVIDENCE 9/14-15/1944 COASTAL DAMAGE
NORTHEASTER 11/1947 FLOODING IN PROVINCETOWN. $100,000 DAMAGE
9/1950 CAPE : $250,000 HWY DAMAGE. LOSS OF BOASTS AND FISHING GEAR
NORTHEASTER 11/53 FLOODING IN PROVINCETOWN $60,000

CAROL (WESTERN MASS) 8/31/54. EDNA (THROUGH PLYMOUTH) 9/14-15/54. COMBINED DAMAGE PROV $150,000

NORTHEASTER 12/29/1959 PROVINCETOWN:85 PROPERTIES FLOODED. $61,000 EMERGENCY COSTS. TRURO 6A FLOODED

9/1960 ORLEANS TO PROVINCETOWN BEACH EROSION DAMAGE $500,000

TABLE IV.
LAND USE FROM U.S. CENSUS

MAPS

LOCATION MAP
GENERAL VEGETATION COVER 1848
GENERAL VEGETATION COVER 1943
VEGETATION 1991
DECIDUOUS FOREST IN TRURO (1848, 1943, 1991)
WILDFIRES 1890-1960

MAP KEY

1. 1897 Eastham: Old Orchard fire
2. 1908 8/20 Truro: 500 ac.
4. c1914 Wellfleet: 200-300 ac. from Long Pond Rd
5. 1915 4/5 Truro: North Truro fire across moors from pumping station
6. 1920s Truro: intentional burning of Pamet marshes
7. 1927 4/19-21 Truro: 2000 ac.; from S. Truro Post Office
8. 1930 3/27 Provincetown: 20 homes and the high school.
9. 1931 Provincetown: fire bug fires between town and ponds
10. 1933 5/19-21 Wellfleet: 100-200 ac. RR fire
11. 1938 4/5 Truro: 2500 ac, from behind cemetery
12. 1938 4/19 Wellfleet: 52 ac grass fire at Duck Harbor
13. 1938 5/18, 7/7, 8/23 Provincetown: near west end and Clamp's Pond.
1941 10/30 Provincetown: brush and woods fire, West End.
14. 1938 South Truro: from near Paradise Hollow to the northeast, past South Truro Ponds to backshore.
15. 1942 8/5 Provincetown: near Truro line and backshore
16. 1949 8/9 Provincetown: Grand View Hill fire
17. 1954 5/1 Wellfleet: 140 ac. peat fire near Rt 6/Herring River

PHOTOGRAPHS

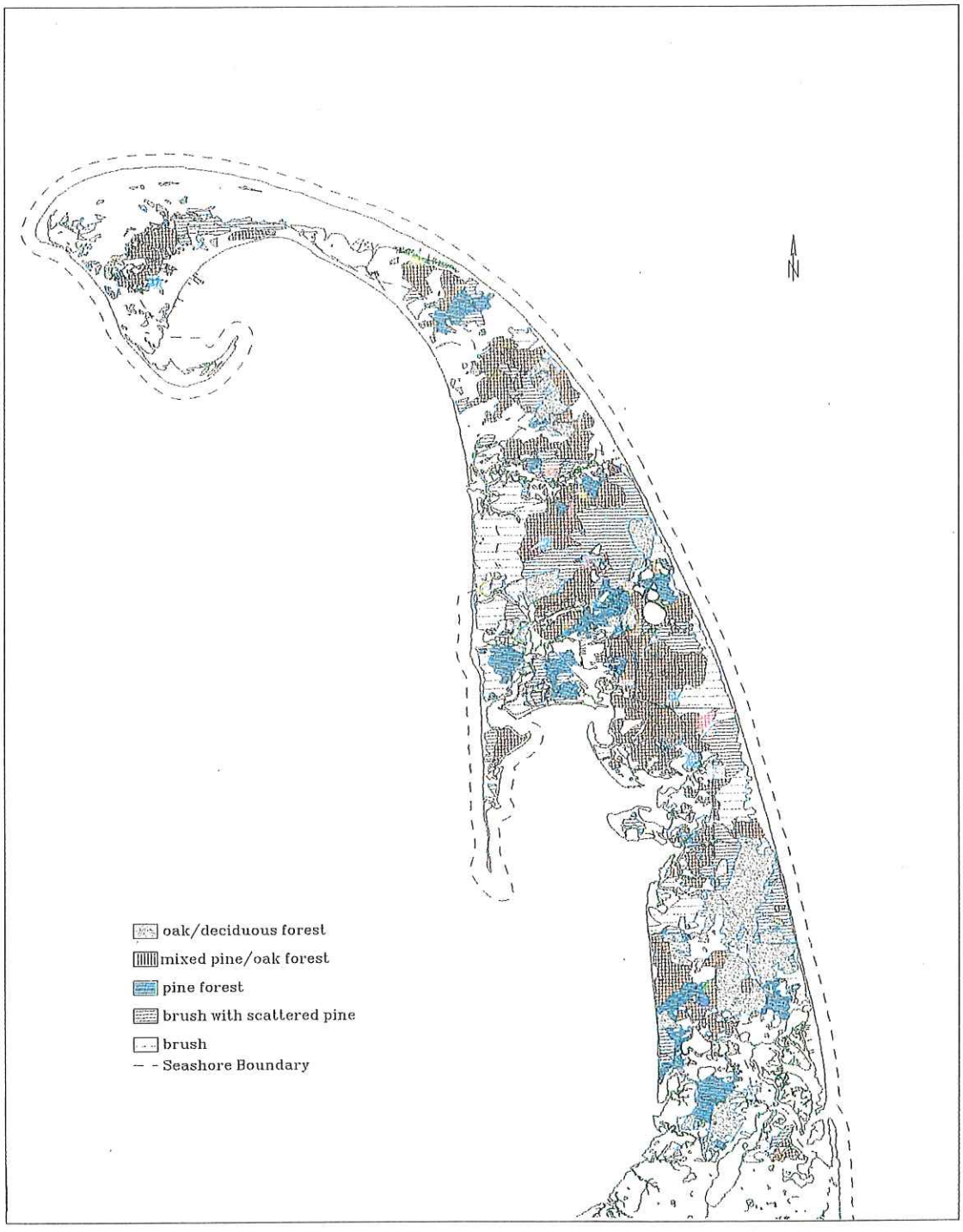
PHOTO LOCATION MAPS
PAIRED PHOTOS
PHOTO DATA RECORDS



General Cover Types 1848
Cape Cod National Seashore

(from U.S.Coast and Geodetic Survey Maps)

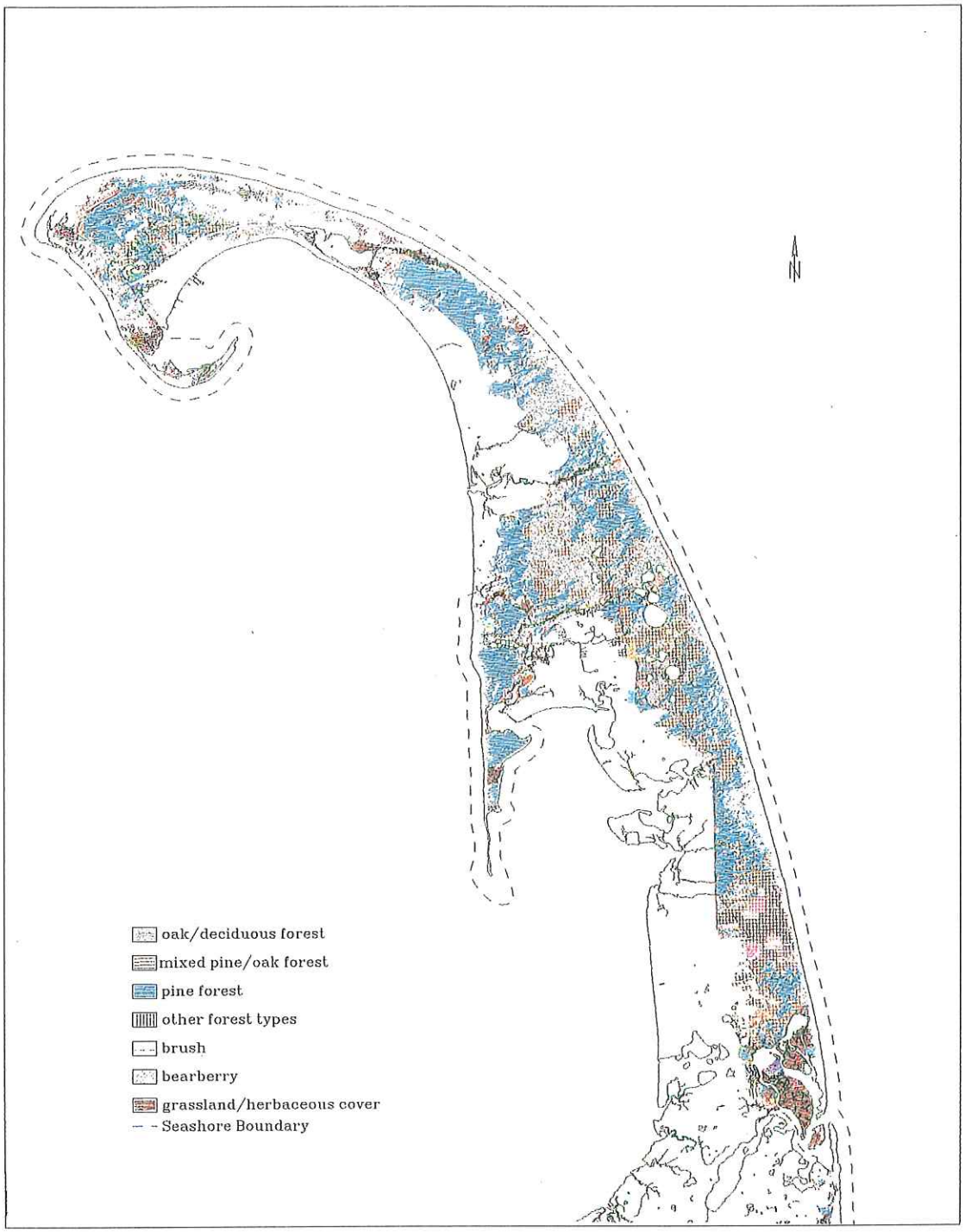
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General Cover Types 1943
Cape Cod National Seashore

(from U.S.Coast and Geodetic Survey Maps)

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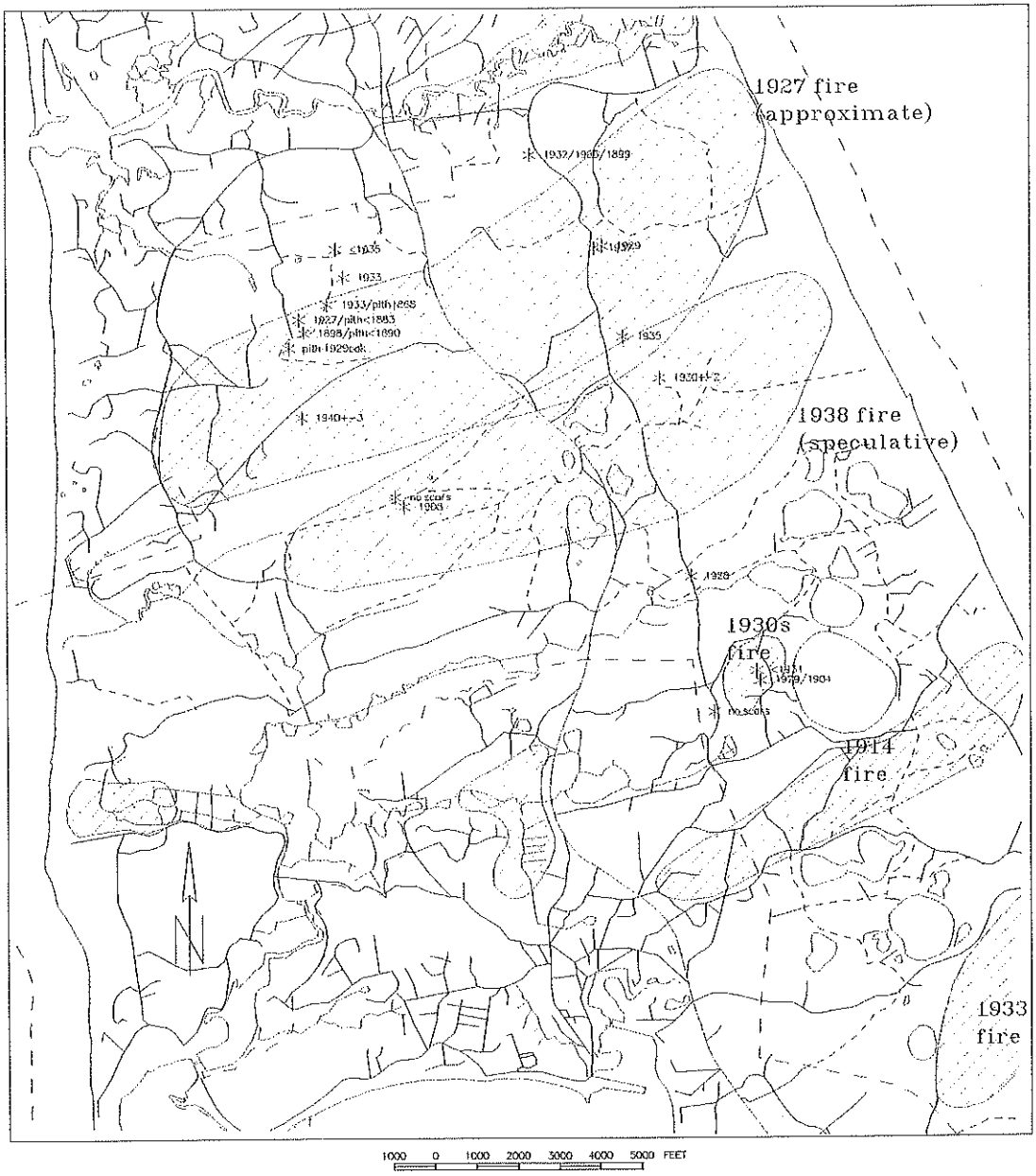


General Cover Types 1991
Cape Cod National Seashore

(from 1991 aerial photographs)

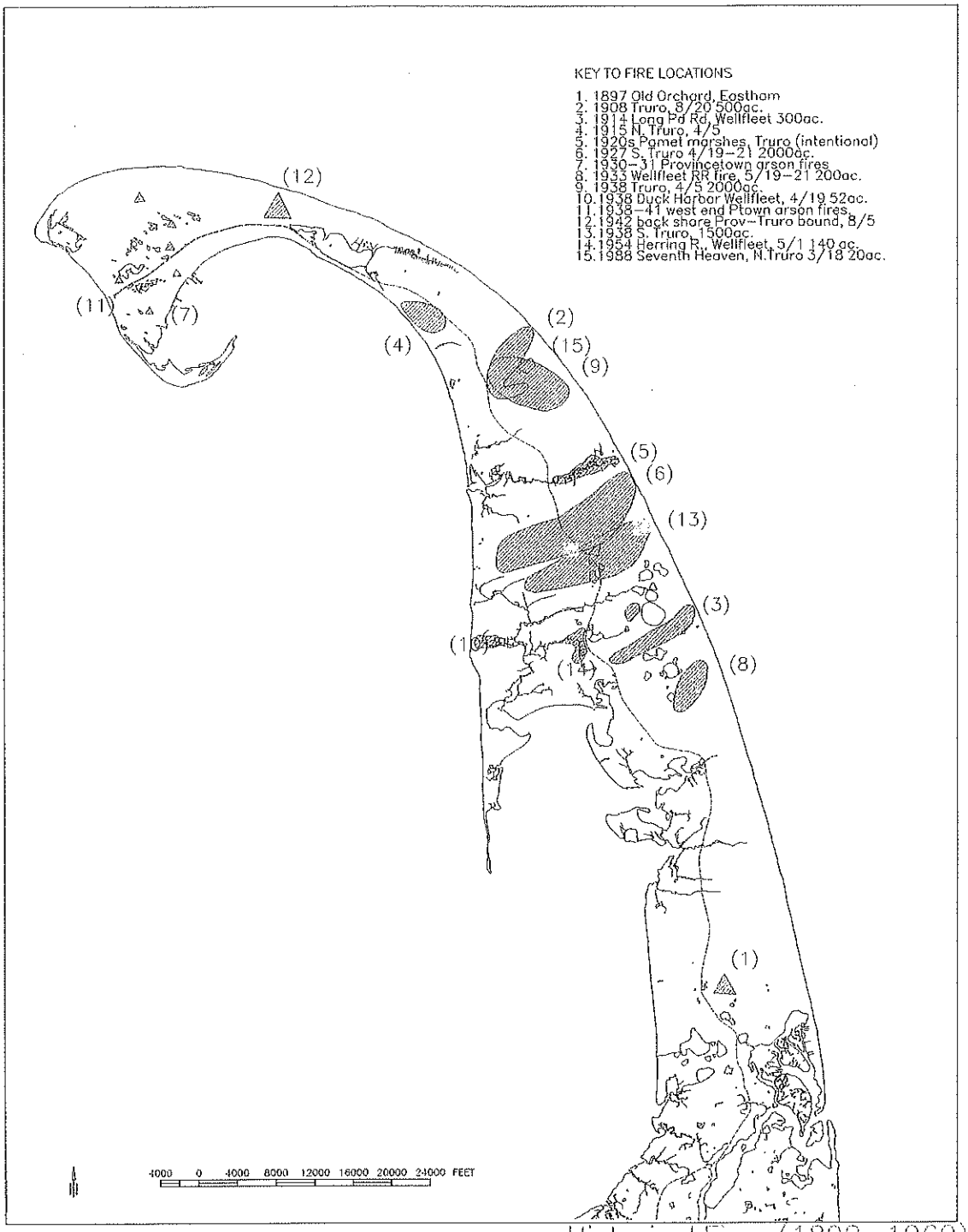
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WELLFLEET QUAD



Trees Cored to Estimate Fire Dates Shown with Estimated Fire Boundaries

scale 1:50000 map:firehist region:firescar mbo CACO 9/94



Historical Fires (1890–1960)
Cape Cod National Seashore Fire Suppression Study

Sources: Provincetown Advocate, Barnstable Patriot, Town Records
Cape Cod National Seashore records, interviews

scale 1:50000 map:bkl/fire1.a 9/95 mbs

PHOTOGRAPHS

PHOTO LOCATION MAPS
PAIRED PHOTOS
PHOTO DATA RECORDS

CACO HISTORICAL LANDSCAPE PHOTO LIST

1 EA <1951 Salt Pond and Nauset Inlet
Eastham Tricentennial

2 EA <1900 Doane Rock with Captain Penniman.
Bessie Penniman: NPS CACO Photo Archive

3 EA 1890-2 Three Sisters, long view (H14-23)
NPS CACO Photo Archive, 4:10

4 WE <1920 Marconi Site looking S
Wellfleet Historical Society

5 WEc.1920 Route 6, S.Wellfleet looking south (old Stubbs place) 556 Q2
Wellfleet Historical Society

6 WE c.1910 Pleasant Point
Wellfleet Historical Society (post card)

7 WE c.1938 From firetower looking S
Wellfleet Historical Society
(S.Wellfleet Hist. Soc.)

8 WE <1911 E fr Cong Church Tower
SPNEA Photo Collection (Wellfl. Unmounted)
Thomson & Thomson

9 WE 1906 From dike looking SE toward town center.
Everett Nye Collection

10 WE 1906 From dike looking N upstream.
Everett Nye Collection

11 WE c1906 Dike looking W
Wellfleet Historical Society (scrapbook)

12 WE c1906 Dike looking SW
Wellfleet Historical Society (scrapbook)

13 WE 1930s Dike looking NW (186-8)
Wellfleet Historical Society

14 WE c1906 Dike looking W

15	WE	1957	Herring River looking W, south of Merrick Is. just W of RR ROW (Fig.14) Vegetation Cover Type Report, Cape Cod National Seashore, NPS CACO 1957
16	WE	1920	Herring River crossing to BBI NPS Atwood Higgins Diary
17	WE	c1900	Herring River bend, Merrick Is. NPS CACO Archive (post card)
18	WE	1924	Bound Br. School site Wellfleet Historical Society (scrapbook)
19	WE	1924	Bound Brook Island to W from school site Wellfleet Historical Society (scrapbook)
20	WE	c.1900	Cottages on Bound Brook Is.(NPS H27-115) NPS CACO Photo Archive, 1:14-20
21	WE	c.1920	Duck Pond, south shore looking W Wellfleet Historical Society (scrapbook)
22	WE	c1920	North East & Great Ponds SPNEA Photo Collection (Wellfl. Post Cards)
23	WE	<1910	Gull & Higgins Ponds fr General's Hill SPNEA Photo Collection, (Wellfl. Unmounted) NE News
24	WE	<1910	Williams & Higgins Ponds fr General's Hill SPNEA Photo Collection (Wellfl. Unmounted) NE News
25	WE	<1910	Horseleech Pond fr General's Hill SPNEA Photo Collection (Wellfl. Unmountd) NE News
26	WE	1903	Truro-Wellf. boundary marker (west) Mass Archives box 114 (6)
27	WE	1903	Truro-Wellf. boundary marker (east) Mass Archives box 113 (4)
28	TR	c1890s	RR Depot S. Truro (Perry, 1898, p.160) A Trip Around Cape Cod
29	TR	1920	Messinger house

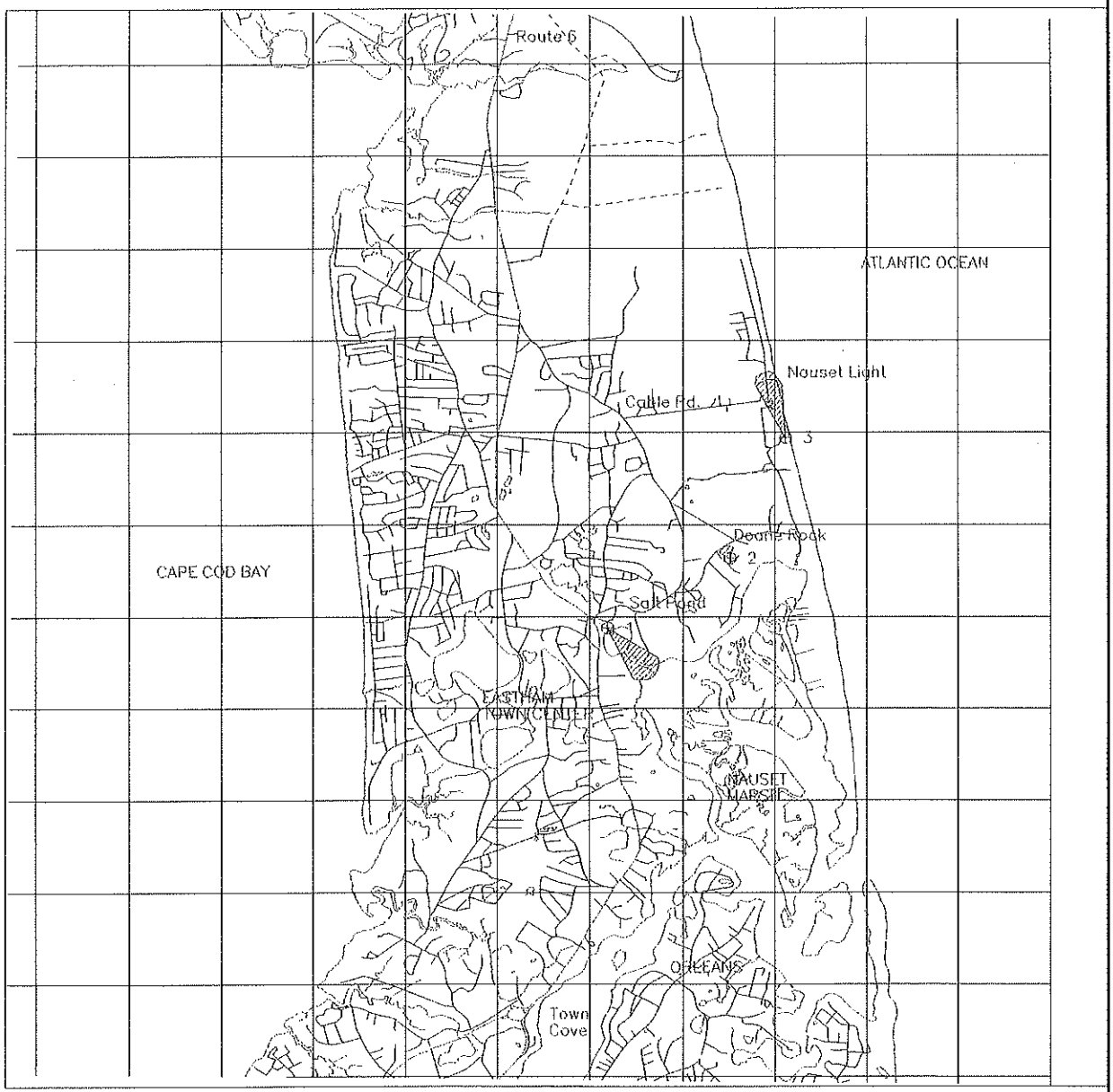
Fritz Messinger photos

30	TR	1916	Fisher Rd, Scott's cottage RR Truro Historical Society
31	TR	c1900	Mill Pond area/ RR corridor. Truro Historical Society
32	TR	1916	From Pamet Harbor RR Station looking Woodworth, J.B., USGS file photos (212)
33	TR	1870	South across Pamet mouth toward Holsbery Rd. NPS CACO Photo Archive (h26-5); also Truro Hist. Soc. and SPNEA
5 11-12, a			
34	TR	1900	Truro Center with Dike looking North Truro Historical Society (TC9)
35	TR	1938	Truro Center (THS G255H) Truro Historical Society
36	TR	c1900	Pamet River near highway crossing. original post card
37	TR	1925	From Corn Hill NW over Pamet to Town Hall (THS TC3). Truro Historical Society
38	TR	1955	Train over Little Pamet Wellfleet Historical Society
39	TR	c1900	South from Corn Hill to mouth of Pamet. Truro Historical Society
40	TR	c1900	Windy Willows, Castle Rd @ Corn Hill Rd Truro Historical Society
41	TR	c1910	Road to P.O. from Head of Pamet Truro Historical Society
42	TR	1928?	N Pamet House (Meilziner, Chaplin)

			Truro Historical Society (Dyer family - Richard Haskell)
43	TR	1912	Pamet Bog House Truro Historical Society
44	TR	1962	N of Pamet Bog (Fig.8) CCNS Vegetation Cover Type Report NPS CACO 1962
45	TR	c1900	Great Hollow Rd, "Path to the Beach" looking E Truro Historical Society
46	TR	c1900	Longnook, 1710 House looking E (TC L6) Truro Historical Society
47	TR	1900	N over N. Truro village Snow, E.: Truro Historical Society
48	TR	1916	Highlands, from Light/Signal Station looking N52W Woodworth, J.B.: USGS file photos (219)
49	NT	c1920	Highland Light & plains looking E Truro Historical Society
50	TR	1957	Small's Swamp Vegetation Cover Type Report, Cape Cod National Seashore, NPS CACO 1957
51	TR	1916	Pilgrim Hts looking N22W Woodworth, J.B.: USGS file photos (214)
52	TR	1916	Pilgrim Hts to NE (1352-3) Vaughan, T.W.: USGS file photos (1352-53)
53	TR	1962	Toward High Head, backshore looking S Vegetation Cover Type Report, Cape Cod National Seashore, NPS CACO 1962
54	PR	<1911	N from Pilgrim Monument to Race Pt SPNEA Photo Collection (Prov. Unmt) Thomson & Thomson
55	PR	1916	N from Pilgrim Monument Vaughan, T.W.: USGS file photos (1327)

56	PR	1916	W from Pilgrim Monument to Shank Painters Pond Vaughan, T.W.: USGS file photos (1329)
57	PR	1962	From Province Lands Rd, N toward airport (Randall)Vegetation Cover Type Report, Cape Cod National Seashore, NPS CACO 1962
58	PR	1930	New Road (Province Lands Road) just completed Althea's Large Wooden Scrapbook Clive Driver collection
59	PR	c1910	Hatches Harbor, dike and Race Pt Light John R. Smith: Althea's Large Wooden Scrapbook, Clive Driver Collection
60	PR	1931 1945 1953	Sunset Hill to Race Pt Althea's Large Wooden Scrapbook Clive Driver Collection

