

# The Guide's Guide to Cape Cod National Seashore



Canada

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**The National Tourism Foundation in partnership with  
the National Park Foundation, U.S. National Park Service,  
Parks Canada and the National Tour Association**

# *The Guide's Guide to Cape Cod National Seashore*

A Guidebook for Tour and School Group Leaders  
Visiting Outer Cape Cod by Motorcoach





# *The Guide's Guide to Cape Cod National Seashore*

National Tour Association

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This Guide has been made possible by a grant from the National Tourism Foundation and  
the National Park Foundation.

Printed 1997



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The Guide's Guide to Cape Cod National Seashore is one in a series of guides that will focus on national parks throughout North America.

The **National Tourism Foundation** is proud to be working with the **National Tour Association, Parks Canada, National Park Foundation** and the **National Park Service** to produce the Guide's Guide series to national parks throughout Canada and the United States.

The **National Tourism Foundation** was chartered in 1982 to enhance the packaged tour and travel industry in North America. The Foundation's mission is to foster quality tour operator travel services for the traveling public through education, research and industry relations. Its Board of Trustees, which sets policy and direction for the Foundation, consists of leaders from the travel industry, academia, and corporate entities.

The National Tourism Foundation, through its mission, strives to:

- Enhance the quality of education programs and processes in support of a more qualified work force and professionalism in providing travel-related services to the traveling public;
- Improve the quality, scope and use of tour and travel research and resource information for the betterment of planning, developing and marketing of tourism products; and
- Create awareness among the public and related industries of the value of tourism.

The Foundation is a nonprofit 501 (c)(3) organization supported by private endowments, gifts and other personal and corporate contributions.

The **National Tour Association** is an organization of nearly 4,000 North American tourism professionals focused on the development, promotion and increased use of tour operator - packaged travel. NTA serves as a consumer advocate by promoting excellence in all forms of packaged travel.

The **National Park Foundation**, created by the U.S. Congress in 1967, is the official nonprofit partner of the National Park Service.

The National Park Foundation Mission is to:

- Help conserve, preserve and enhance our National Parks for the benefit of the American People.
- Support programs primarily for education and outreach, visitor information and interpretive facilities, volunteer activities and National Park Service employees.
- Generate funds for grantmaking and assistance programs through gifts from private individuals, organizations and a range of fundraising and marketing activities.

The concept of national parks is a unique idea that first developed in the United States. The world's first officially recognized park, Yellowstone National Park, was created by congress in 1872, under the Department of Interior. Under this department, the agency of the **National Park Service** was created by the Organic Act of 1916. It's purpose is to: "Conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Originally set aside for natural, historical and cultural significance, National Parks eventually became important for wilderness preservation, wildlife protection and other ecological concerns. Today the National Park System is comprised of 375 units including National Parks, National Historic Sites, and National Monuments.



## **Prominent Topics**

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## How to Use This Guide

*The Guide's Guide to Cape Cod National Seashore* is divided into three major sections and an Appendix. **Section I** takes you step by step through the National Seashore. It provides a sequential "tour" of the Seashore from south to north—along the same route followed by most motorcoach or bus visitors. In this section, the Seashore is arranged into thirteen key geographic areas. Each area contains a map, location summary, natural highlights, touring script (area overview), and fact sheets on the nature, the history of the area, and the people who helped to shape it.

**Section II** provides additional details on topics summarized in Section I, and more detailed background on prominent Cape Cod personalities and natural history.

**Section III** focuses on emergency information and guidelines for use of Seashore facilities, Park policies, management practices, and other sources for support within the community.

The information contained within this Guide is of a "dynamic" nature. Changes are a natural and constant occurrence on Cape Cod. As scientists and researchers uncover new findings, facts and figures require revision. For this reason, individual components of the Guide are identified by a date of issue located at the bottom left margin of the concluding page of the subject.

The Guide will be updated as necessary and be available periodically. For your convenience, an Order/Feedback Form is located at the end of the Guide.

The Guide provides both capsule and in-depth information designed to meet the time schedules and needs of tour guides. For those with only limited time, one-page touring scripts serve as succinct overviews of the thirteen areas of Cape Cod National Seashore identified in the Guide. For guides who have more tour time and want to prepare for longer presentations, fact sheets provide a comprehensive and detailed account of the history, nature, and present-day scene.

Accordingly, throughout the Guide there are subjects that overlap. This has been done for expediency and accessibility—fact sheets and information sheets can be removed from the binder and used alone. Thus, a tour director and school group leader can select, remove and collate from the manual the subjects he/she would like to program—all to fit in a time schedule. You may wish to duplicate copies of pages you remove and return the originals or the copies to the master Guide.

Another feature of the Guide is that self-guiding trail information has been arranged in a format that can be copied for distribution to group participants (thus alleviating the depletion of free handouts for other users at trailheads).

## *How to Use This Guide — continued*

Pages are numbered in two ways:

1. In sequence at the bottom right of each page—1, 2, 3, etc.—to the end of the Guide.
2. By reference numbers at the bottom of the concluding page of each subject—Guide-124.WP5, Guide-48.WP5, Guide-1.WP5, for example. These guide numbers are not in sequence, but are for reference and updating purposes.

Happy guiding!



# ***Section I***

## **Touring Cape Cod National Seashore from South to North:**

*Fort Hill*

*Salt Pond and Nauset Marsh*

*Doane Rock and Doane Memorial*

*Coast Guard Beach*

*Nauset Light*

*Marconi Station*

*Great Island*

*Bound Brook*

*Kettle Ponds*

*Pamet Valley*

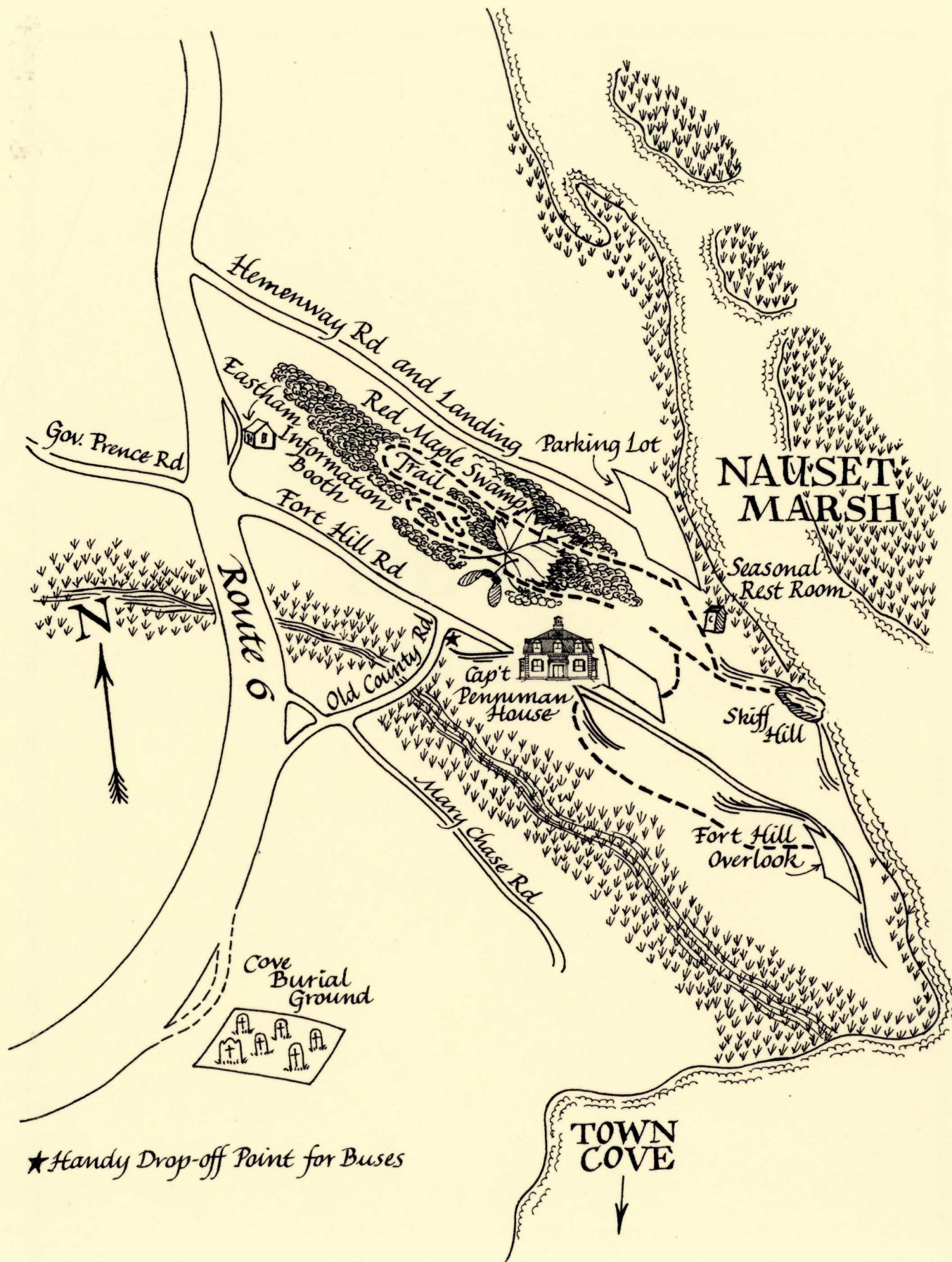
*The Highlands*

*Head of the Meadow and Pilgrim Heights*

*The Province Lands*

# **Fort Hill**

## **Eastham**





## *Cape Cod National Seashore Location Summary*



### **Fort Hill**

- Directions:** Traveling north, Fort Hill (marked by brown and white signs) is to the right side of Route 6, in Eastham, one mile past the Orleans/Eastham rotary.
- Safety:** Parking and turning around are difficult in designated lots. Buses are advised to unload at the junction below the Penniman house. Use extreme caution when returning to Route 6.
- Other:** No restrooms on site. Seasonal restrooms are located near Skiff Hill, a short distance from the town of Eastham parking lot at Hemenway Landing. It may be preferred to wait until reaching Salt Pond Visitor Center.
- Tips:** Start telling the Fort Hill story after leaving the Orleans/Eastham rotary.
- Time Frame:** Five-minute narration on board bus. Ten to twenty minutes if stop is made at the overlook, or for outside tour of the Penniman house and grounds.
- Notes for Educators:** Fort Hill and Red Maple Swamp nature trails are located here. Allow one hour to walk both trails.
- Highlights:** Gateway to Cape Cod National Seashore  
Old Cove Burying Ground (three *Mayflower* passengers)  
Whale jawbone arch  
Penniman House  
Nature trails  
Scenic overviews