ORLEANS QUAD



⊕ photo viewpoints

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 FEET

Field of view for selected photos

N

Paired Photo Viewpoint Locations

scale 1:60000 map:photos.orleans mba12/94

WELLFLEET QUAD

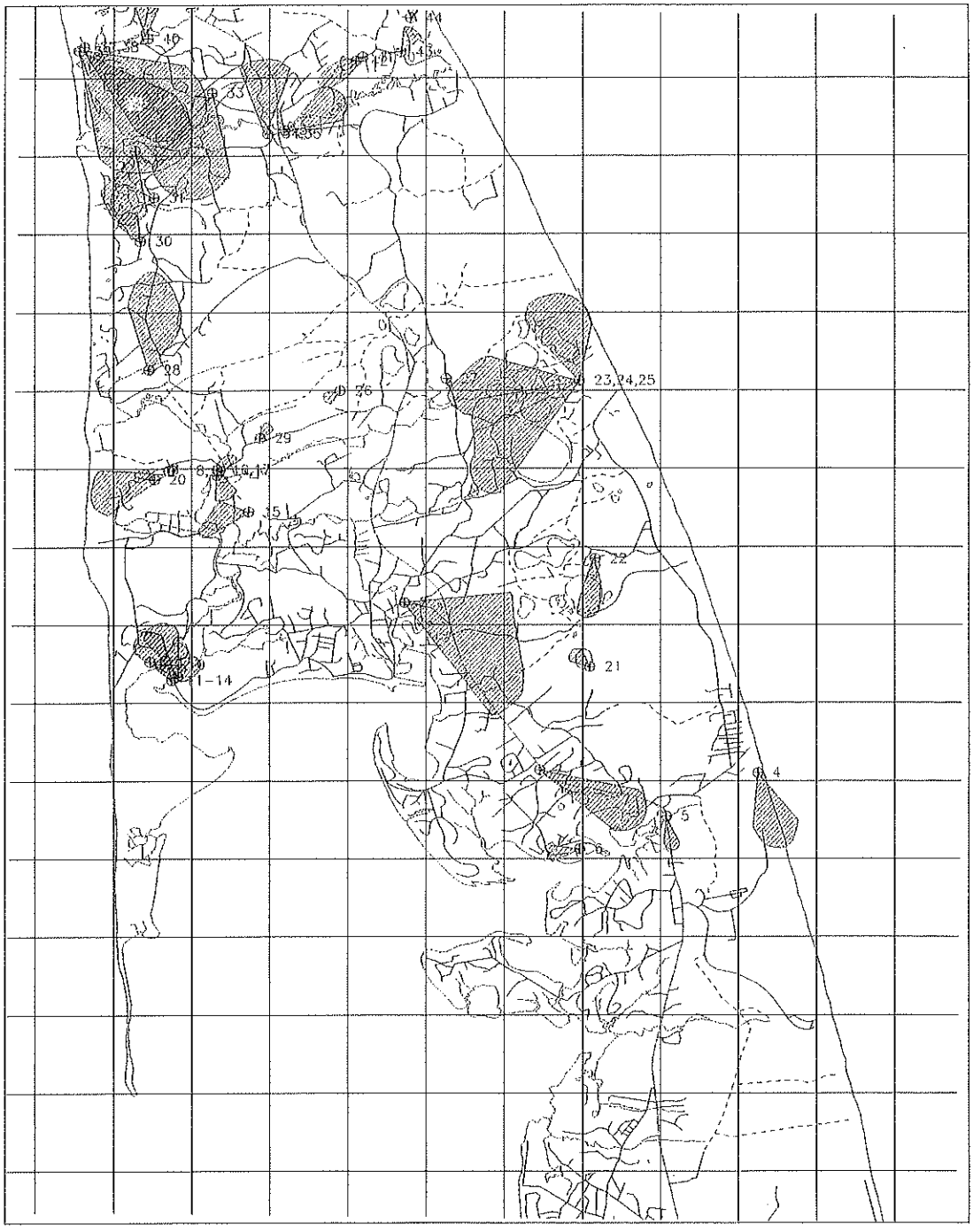


photo viewpoints

Field of view for selected photos

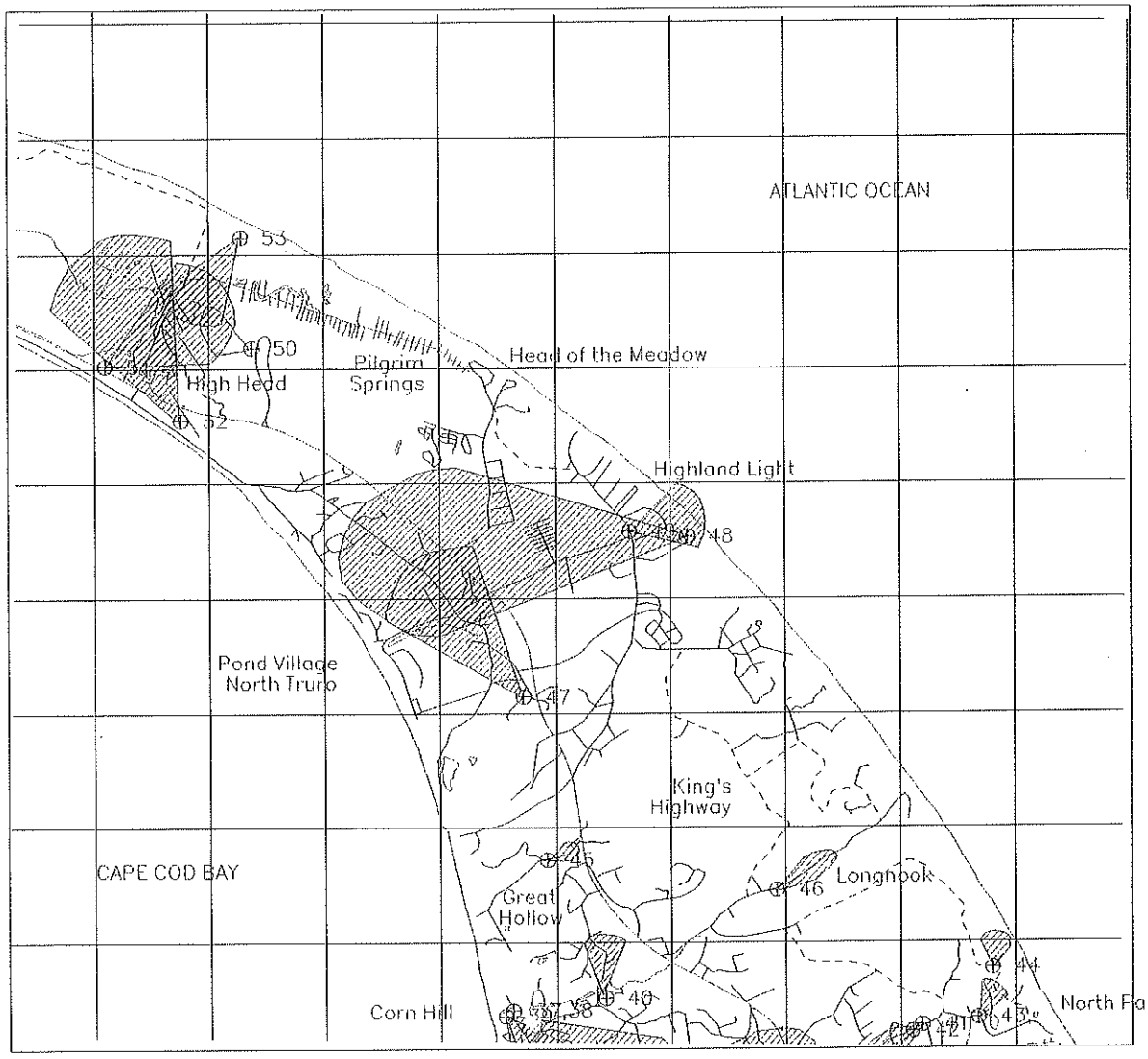
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NORTH TRURO QUAD



⊕ photo viewpoints

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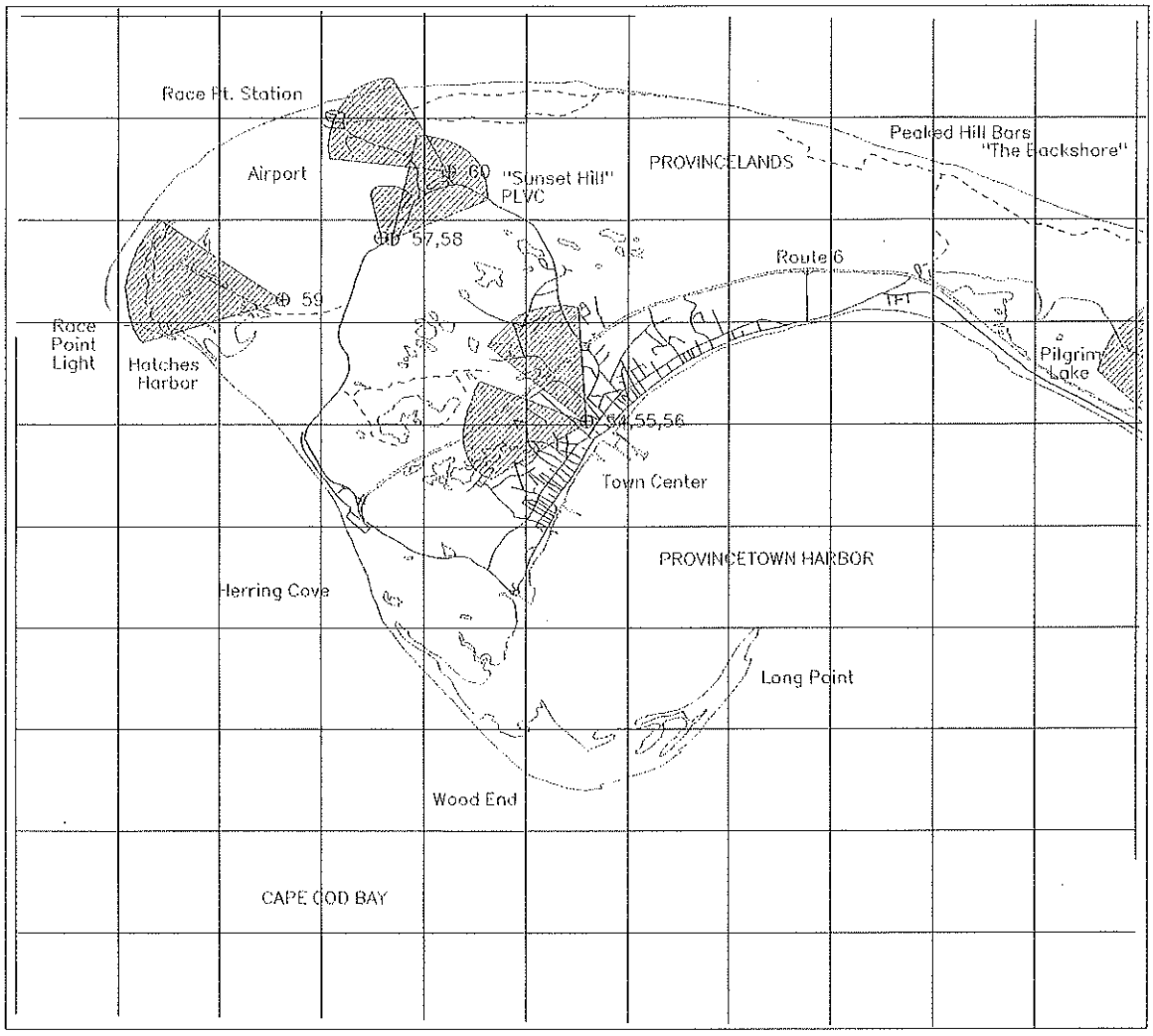
Field of view for selected photos

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Paired Photo Viewpoint Locations

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PROVINCETOWN QUAD



⊕ photo viewpoints

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Field of view for selected photos

N

Paired Photo Viewpoint Locations

scale 1:60000 map:photos.prov mba12/94

No: 1 Town: EA Year: ~1951 Priority: a
Location: Salt Pond and Nauset Inlet
VuType: Seashore: in

DOCUMENT SOURCE
Title Instit: Eastham Tricentennial
Photog Auth: Author: Trayser, D
Publish: Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 9/20/93 Time: 14:30 Film: TX100 Settings: 40mm, f8 250
NewDate2: 9/20/93 Time2: 14:30 Film2: KC Settings2: 40mm, f8 500
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: coastal pondshore, tidal marsh

Hist.Cover: Pasture/red cedar savannah; numerous small cedars invading grassland on horizon; brush probably bayberry, blueberry; Juncus at pond shore.

PresentCover: Oak/pine/red cedar woodland; black oak, pitch pine (up to 30 ft tall), black cherry, bayberry, blueberry.

Land Use Notes: Likely site of native clearing; 17th c. land grants for salt hay and pasture, later grain production and desertifcation: agricultural revival c1915-1945 (especially asparagus and turnips); nearby golf course from 1925-1935; NPS visitor center.

Photo notes: Reshot from 50 ft SW of original viewpoint due to obstructions from mature trees.

Fire History: Small fire in late 1970s nearby. Little fuel present from colonial period to recent regeneration beginning around the date of this photo. Likely some agricultural burning c 17th

Other Photos: Post cards of "Cedar Bank" (c1910) show mature cedar near channel with barren pasture at current V.C. site and on eroded coastl bluffs. Randall 1957, fig.22, view NW across the channel shows emergence of cedar;

Comments: Many sites around Nauset Marsh (e.g. Fort Hill) have long cultural land use history from native use of coastal land for shellfishing/agriculture to colonial intensive exploitation leading to extreme descriptions of c1800 (Mass. Hist. Society).

References: Descriptions: MHS 1807, history of Eastham, Thoreau, Echevarria.









CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 2 Town: EA Year: <1900 Priority: a
Location: Doane Rock with Captain Penniman.
VuType: fore Seashore: in

DOCUMENT SOURCE
Title/Instit: NPS CACO Photo Archive
Photog/Auth: Bessie Penniman Author:
Publish: Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/23/92 Time: Film: PX Settings: 35mm
NewDate2: 10/14/93 Time2: 14:00 Film2: t100 Settings2: 35mm f4 60
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: glacial erratic on coastal plain

Hist.Cover: Pasture with distant stand of woodland on horizon. Grass not close cropped (sheep were in decline since 1840); patch of brush at base of rock.

PresentCover: oak/pine woodland; pitch pine up to 40 ft tall, smaller black oak (up to 20 ft), red cedar near rock, ground cover of bearberry and Deschampsia, understory of black oak, shrub species.

Land Use Notes: Long history of agriculture and grazing, golf course nearby. The rock is one of the largest on the outer Cape, a well known destination even in the 1890s as evidenced by picnickers. (Bessie Penniman left a collection of amateur snapshots).

Photo notes: Contemporary view is closer to the rock due to encroachment of woodland and lack of panoramic views.

Fire History: Early agriculture probably involved regular cycle of planned burning. Very little fuel available for most of modern history. Forest regeneration relatively recent.

Other Photos: Published views in Trayser (1951) and Chamberlain (1964) show low brush, possibly including regenerating oak at the base of the rock with a few red cedars to the left and pitch pine just surpassing the height of the rock.

Comments:

References: USCGS Maps 1840-1860?, 1943; WPA maps 1940?, histories, MHS, Thoreau





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 3 Town: EA Year: 1890-2 Priority: a
Location: Three Sisters, long view (H14-23)
VuType: mid Seashore: in

DOCUMENT SOURCE
Title/Instit: NPS CACO Photo Archive
Photog/Auth: Author:
Publish: Ref: 4 10

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/23/92 Time: 13:30 Film: PX Settings: 40mm f11 250
NewDate2: 9/21/93 Time2: 14:30 Film2: TX KC100Settings2: 35mm f5.6 500
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: coastal bluff and plain

Hist.Cover: pasture, coastal heathland/grassland; patches of low brush, possibly bearberry or salt-blasted huckleberry, distant woodland on horizon.

PresentCover: Beach grass, hudsonia, bearberry, coastal brush and extensive pitch pine, some oak.

Land Use Notes: Shoreline now eroded away to center of photo; originally there were three lights to distinguish them from Highland and Chatham lights, originally built in May 1838, replaced with movable wooden towers in 1892; a single light in 1911.

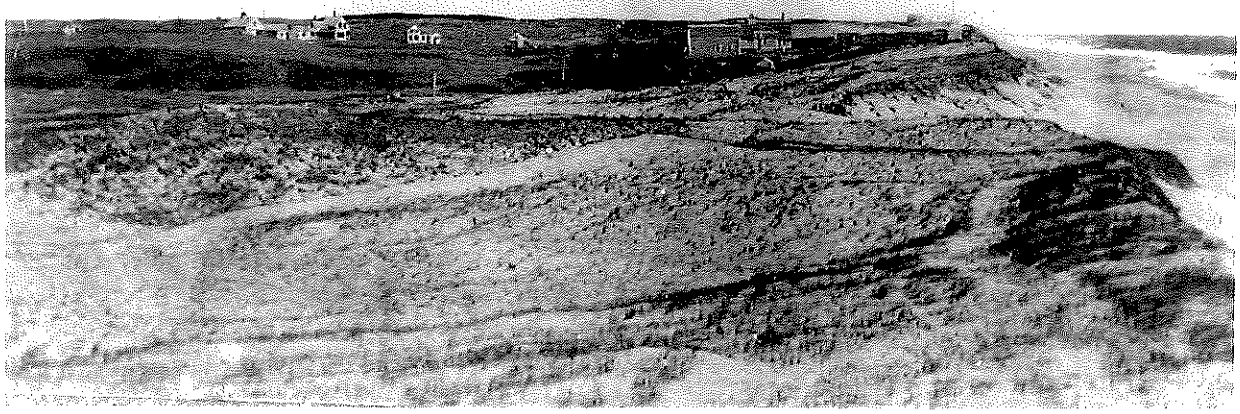
Photo notes: Reshot closer to original lighthouse locations due to coastal change and obstruction of view by woodland.

Fire History:

Other Photos: Chamberlain 1937 shows young pitch pine (up to 5 feet)

Comments: Desribed as featureless plain by Thoreau.

References: Histories, Thoreau, Chamberlain 1937





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 4 Town: WE Year: ~1920 Priority: a
Location: Marconi Site looking S
VuType: pan Seashore: in

DOCUMENT SOURCE
Title/Instit: Wellfleet Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Joan Last: Coughlin Phone:
Affil: curator

CONTEMPORARY PHOTO MATCH
NewDate: 10/13/93 Time: 13:15 Film: PX Settings: 45mm, f8 250.125
NewDate2: 10/13/92 Time2: Film2: KC64 Settings2: 45mm, f8 250.125
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: bluff and coastal plain

Hist.Cover: Barren areas with close cropped beach grass and distant patches of low brush.

PresentCover: Grassland/heathland: bearberry beach grass, Hudsonia, huckleberry bayberry, pitch pine in the distance. One of few extensive coastal heathland (bearberry, bear oak) areas. Pine regeneration relatively recent (since 1950s).

Land Use Notes: Bluffs eroded to near inland set of tower bases, towers removed in 1940?. Area extensively disturbed by military activities from 1930s through 1950s including vehicles, contruction, bombing targets and equipment storage. Succession is recent.

Photo notes: Reshot from about 200 yards north of Marconi site near Cook's Cabins?

Fire History: Possibly some fires associated with munitions and bombing after 1930. Railroad fires likely 1870-1950.

Other Photos: SPNEA Wireless Road, c1910

Comments: Heathland areas may decrease in extent as disturbance disappears. Coastal influences will maintain some open habitat.

References: maps histories

CACO LANDSCAPE HISTORY DOCUMENT REFERENCE





No: 5 Town: WE Year: c.1920? Priority: a
Location: Route 6, S.Wellfleet looking south (old Stubbs place) 556 Q2
VuType: pan Seashore: out

DOCUMENT SOURCE
Title Instit: Wellfleet Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Joan Last: Coughlin Phone:
Affil: curator

CONTEMPORARY PHOTO MATCH
NewDate: 9/20/93 Time: 12:00 Film: PX TX Settings: 45 mm f8 250 500
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: tidal estuary and coastal plain upland

Hist.Cover: Farm and domestic; pasture and woodlots, roadside brush, on horizon; stand of pine? on Marconi side of road, possibly oak on bayside of road; Stubbs farm had boatyard, docks, parture.

PresentCover: oak/pine woodland; white oak, black oak, pitch pine, apple trees, black locust, red cedar, beach plum, huckleberry understory, cattail/reed marsh.

Land Use Notes: Landscape domesticated early in settlement period. Blackfish Creek known for massive pilot whale strandings. Nearby Wireless Road photos show dense mature pine forest c1910.

Photo notes: Contemporary view from south entrance to S.Wellfleet Post Office at Route 6 looking south.

Fire History: Proximity to RR station probably indicates numerous small fires from 1870 through 1940. One fire reported nearby c193? Agricultural and marsh fires also likely before 1940.

Other Photos: SPNEA views of Wireless Road show 40-50 foot pine forest. WHS view of "road to post office" shows taller dense forest. View from fire tower1930s? shows patchy mature pine forest.

Comments: The farmstead on the right side of the road was the site of the Stubbs shipyard that built 90-foot schooners in the 1880s (according to long-time South Wellfleet resident Robert Paine).

References: maps histrories fires stuff 1930s forest survey





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 6 Town: WE Year: c.1910 Priority: a
Location: Pleasant Point
VuType: Seashore: no

DOCUMENT SOURCE
Title/Instit: Wellfleet Historical Society
Photog/Auth: Author:
Publish: Ref: post card

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 8/20/92 Time: 11:00 Film: Settings: 45mm
NewDate2: 10/17/93 Time2: 15:30 Film2: PX100 Settings2: 45 mm f5.6 250
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: coastal bay shore, tidal marsh just out of view

Hist.Cover: beach grass, bearberry, coastal heathland and patches of bare sand, scattered regenerating pine (less than 4 ft tall)

PresentCover: open pitch pine forest with mixed grass understory, some brush and domestic plantings

Land Use Notes: Cottages visible in early view still exist; many more have been built in this residential area. All land bordering Wellfleet Bay was exploited early in settlement period for fishing needs (fuel to try whales, space to dry nets, etc) and as pasture.

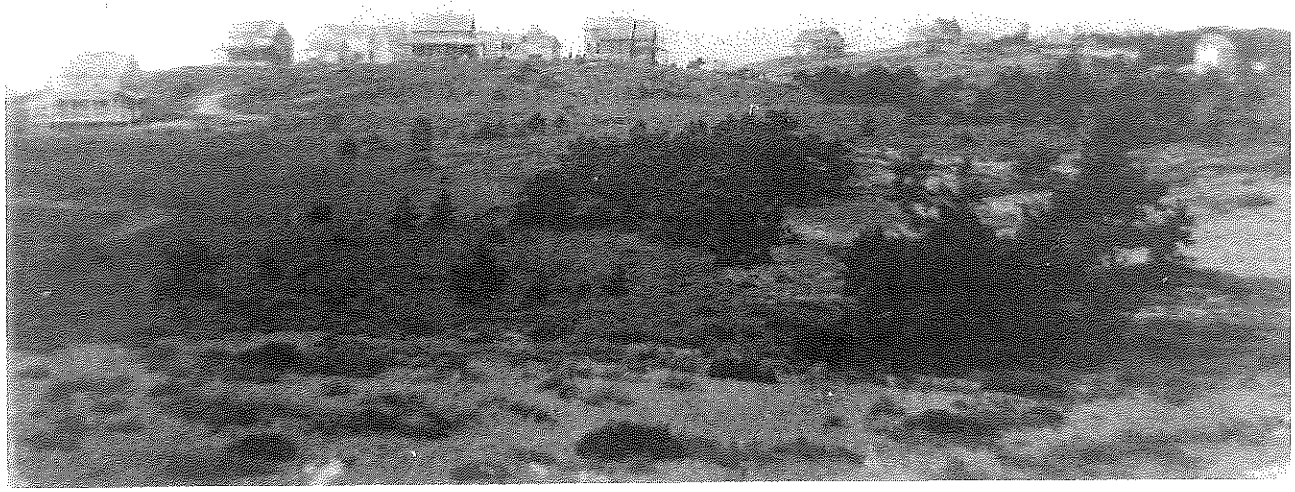
Photo notes: Location is a good match. Edge of marsh barely visible at left edge of photo.

Fire History:

Other Photos: Another view in WHS collection shows Marconi towers clearly from Pleasant Point, a bay to ocean view. Views from church tower in Wellfleet center show familiar pattern of domestic use, a scattered network of forest cover emerging.

Comments: A 1940s South Wellfleet panorama looking W from Robert Paine shows transition to pitch pine, (mostly under 5 feet tall).

References: Ech, histories, maps





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 7 Town: WE Year: c.1938 Priority: a
Location: From firetower looking S
VuType: Seashore:

DOCUMENT SOURCE
Title/Instit: Wellfleet Historical Society
Photog/Auth: Author:
Publish: S. Wellfleet Hist. Soc. Ref:

CONTACT
First: Ms. Joan Last: Coughlin Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/13/93 Time: 13:15 Film: PX KC Settings: f8 125 250 45mm
NewDate2: 10/26/93 Time2: 12:00 Film2: TX KC Settings2: f11 250 f5.6 125
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Wellfleet bay shore and upland plains

Hist.Cover: Pine forest with patchy edges due to different ages (cutting, clearing, other land use activity among different ownerships). Some oak stands.

PresentCover: Mixed oak/pine forest, nearly continuous canopy.

Land Use Notes: Wide highway swath.

Photo notes:

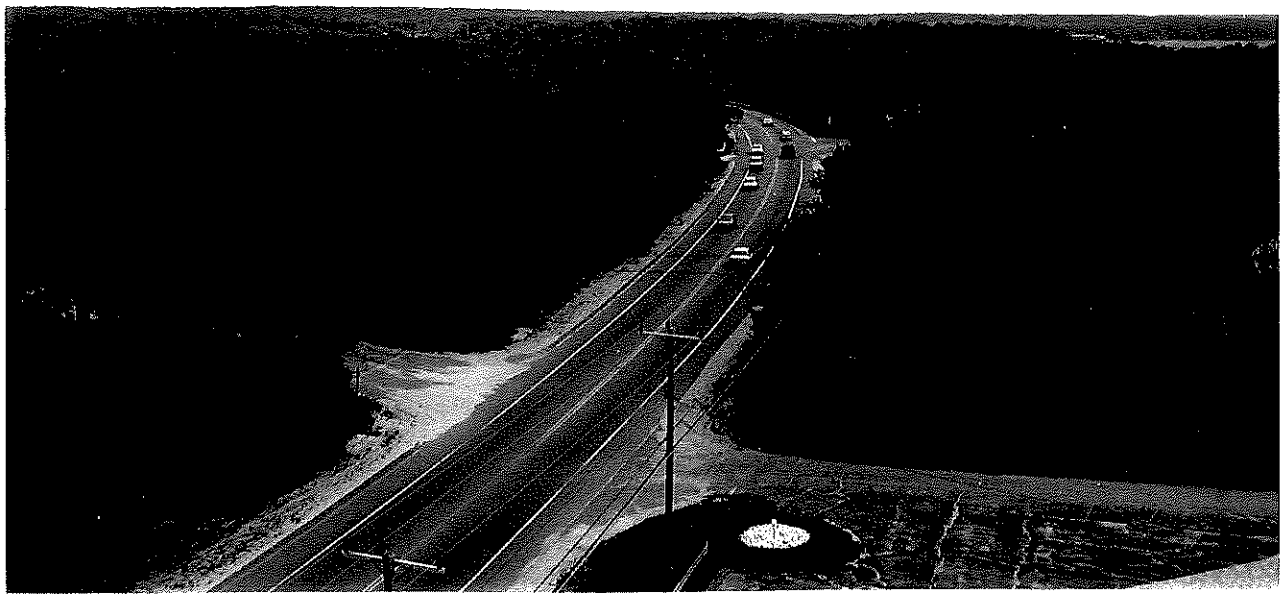
Fire History: RR fires likely, especially east of ROW. One fire reported c.1911.

Other Photos: Photos along Wireless Rd show substantial pine forest c. 1910. View from Pleasant Point across Cape to the E shows a clear view of Marconi Towers (Wellfleet Historical Society).

Comments: Tower built in the summer of 1927 and is 68 feet high. (According to Mass. DEM)

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 8 Town: WE Year: <1911 Priority: a
Location: E fr Cong Church Tower
VuType: backgr Seashore:

DOCUMENT SOURCE
Title/Instit: SPNEA Photo Collection
Photog/Auth: Author:
Publish: Thomson Ref: Wellfl. Unmtd 1of2

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: Time: Film: Settings:
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform:

Hist.Cover:

PresentCover:

Land Use Notes:

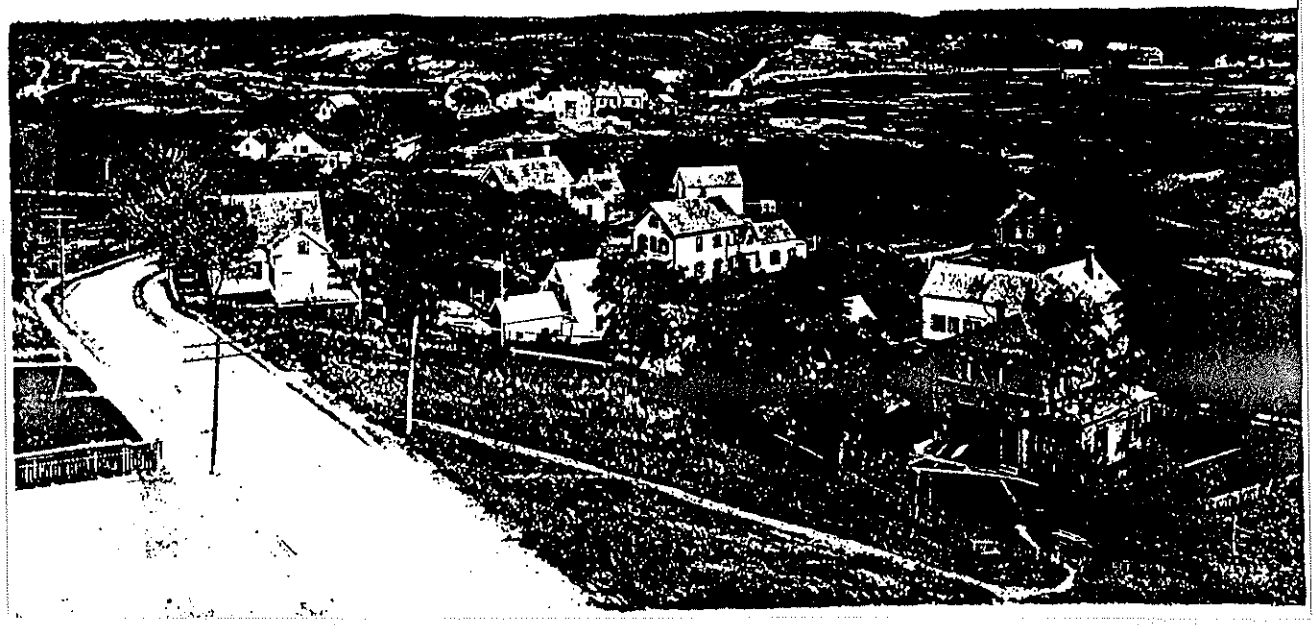
Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 9 Town: WE Year: 1906 Priority: a
Location: From dike looking SE toward town center.
VuType: Seashore:

DOCUMENT SOURCE
Title/Instit: Everett Nye Collection
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Linda Last: Barr Phone:
Affil: personal collection

CONTEMPORARY PHOTO MATCH
NewDate: 9/16/93 Time: 10:30 Film: PX Settings: f5.6 125 45mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Wellfleet Bay shore/ Herring River estuary

Hist.Cover: Barren sand, grasses and bayberry on town side, grazed or cropped marsh cover andgrassy upland on island side: shrub sized pine visible in foreground.

PresentCover: Pine forest on both sides of dike; patches of eroded bluffs with bearberry and bare sand on town side, pine (6-8"dbh) with bearberry understory on Great Island.

Land Use Notes:

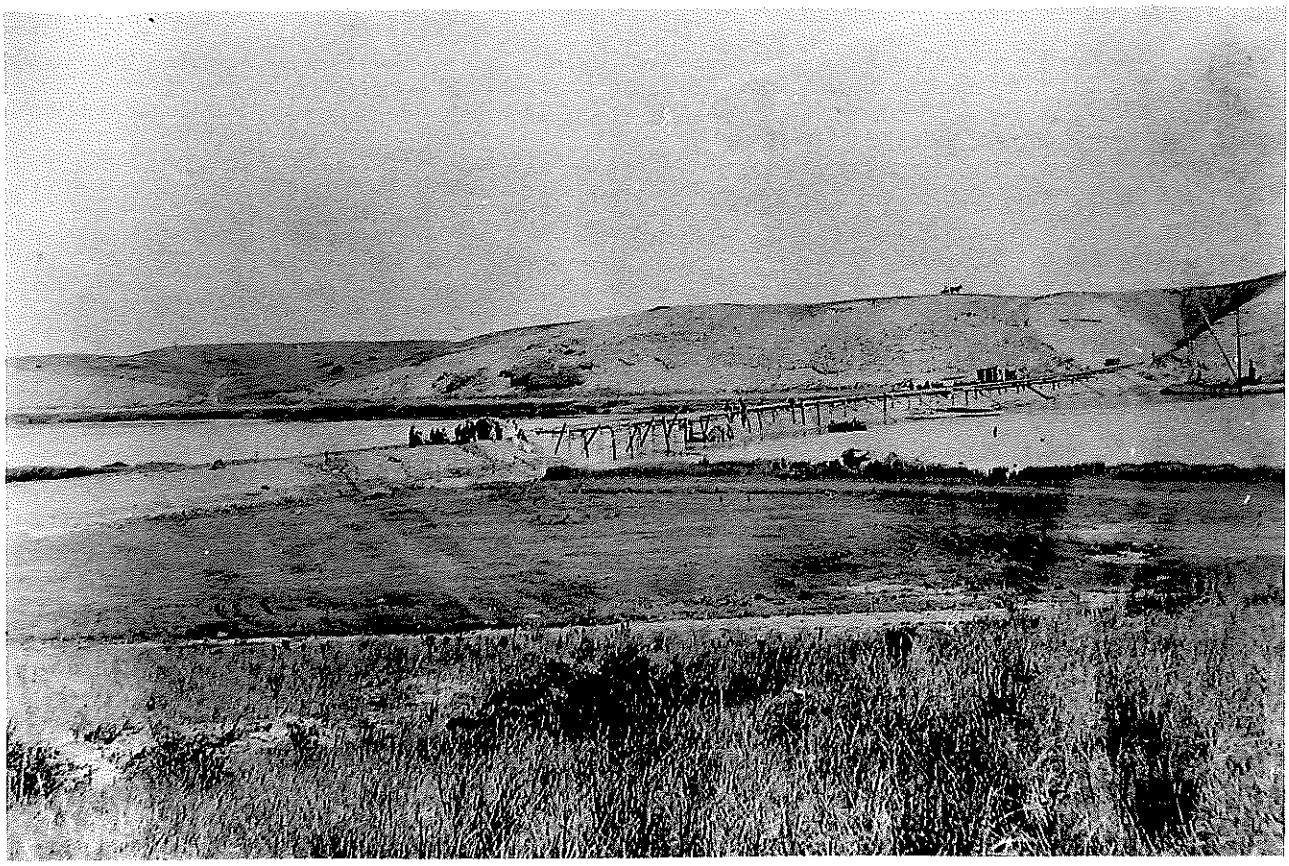
Photo notes:

Fire History:

Other Photos:

Comments: The extreme barrenness of the uplands on both sides of the Herring River in Plates 9-12 is striking. The steep slopes appear to be almost devoid of vegetation and are eroding. Grazing animals traversing the loose sand on these bluffs probably accounted for this condition, which developed very early following European settlement; ordinances were passed in the 17th and 18th centuries to control erosion from grazing on the bayshore island. Re-establishment of trees was especially slow in this area. Despite the forested appearance in the modern photos, the trees remain small (<5 m) with much space between them.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 10 Town: WE Year: 1906 Priority: a
Location: From dike looking N upstream.
VuType: Seashore:

DOCUMENT SOURCE
Title/Instit: Everett Nye Collection
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Linda Last: Barr Phone:
Affil: personal collection

CONTEMPORARY PHOTO MATCH
NewDate: 9/16/93 Time: 10:30 Film: PX KC Settings: f8 125
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Bay shore islands/Herring River estuary

Hist.Cover: Nearly barren island with sparse grasses or heathland. Several patches of brush or young trees. Early dike construction.

PresentCover: Bearberry on formerly bald slope, young pitch pine on island upland: extensive sedimentation or fill in marsh now vegetated.

Land Use Notes:

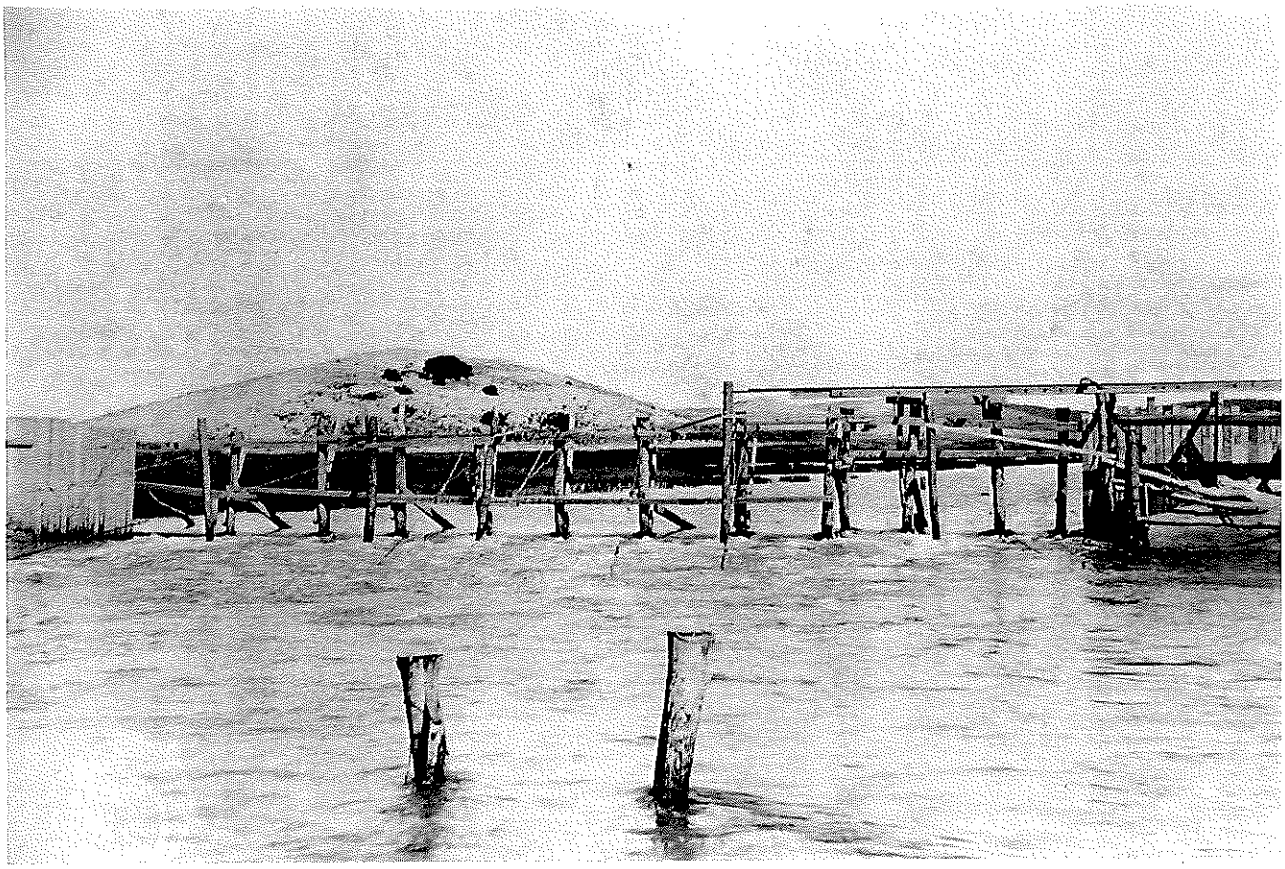
Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 11 Town: WE Year: c1906 Priority: a
Location: Dike looking W
VuType: mid Seashore: in

DOCUMENT SOURCE
Title/Instit: Wellfleet Historical Society
Photog/Auth: Author:
Publish: Ref: scrapbook

CONTACT
First: Joan Last: Coughlin Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/27/92 Time: 14:30 Film: PX KC Settings: 40mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: estuary, island

Hist.Cover: pasture

PresentCover: pine woodland

Land Use Notes:

Photo notes:

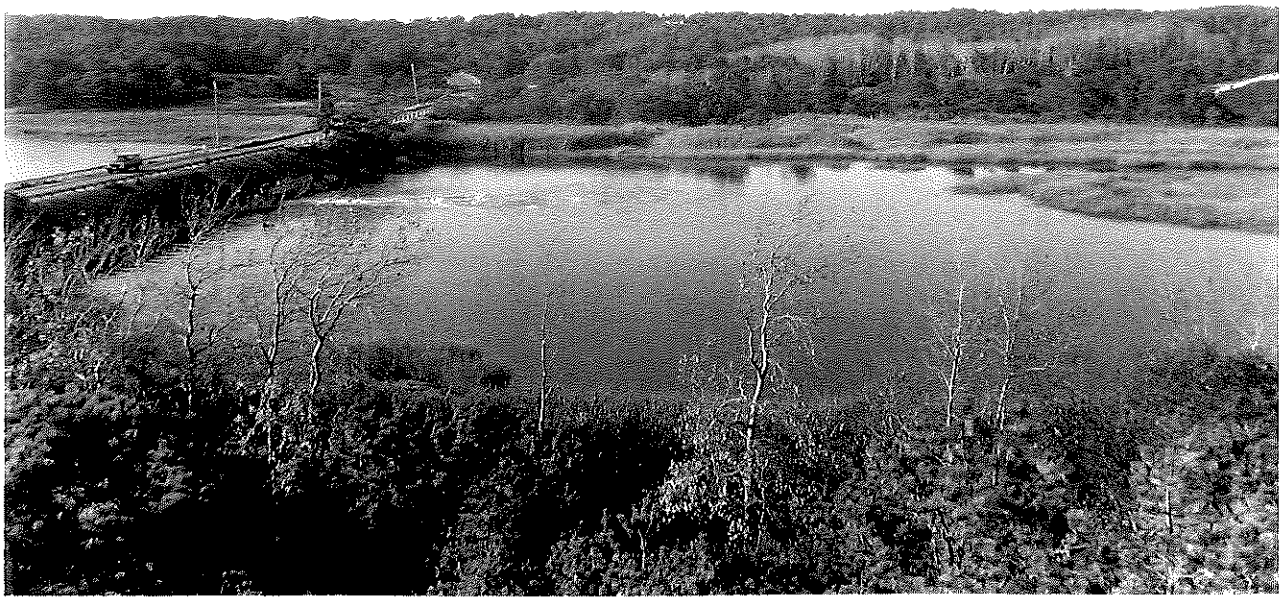
Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 12 Town: WE Year: c1906 Priority: a
Location: Dike looking SW
VuType: mid Seashore: in

DOCUMENT SOURCE
Title/Instit: Wellfleet Historical Society
Photog/Auth: Author:
Publish: Ref: scrapbook

CONTACT
First: Joan Last: Coughlin Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/27/92 Time: 14:30 Film: PX KC Settings: f8 125 40mm
NewDate2: 8/11/92 Time2: Film2: PX Settings2: f8 250
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: estuary, bluffs

Hist.Cover: Pasture

PresentCover: pine woodland

Land Use Notes:

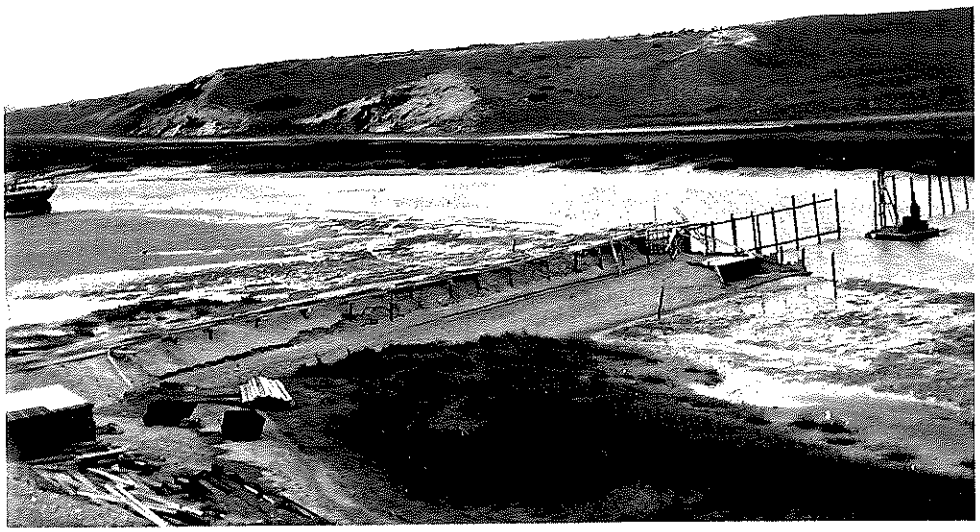
Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 13 Town: WE Year: 1930s Priority: a
Location: Dike looking NW (186-8)
VuType: Seashore: in

DOCUMENT SOURCE
Title/Instit: Wellfleet Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Peg Last: Rasmussen Phone: 349-2112
Affil: Well Hist Soc

CONTEMPORARY PHOTO MATCH
NewDate: 10/27/92 Time: 14:15 Film: PX KC Settings: f8 250 40mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Bay shore islands/Herring River estuary

Hist.Cover: Grassland/heathland with emerging pine forest. Scattered seedlings across island hillsides indicate rapid change taking place.

PresentCover: Pine forest with bearberry heathland.

Land Use Notes:

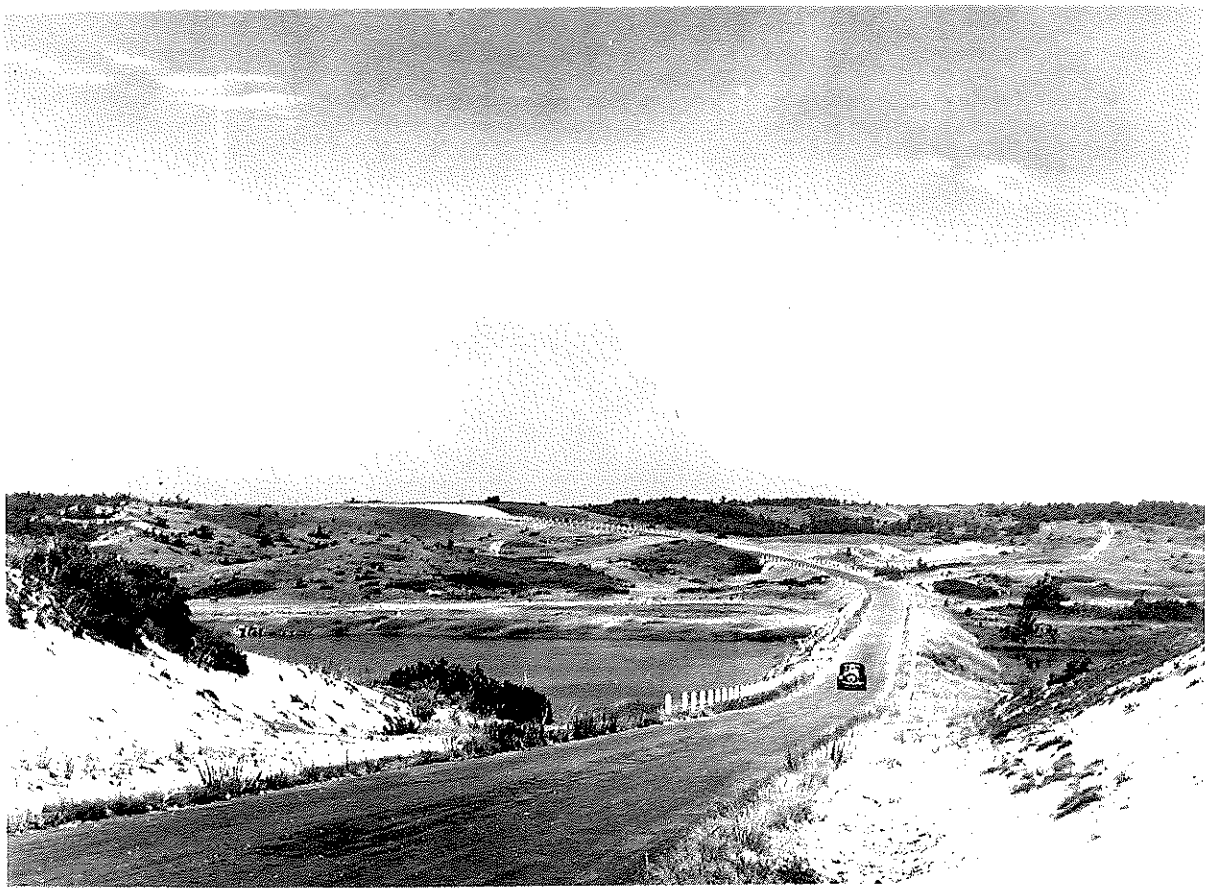
Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 14 Town: WE Year: c1906 Priority: a
Location: Dike looking W
VuType: Seashore:

DOCUMENT SOURCE
Title/Instit: Everett Nye Collection
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Linda Last: Barr Phone:
Affil: personal collection

CONTEMPORARY PHOTO MATCH
NewDate: 10/27/92 Time: 14:15 Film: TX KC Settings: f8 250 40mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Bay shore island, Herring River estuary

Hist.Cover: Pasture grassland/ heathland, with pine forest on horizon to
the N; patch of rougher looking grasses in center persists
in several photos (former cultivation or settlement site?)A stand of stunted pines is visible along the skyline to the right.

PresentCover: Pine forest with bearberry understory; patch of rough grass
is now locust (evidence of shell midden on the same site):
emergent marsh vegetation now lines river.

Land Use Notes: A stand of black locust trees is visible in the middle distance along the far side of the river. Although no buildings can be seen in this area in the early view, it appears to have been a favored residence site for centuries; shell middens were visible under the upturned roots of many of the trees that had been blown over by recent storms.

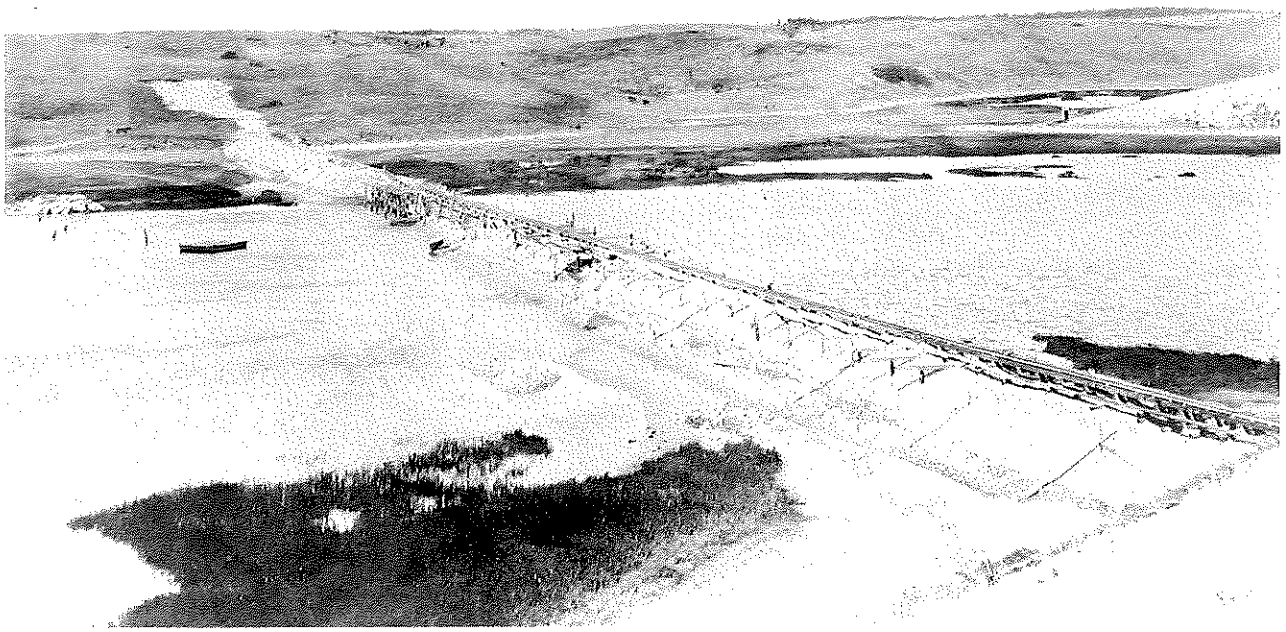
Photo notes:

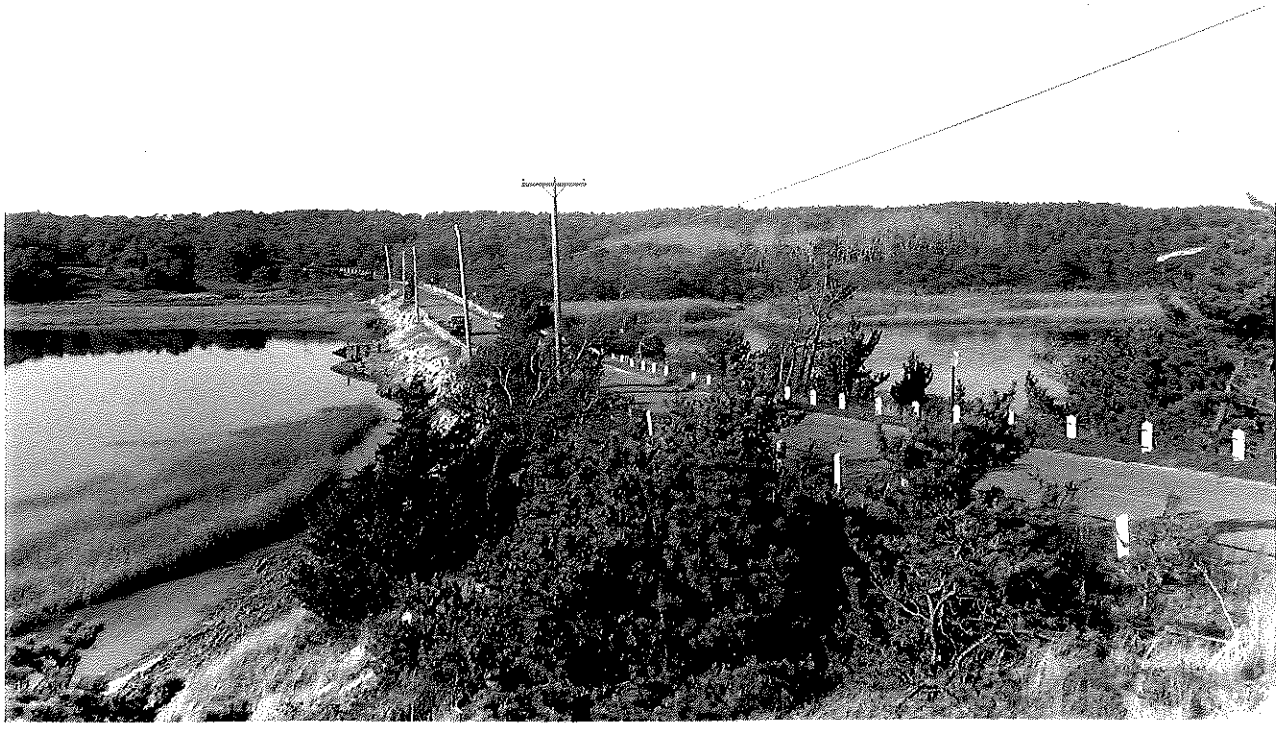
Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 15 Town: WE Year: 195[illegible] Priority: a
Location: Herring River looking W. south of Merrick Is. just W of RR ROW.
VuType: fore mid Seashore: in

DOCUMENT SOURCE
Title/Instit: Vegetation Cover Type Report, Cape Cod National Seashore
Photog/Auth: Author: Randall, William
Publish: NPS CACO 1957 Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 5/13/92 Time: 11:00 Film: PX KC Settings: 55mm, f8 250.
NewDate2: 9/28/93 Time2: 16:00 Film2: TX100 Settings2: f8 250 50mm
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Bayshore drained estuarine/riparian shrub community.

Hist.Cover: Riparian herbaceous vegetation with scattered patches of woody growth. Vegetation is low - looks like recently abandoned pasture. Probably oak cover on Merrick Is. (distant right)

PresentCover: Black oak, black cherry, red maple, bayberry, blueberry and other brush. A few pitch pine.

Land Use Notes: Bay outlet at Duck Harbor closed by turn of century. Herring River tidal flow restricted by Dike in 1906. Mosquito drainage ditches still maintained.

Photo notes:

Fire History: Possible burning of marsh for mosquito control in the 1930s (Kane, 1990)

Other Photos: Herring River overlook from Bound Brook Island.

Comments: A dramatic change has taken place in the aspect of this landscape in only 45 years. The change from open wetland to a wooded swamp reflects a rapid succession of trees and shrubs. Such abrupt changes generally follow shifts in land use practices, such as cessation of burning or grazing.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 16 Town: WE Year: 1920 Priority: a
Location: Herring River crossing to BBI
VuType: Seashore:

DOCUMENT SOURCE
Title/Instit: NPS Atwood Higgins Diary
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 11/6/92 Time: 11:30 Film: TX KC Settings: 35mm f8 250
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Riparian marsh and islands.

Hist.Cover: Heavily grazed hillsides and marsh, stands of oak and pine. Herring River developed for fisheries (weirs, diversions, traps)

PresentCover: Upland shrub community overtaking partially drained marsh, Bound Brook cover oak, pine, maple, locust and domestic plantings. Nearby Merrick Island has coppiced oak woodland >100 yrs old.

Land Use Notes: According to Jack Hall, Bound Brookl Island resident, the only grazing this century was by family cows and a few horses. very little upland agriculture was ever sustained Islands were exploited early for fuel and protected, bounded grazing land.

Photo notes: Good match.

Fire History: Intentional burning of marsh may have been used to control mosquitos before 1940.

Other Photos: Herring River view from hilltop shown in this view shows screen of hardwoods on Bound Brook Island, close cropped marsh and ancient oak coppice on Merrick Is. opposite. Other Bound Brook Island views show barren pasture with pines.