## **Fort Hill**

- **The Fort Hill Trail** is a 1½ mile series of connected pathways that lead across fields, through cedar/oak forests, and along the edge of Nauset Marsh. The main starting point is the parking lot across from the Penniman House.
- The ¾ mile **Red Maple Swamp Trail**, which adjoins the Fort Hill Trail, contains a boardwalk loop through the heart of swamp, which is wheelchair accessible from the Hemenway entrance.
- **Skiff Hill**, reached by footpath from the Penniman parking lot, or via a paved walkway from Hemenway Landing, offers magnificent vistas of Nauset Marsh. Exhibit panels describe marsh life, Native Americans and Champlain's visit to the area in 1605. The Skiff Hill site also contains a sharpening rock used by native people for tool maintenance.
- **The Fort Hill Overlook** is located at the end of the roadway beyond the Penniman House. This spectacular vista overlooks Nauset Marsh, adjacent fields, Coast Guard Beach and Nauset Spit. The main inlet into the marsh is prominently visible from this location.
- **Birdwatching** is popular in this vicinity, and both the Fort Hill and Skiff Hill overlooks are superior for this activity. A variety of species can be seen from these locations, ranging from shorebirds working the nearby Nauset Marsh to birds of prey soaring overhead. Common sightings include mergansers and bufflehead ducks in fall and late winter, warblers and various inland songbirds in the spring, and great blue herons and yellowleg sandpipers in summer.
- **An upland portion of Nauset Marsh**, located between Hemenway Landing and Fort Hill, can also be walked, and offers close-up views of mussels, marsh grasses, and other salt marsh life forms.
- **Hemenway Landing** (operated by the Town of Eastham) at the end of Hemenway Road is an excellent area to study tidal flats and salt marsh ecosystems.

**Watch out for ticks and poison ivy in this area.**



### **Fort Hill**

Eastham is the gateway to Cape Cod National Seashore for those traveling north along Route 6. The Park boundary, which extends some forty miles from Chatham to Provincetown, is located just to the right of the roadway.

Also visible after passing the Orleans/Eastham rotary is Town Cove, the first saltwater vista from Route 6 on the Outer Cape.

One mile further on the right is the Old Cove Burial Ground. Three *Mayflower* passengers are buried here, along with other prominent historical personalities. This was also the location of the first Congregational meeting house.

The Town of Eastham was settled by Pilgrims in 1644, but was originally known as Nauset, in recognition of the local natives.

Somewhat further on the right is the Fort Hill area which offers a rich array of natural and historic features. Native Americans frequented this location for several thousand years, living off the diversity of resources provided by the marsh and uplands. When Champlain charted this site in 1605, he drew dozens of beehive shaped huts along the edge of Nauset Marsh, attesting to the area's productivity.

Reverend Samuel Treat, who ministered to both Nauset and Pilgrim settlers in the early 1700's, was given a parcel of twenty acres here, and succeeding generations of Treat, Knowles and Penniman families built homesteads in the vicinity.

When the landscape underwent dramatic changes during the 1800's and the soil became impoverished, local families were often faced with difficult choices. Moving away was one option, going to sea another.

Captain Edward Penniman was a local boy who made good in the whaling industry. As he became more successful, the Captain often took his wife and children to sea with him, and built an elaborate French Second Empire style home at this site in 1867-1868.

The open fields of Captain Penniman's days are now maintained by the National Park Service. The area also hosts a variety of trails and wayside exhibit panels that describe features, such as the area's picturesque Red Maple Swamp, prehistoric sharpening rock at Skiff Hill, and the marine resources of the neighboring Nauset Marsh.





## **Fort Hill/Skiff Hill**

### **Native Americans**

The Nauset Indians, who were living in the Eastham/Orleans area in 1600, were Wampanoags (Algonquin stock). It is not known how long they lived here—perhaps three-to-five thousand years, although earlier settlement sites dating back 8,000 years have been found in adjoining areas. The Nausets were primarily agriculturists and fishermen, supplementing their diet with game. They grew beans, corn and squash. Succotash, a mixture of beans and corn, was the principal dish to which any available meat was added. Shellfish was used extensively.

Houses were of the “beehive” type, historically described by Gosnold (1602), Champlain (1605), and others. These simple structures were built of saplings tied together and covered with sedge grass. Beds were simple—slightly raised bunks, with skin or grass covered padding. Wooden bowls and spoons, baskets, and conical clay pots (bullet shaped) were fashioned by the squaws. Projectile points, scrapers, knives, stone axes, and harpoon heads were made in profusion.

Until September 1965, a twenty-ton granitic glacial boulder, used by Native Americans for tool sharpening, was located on the marsh just south of Hemenway Landing. Due to shoreline retreat, the boulder was almost lost in the marsh, so it was moved about 100 feet to the top of Skiff Hill. The original site is now under water. Studies revealed that the stone was probably used for sharpening bone items such as harpoon heads and fishhooks (note the long, moon-shaped grooves) and stone axes (wide, smooth depressions which, in some cases, show “pecking” to make them rough).