Comments: Subject of many 17th-18th c. ordinances attempting to control erosion caused by overgrazing. Herring River tidal reach diminished in 1906 by dike with small culvert. Marsh vegetation has come to resemble upland shrub community.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 17 Town: WE Year: c1900 Priority: a
Location: Herring River bend, Merrick Is.
VuType: pan Seashore: in

DOCUMENT SOURCE
Title/Instit: NPS CACO Archive
Photog/Auth: Author:
Publish: Ref: post card

CONTACT
First: Hope Last: Morrill Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 2/5/92 Time: 15:15 Film: TX KC Settings: f8 250
NewDate2: 4/29/93 Time2: 12:30 Film2: TX KC Settings2: f8 500
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: River corridor, marsh, bayshore "islands".

Hist.Cover: Heavily grazed floodplain and marsh, longstanding oak forest on Merrick Is. (background hill); pine stands on other upland areas. Herring River developed for fisheries (weirs, diversions, traps).

PresentCover: Marsh area invaded by upland shrub community. Foreground hillside (Bound Brook Is.): mixed locust, oak, cherry, pine. Slope below: gray birch, shadbush. Merrick Is. (on horizon) pure coppice oak. Some ancient oak (>20" dbh) on bottom

Land Use Notes: River channel altered for Herring fishery. Other views show "fish houses" upstream. Floodplain likely mowed and grazed. Bound Brook Is. and other islands intensely cleared until recently; Merrick Is. is an anomaly for its woodland.

Photo notes:

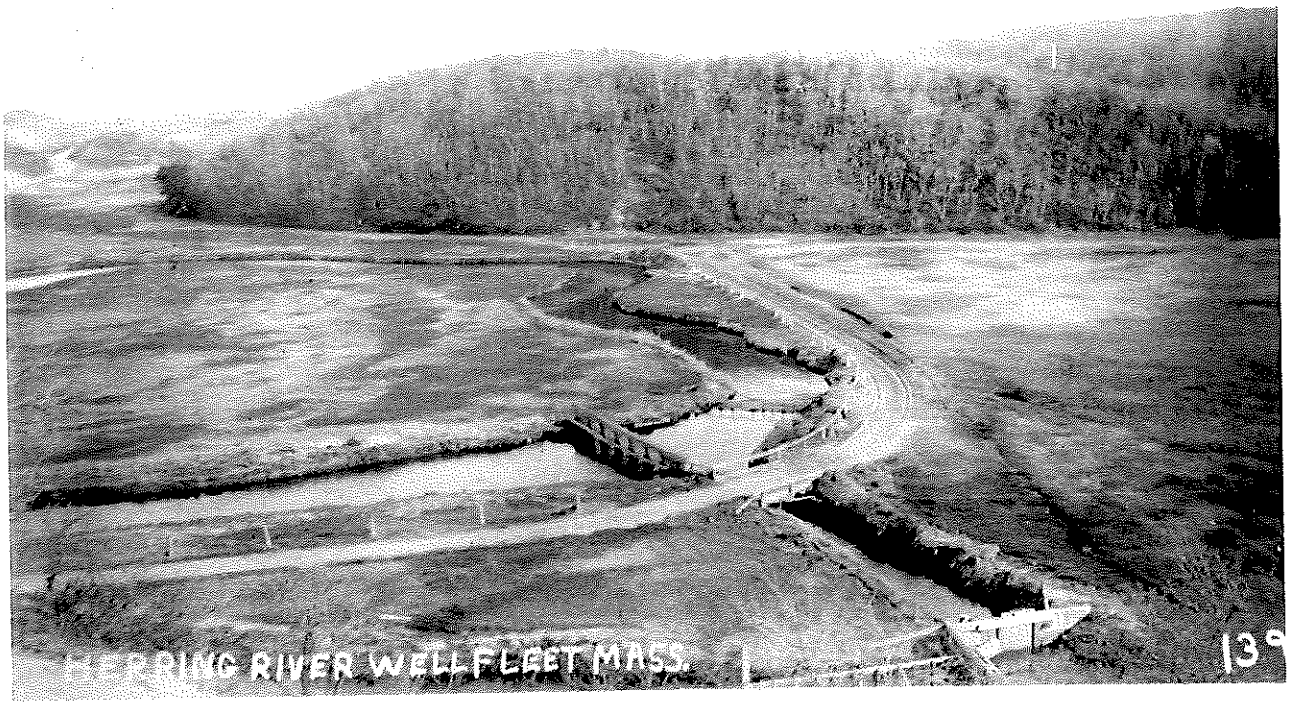
Fire History:

Other Photos: View upstream on Herring R. with oyster and herring shacks.

Comments: A mixture of hardwoods have invaded the abandoned farm on the hillside where the original photo was taken. Only by retaking the photo when the trees were leafless could a match be made. The coppiced oak forest on Merrick Island is unusual for this area today. Its presence in the earlier view as well suggests that it had remained as an oak woodlot for centuries.

References:

Comments:


HERRING RIVER WELLFLEET MASS.
139



CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 18 Town: WE Year: 1924 Priority: a
Location: Bound Br. School site
VuType: Seashore: in

DOCUMENT SOURCE
Title/Instit: Wellfleet Historical Society
Photog/Auth: Dr.?? Author:
Publish: Ref: scrapbook

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 9/24/92 Time: 14:45 Film: PX KC Settings: 40mm, f5.6 250
NewDate2: 4/29/93 Time2: 13:00 Film2: TX KC Settings2: 45mm f5.6 f8 250
NewDate3: 8/31/92 Time3: 13:00 Film3: 125ASA Settings3:

OTHER DATA
Landform: Bayshore island upland.

Hist.Cover: Brush/grassland; possibly huckleberry and mixed grasses.
barren patches.

PresentCover: Pine/oak forest; open areas with bearberry understory.
pole-sized pines, smaller regenerating oaks. Forest cover
relatively recent (<50 years).

Land Use Notes: Cleared and grazed early in settlement period. Coastal
islands provided fuel for "trying" whales when caught
inshore. Islands were convenient protected grazing areas,
easily fenced. Proprieters records document overgrazing and
erosion.

Photo notes: Photo taken to document the emplacement of a stone marker
commemorating the Bound Brook School site. Figure in the
modern view marks the present location of the stone amid
pitch pine forest.

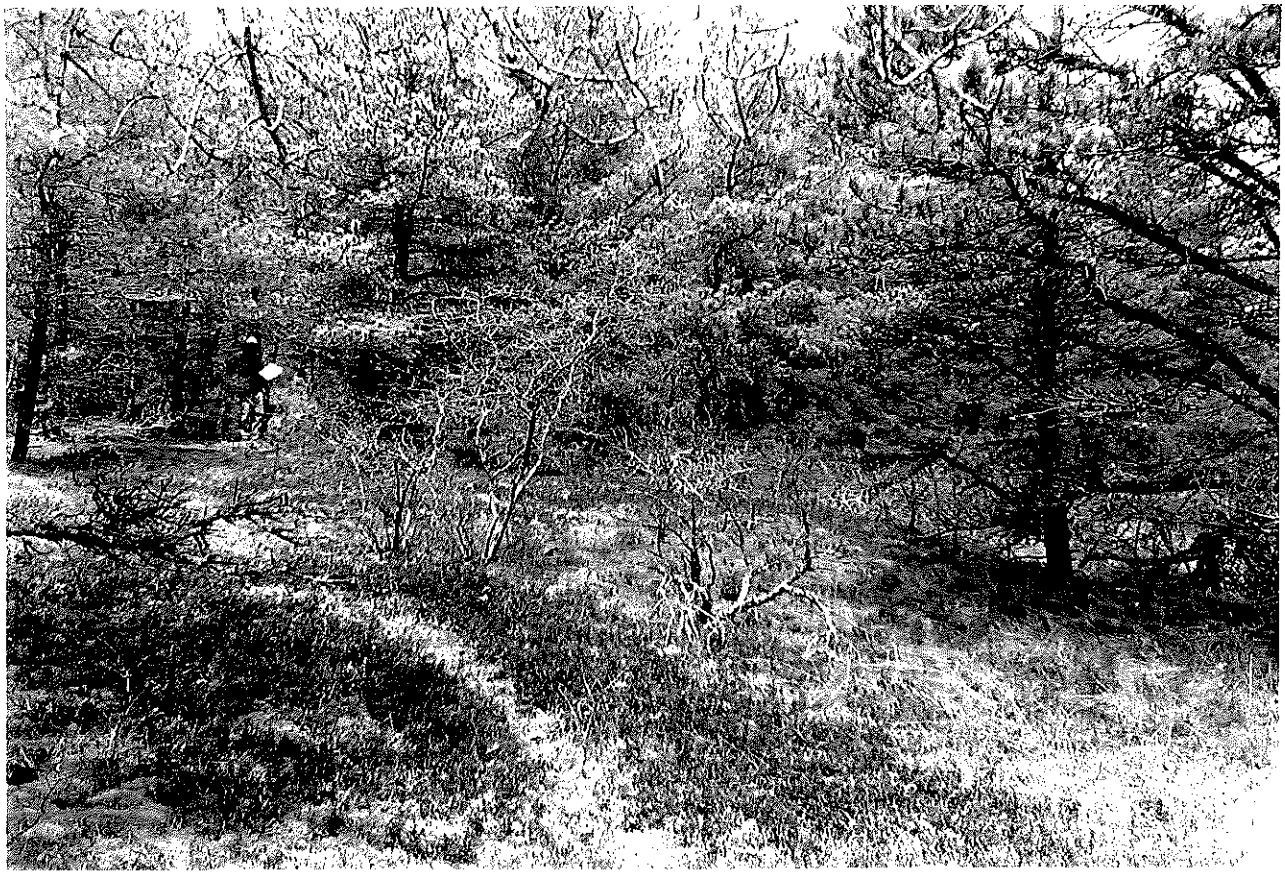
Fire History: Burning likely during early settlement period. Unlikely in
recent century.

Other Photos: View W from same location included next. Also view of Jack
Hall house.

Comments: Largest nearby pitch pine cored (about 40 yrs); most pines are
multi-stemmed, starting 2-3 ft above ground. Nearby coppice black oak,
4-5 ft basal diam. Many patchy canopy openings. Horses and buggies continued to be used, especially in rural areas, long after automobiles became commonplace.

References: Jack Hall Helen Olsen etc





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 19 Town: WE Year: 1924 Priority: a
Location: Bound Brook Island to W from school site
VuType: back pan Seashore: in

DOCUMENT SOURCE
Title/Instit: Wellfleet Historical Society
Photog/Auth: Author:
Publish: Ref: scrapbook

CONTACT
First: Ms. Joan Last: Coughlin Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 8/31/92 Time: 10:00 Film: PX Settings: f8 125 40mm
NewDate2: 4/29/93 Time2: 13:00 Film2: TX KC Settings2: f8 500
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Bayshore island upland.

Hist.Cover: Pasture grassland, bearberry mats on hilltops, trees in hollows and near houses.

PresentCover: Pitch pine recently invading heathland; predominantly young pitch pine (estimated <40 yrs old), about 20% oak; ericacious heathland, honeysuckle in patches near school site, hairgrass.

Land Use Notes: Clearing early in settlement period for fuel/fishing needs. Islands favored grazing sites due to ease of enclosure. Eroded soils led to proprieters resolutions (18th c). Though grazing declined by 1840, family cows and horses kept clear until ca. 1940s.

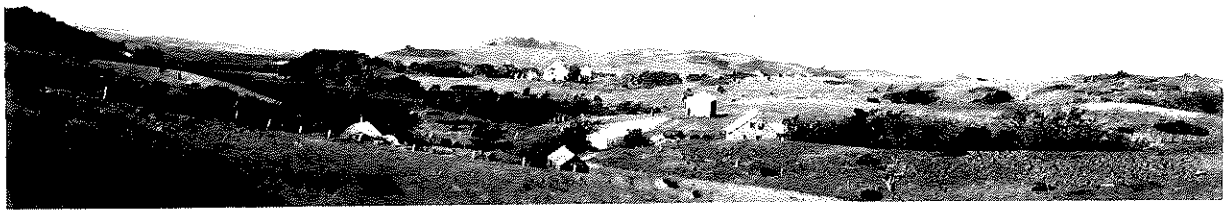
Photo notes: Location about 100 yds E of school marker stone.

Fire History: No recent fires according to resident Jack Hall.

Other Photos: Views of schoolhouse marker, cottages to the W.

Comments: Some steeper slopes on south side of Bound Brook Island have large (estimated 60 ft tall) pitch pine, some areas of hurricane damage among large trees. Other parts of Bound Brook have solitary, open grown oaks with basal diameters up to 3 ft.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 20 Town: WE Year: c.1900 Priority: a
Location: Cottages on Bound Brook Is.(NPS H27-115)
VuType: detail Seashore: in

DOCUMENT SOURCE
Title/Instit: NPS CACO Photo Archive
Photog/Auth: Author:
Publish: Ref: 1 14-20

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 4/20/93 Time: 16:00 Film: PX KC Settings: f8 125
NewDate2: 4/29/93 Time2: 14:00 Film2: TX KC Settings2: f8 f4 250 35mm
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Bayshore island upland.

Hist.Cover: Pasture grassland, intensely grazed. Pines and locusts in hollows. orchard trees in farmyard.

PresentCover: Pitch pine/oak/black locust woodland. Bearberry and mixed grasses on foreground hillside and open areas.

Land Use Notes: Clearing early in settlement period for fuel/fishing needs. Islands favored grazing sites due to ease of enclosure. Eroded soils led to proprieters resolutions (18th c). Though grazing declined by 1840. family cows and horses kept clear until ca. 1940s.

Photo notes:

Fire History: No fires recalled by resident Jack Hall since 1940s.

Other Photos: See Bound Brook school site views.

Comments:

References:

PHOTO ★ GUARD # 3224
LIGHT IMPRESSIONS®
Rochester, NY

CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 21 Town: WE Year: c.1920 Priority: a
Location: Duck Pond, south shore looking W
VuType: fore mid Seashore: in

DOCUMENT SOURCE
Title/Instit: Wellfleet Historical Society
Photog/Auth: Author:
Publish: Ref: scrapbook

CONTACT
First: Ms. Joan Last: Coughlin Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 8/24/92 Time: 13:30 Film: PX KC Settings: f8 250 35mm
NewDate2: 8/12/92 Time2: 14:00 Film2: PX Settings2: f8 125
NewDate3: 9/21/93 Time3: 12:00 Film3: TX100 KCSettings3: f5.6 125 45mm

OTHER DATA
Landform: kettle pond shore

Hist.Cover: Open pine woodland. Some oak likely. Eroded sandy bank above distant shore. Rushes along foreground shore appear to show changing water levels.

PresentCover: Pine/oak woodland, pines 8-10"dbh, to 35 ft tall; some regenerating oak; understory dense huckleberry to 3 ft tall. Water level higher than previous view.

Land Use Notes:

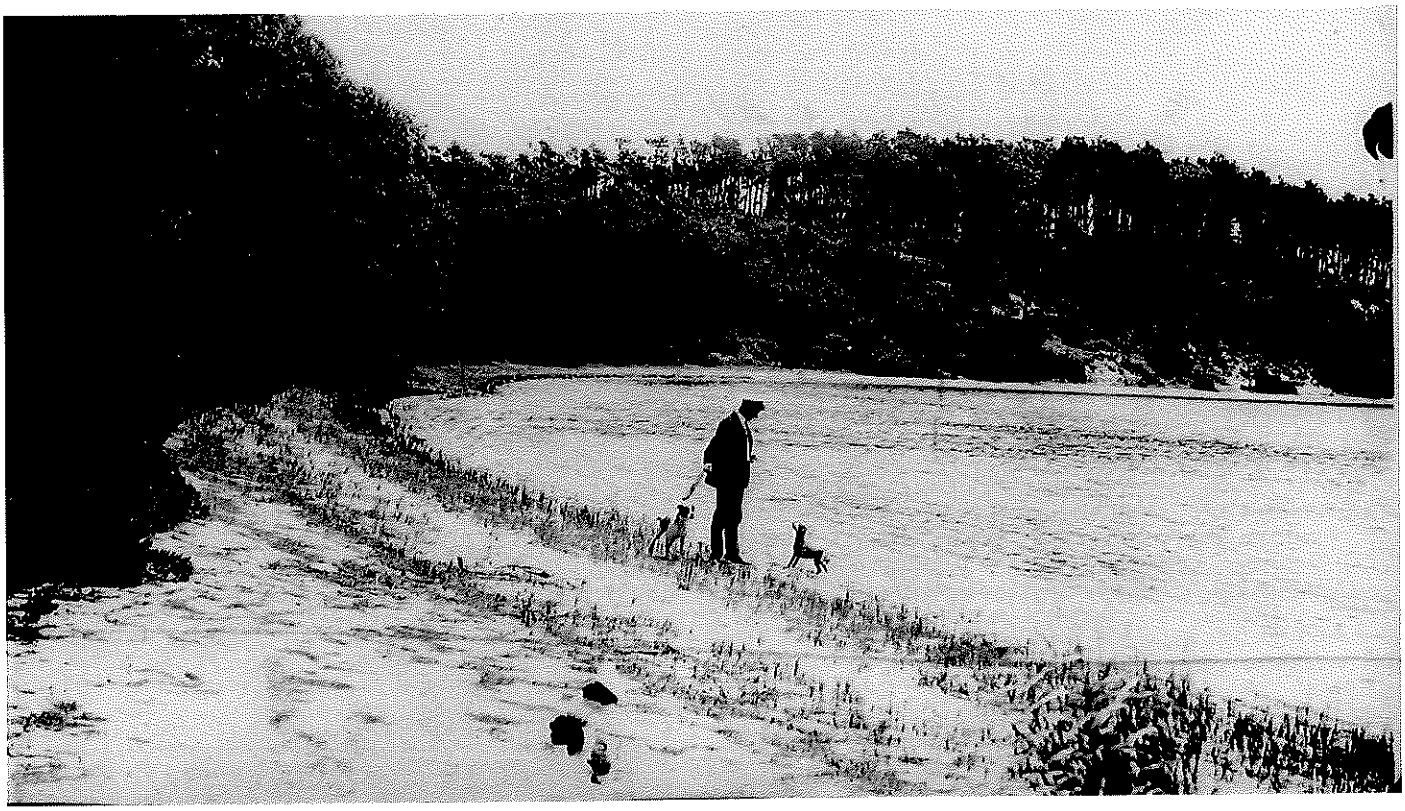
Photo notes: Location for match chosen based on topography (banks on east side much steeper), and angle of sun.

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 22 Town: WE Year: c1920 Priority: a
Location: North East & Great Ponds
VuType: fore mid Seashore: in

DOCUMENT SOURCE
Title/Instit: SPNEA Photo Collection
Photog/Auth: Author:
Publish: Ref: Wellfl. Post Cards

CONTACT
First: Ms. Lorna Last: Condon Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 8/12/92 Time: 14:30 Film: PX Settings: 45mm, f8 60
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Kettle pond shore uplands.

Hist.Cover: Open pine forest with emergent oak. Distant shore SE of Great Pond has large patches of open brushy cover (possibly burned or defoliated).

PresentCover: Single trunk oak/pine forest (up to 50 ft tall), pines 10-14"dbh, oaks 5-6"dbh, with deep oak litter; understory huckleberry to 3-4 ft tall, dense but passable.

Land Use Notes: 1950s-60s expansion of residential uses throughout ponds area.

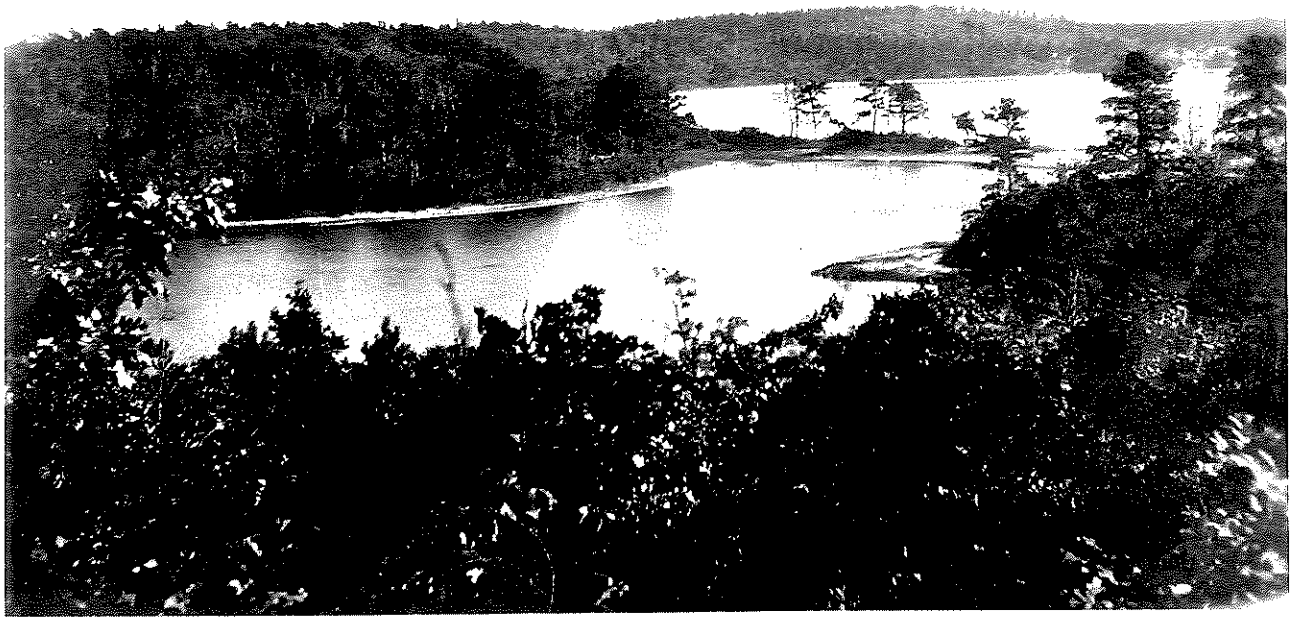
Photo notes:

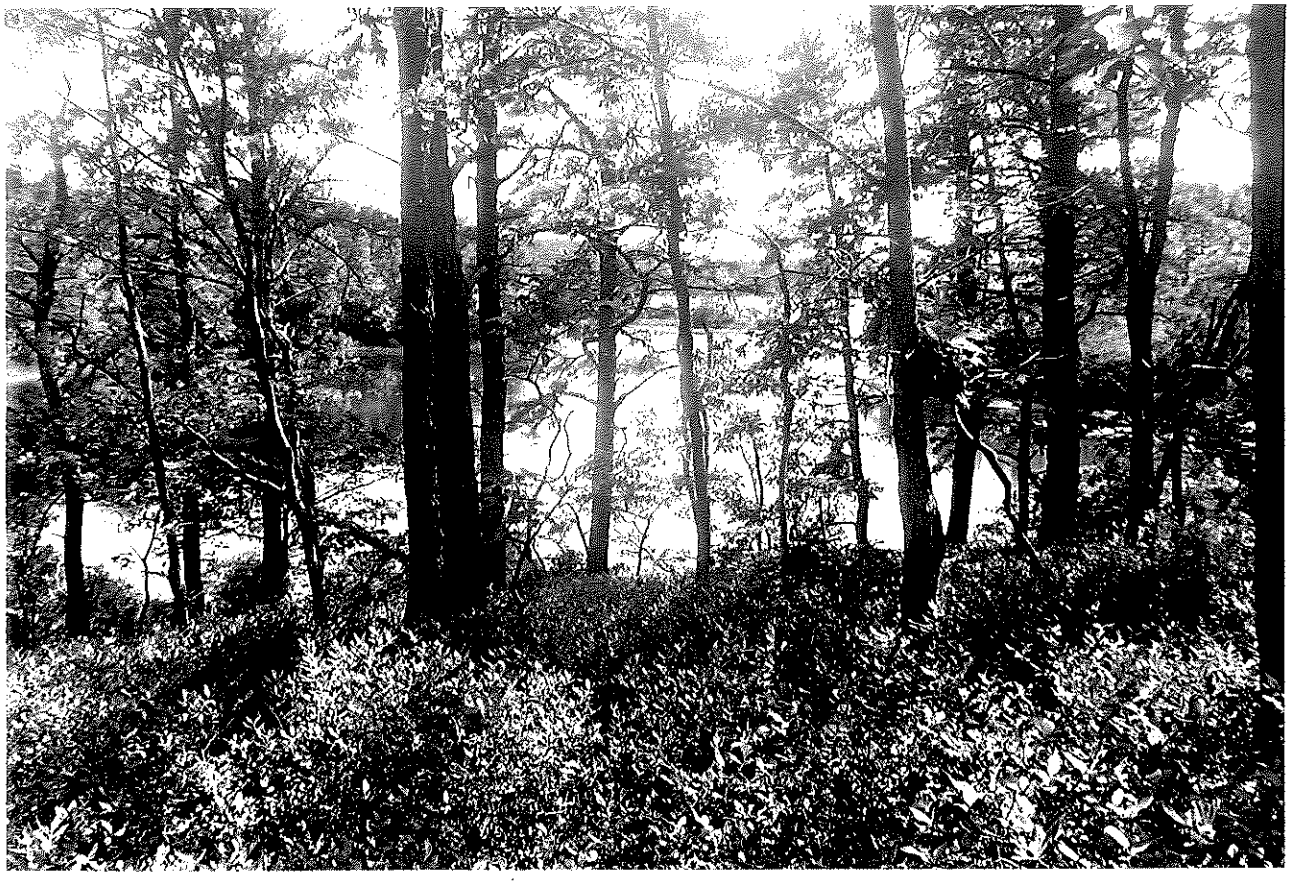
Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 23 Town: WE Year: <1910 Priority: a
Location: Gull & Higgins Ponds fr General's Hill
VuType: fore mid Seashore: in

DOCUMENT SOURCE
Title/Instit: SPNEA Photo Collection
Photog/Auth: Author:
Publish: NE News Ref: Wellfl. Unmtd 2of2

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 11/6/92 Time: 9:30 Film: PX KC Settings: 35mm. f8 250
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Kettle pond shores and upland.

Hist.Cover: Bearberry, mixed grassland with scattered regenerating pitch pine; deciduous woodland in patches near pond shores. More extensive woodland on far side of ponds. Note eroded bluff west of Gull Pond and wooded wetland uphill between Gull and Higgins Ponds.

PresentCover: Predominantly pitch pine forest with mixed pine/oak forest west of ponds. Eroded bank between Gull and Higgins now with open pine cover. Wooded wetland area unchanged. Foreground with bearberry understory.

Land Use Notes: Although the foreground vegetation is largely unpalatable bearberry, evidence of grazing, in the form of livestock trails, can be seen crossing the slope in the middle right. It cannot be determined if this records previous activity, or if animals were still grazing the area in 1910. Recent expansion of pondside residential use occurred before 1962.

Photo notes: Thoreau noted this viewpoint as a place where seven ponds could be seen from the same point. Together with #24 and #25, these photos form an outstanding panorama from a hilltop that once offerred a magnificent view of a suite of ponds. Pitch pines have overtaken the entire view, including the camera location. The modern view was captured by elevating the camera atop an extension pole.
Fire History:

Other Photos:

Comments: In less than a century, this bearberry heathland has been converted to pine forest, although bearberry plants still manage to persist in the understory. A similar, but slower, process is continuing today close to the ocean shore (#43, 44)

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 24 Town: WE Year: <1910 Priority: a
Location: Williams & Higgins Ponds fr General's Hill
VuType: fore mid Seashore: in

DOCUMENT SOURCE
Title Instit: SPNEA Photo Collection
Photog Auth: Author:
Publish: NE News Ref: Wellfl. Unmtd 1of2

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 11/6/92 Time: 9:30 Film: PX KC Settings: 35mm. f8 250
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Kettle pond shores and uplands.

Hist.Cover: Foreground: bearberry with sparse regenerating pitch pines (one shrubby oak in foreground); decid. cover near pond shores; distance: more continuous woodland with irregular pine stands beyond Williams Pond; cleared hillsides in Herring River drainage.

PresentCover: Foreground mostly continous pitch pine with bearberry understory; mixed oak/pine forest in distance.

Land Use Notes: One of the cottages may be Thoreau's "Wellfleet Oysterman." Peter Rich recalls the use of woodlots south of the ponds in the 1940s for garden plots and wood cutting. Many town center residents spent Sundays "gardening" in the woods around the ponds.

Photo notes:

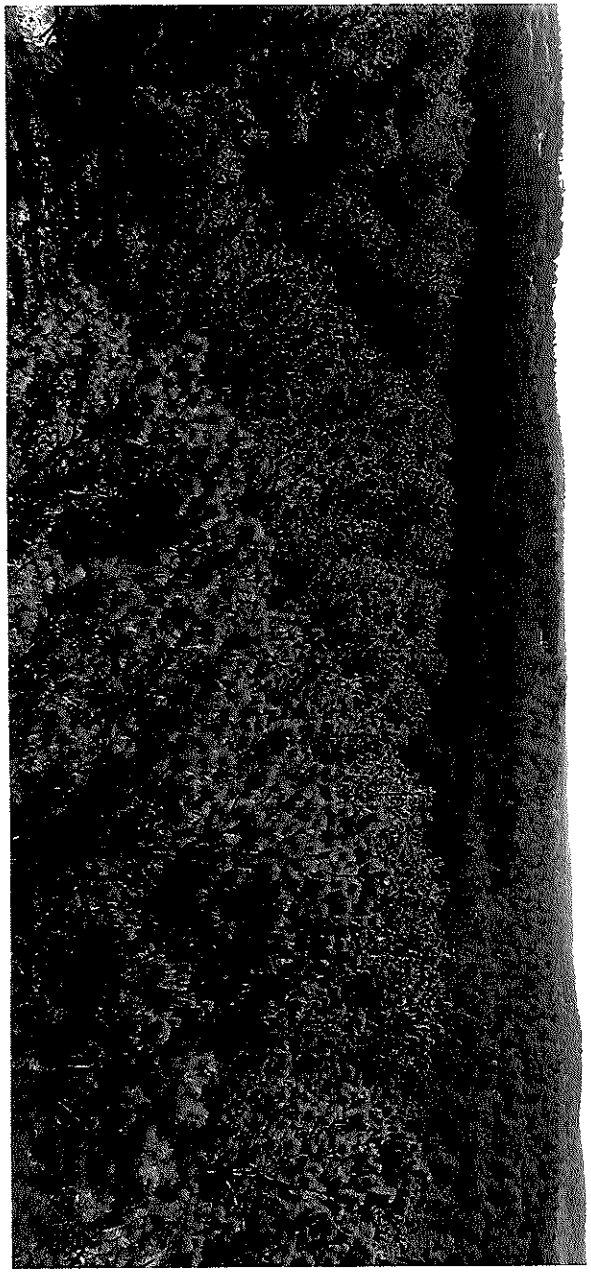
Fire History:

Other Photos:

Comments:

References:

PHOTO ★ GUARD # 3224
LIGHT IMPRESSIONS®
Rochester, NY





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 25 Town: WE Year: <1910 Priority: a
Location: Horseleech Pond fr General's Hill
VuType: mid back Seashore: in

DOCUMENT SOURCE
Title/Instit: SPNEA Photo Collection
Photog/Auth: Author:
Publish: NE News Ref: Wellfl. Unmtd 1of2

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 11/6/92 Time: 9:30 Film: PX KC Settings: 35mm, f8 250
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Kettle pond shores and coastal bluffs.

Hist.Cover: Bearberry in foreground; mixed pine/oak forest in distance; apparrent deciduous wood near east shore, open heathland on coastal bluffs.

PresentCover: Mostly pitch pine in foreground; mixed oak woodland around pond extending nearly to coastal bluffs.

Land Use Notes: 1962 parcel map shows narrow east-west "woodlot" land divisions beginning in South Truro, continuing northward.

Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 26 Town: WE Year: 1903 Priority: a
Location: Truro-Wellf. boundary marker (west)
VuType: Seashore: in

DOCUMENT SOURCE
Title/Instit: Mass Archives
Photog/Auth: Author:
Publish: Ref: box 114 (6)180

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 5/10/93 Time: 9:00 Film: TX KC Settings: f8 125 45mm
NewDate2: 8/30/93 Time2: 13:00 Film2: PX KC Settings2: f4 60, f8 30
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Upland ridge between dry E-W hollows.

Hist.Cover: Dense brushy oak woodland (apparently <25 ft tall); probably huckleberry understory. Peter Rich (pers com.) recalls that these hollows were checkered with clearings and small kettle holes in his childhood (1940s).

PresentCover: Pine/oak woodland; pines from 12"dbh, up to 40 ft tall. white /black oaks (8-10"dbh) 10-12 ft tall; huckleberry understory, scattered scrub oak, wintergreen; some areas with grassy understory nearer LeHac House (former

Land Use Notes: Pamet Point/Lombard and Paradise Hollows were among the earliest upland land grants (c.1680); probably sparsely used since first clearing some cellar holes in valley bottoms. Now: larger open grown oaks in bottoms, coppice oaks on ridge.

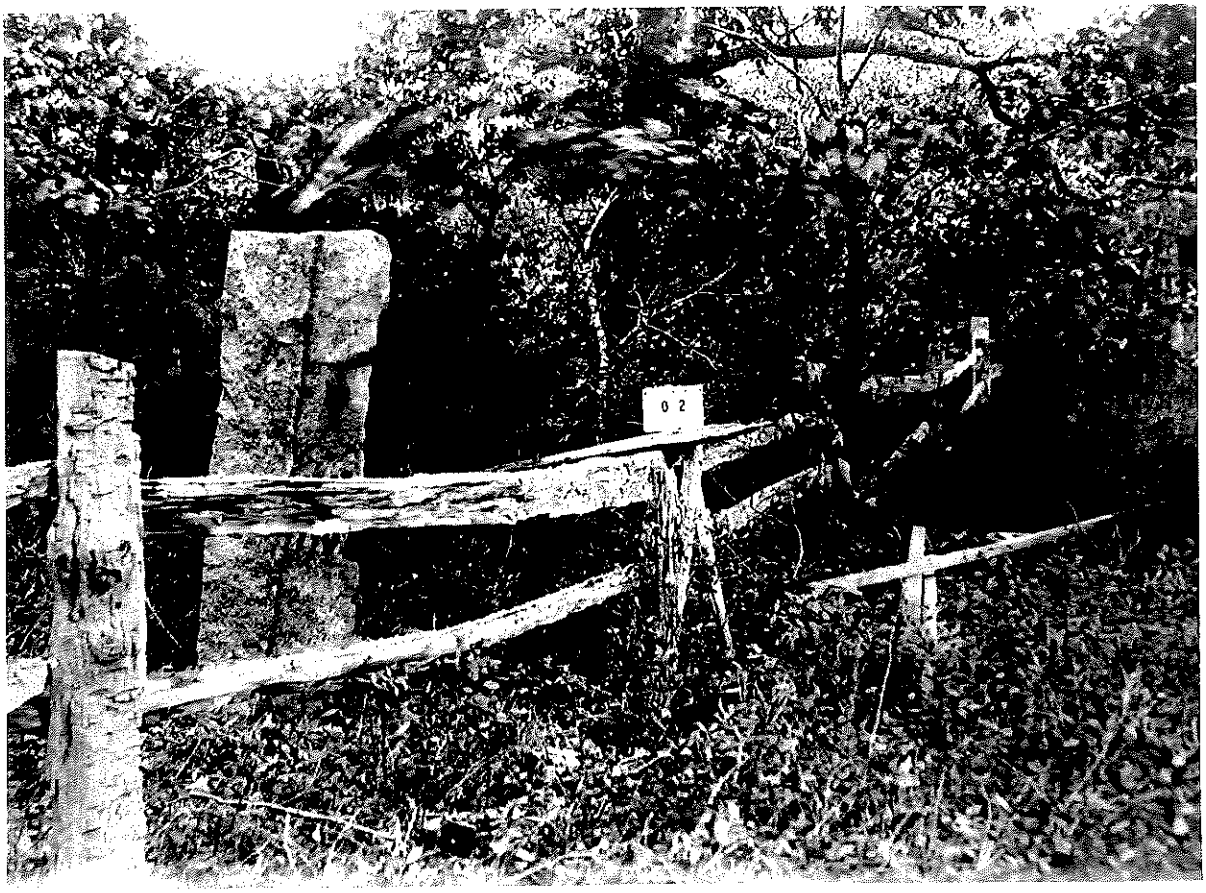
Photo notes:

Fire History:

Other Photos:

Comments: The dominant species in both photos (as in #27) are largely the same. The striking visual changes are due primarily to increases in size, rather than a change in composition. Wood cutting and more frequent fires early in this century may have accounted for the smaller stature of the vegetation at that time.

References:


0 2



CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 27 Town: WE Year: 1903 Priority: a
Location: Truro-Wellf. boundary marker (east)
VuType: Seashore: in

DOCUMENT SOURCE
Title/Instit: Mass Archives
Photog/Auth: Author:
Publish: Ref: box 113 (4)178

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 5/9/93 Time: 16:00 Film: TX KC Settings: f8 250 45mm
NewDate2: 8/30/93 Time2: 13:30 Film2: PX KC Settings2: f8 60, f5.6 125 45mm
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: South Truro forested uplands.

Hist.Cover: Dense brushy oak woodland (apparently <20 ft. tall); Taller pine to left (perhaps 35 ft. tall); foreground: huckleberry and a pine seedling.

PresentCover: Pine/oak woodland, huckleberry understory

Land Use Notes: After initial settlement and clearing, probably divided for woodlots. Proximity to King's Highway.

Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 28 Town: TR Year: c1890s Priority: a
Location: RR Depot S. Truro (Perry, 1898, p.160)
VuType: pan Seashore: x

DOCUMENT SOURCE
Title/Instit: A Trip Around Cape Cod
Photog/Auth: Author: Perry, E.G.
Publish: Ref: CACO Library

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 5/13/93 Time: 11:00 Film: PX KC Settings: f8 250, 125
NewDate2: 5/7/93 Time2: 13:45 Film2: PX Settings2: f8 250
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Bayshore marsh, hollows and uplands.

Hist.Cover: Railroad ROW, eroded banks, bearberry, grasses and bare sand; remnant oaks, cleared freshwater marsh.

PresentCover: Eroded banks, pitch pine, bearberry, beach plum, grasses; cattail/reed marsh in middle ground, bearberry, brush, pitch pine uplands in distance. Pine forest young and dense on abandoned heath.

Land Use Notes: S. Truro Meetinghouse on "Hill of Storms" in distance; bayshore land uses (fishing, whaling, grazing); access via County Rd and RR. Original Depot building moved to nearby residential location.

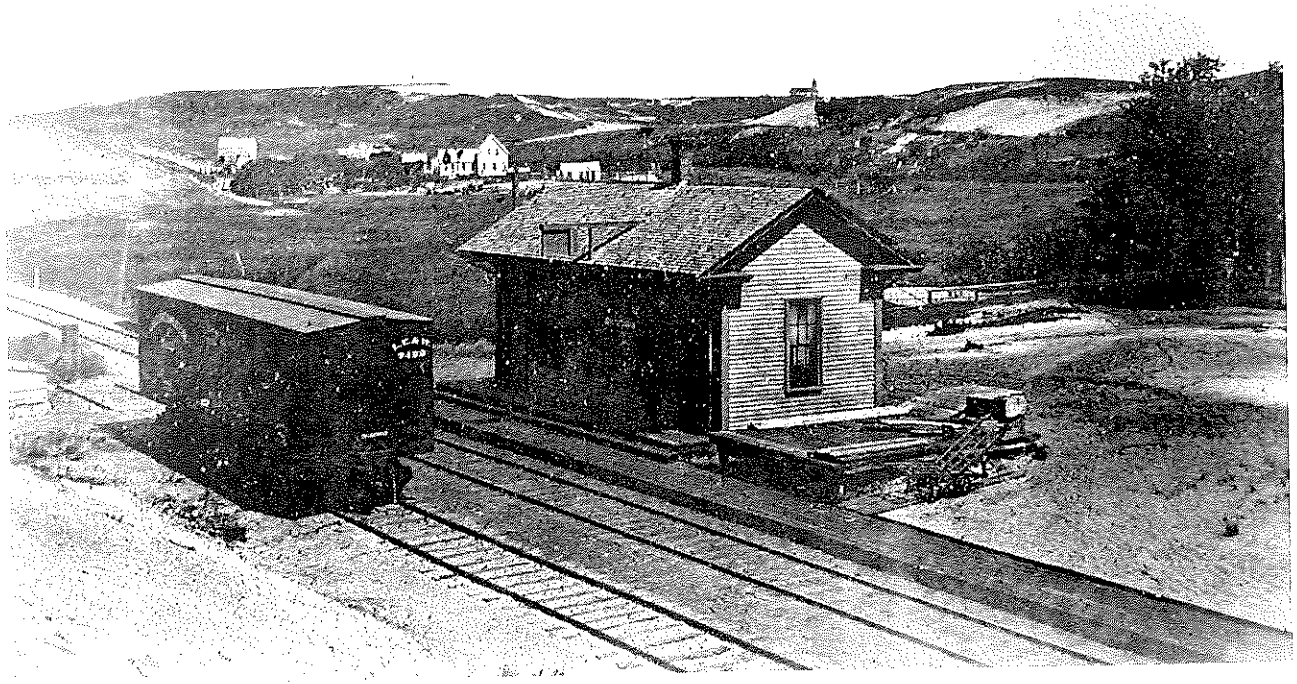
Photo notes:

Fire History: Near origins of 1927 and 1938 fires. Background probably well within both several thousand acre fires. RR corridor fire influences.

Other Photos:

Comments: Passenger railroad service from Wellfleet to Provincetown began in July of 1873 and continued through 1938. Frieght service continued for about 20 more years.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 29 Town: TR Year: 1920 Priority: a
Location: Messinger house
VuType: fore Seashore: in

DOCUMENT SOURCE
Title/Instit: Fritz Messinger photos
Photog/Auth: Fritz Messinger Author:
Publish: Ref: 508-349-2381

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/17/93 Time: 17:00 Film: PX KC Settings: f5.6 125 45mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Bayshore hollows and uplands.

Hist.Cover: Mixed grassland with patches of huckleberry or blueberry. No trees.

PresentCover: Dense pine forest; some white, black and scrub oak and black locust. Grasses/bearberry understory.

Land Use Notes: Messinger house purportedly built c1750 of wide white pine boards imported from Maine. Pamet Pt. area was always sparsely settled. Coastal influences.

Photo notes:

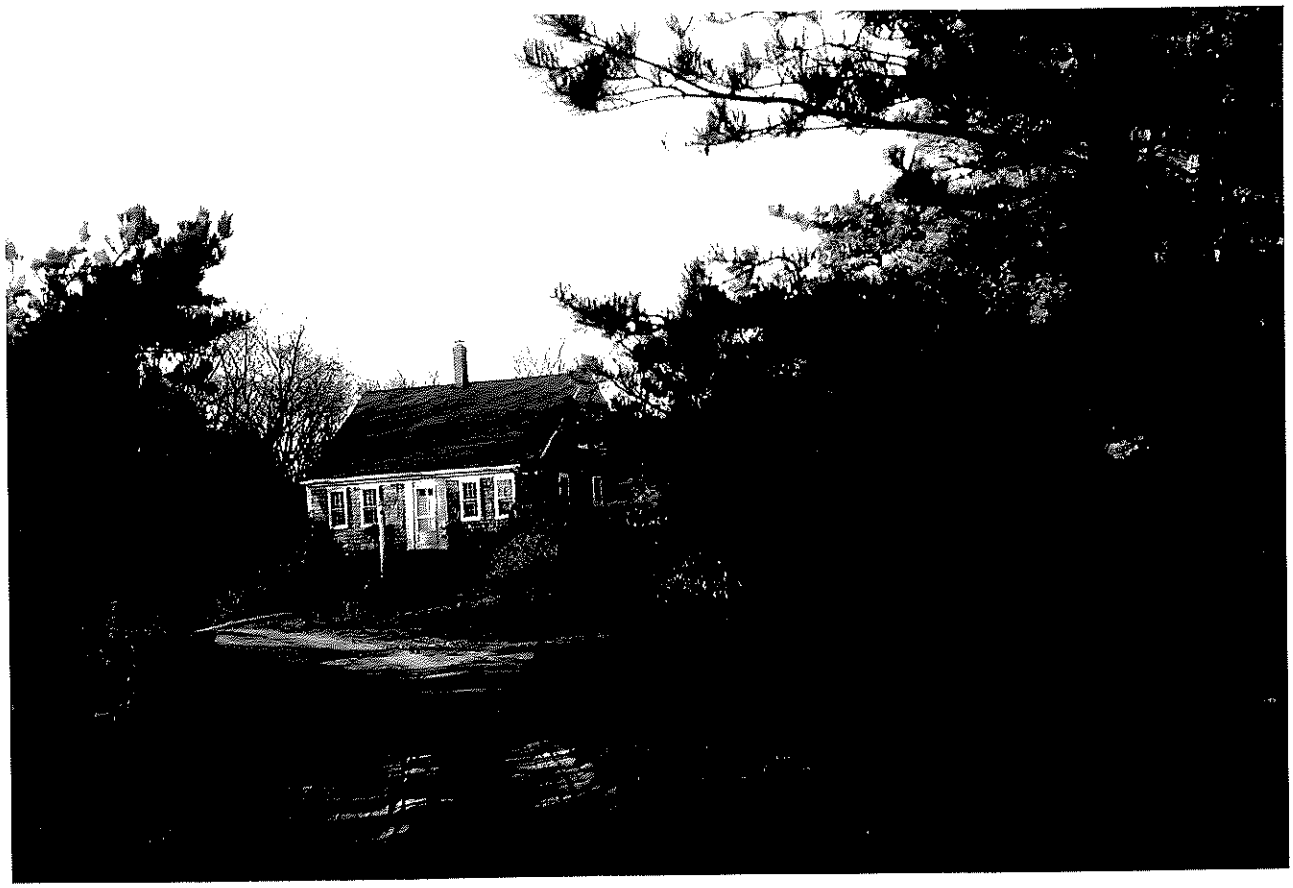
Fire History: Probably just outside fire areas (1927, 1938)

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 30 Town: TR Year: 1916 Priority: a
Location: Fisher Rd, Scott's cottage RR
VuType: Seashore: out

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog Auth: Author:
Publish: Ref:

CONTACT
First: Mrs. B.J. Last: Allen Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 5/9/93 Time: 14:45 Film: TX Settings: f8 500 35mm
NewDate2: 9/28/93 Time2: 14:00 Film2: TM100 Settings2: f8 250 40mm
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Coastal bayshore bluffs and RR corridor.

Hist.Cover: Bearberry, mixed grass, eroded banks, RR ROW; solitary domestic trees.

PresentCover: Extensive pitch pine forest up tp 50 ft tall, bearberry understory; residential area with some locust, oak and ornamentals.

Land Use Notes: Influences of marine weather, railroad, fires and bayshore coastal land uses have not prevented regeneration of dense pine forest. House still standing.

Photo notes: Original viewpoint obscured. Reshot from second level deck of house with 15 ft extension pole.

Fire History: Influences of RR.

Other Photos: Mill Pond (THS) and Pamet RR station (USGS).

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 31 Town: TR Year: c1900 Priority: a
Location: Mill Pond area/ RR corridor.
VuType: Seashore: out

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Mrs. B.J. Last: Allen Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/14/92 Time: 16:30 Film: PX KC Settings: f8 250
NewDate2: 5/7/93 Time2: 14:15 Film2: PX KC Settings2: f8 250 40mm
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Bayshore estuary, marsh and coastal bluffs.

Hist.Cover: Heathland/grassland, eroded banks, altered marsh.

PresentCover: Altered coastal marsh with mixed brush on margins, residential uses; pitch pine almost covering formerly barren hills.

Land Use Notes: Neither marine influences, RR fires nor intensive land use have kept pines from covering coastal bluffs. RR ROW still affecting estuarine drainage/tidal flow.

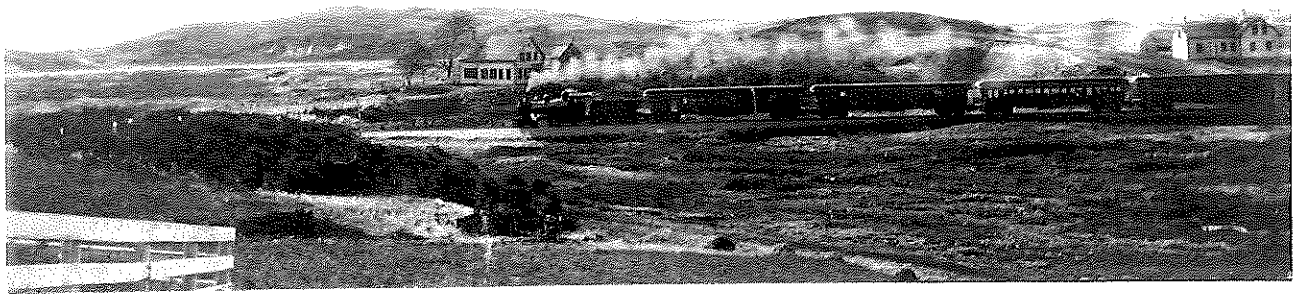
Photo notes: The general area is matched, although the precise location of the original camera point is uncertain.

Fire History: Frequent small RR fires likely from 1870s through 1940s.

Other Photos: see USGS photo from about 1/2 mi north.

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 32 Town: TR Year: 1916 Priority: a
Location: From Pamet Harbor RR Station looking SW (USGS 212)
VuType: Seashore:

DOCUMENT SOURCE
Title/Instit: USGS file photos
Photog/Auth: Woodworth, J.B. Author:
Publish: Ref: 6 8 16

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 5/9/93 Time: 14:30 Film: TX KC Settings: f8 250
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Tidal estuary and coastal hills; RR corridor on filled

Hist.Cover: Eroded hills, grassland/heathland/barren; solitary trees; closely cropped marsh vegetation.

PresentCover: Grassland/heathland/tidal marsh.

Land Use Notes: Dominant influences bayshore marine; also RR and maritime fishing, whaling, grazing. Viewpoint replaced by tennis courts.

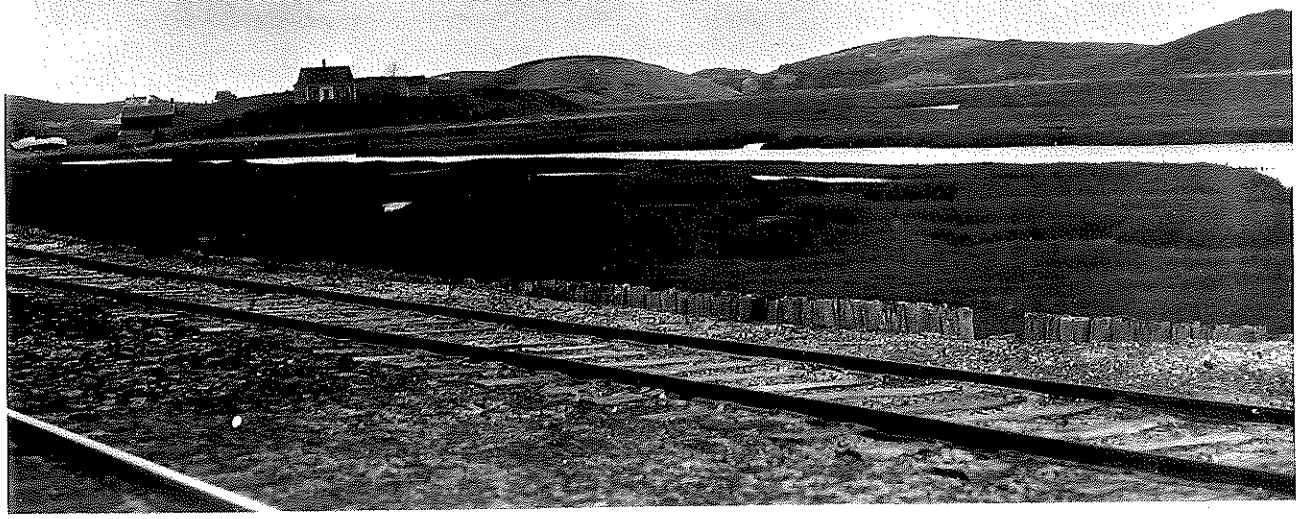
Photo notes: Tennis courts and fencing replaced RR bed; viewpoint moved several hundred feet SW.

Fire History: RR corridor probably had frequent small fires.

Other Photos: Mill Pond photo about 1/2 mi south.

Comments: Succession of trees has been slower in this area than in many other areas on the Outer Cape. The hills are still largely open, except around the house, where planted deciduous trees have become established.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 33 Town: TR Year: 1870 Priority: a
Location: South across Pamet mouth toward Holsbery Rd. (NPS H26-5)
VuType: Seashore: out

DOCUMENT SOURCE
Title/Instit: NPS CACO Photo Archive: also Truro Hist. Soc. and SPNEA
Photog Auth: Author:
Publish: Ref: 5 11-12. also SPNEA

CONTACT
First: Diana Last: Worthington Phone: 349-6379
Affil: private collection.

CONTEMPORARY PHOTO MATCH
NewDate: 9/20/93 Time: 15:10 Film: TX Settings: f8 250 40mm
NewDate2: 4/28/93 Time2: 16:30 Film2: TX KC Settings2: f8 250 500
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: River estuary, floodplain and upland.

Hist.Cover: Grazed floodplain, eroded barren coastal banks; pasture grassland/heathland on distant uplands. Original view shows most of Truro's "Hogsback" upland (2-3 mi. vista) as almost completely treeless.

PresentCover: Mixed oak/pine forest with locust and exotic ornamental planting; pines cored and dated range from 50 to 80 years old; understory: huckleberry, regenerating oak.

Land Use Notes: Early view taken soon after the end of extensive sheep grazing, (note extensive fencing indicating recently maintained pastures). Cores from existing pines show that foreground woodland began regenerating after 1910.

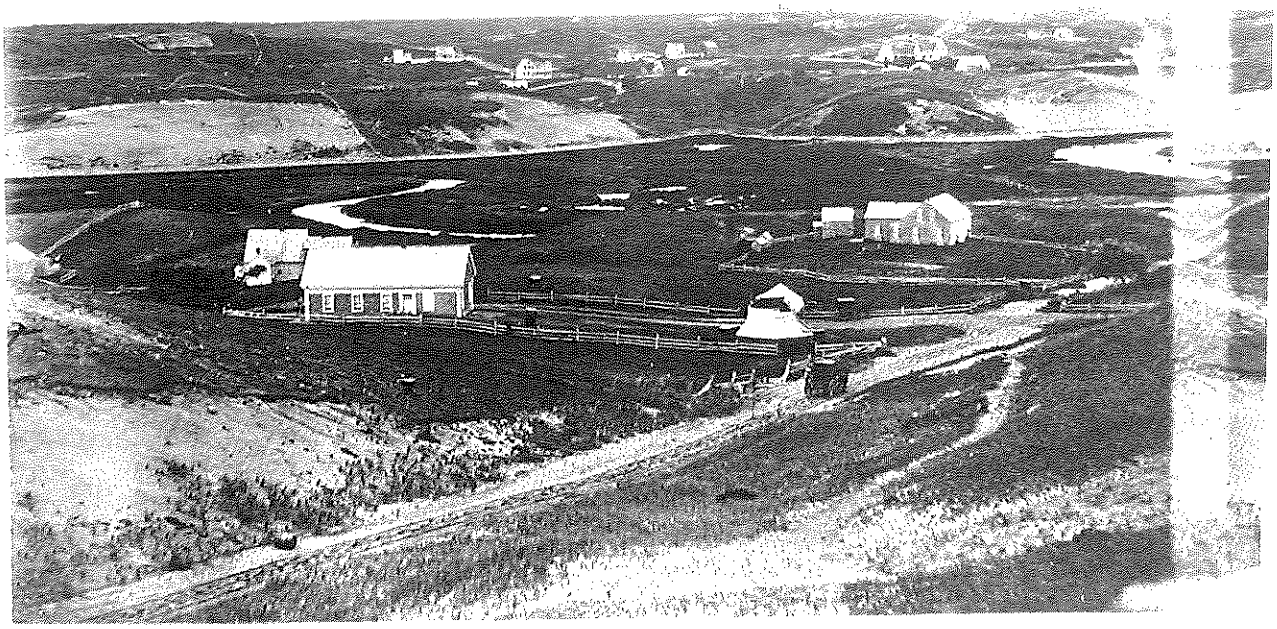
Photo notes: The return of forest thoughout Truro has been remarkable over the last 120 years. Truro's open uplands of the last century are now essentially gone. The original viewpoint now obscured by trees. (Reshot from about 25 ft up in a tree).

Fire History:

Other Photos: As in views of along the Herring River (views 9-12), grazing created extensive areas of bare sand and eroding bluffs which show up as light areas on slopes and bluffs in the early view.

Comments: Extensive fencing in the original photo attest to recent grazing. As along the Herring River (Plates 9-12), grazing created large areas of bare sand and severely eroded bluffs, visible as light-colored expanses.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 34 Town: TR Year: 1900 Priority: a
Location: Truro Center with Dike looking North (THS TC9)
VuType: Seashore: out

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Mrs. B.J. Last: Allen Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 8/13/92 Time: 15:30 Film: TX Settings:
NewDate2: 8/27/93 Time2: 10:30 Film2: PX KC Settings2: f8 250 35mm
NewDate3: 4/28/93 Time3: 15:30 Film3: TX KC Settings3: f8 250 50mm

OTHER DATA
Landform: River corridor and upland; road corridor.

Hist.Cover: Diked estuarine marsh; hay meadow along north river bank, pasture grassland on hillsides with patches of heathland/brush, residential trees, orchard trees in village center.

PresentCover: Pine/oak forest on hillsides, foreground pitch pines up to 50 ft tall, younger oaks about 20% of stand with understory primarily grasses and bearberry; floddplain highly altered by landfill, pavement and other construction.