### **Samuel De Champlain**

Before this was New England, it was known by the French as New France. In 1605, a French expedition under the leadership of Sieur de Monts, with Champlain as cartographer, sailed from St. Croix, in Acadia, to find a more suitable location for the struggling French colony. The voyage of exploration took them south along the New England coast until July 20, 1605, when they dropped anchor at Port de Mallebarre—or Nauset Harbor. It was a provident world. The soil supported cultivated crops, fresh water was at hand, and, if one knew how, the bay yielded a rich harvest. The Nausets reaped this concentration of energy, and, over the years, used it to build their extensive settlement.

Champlain carefully prepared a map of the harbor on which he noted Indian villages, fish traps, corn fields, etc. As his map of 1605 shows, Nauset Harbor was *entirely surrounded by little houses around each one of which was as much land as the occupant needed for his support ... Before reaching their cabins, we entered a field planted with Indian corn ... (which was) five and a half feet high—their cabins are round and covered with heavy thatch made of reeds.*

## *Fort Hill/Skiff Hill — continued*

### **Fort Hill**

Fort Hill was the highest point adjacent to the meetinghouse erected by Pilgrim residents of Nauset (later called Eastham) shortly after they settled the area in 1644. Scholars still speculate on the naming of Fort Hill, but similar names were given to high points at other settlements along the eastern seaboard during that time period. A hill of this sort would serve as a natural point of defense (with or without a structure) from which defenders could shoot downward at attackers. The most probable threat to the Pilgrim residents during that time period was from fellow European settlers such as the Dutch in New Amsterdam (New York).

Some of the farmland in this area was undoubtedly the former property of Governor Thomas Prence (Prince) who governed the colony from Eastham for some years. The Reverend Samuel Treat was called to Eastham in 1672. He also owned about twenty acres of land at Fort Hill. The boundaries were marked by a stone inscribed with a “T”, and the northwest marker still exists.



Treat, the son of the governor of Connecticut, became famous as a preacher and defender of the “Praying Indians.” While serving his Eastham parishioners, he worked to win the confidence and support of the Indians by learning their language and attending their feasts. He was so successful, there were 500 praying Indians under his protection. These Indians maintained their own villages within Eastham, their own churches, schools, magistrates and courts. Reverend Treat labored throughout his life to improve the welfare of the Indians, and encouraged others to follow. The good preacher died at the height of a blizzard in 1717.

Few objects in this era were not used as resources. Salt hay was harvested from the marsh in barges; the Atlantic White Cedar Swamp south of Fort Hill and the Red Maple Swamp were cleared of trees; and as local wood disappeared, an Irish-born minister taught residents how to dry and burn peat. Even the salt of the sea was gathered—first by boiling (a costly, wood-consuming practice), and then by solar evaporation. This activity grew until in 1830 salt vats dotted the water’s edge of Nauset Marsh.

Changes occurred. Within three decades of settlement, the Eastham forests had become the Eastham plains. Only at Fort Hill was there any semblance of soil. Dairy farming continued here until the 1940’s, and now, again, a forest creeps in. But the pastures are still kept open as a reminder of those yesterdays.





## **The Pilgrims in Eastham**

### **First Sightings of the New World**

Eastham is a centerpiece of the Pilgrim story. The first sighting of the New World from the *Mayflower* was the Eastham shoreline. The scene was met with prayerful jubilation. It was also near here that the *Mayflower* encountered the Pollock Rip, and nearly sank. It was then that the Pilgrims elected to settle in New England rather than continue south (to the northern extent of Virginia Colony) where they were originally authorized to establish their colony.

After the *Mayflower* anchored in the vicinity of Provincetown harbor, and the Mayflower Compact was signed on November 11, 1620, explorations were initiated. Three “discoveries” (expeditions) were subsequently made, the first two in the Provincetown and Truro areas. The “Third Discoverie,” starting out on December 6, consisted of a band of ten Pilgrims and eight sailors under the direction of Captain Myles Standish. The group used the company’s oar and sail powered shallop to voyage southward, eventually making landfall on the bayside flats of Eastham. At this point they set up camp for the night. The next day was spent exploring. A number of native dwellings were observed, but no contacts were made. A second night was spent on the beach, but with more dramatic consequences. In the early morning the Pilgrims heard loud “whooping” and “hollering” noises, and with much confusion, took up defensive positions. Shots were fired by one side and arrows by the other. In the dazed aftermath, amazingly, there were no injuries to report on either side. It was a frightening, but nonrecurring incident (probably based on the Pilgrims’ earlier pilfering of native corn reserves and dwellings). The Pilgrims named this place “First Encounter.” The “Third Discoverie” party continued westward in the shallop, despite bad weather, to an area known previously by the *Mayflower*’s pilot, Robert Coppin, as Thievish Harbor. The open fields and proximity to fresh and navigable water made this site their choice for settlement—hence the beginnings of Plymouth Colony. But it was not long after that some of the original Pilgrims desired to return to Cape Cod, and more specifically the Eastham area.