Land Use Notes: Town center; alteration of wetlands began with haying the floodplain, then diking the road corridor and recently, construction on filled wetlands.

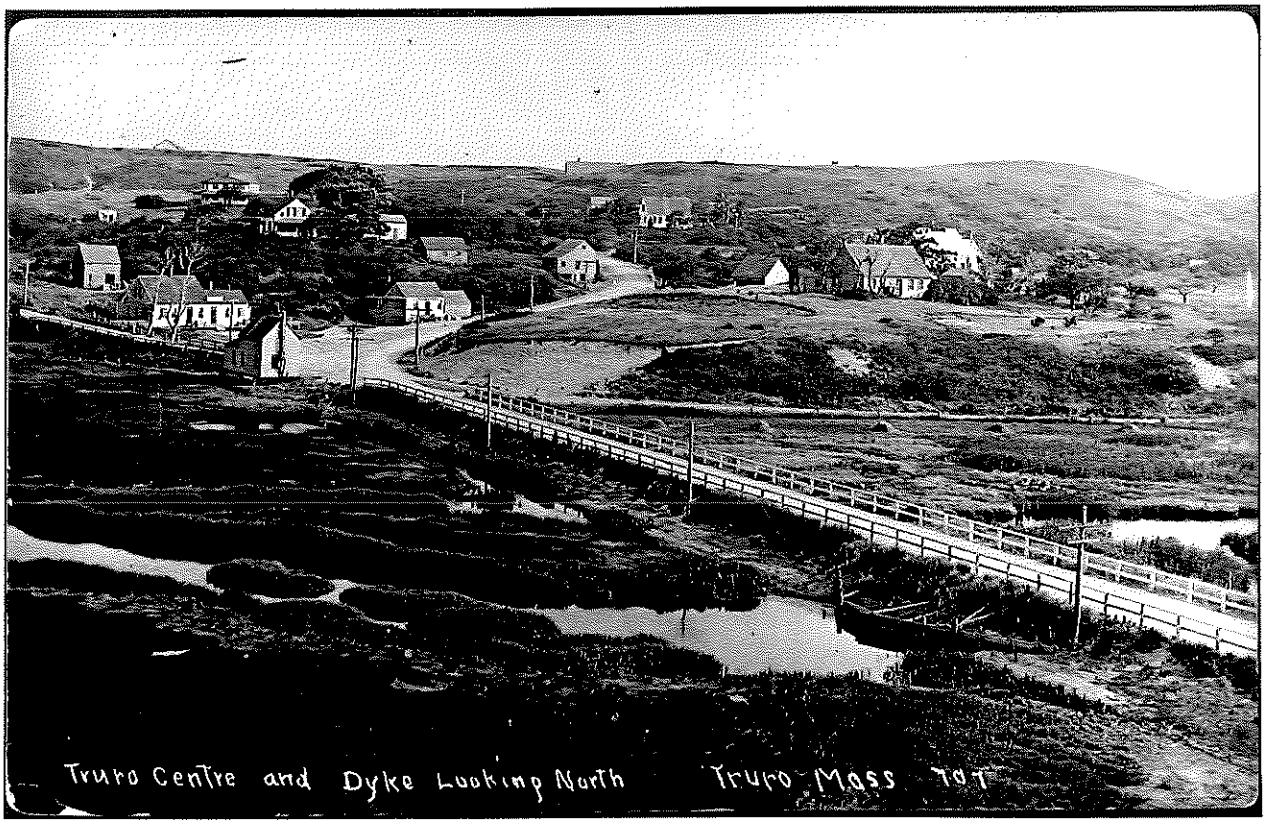
Photo notes: Original viewpoint obscured by trees, reshot from lower on hillside.

Fire History:

Other Photos: Many other town center photos in Truro Historical Society collections: 1930s drawings by Charles Grosz show regenerating pines 4-6 ft tall. 1938 view included here follows.

Comments:

References:


Truro Centre and Dyke Looking North
Truro Mass 101



CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 35 Town: TR Year: 1938 Priority: a
Location: Truro Center (THS G255H)
VuType: Seashore: out

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Mrs. B.J. Last: Allen Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 8/13/92 Time: 15:30 Film: TX Settings:
NewDate2: 8/27/93 Time2: 10:30 Film2: PX KC Settings2: f8 250 35mm
NewDate3: 4/28/93 Time3: 15:30 Film3: TX KC Settings3: f8 250 50mm

OTHER DATA
Landform:

Hist.Cover: Regenerating tree cover, hillsides and horizon now with patchy growth of pitch pine; new contruction in town center and floodplain; former hayfield on riverbank now brush.

PresentCover: see above

Land Use Notes: see above

Photo notes: Original viewpoint obscured by trees, reshot from lower on hillside.

Fire History:

Other Photos: Many other town center photos in Truro Historical Society collections; 1930s drawings by Charles Grosz show regenerating pines 4-6 ft tall.

Comments:

References:



CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 36 Town: TR Year: c1900 Priority: a
Location: Pamet River near highway crossing.
VuType: Seashore: in

DOCUMENT SOURCE
Title/Instit: original post card
Photog Auth: Author:
Publish: Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 8/27/93 Time: 10:00 Film: PX KC Settings: f8 250
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Estuarine riparian corridor. Upland hollow.

Hist.Cover: Floodplain: cropped reeds. upland pasture grassland with patchy shrubs, extensive bearberry on upper slopes; no trees in view.

PresentCover: Foreground: black cherry, pitch pine, willow; brush replacing cattail marsh vegetation. BAckground similar to other N. Pamet descriptions.

Land Use Notes: Formerly grazing and residential/agricultural uses.

Photo notes: Taken from edge of highway service road looking ENE

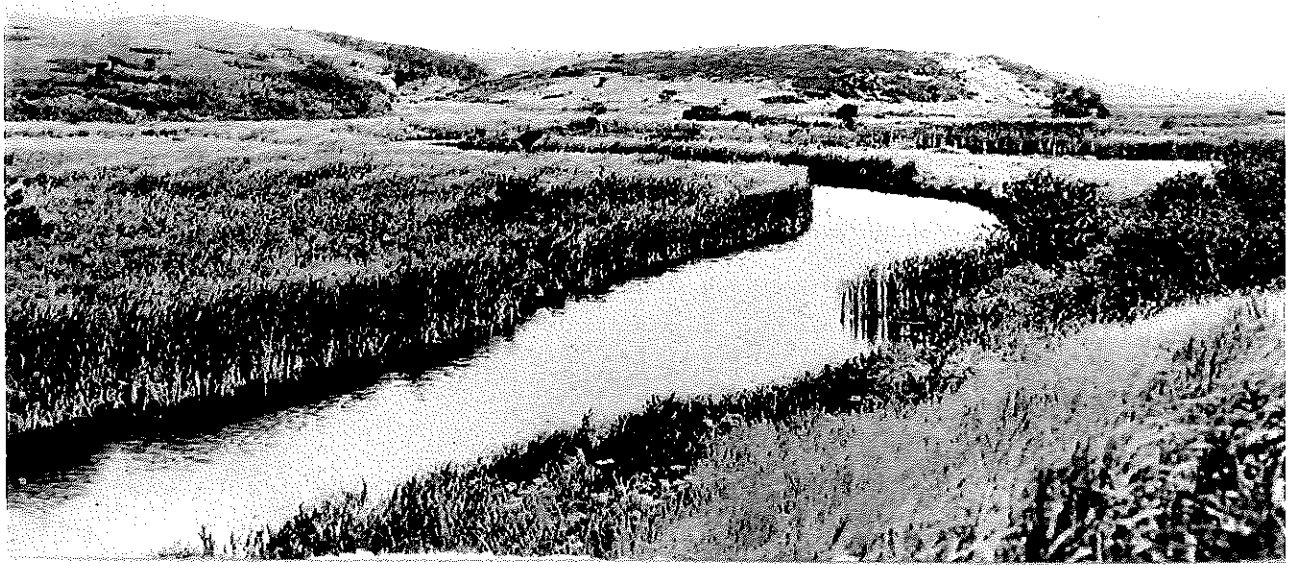
Fire History: Intentional burning of upper Pamet marshes for mosquito control (1930s) documented by Kane, 1992.

Other Photos: Encroachment of woody shrubs into an open wetland is similar here to that recorded in #15.

Comments:

References:

Pamet River, Truro, Mass.





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 37 Town: TR Year: 1925 Priority: a
Location: From Corn Hill NW over Pamet to Town Hall (THS TC3).
VuType: fore mid Seashore: out

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Mrs. B.J. Last: Allen Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 8/24/92 Time: 14:00 Film: PX KC Settings: 45mm
NewDate2: 4/28/93 Time2: 18:30 Film2: TX KC Settings2: f8 250
NewDate3: 10/14/93 Time3: 12:30 Film3: TX100 KCSettings3: f8 250 55mm

OTHER DATA
Landform: Estuary, floodplain, banks and upland.

Hist.Cover: Little Pamet floodplain: grazed and cropped estuarine marsh.
Pasture grassland, patchy brush.

PresentCover: Mixed oak/pine forest now covers all former upland
grassland, sandy hillsides now pitch pine with Deschampsia
understory; coastal brush, black cherry, mixed grasses.
cattail/reeds to channel banks.

Land Use Notes: RR corridor and coastal maritime uses. Cottages on Corn Hill
date to early 19th c. Viewpoint altered by road
construction. RR embankment completed before 1870) altered
estuarine flow/ channel configuration to Pamet and Little
Pamet.

Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 39 Town: TR Year: c1900 Priority: a
Location: South from Corn Hill to mouth of Pamet.
VuType: mid back pan Seashore: out

DOCUMENT SOURCE
Title Instit: Truro Historical Society
Photog Auth: Author:
Publish: Ref:

CONTACT
First: Mrs. B.J. Last: Allen Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 8/20/92 Time: Film: PX Settings: 40mm
NewDate2: 4/28/93 Time2: 18:00 Film2: TX KC Settings2: f5.6 125 45mm
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Estuarine, river mouth, bayshore bluffs.

Hist.Cover: Altered floodplain, pasture grassland. Distant "hogsback" upland: heathland, patchy pine forest.

PresentCover: Cattail/reed marsh, shrub swamp now replacing wet meadow/hayfield, upland: mixed oak/pine woodland with black locust.

Land Use Notes: Alterations and dredging of Pamet Harbor date back to mid-late 19th c. (incl. RR). Corn Hill and N. Pamet ridge have long history of use (grazing, residential, railroad, civic uses).

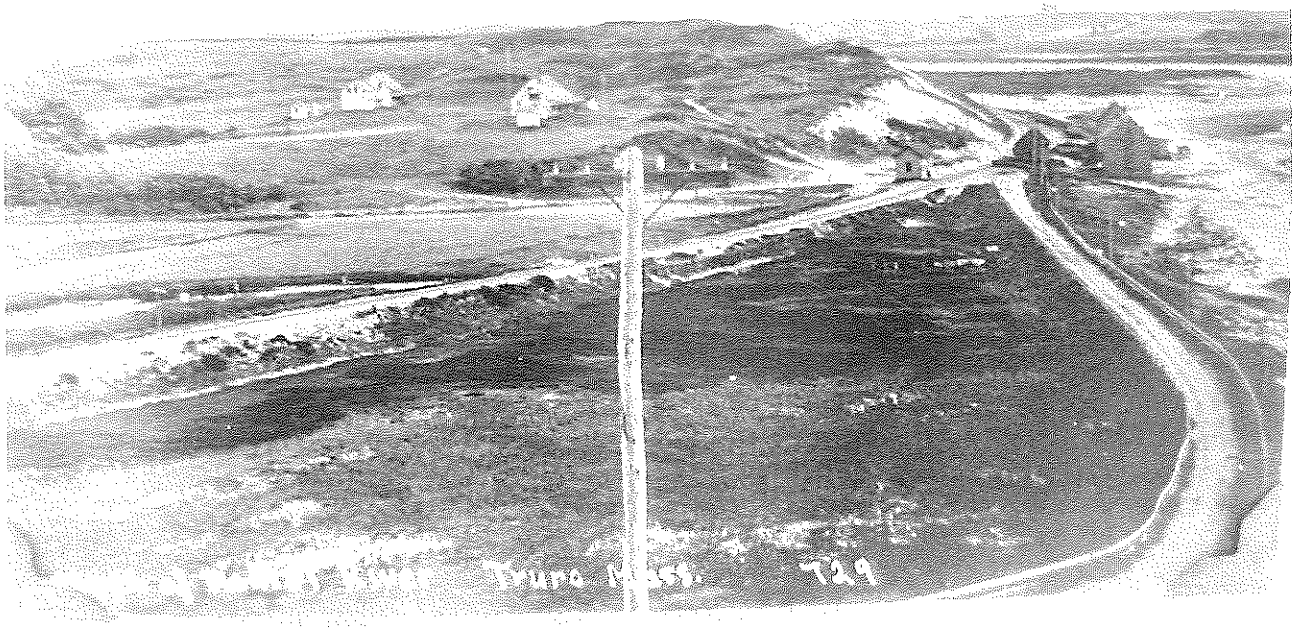
Photo notes:

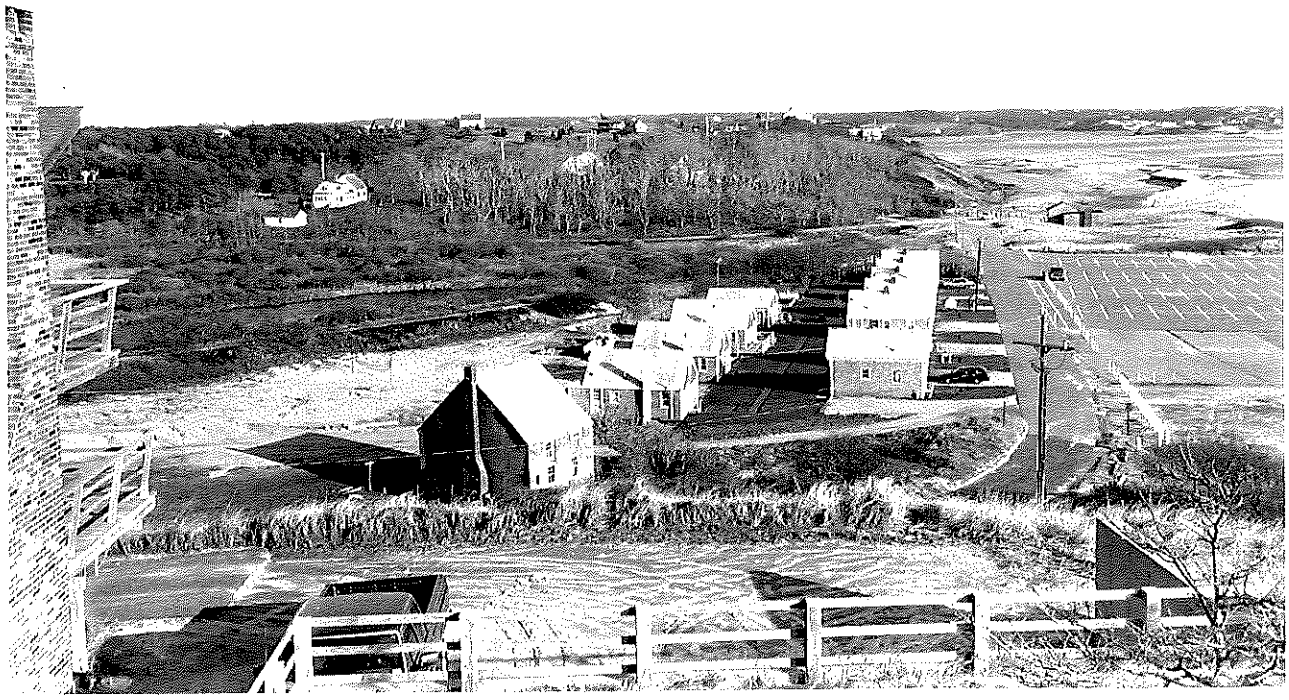
Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 40 Town: TR Year: c1900 Priority: a
Location: Windy Willows, Castle Rd /@ Corn Hill Rd
VuType: fore Seashore: out

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog Auth: Author:
Publish: Ref:

CONTACT
First: Mrs. B.J. Last: Allen Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/15/92 Time: 16:00 Film: PX KC Settings: 45mm
NewDate2: 8/27/93 Time2: 8:30 Film2: PX KC Settings2: f8 125 45mm
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Freshwater marsh, coastal uplands.

Hist.Cover: Cattail-reed marsh, pasture grassland, domestic trees.

PresentCover: Mixed pine/oak woodland on hillsides; oak, aspen, brush in foreground; cattail-reed marsh.

Land Use Notes:

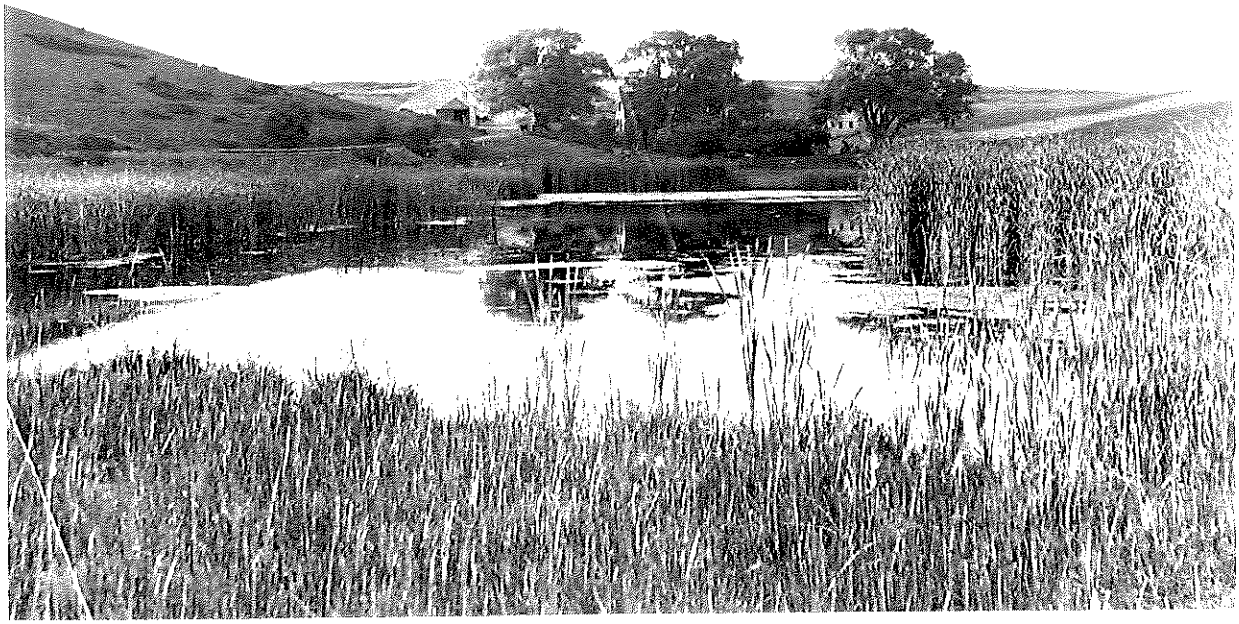
Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 41 Town: TR Year: c1910 Priority: a
Location: Road to P.O. from Head of Pamet
VuType: Seashore: in

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Richard Last: Haskell Phone:
Affil: Dyer family

CONTEMPORARY PHOTO MATCH
NewDate: 5/10/93 Time: 10:45 Film: TX Settings: f8 500 45mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: River corridor upland.

Hist.Cover: Abandoned pasture grassland/heathland; scattered brush, regenerating pines and oaks, eroded barren banks.

PresentCover: Predominantly pine forest, mixed oak/pine on hilltops, bearberry, grasses, huckleberry understory.

Land Use Notes: Upper Pamet has continuous history of domestic and agricultural use. As in #33, extensive rail fences indicate grazing history of this area. The modern paved road was straightened, filled and widened over the old track.

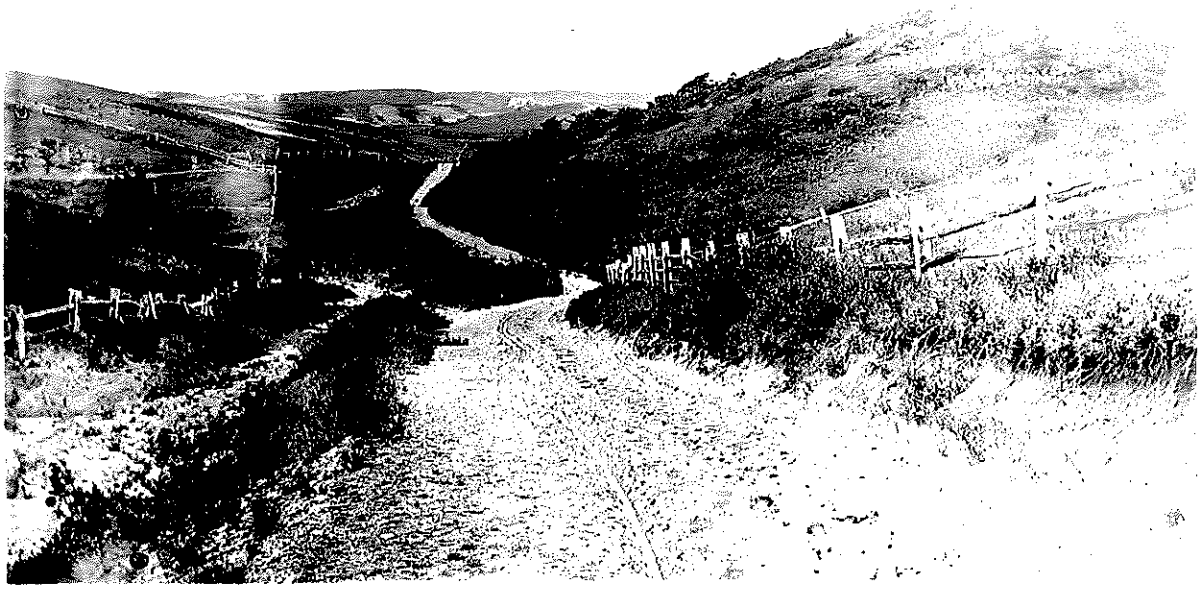
Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 42 Town: TR Year: 1928? Priority: a
Location: N Pamet House (Meilziner, Chaplin)
VuType: mid Seashore: in

DOCUMENT SOURCE
Title/Instit: Truro Historical Society (Dyer family - Richard Haskell)
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Mrs. B.J. Last: Allen Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/14/92 Time: 12:00 Film: PX Settings: 35mm
NewDate2: 8/20/93 Time2: 16:00 Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Upland hollow. Pamet River corridor.

Hist.Cover: Heathland/grassland with scattered, patchy pine. Extensive bearberry cover on hillside above house; grasses, pine seedlings, Hudsonia and emerging brush in foreground.

PresentCover: Pine/oak forest with oak/huckleberry/bearberry understory. Background hillside: older pine (to 20" dbh) with younger black oaks, overtaking bearberry understory (first example of oak/pine mix on old heathland).

Land Use Notes: Valley bottom: abandoned pasture surrounding well-established residential uses. House (dating to 1828) and wellhouse present, garage gone. Hillside was dry heathland now replaced by native species.

Photo notes: Camera position was moved closer to the road for the modern view due to screening by trees.

Fire History:

Other Photos:

Comments: Known as the Joshua Snow house built 1828. Now Ansel Chaplin.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 43 Town: TR Year: 1912 Priority: a
Location: Pamet Bog House
VuType: mid Seashore: in

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Mrs. B.J. Last: Allen Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/14/92 Time: 11:30 Film: PX KC Settings: 40mm
NewDate2: 8/20/93 Time2: 14:00 Film2: TM Settings2: f5.6 250 40mm
NewDate3: 4/28/92 Time3: 18:45 Film3: TX KC Settings3: f8 250

OTHER DATA
Landform: Bog and coastal hills.

Hist.Cover: Cranberry bog and eroded hillsides (heathland/grassland): bog now overgrown with brush. Foreground patch of brush.

PresentCover: Mixed pine/deciduous woodland: coastal bluffs with heathland/grassland. Shrub wetland now replaces cranberry bog.

Land Use Notes: Grazing ended in late 19th c. Cranberry production tapered off about 50 years ago. ?

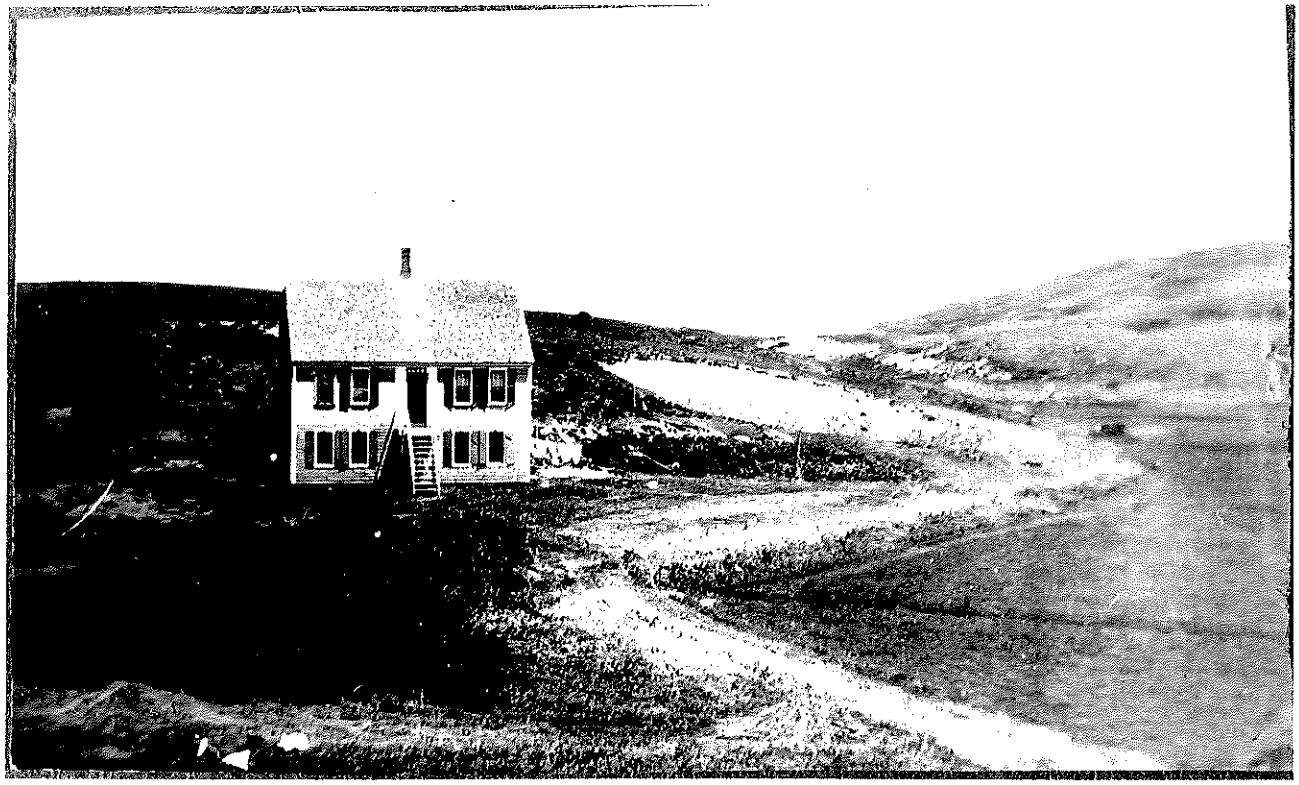
Photo notes: Taken from extension pole.

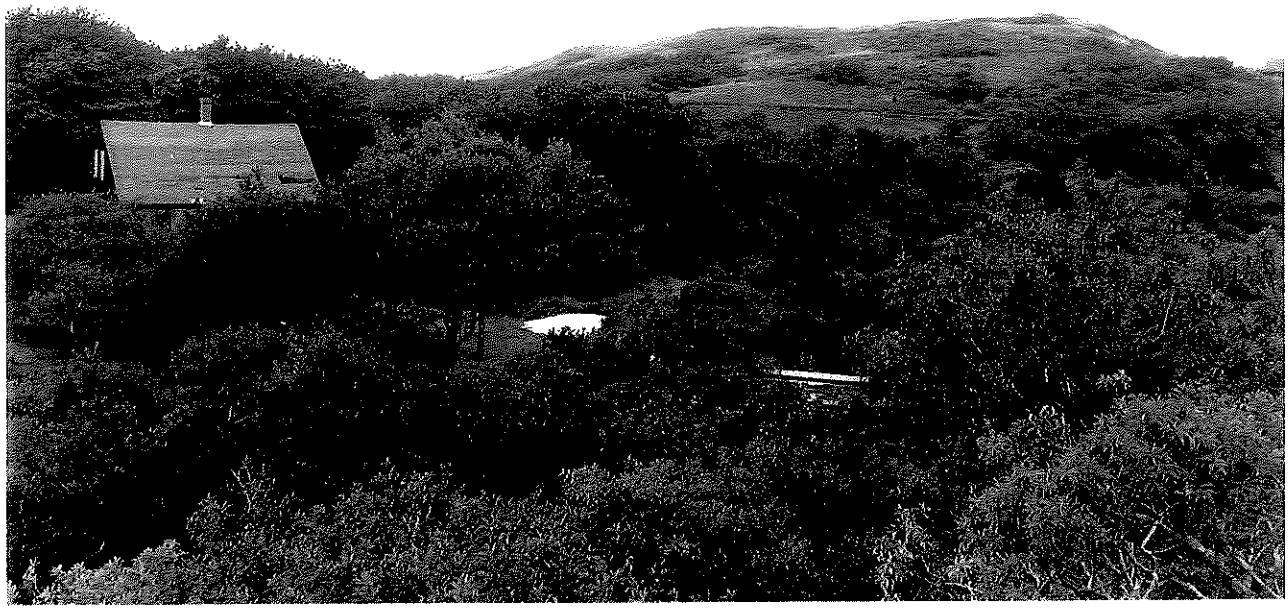
Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 44 Town: TR Year: 1962 Priority: a
Location: N of Pamet Bog (Fig.8)
VuType: Seashore:

DOCUMENT SOURCE
Title/Instit: CCNS Vegetation Cover Type Report
Photog/Auth: Author: Randall, William
Publish: NPS CACO 1962 Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 9/22/93 Time: 10:30 Film: PX Settings: f4 125 50mm
NewDate2: 5/10/93 Time2: 10:30 Film2: TX Settings2: f8 500
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Backshore coastal hollow and bluffs.