### **Another Departure**

In April of 1644, seven families obtained permission to depart from the Plymouth area to resettle in the Nauset area of Cape Cod. It was originally hoped to resettle the entire Plymouth township, with its leadership and authoritative functions as well, to the Nauset area, but this was determined unfeasible. However, seven families felt the need to move onward, and so took advantage of this parcel of Cape Cod which was one of only three remaining tracts set aside for the “Old Comers” of Plymouth Colony. And thus, the Court of Plymouth granted that *all those that goe to dwell at Nosett be given ... all the land between sea and sea*. At first the area was known as Nauset, sometimes spelled “Nosett” or “Nawsett.” Within two years the settlement was incorporated. An undated list of freemen in the 1640’s includes the names of Thomas Prence, John Doane, Edward Banks,



## **The Pilgrims in Eastham**

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## *The Pilgrims in Eastham — continued*

Nicholas Snow, John Jenkins, Josiah Cooke, Samuel Hicks, John Smalley, and Richard Higgins. On June 7, 1651, the Plymouth Court ordered the town's name changed to Eastham (based on various petitions).

Nauset soil was reported to be the best soil in the colony, and attracted a number of prominent citizens. Unfortunately, over-exploitation of the soil and forests eventually led to degradation of the local environment. But in the early days of settlement, there was prosperity. Tracts of land given out here were designed to provide settlers with bay, ocean, forest and field resources, often granted in linear strips—thus accounting for why Eastham does not have a well-defined “town center.”

Three *Mayflower* passengers selected Eastham as their final settlement, and are buried in the old Cove Burying Ground. They were Constance Hopkins Snow, Giles Hopkins, and Joseph Rogers. Constance and Giles were both members of the Hopkins family (brother and sister), a “stranger” family that boarded the *Mayflower* (i.e. not part of the Pilgrim Old World congregation). Joseph Rogers was a lieutenant, under Myles Standish, in the colonial militia. It is hard to imagine what these pioneers thought when looking out to sea from the Eastham shoreline and reflecting on that first vista of this landscape while on board the *Mayflower* in 1620.

Another prominent citizen was Thomas Prence. Prence arrived in 1621 on the *Fortune*, at the age of 21, and quickly rose to prominence, becoming one of the eight Plymouth Colony “Undertakers” (financial overseers) in 1627. He was appointed governor in 1634, and served as either governor or assistant governor until his death in 1673. He was one of the original settlers of Eastham, holding extensive acreage in the Fort Hill area, and purportedly ran the colony at times from his Cape Cod residence. In 1665 he was required by the Court, as an official, to reside in Plymouth, for which he was compensated. With the death of Governor Bradford in 1657, Prence became the most influential personality in the colony.

### **Prominent Pastor**

The Reverend Samuel Treat was another prominent citizen in the early days of the town. He was born in Milford, Connecticut in 1648. He graduated from Harvard in 1669, and spent some time in New Jersey along with his father and other relatives. In 1672 he was called to become the pastor of the church in Eastham. His starting salary was fifty pounds, with enough wood for his use to be brought to his door. He also received parcels of meadows, marsh, an island at Billingsgate, and twenty acres of upland and a house at the head of Town Cove (Fort Hill area). Reverend Treat was renowned partly for his harsh, howling sermons, but equally for his earnest and compassionate nature. He treated the local Nauset Native Americans as full members of the community, and extended his service to them. In 1693 there were reportedly five hundred natives to whom Reverend Treat preached. It was written, *knowing that he could not make much impression on the Indians without first gaining their affections, Mr. Treat not only treated them with great kindness on all public occasions, but also visited them at their homes, and joined in their festivals. In that way he gained their good favor.*



## **The Penniman House and Family**

The Penniman House was built at the end of the Victorian Age and styled after the French Second Empire Period (1855-1870). The house was designed by an unknown architect, built by local artisans using the finest available materials, and sited on land purchased from Captain Penniman's father.

Completed in 1868 for the family's use while the Captain continued his whaling career, the house included every known comfort and many innovative ideas. The foundation was laid on the existing ground, the basement walls built up, and fill brought in to raise the surrounding land by eight feet. This provided excellent drainage, insuring a dry basement, and raised the windows of the cupola high enough for the Captain to observe the ships passing in both Cape Cod Bay and the Atlantic Ocean.

The first floor contains a parlor, sitting room, dining room, kitchen and pantry. A center hall divides these rooms and contains the stairs to the second floor. A rear door gives access to the kitchen and the back stairs.

Upstairs, four bedrooms are separated by a center hall. A small bathroom and stairs to the attic and cupola are at the rear.

Two chimneys served the wood/coal stoves in the eight rooms. By 1897, a coal-fired furnace was installed in the basement, with pipes running to the parlor, sitting room and dining room. Floor grills are still visible in each of the rooms. The stoves continued to be used as supplementary heat in the spring and fall. About 1915, all the stoves except the kitchen range were removed, and the three-pipe furnace was replaced by a central coal-fired warm air furnace in the basement with a floor grill in the center hall. By 1940, the coal furnace was replaced by the existing oil furnace.

A novel washwater collection system supplied the kitchen and bathroom. Drinking water came from a deep well in the rear yard. This house had the first kitchen and bath with indoor plumbing in Eastham and the first indoor flush toilet in town.

Carpeting, stained glass windows, fine woodwork, running water and an efficient heating system made it one of the finest homes in town.

The Penniman family enjoyed this fine home for nearly one hundred years, except when the captain was at sea or when Mrs. Penniman took each of the children along on one of the whaling voyages.

Mrs. Penniman's family occupied three homes adjacent to the Penniman house. Her parents' home was located where the parking lot is today. Sylvanus Knowles owned the house across the road from the Penniman house, and Seth Knowles had the big house at the bend in the road where the road ascends Fort Hill. The Knowles family farmed the land between Fort Hill and Skiff Hill to the north. Some of this land was originally given to Reverend Treat, the first minister in Eastham, and before that, had a long history of Native American use.

## *The Penniman House and Family — continued*

### **The Life of Captain Edward Penniman, 1831-1913**

- 1831 Born at Eastham, August 16, the second of nine children of Betsey (Mayo) Penniman.
- 1842 At age 11, shipped as cook on a schooner bound for fishing on the Grand Banks. Wrecked near Nauset Light, crew and cargo saved. Continued as a local fisherman until 1852.
- 1852-1855 Boatsteerer on the whaling bark *Isabella*, 3 years, 2 months.
- 1855-1859 Mate on the whaler *Minerva*, 3 years, 10 months.
- 1859 Married Betsey Augusta Knowles of Eastham, daughter of William Freeman Knowles, Jr. and Betsey Augusta Doane Knowles.
- 1860-1864 Captain of the whaler *Minerva*, 3 years, 11 months.
- 1860 Son Eugene Blanchard Penniman born at Eastham, September 11, 1860.
- 1864-1868 Captain of the whaler *Minerva*, 3 years, 5 months. Narrowly avoided capture by the Confederate raider *Shenandoah* in the Arctic. Mrs. Penniman and Eugene along on this voyage.
- 1867-1868 The Penniman house was built on Fort Hill Road in Eastham.
- 1868 Daughter Betsey Augusta Penniman born at Eastham, September 2, 1868.
- 1870 Son Edward Damon Penniman born at Eastham, March 25, 1870.
- 1874-1875 Captain of the whaler *Cicero*, 1 year, 7 months.
- 1876-1879 Captain of the whaler *Europa*, 3 years, 2 months. Mrs. Penniman and Edward along on this voyage.
- 1881-1884 Captain of the whaler *Jacob A. Howland*, 3 years, 1 month. Mrs. Penniman and Betsey along on this voyage.
- 1884 Retired from the sea to the family home at Eastham at age 53, hoping for ten years of retirement as a gentleman farmer.
- 1913 Died at home, October 16. Buried in Evergreen Cemetery, Eastham.

During the 32-year period between 1852 and 1884, each of Captain Penniman's seven voyages averaged three years, two months, for a total time at sea of over 22 years. Mrs. Penniman spent more than nine years at sea over a twenty year period. Captain Penniman's vessels produced 4,237 bbls. of sperm oil, 12,096 bbls. of whale oil, and 166,871 lbs. of whalebone.

After the Captain's death, Mrs. Penniman and their daughter, Betsey, occupied the home until Mrs. Penniman's death in 1921. Betsey Penniman, who never married, raised her niece, Irma. Upon Betsey's death in 1957, the home was left to Irma Penniman Broun. Irma and her husband sold the house with twelve acres to the National Park Service in 1963 when the Cape Cod National Seashore was formed.

After the sons, Eugene and Edward, had completed their careers, they retired to the home in Eastham until they died. All are buried in Evergreen Cemetery, Eastham.





## **Background of Penniman House**

### **Architecture**



The Penniman House was built by Captain and Mrs. Edward Penniman in 1868. The most conclusive documentation for this date of construction is the entries in Captain Edward Penniman's account book for the expenses he incurred building the house from June 17 through December 8, 1868. Original drawings and specifications for the house also exist; unfortunately, they bear neither the signature of the architect nor a date.

The last two pages of the specifications, where the date and name of the architect probably were written, have been lost.

The Penniman House is a 2½ story, wood-frame structure with a mansard roof. The mansard roof is the characteristic feature of French Second Empire style architecture in mid-19th century America.

Although the architect of the Penniman House remains unknown, it seems likely that a Boston architect prepared these drawings and specifications. The theory that the plans for the house were either brought by the Captain from France, or ordered by him directly from France, is completely unfounded. There are no records of Captain Edward Penniman ever traveling to France. From September 11, 1864, to April 2, 1868—the years immediately preceding the building of the house—Penniman served as Captain of the *Minerva*, and was on a whaling voyage around the world.

The master builder of the Penniman House was Nathaniel Nickerson. His name is written on the back of one of the original drawings of the house, suggesting that they were the drawings and specifications from which he worked. Nathaniel Nickerson was also the most highly paid of the men who worked on the construction of the house.

### **Setting**

The property that Captain Penniman purchased from his father in 1867 consisted of approximately twelve acres of land, on which were located a dwelling house, two barns, and several outbuildings.

By 1880, however, all of the pre-1867 structures had disappeared. The earliest photograph of the property shows only the present house and the mansard-roofed barn built by the Pennimans in 1880. The old house, barn, and woodhouse thus must have been taken down between 1878 and 1880.

Soon after the barn was built, a greenhouse was constructed along the north wall of the courtyard. It was a rectangular structure of wood and glass that extended along the full length of the courtyard's north stone wall. With the building of this greenhouse,

## ***Background of Penniman House — continued***

Captain Penniman appears to have completed his master plan for the property; all of the old buildings had been demolished, and three new structures erected.

In the 1920's, the greenhouse was destroyed in a hurricane; it was not rebuilt. With this exception, the property retains its late 19th-century site plan.