Hist.Cover: Coastal bearberry heathland/grassland, scattered small pitch pines, black cherry, possibly beach plum.

PresentCover: Coastal heathland/grassland, regenerating pitch pine forest, coastal shrub community

Land Use Notes: Near Ball estate?

Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 45 Town: TR Year: c1900 Priority: a
Location: Great Hollow Rd. "Path to the Beach" looking E
VuType: Seashore: out

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: B.J. Last: Allen Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 8/24/93 Time: 13:30 Film: PX KC Settings: f11 250 45mm
NewDate2: 8/24/93 Time2: 13:30 Film2: KC Settings2: f11 125 45mm
NewDate3: 10/14/93 Time3: 10:30 Film3: Settings3:

OTHER DATA
Landform: Dry upland hollow.

Hist.Cover: Pasture grassland with planted trees, exotics and natives.

PresentCover: Abandoned pasture grassland with mixed native and exotic trees (pine, oak, chestnut, Alianthus, white poplar, willow, cherry, red cedar, scrub oak, privet) Lots of resprouting of poplar and pine W of house.

Land Use Notes: Farm, grazing land, inn. Former fenced pasture now has exotic grasses (little bluestem, Agrostis, Festuca, also Deschampsia) with beach plum, sprouting pine and poplar.

Photo notes:

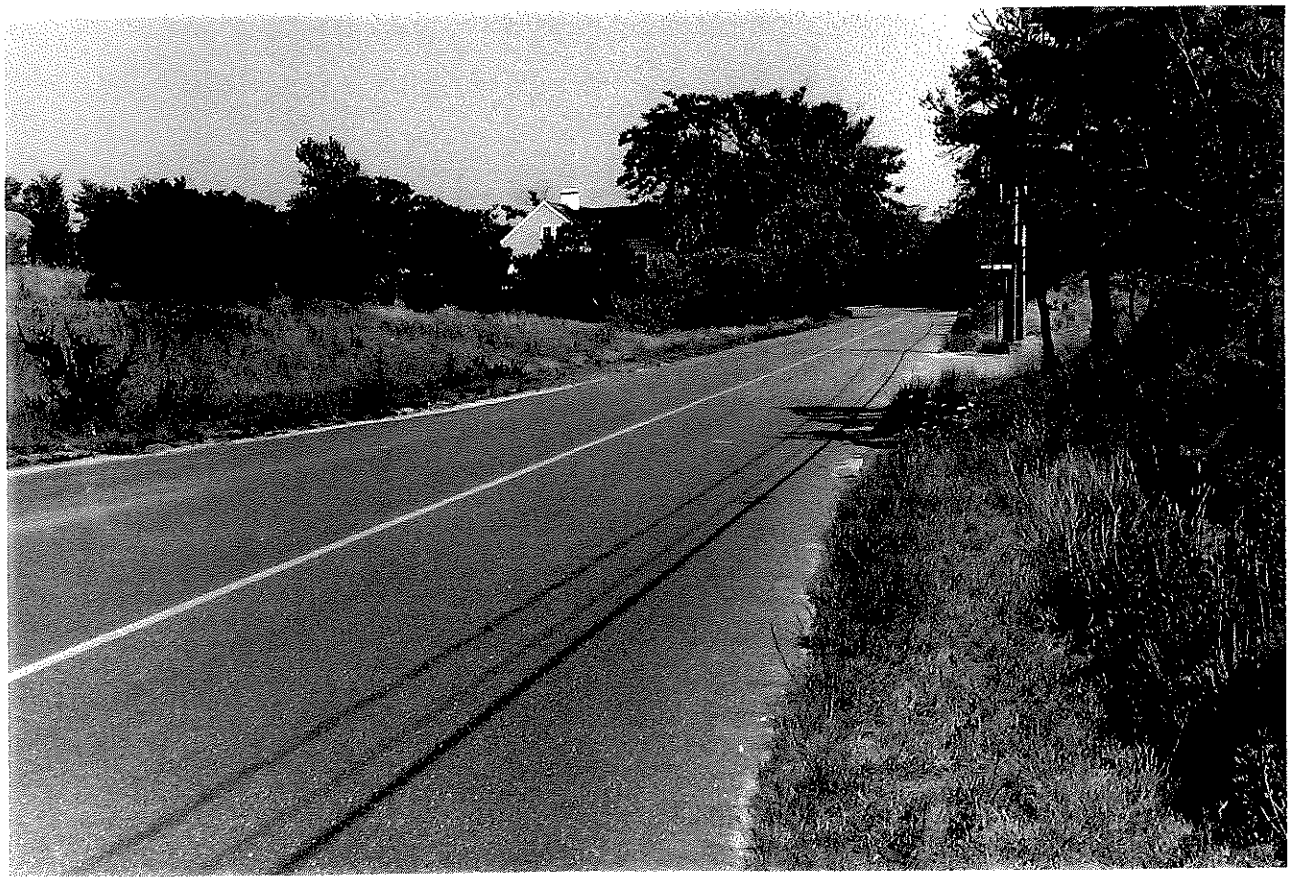
Fire History:

Other Photos:

Comments: Without the original farmhouse, the site would be unrecognizable today. Farm buildings and fences have been removed, the little-used dirt track has become a paved road, and pines have spread across the scene.

References:


THE PATH TO THE BEACH



CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 46 Town: TR Year: c1900 Priority: a
Location: Longnook. 1710 House looking E (TC L6)
VuType: Seashore:

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/14/93 Time: 11:30 Film: TM100, Settings: f5.6 250
NewDate2: 8/24/93 Time2: 14:30 Film2: PX Settings2: f8 125 35mm
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Dry upland hollow.

Hist.Cover: Pasture. mixed deciduous forest on hillsides. 18th c. houses.

PresentCover: Pine/oak forest and lawns on valley bottom: Mixed deciduous forest with pine on hillsides. Pitch pine up to 10" dbh; white oak invading understory.

Land Use Notes: Residential and domestic agriculture since 18th c. This house now called the "Ramble Roof House".

Photo notes: Reshot from viewpoint closer to house due to trees.

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 47 Town: TR Year: 1900 Priority: a
Location: N over N. Truro village
VuType: pan Seashore: out

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog/Auth: Snow, E. Author:
Publish: Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/14/93 Time: 10:15 Film: TX100. Settings: 40mm f8 250
NewDate2: 8/24/93 Time2: 11:30 Film2: PX125.KCSettings2: 45mm f11 250
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Upland plains and hollow.

Hist.Cover: Pasture grassland/heathland; probably false heather in foreground, shrubby pine woods in right foreground, distant pine (?) stand on horizon amidst pasture/grassland.

PresentCover: About 80% pitch pine woodland (browned by salt blast or insect predators), mostly young, dense, pole-sized trees; some oak and locust; patches of grassland/residential devel.

Land Use Notes: Pond Village was settled in the 18th century and cleared soon after, recent regeneration of pitch pine dates from 1950s.

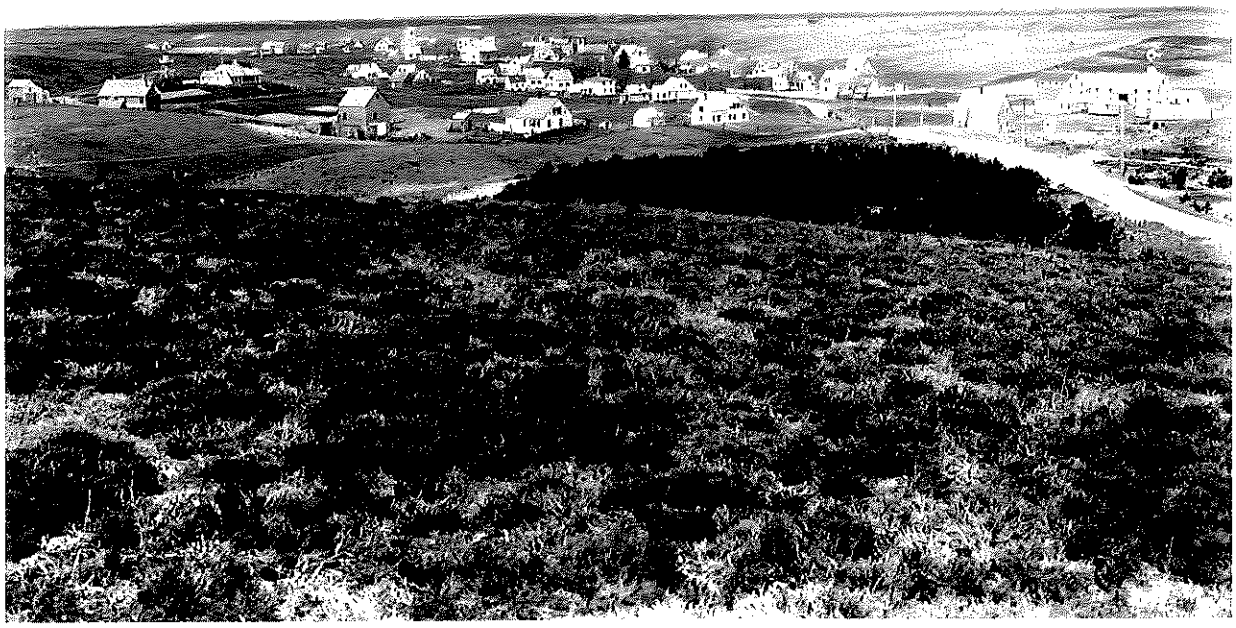
Photo notes: Reshot from terrace of Ocean View Motel, built on the bluff where the original photo was taken.

Fire History: Two large fires 1915-1917 in area visible north of village. Another large fire behind viewpoint 1908. RR fires started from the east.

Other Photos: Other views in Snow collection (Ruikstuhl, 1991) and Cummings collection.

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 48 Town: TR Year: 1916 Priority: a
Location: Highlands, from Light/Signal Station looking N52W (USGS 219).
VuType: fore mid Seashore: in

DOCUMENT SOURCE
Title/Instit: USGS file photos
Photog/Auth: Woodworth, J.B. Author:
Publish: Ref: 6 3 16

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/27/92 Time: Film: PX KC Settings: 40mm, f8 250
NewDate2: 4/28/93 Time2: 10:00 Film2: PX.KC Settings2: f8 250
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Truro Plains

Hist.Cover: Closely cropped pasture/heathland.

PresentCover: Bayberry, blueberry, other coastal shrubs, scattered emerging pitch pine, golf fairway.

Land Use Notes: Highland Hotel now visible (moved north); golf links date c.1890; Hotle kept vegetable garden, no other known cultivation.

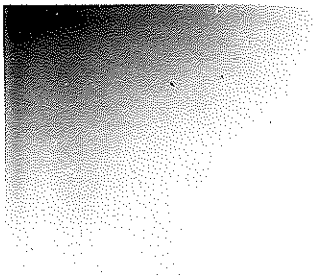
Photo notes: Early view may have been shot from signal tower, flattening apparent topography.

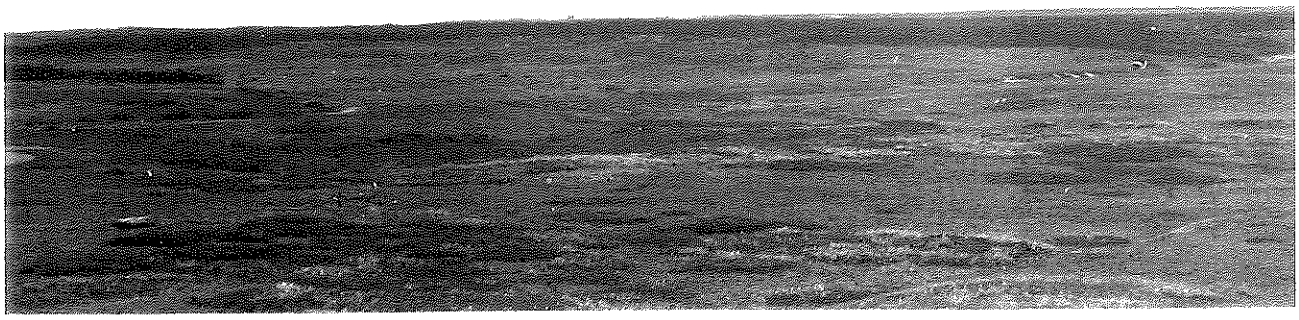
Fire History: 1908 fire to the north near left horizon.

Other Photos:

Comments:

References:







CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 49 Town: NT Year: c1920 Priority: a
Location: Highland Light & plains looking E
VuType: fore mid pan Seashore: in

DOCUMENT SOURCE
Title/Instit: Truro Historical Society
Photog/Auth: Author:
Publish: Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/27/92 Time: 14:30 Film: PX KC Settings: 40mm, f8
NewDate2: 4/28/93 Time2: 10:00 Film2: KC Settings2: f8 250 35mm
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Truro Plain

Hist.Cover: Mixed pasture grassland, heathland on background hills, brush along field edges.

PresentCover: Bearberry/grass understory, bayberry, shadbush, bl. cherry, Viburnum, briars, honeysuckle, scattered pitch pine.

Land Use Notes: Pasture grazed before 1800 through late 19th c.; Highland Golf links, resort hotel and cottages c.1890; cottage (left) burned by NPS due to erosion.

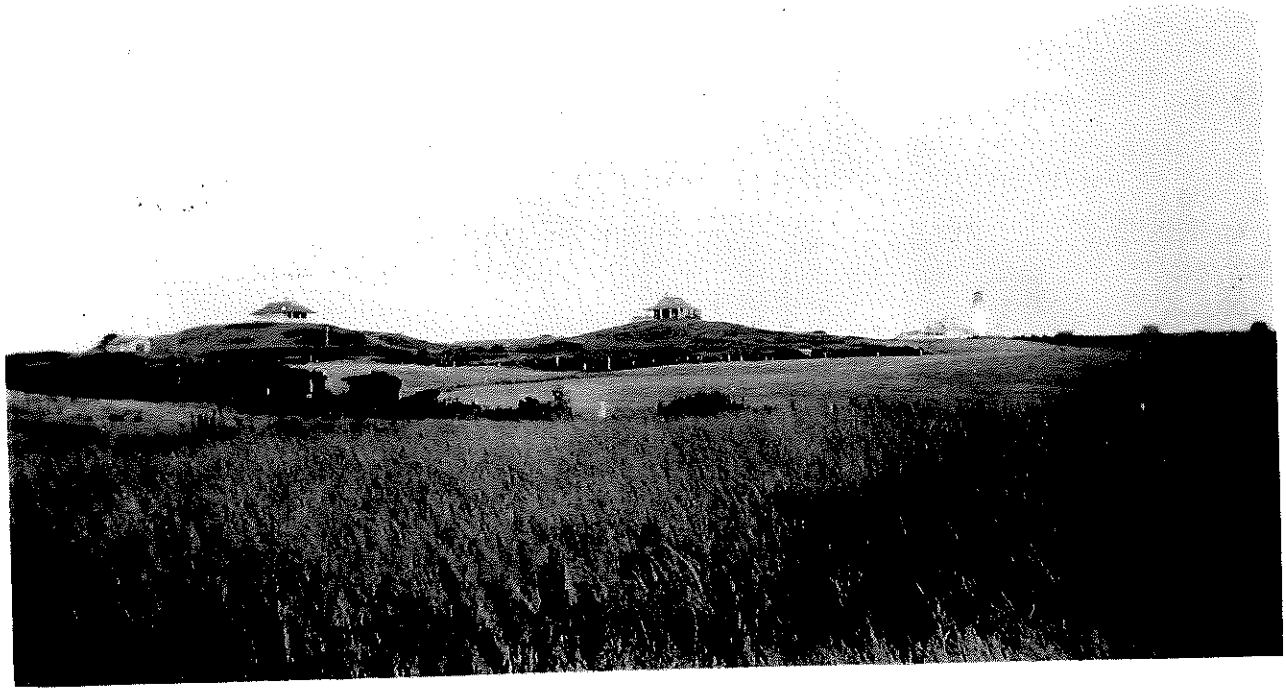
Photo notes: Reshot from west of original viewpoint due to obstructing trees.

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 50 Town: TR Year: 1957 Priority: a
Location: Small's Swamp
VuType: fore Seashore: in

DOCUMENT SOURCE
Title/Instit: Vegetation Cover Type Report, Cape Cod National Seashore
Photog/Auth: Author: Randall, William
Publish: NPS CACO 1957 Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/23/92 Time: Film: PX Settings: 40mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Coastal bluffs, freshwater bog.

Hist.Cover: Bearberry, few pitch pine, barren eroded bank, freshwater bog in background. Pine/oak on horizon.

PresentCover: Emerging pitch pine, bearberry/grassland understory. Swamp now covered with trees and brush.

Land Use Notes: Site of farmsteads dating back into 19th c. Widely cleared and grazed.

Photo notes: Near Pilgrim Springs picnic area.

Fire History:

Other Photos: Truro Historical Society has view of Small farmhouse (now gone) c.1900 showing uniform grazed marsh and hillside.

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 52 Town: TR Year: 1916 Priority: a
Location: Pilgrim Hts to NE (1352-3)
VuType: fore mid Seashore: in

DOCUMENT SOURCE
Title/Instit: USGS file photos
Photog/Auth: Vaughan, T.W. Author:
Publish: Ref: 9 1 16

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/23/92 Time: 12:00 Film: PX KC Settings: 35mm, f8 250
NewDate2: 4/28/93 Time2: 10:30 Film2: PX.KC Settings2: f8,11 250
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Coastal marsh and bluffs.

Hist.Cover: Grazed or cropped marshland, eroded cliffs with low grasses/heathland cover. No trees visible.

PresentCover: Foreground marsh: cattail and reed, honeysuckle and high blueberry, willow, Viburnum, bayberry, sweet pepperbush, beach plum, bl. cherry.

Land Use Notes: Marsh was heavily cropped as salt haymeadow in 18th cent. known as East Harbor. Slow succession/regeneration due to marine exposure and infertile subsoil. Structures (left): Vista del Mar, a prohibition "speakeasy."

Photo notes:

Fire History:

Other Photos:

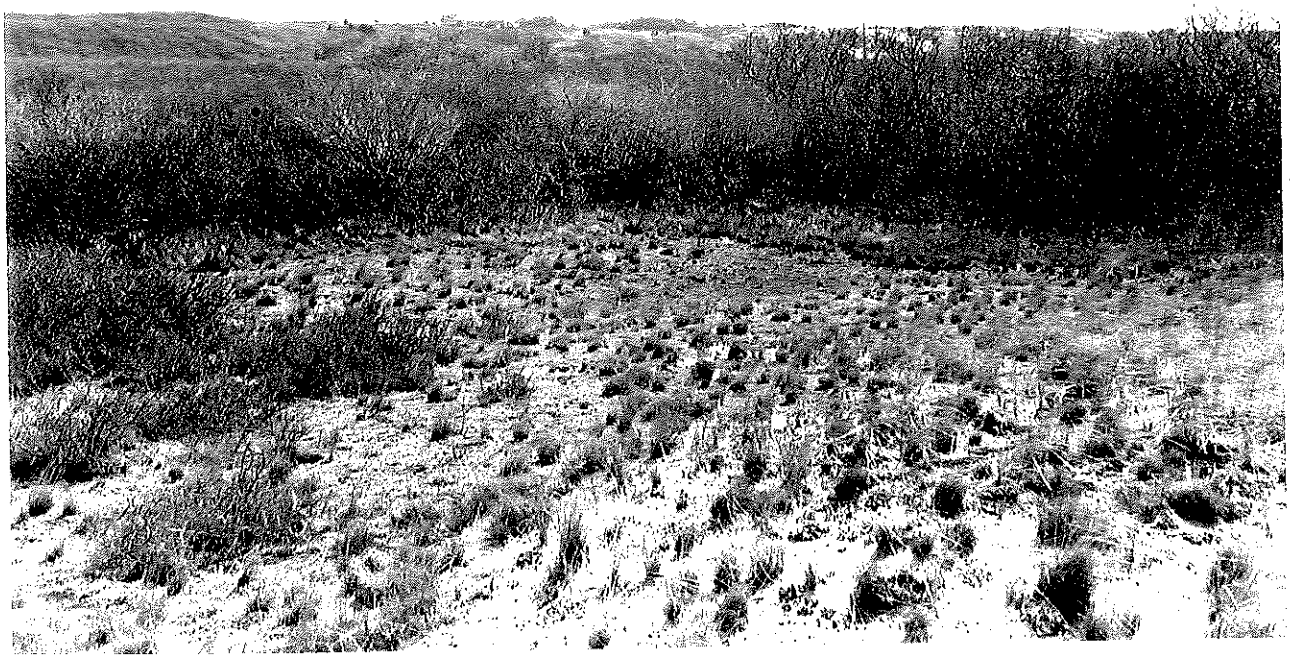
Comments:

References:


PILGRIM HEIGHTS







CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 53 Town: TR Year: 1962 Priority: a
Location: Toward High Head from backshore looking S
VuType: mid Seashore: in

DOCUMENT SOURCE
Title/Instit: Vegetation Cover Type Report. Cape Cod National Seashore
Photog/Auth: Author: Randall. William
Publish: NPS CACO 1962 Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 11/1/92 Time: 10:00 Film: PX Settings: f5.6 250 55mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Dunelands and coastal bluffs.

Hist.Cover: Bayberry, poison ivy, beach grass, Hudsonia, hairgrass. interdunal bogs; background: coastal shrub community. bayberry-beach plum-black cherry.

PresentCover: Stand of pitch pine (possibly plantation) in middle ground. mixed pine/oak woodland on High Head, beach grass and shrub communities as before.

Land Use Notes: East Harbor had 18th c. land grants for hay meadows; High Head had 2-3 farmsteads c.1850. new residential uses plotted in 1950s, stopped by creation of seashore.

Photo notes: 0.3 mi N of High Head looking S.

Fire History: None recorded.

Other Photos: USGS views (1916) show High Head from opposite direction looking N. Very little tree cover visible at that time.

Comments: Documents recent return of forest cover to High Head and dunelands.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 54 Town: PR Year: <1911 Priority: a
Location: N from Pilgrim Monument to Race Pt
VuType: pan Seashore: in

DOCUMENT SOURCE
Title/Instit: SPNEA Photo Collection
Photog/Auth: Author:
Publish: Thomson Ref: Prov. Unmtd.

CONTACT
First: Ms. Lorna Last: Condin Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/19/93 Time: 12:00 Film: PX KC Settings: f8 250 45mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Provincelands dune fields, interdunal ponds and bogs.

Hist.Cover: Foreground: Mixed land uses, forest, brush and mixed grass, eroded trails/roads. Background: Pine forest up to edge of dunefields, then scattered brush, stunted trees and beach grass.

PresentCover: Foreground: more urbanized mixed land uses with forest cover; background: more extensive mixed forest extending into dune fields, with barren higher ground grading into sparse heathland and beach grass at north shore.

Land Use Notes: Provincelands was historically a preserve used by fisherman and squatters, harvested for fuel, forage and fishing shacks/industrial sites (ice houses, whale oil processing). Quickly depleted resources on thin dry soils led to devegetation. Richer interdu

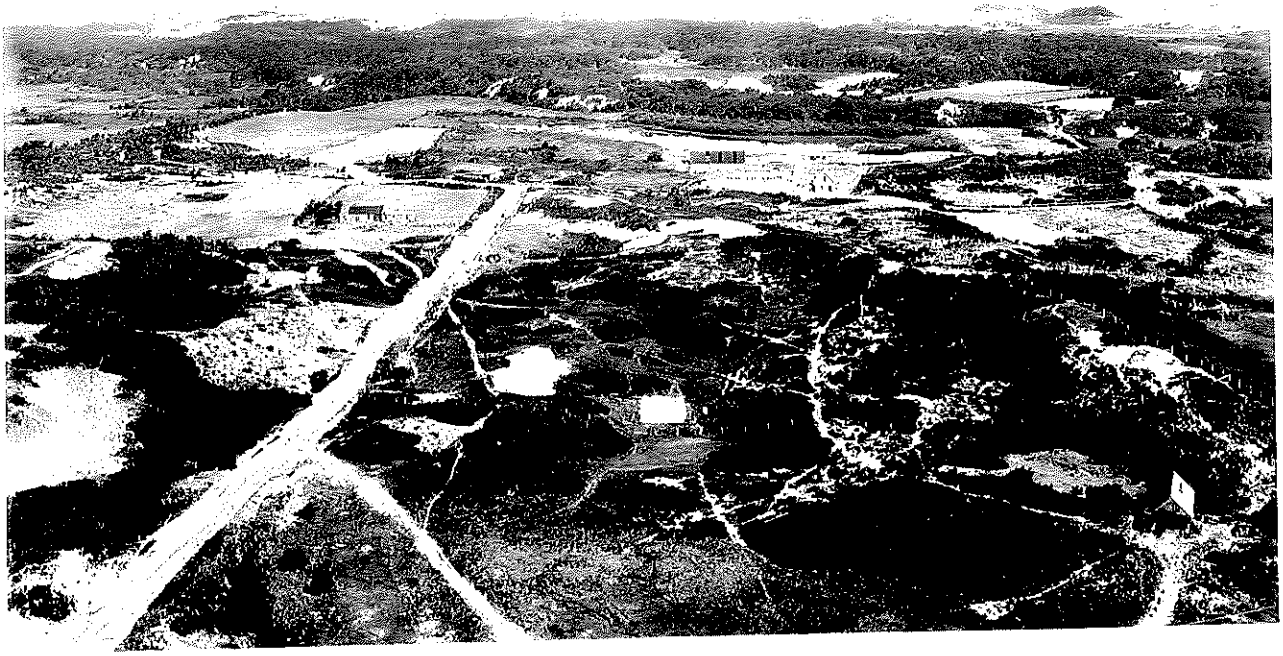
Photo notes:

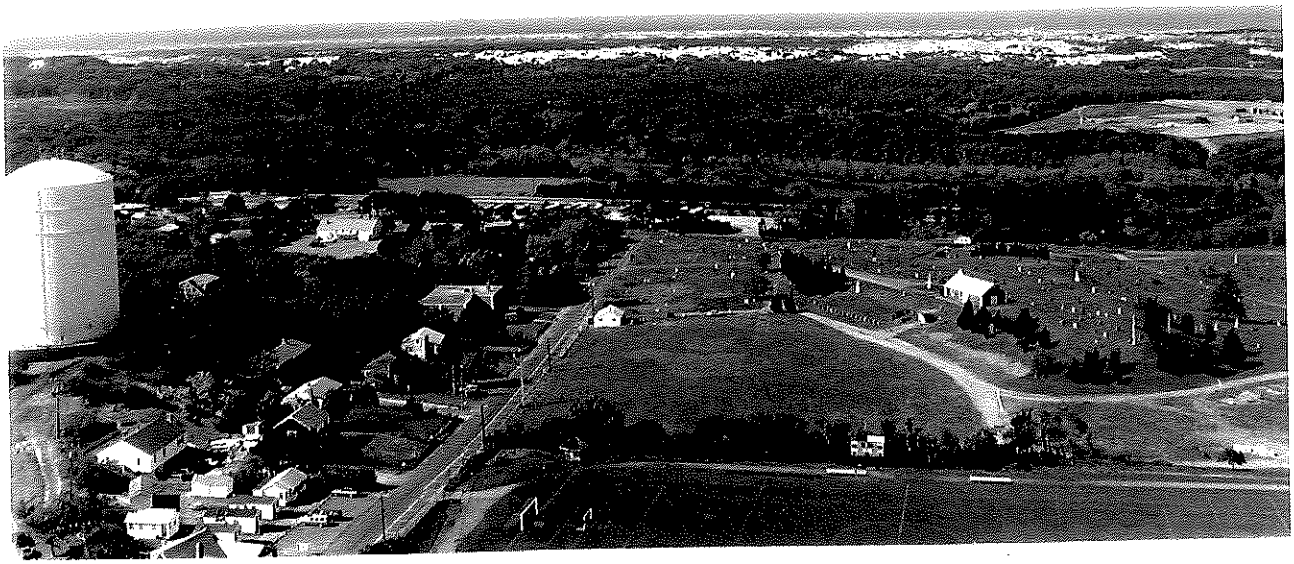
Fire History: Small fires over discontinuous fuels likely, ignited by RR and intentionally set by arsonists, or to encourage blueberries.