### **Interior**

The interior layout consists of four rooms on the first floor, two on each side of a central hall, four bedrooms and a bathroom on the second floor, a finished bedroom in the attic, and a cupola above. The interior woodwork and finishes are ornate and of high quality. Windows in the southwest parlor, northwest parlor, and dining room have molded, recessed panels below them extending from window apron to baseboard. The front stair has a handsome mahogany newel, handrail, and turned balusters. Doors on both the first and second stories have fine, hand painted grained finishes. The northwest parlor retains the design scheme applied when the flocked wallpaper and ceiling paper were hung in 1885.

The house was built with interior plumbing. The kitchen contained two sinks, and a full bath was located on the second story. Water was supplied to this system by two cisterns, one located in the attic and the other underground at the northeast corner of the house. The kitchen retains its original marble sink and cabinet.

The original heat source for the house was eight wood or coal stoves. They stood in front of the marble mantles in each of the rooms, and were piped directly into the two chimneys. In the 1890's, a three-pipe, coal-fired furnace was installed to supplement the stoves. Floor grills are still visible in the parlor, sitting room and dining room. In the early 1900's, the furnace and all the stoves (except the kitchen range) were replaced by a central coal-fired warm air furnace with a floor grill in the center hall. Later, the coal furnace was replaced by the existing oil furnace.

When first built, the house was lighted with kerosene lamps. Electricity was introduced in the 1930s, but most of it was removed when the house was restored.

In the 1980's, the National Park Service installed reproduction wallpaper based on original designs documented by photographs and physical remainders. A collection of some one hundred glass plate negatives of turn-of-the-century scenes of the house and family serve to allow visitors to the house to envision how rooms were furnished and life was lived in the Penniman family days.





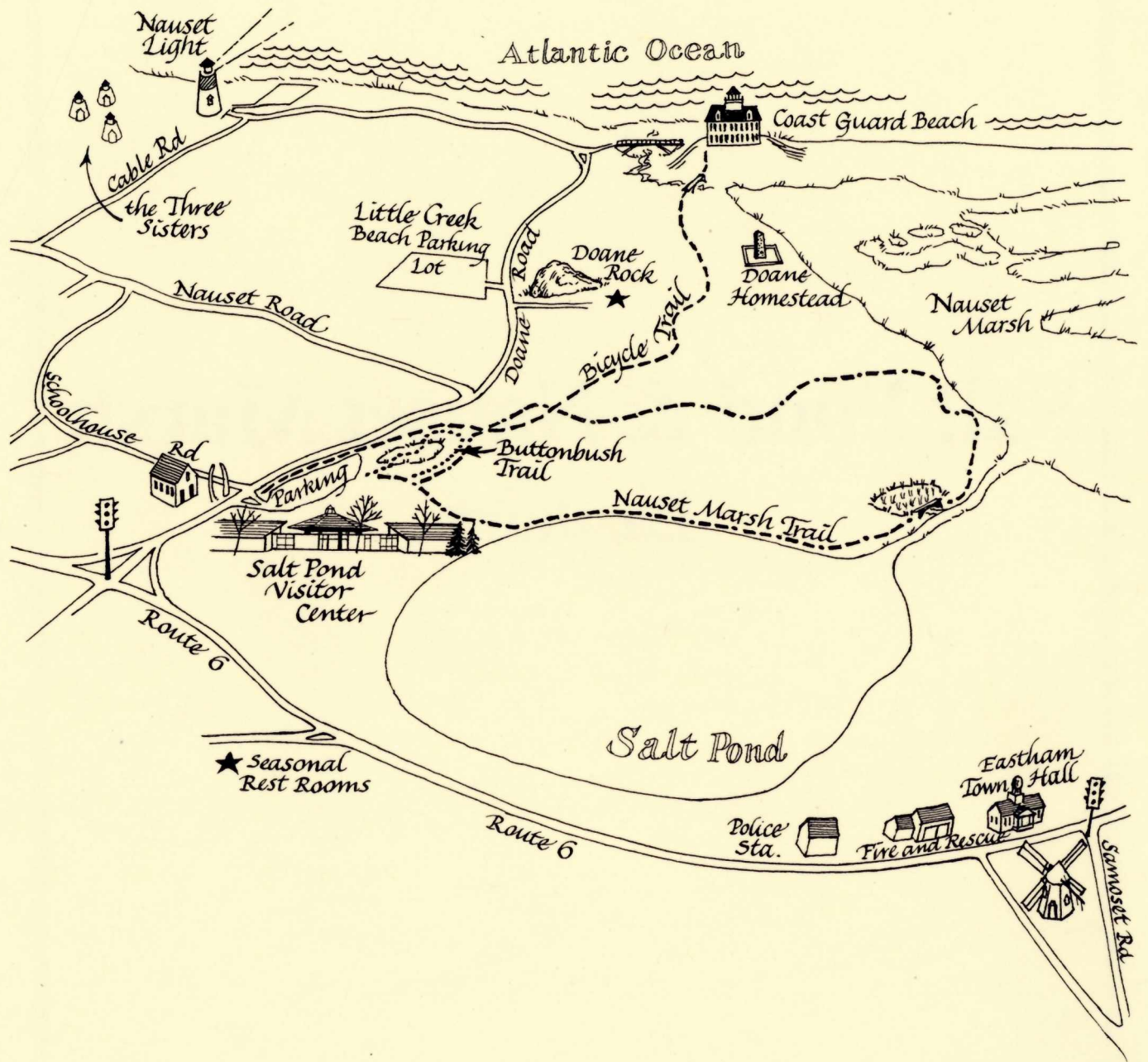
## **Fort Hill Trail Guide**

The Fort Hill Trail is 1½ miles long. It connects with the Penniman House, the Red Maple Swamp and Skiff Hill by walking in the following sequence (from the parking lot across from the Penniman Family Home):