Other Photos: See views from Randall, Driver, USGS.

Comments: This "commons" was not well defended for purposes of fire suppression, was overgrazed and depleted of resources continuously.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 55 Town: PR Year: 1916 Priority: a
Location: N from Pilgrim Monument (USGS 1327)
VuType: pan Seashore: in

DOCUMENT SOURCE
Title/Instit: USGS file photos
Photog/Auth: Vaughan, T.W. Author:
Publish: Ref: 8 26 16

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/19/93 Time: 12:00 Film: PX KC Settings: f8.5.6 250 45mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Dunelands, bogs and ponds.

Hist.Cover: Foreground: eroded heathland,grassland, coastal brush. Grazed pasture, icehouse around Bennett Pond. Mixed deciduous woods ending at barren dunelands. Scattered bogs, mowed/grazed fields, cemetary.

PresentCover: Foreground residential/lawns; background: more extensive deciduous woods extending across dunes, bogs; town landfill.

Land Use Notes: Agricultural working landscape now abandoned to forest in the dunes. Succession taking place across formerly barren sand.

Photo notes: Views from Pilgrim monument.

Fire History: 1930s arson fires reported in woodland at edge of dunes around ponds.

Other Photos: USGS 1328-30; SPNEA THompson post card.

Comments: This "commons" was not well defended for purposes of fire suppression. was overgrazed and depleted of resources continuously.

References:



CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 56 Town: PR Year: 1916 Priority: a
Location: W from Pilgrim Monument to Shank Painters Pond (USGS 1329)
VuType: pan Seashore: in

DOCUMENT SOURCE
Title/Instit: USGS file photos
Photog/Auth: Vaughan, T.W. Author:
Publish: Ref: 8 29 16

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/19/93 Time: 12:00 Film: PX KC Settings: f5.6 250 45mm
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Dunelands, bogs and ponds.

Hist.Cover: Small cropped/hayed fields, icehouse; dunes with patchy cover of beach grass, brush, stands of trees around Clapps Pond.

PresentCover: Mixed woodland and brush has filled all remaining unbuilt land up to pond shores.

Land Use Notes: Abandoned low-intensity agricultural land mostly developed or regenerated as forest.

Photo notes:

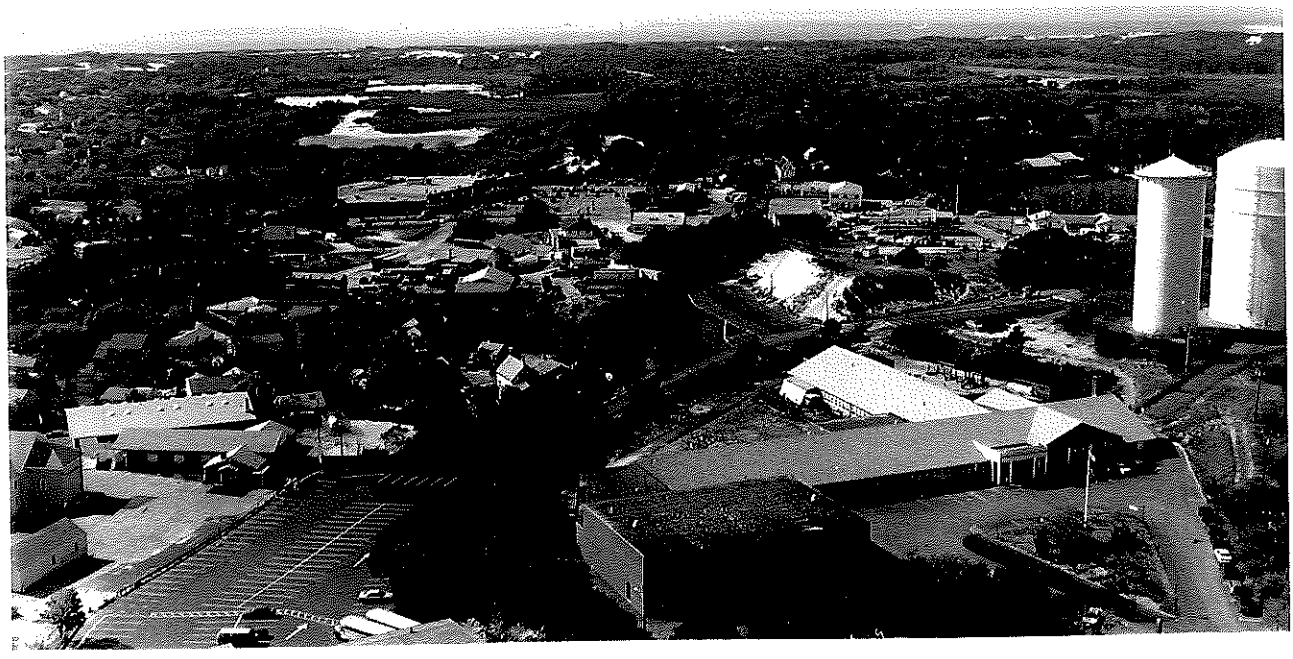
Fire History: Arson fires between town and dunelands reported in 1930s.

Other Photos: USGS 1328-30; SPNEA THompson post card.

Comments: This "commons" was not well defended for purposes of fire suppression, was overgrazed and depleted of resources continuously.

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 57 Town: PR Year: 1962 Priority: a
Location: From Province Lands Rd looking N toward airport (Randall, Fig.2)
VuType: mid Seashore: in

DOCUMENT SOURCE
Title/Instit: Vegetation Cover Type Report. Cape Cod National Seashore
Photog/Auth: Author: Randall, William
Publish: NPS CACO 1962 Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: 10/14/93 Time: 9:00 Film: TX KC Settings: f5.6 250
NewDate2: 8/24/92 Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Provincelands dune fields, interdunal bogs.

Hist.Cover: Scattered (planted) pitch and scotch pine (18-30 yrs old).
scotch broom, other brush, beach grass.

PresentCover: Mixed pine/oak forest, black cherry, beach grass.

Land Use Notes: Provincelands vegetation was apparently cleared and grazed
in the 18th c.; Town acted to prevent erosion in early 19th
c.: State revegetation program began c.1890 through 1930s.

Photo notes: Reshot from small parking lot N of Provincelands Rd.
Location based on map provided with Randall report.

Fire History:

Other Photos: Photos from Clive Driver collection show various stages of
planting and revegetation.

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 58 Town: PR Year: 1930 Priority: a
Location: New Road (Province Lands Road) just completed (17. Same as 15)
VuType: Seashore: in

DOCUMENT SOURCE
Title/Instit: Althea's Large Wooden Scrapbook
Photog/Auth: Author:
Publish: Clive Driver collection Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: Time: Film: Settings:
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform:

Hist.Cover:

PresentCover:

Land Use Notes:

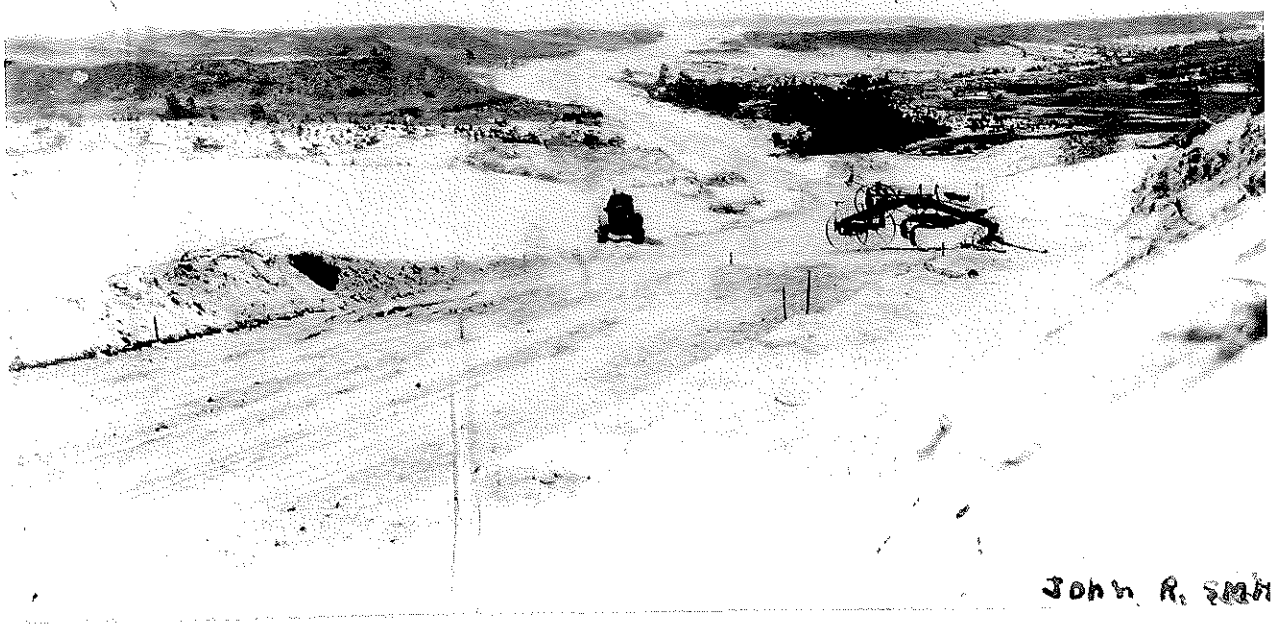
Photo notes:

Fire History:

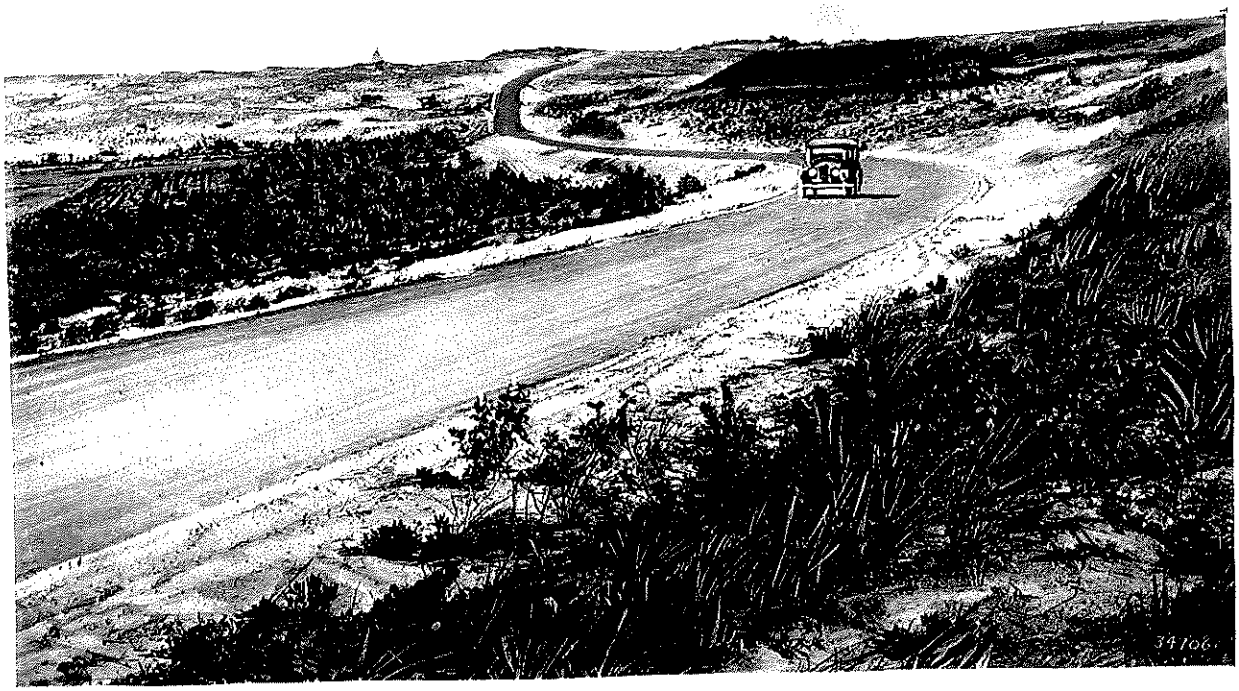
Other Photos:

Comments:

References:



New Road through the Dunes, Cape Cod, Provincetown, Mass.



CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 58 Town: PR Year: Priority: a
Location: New Road. N to PLVC.
VuType: Seashore:

DOCUMENT SOURCE
Title Instit:
Photog/Auth: Author: Driver
Publish: Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: Time: Film: Settings:
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform:

Hist.Cover:

PresentCover:

Land Use Notes:

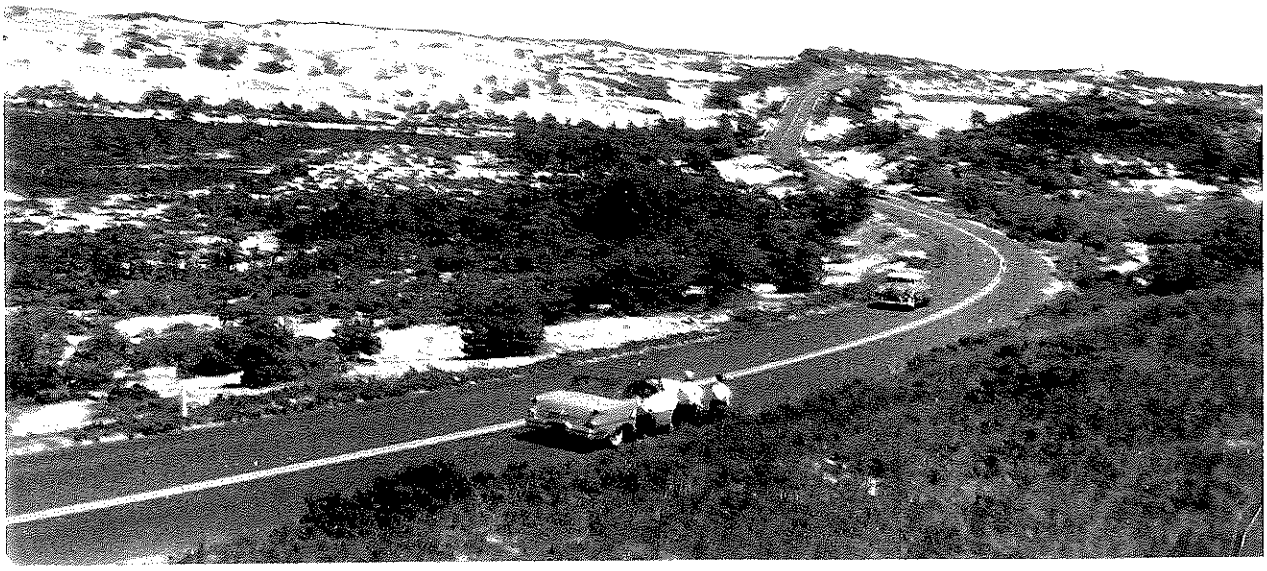
Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 59 Town: PR Year: c1910 Priority: a
Location: Hatches Harbor, dike and Race Pt Light (10)
VuType: pan Seashore: in

DOCUMENT SOURCE
Title/Instit: Althea's Large Wooden Scrapbook
Photog/Auth: John R. Smith Author:
Publish: Clive Driver Collection Ref:

CONTACT
First: Clive Last: Driver Phone:
Affil: personal collection

CONTEMPORARY PHOTO MATCH
NewDate: 10/19/93 Time: 10:00 Film: PX KC Settings: f5.6 250
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform: Dunes and drained estuary.

Hist.Cover: Beach grass, dead branches (ground cover for reveg., fire killed pines, failed plantation material?)

PresentCover: Stunted pitch pine (apparently in plantation rows), black oak, black cherry, bayberry, huckleberry, Rosa rugosa, beach grass, bearberry, Hudsonia, drained tidal marsh.

Land Use Notes: Pines and brush planted beginning c.1890; Hatches Harbor diked 19xx?

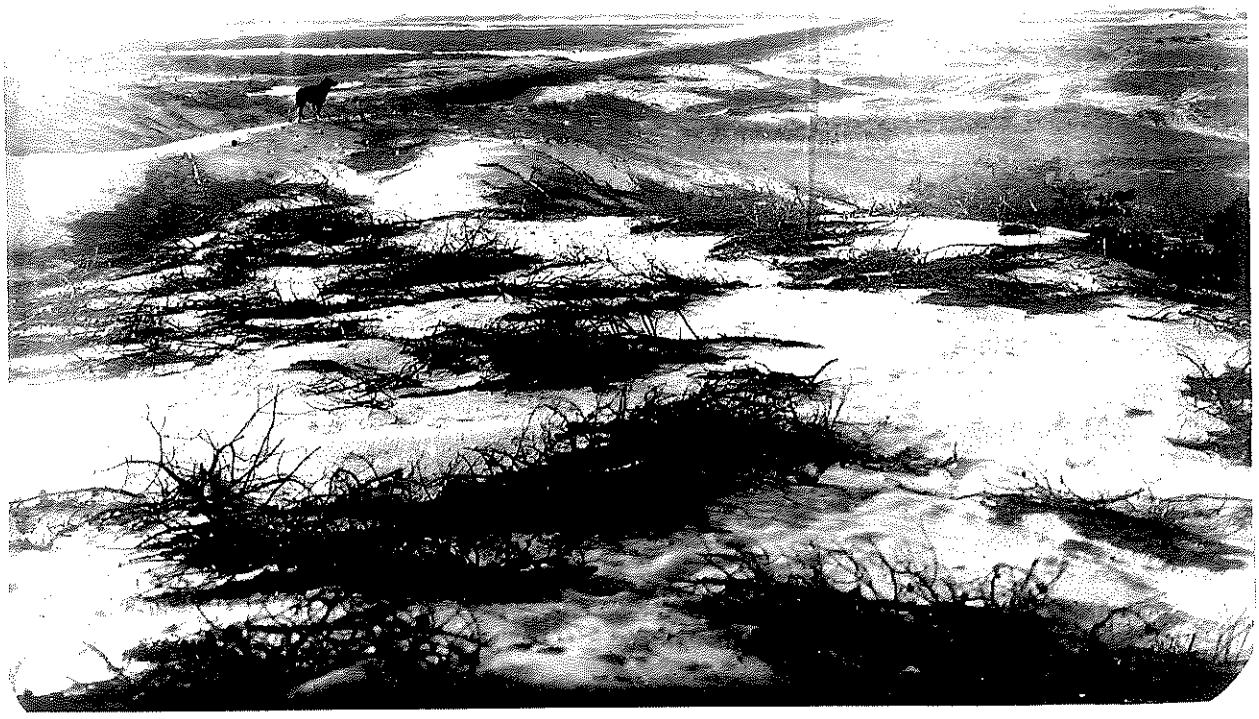
Photo notes:

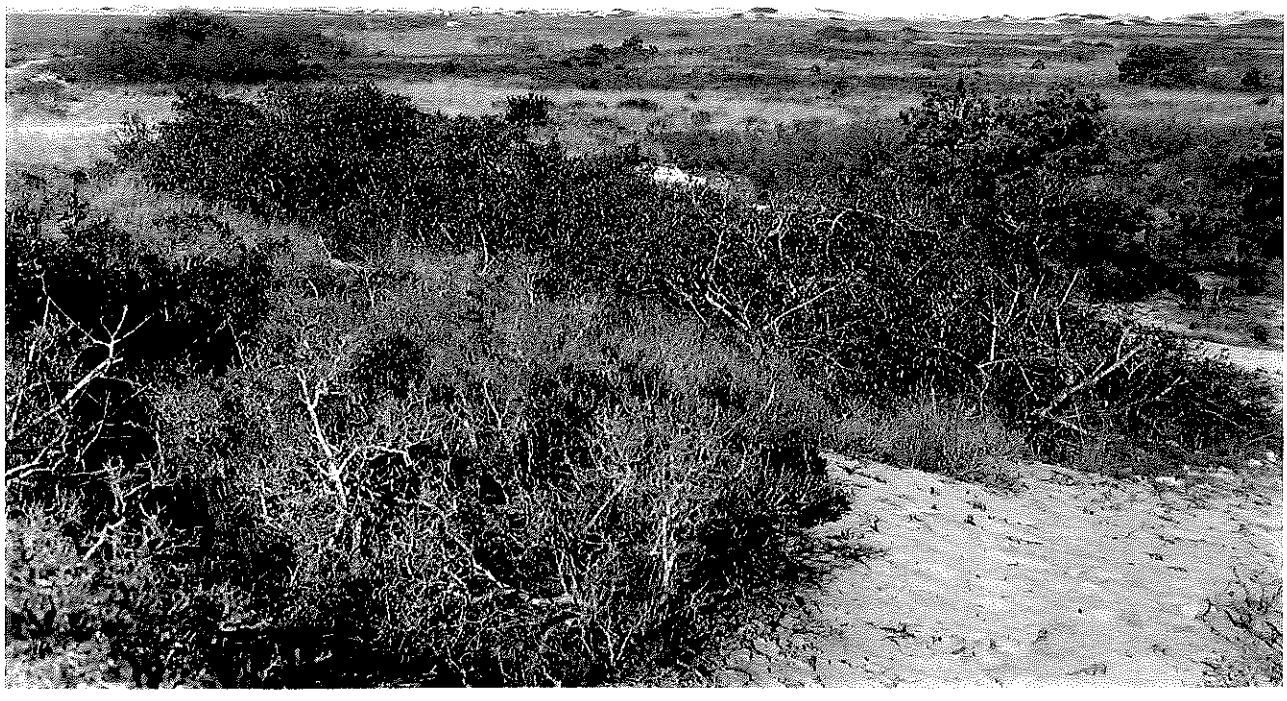
Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 60 Town: PR Year: 1945 Priority: a
Location: Sunset Hill to Race Pt (27,28)
VuType: Seashore: in

DOCUMENT SOURCE
Title/Instit: Althea's Large Wooden Scrapbook
Photog/Auth: Author:
Publish: Clive Driver Collection Ref:

CONTACT
First: Last: Phone:
Affil:

CONTEMPORARY PHOTO MATCH
NewDate: Time: Film: Settings:
NewDate2: Time2: Film2: Settings2:
NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform:

Hist.Cover:

PresentCover:

Land Use Notes:

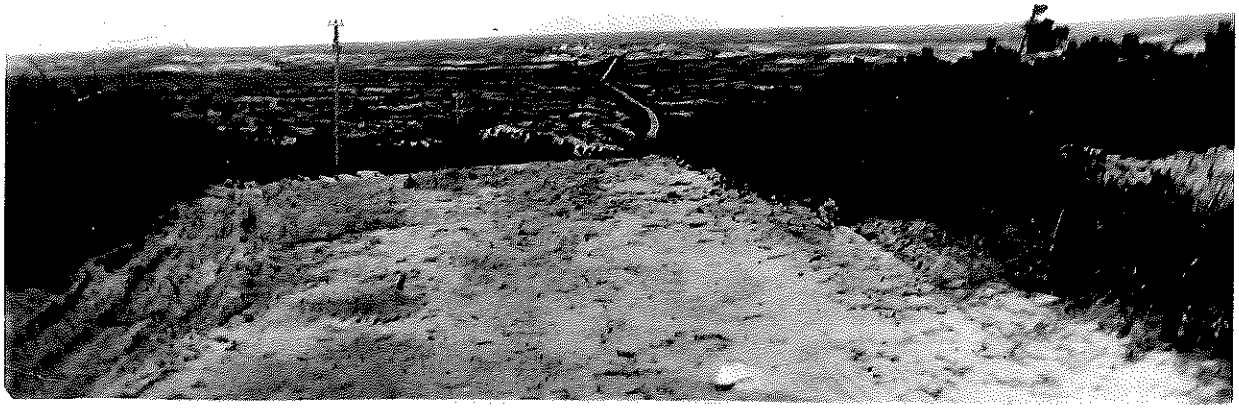
Photo notes:

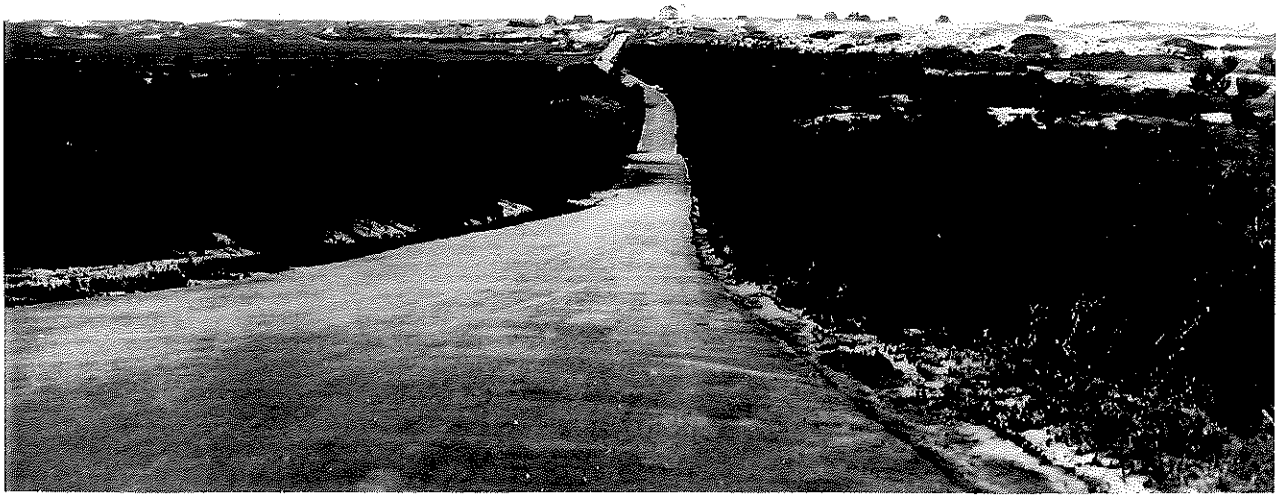
Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 60 Town: PR Year: 1953 Priority: a
Location: Sunset Hill (Grand View) to Race Point (29)
VuType: Seashore: in

DOCUMENT SOURCE
Title Instit: Althea's Large Wooden Scrapbook
Photog Auth: Author:
Publish: Clive Driver Collection Ref:

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CONTEMPORARY PHOTO MATCH
NewDate: Time: Film: Settings:
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NewDate3: Time3: Film3: Settings3:

OTHER DATA
Landform:

Hist.Cover:

PresentCover:

Land Use Notes:

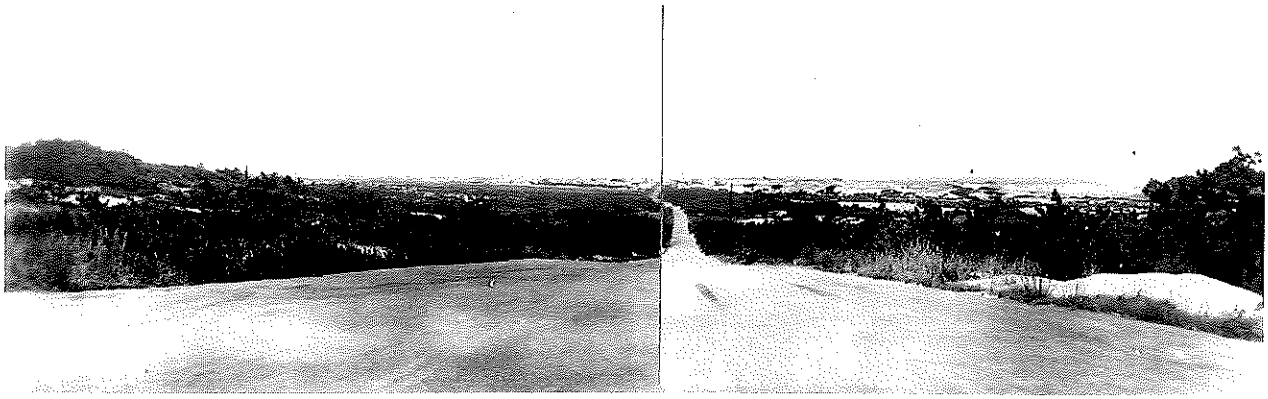
Photo notes:

Fire History:

Other Photos:

Comments:

References:





CACO LANDSCAPE HISTORY DOCUMENT REFERENCE
No: 60 Town: PR Year: 1931 Priority: a
Location: Sunset Hill to Race Point (31)
VuType: Seashore: in

DOCUMENT SOURCE
Title/Instit: Althea's Large Wooden Scrapbook
Photog/Auth: Author:
Publish: Clive Driver Collection Ref:

CONTACT
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Affil:

CONTEMPORARY PHOTO MATCH
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NewDate3: Time3: Film3: Settings3:

OTHER DATA
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Hist.Cover:

PresentCover:

Land Use Notes:

Photo notes:

Fire History:

Other Photos:

Comments:

References:

REPORT
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Dunwiddie
The suppression and landscape change on Outer Cape Cod 1600-1994.

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REPORT
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Dunwiddie
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