- 1) Cross the road and walk to the Penniman house. This is the home of Captain and Mrs. Edward Penniman, and is Eastham's best example of 19th century Victorian era architecture. The Pennimans built the house here in 1868 because of the marvelous view of the ocean and bay. Penniman was a very successful whaling captain.
- 2) Walk down the trail to the barn where a horse and cow were kept. After he retired from whaling, Captain Penniman farmed a few acres of land. He would probably be called a "gentleman farmer" today because he did not depend on farming for a living.
- 3) About 200 feet down the trail notice some fruit trees on the left. These are survivors from the Penniman's orchards.
- 4) In the fields to your left is a farm house. Built by an early member of the Knowles family about 1826, this is the oldest house in the vicinity. The earliest Knowles probably obtained their original twenty acres for farming from the Treat family.
- 5) Proceed uphill to the Fort Hill overlook. To the right is Town Cove. Nauset Marsh lies before you, and beyond the dunes is the Atlantic Ocean. Native Americans were the first people to live in the area. In the 1600's, they lived in beehive-shaped huts around the marsh. In 1605, French explorers (including Champlain) sailed into Nauset Harbor (now Nauset Marsh). They were searching for a more suitable place to settle than their site in Canada. The shallowness of the harbor and the presence of many natives discouraged them. Pilgrims from Plymouth Colony settled here in 1644. The town was called Nauset (the old Indian name) and was one of the four original towns founded on Cape Cod (the others being Sandwich, Yarmouth and Barnstable). These first settlers were attracted to the Nauset area by the abundant forests, the fresh water springs, and rich soils to be found here. After the land was cleared, however, farming began and the good soil was quickly "used up." When the land no longer produced crops, the fields were used as pasture for cattle, goats and sheep. But this too had a severe effect upon the land. Overgrazing had become a problem in Eastham.
- 6) Walk down to the large boulder before you. This boulder, a glacial erratic, was possibly used by settlers for anchoring and pulling in barges containing salt marsh hay. Salt marsh grasses were cut and brought to the shore by barges or by horsedrawn wagons. The dried hay was used to feed livestock. Nauset Marsh has been developing for several hundred years. It is being built up by silt, sand and decomposing marsh grasses. Salt marshes produce food for ocean fish, birds and other wildlife, as well as for humans. Decaying marsh plants and animals become food for microscopic animals in the marsh which, in turn, are fed upon by small fish. They then become

# **Salt Pond & Nauset Marsh**

## **Eastham**



## *Cape Cod National Seashore Location Summary*



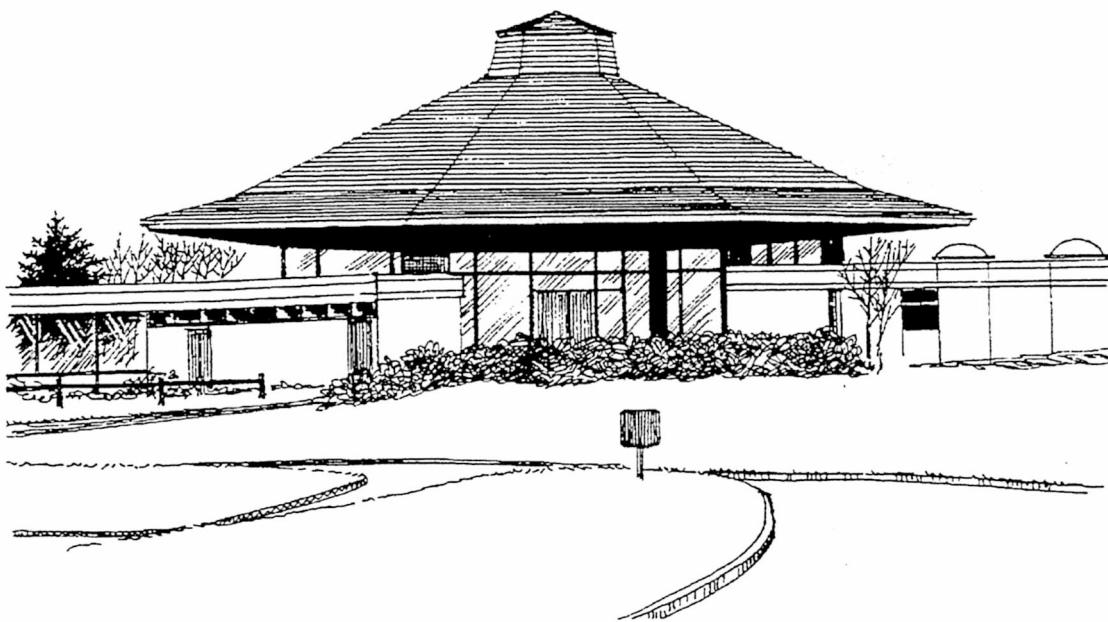
### **Salt Pond and Nauset Marsh**

- Directions:** At the second stoplight in Eastham, turn right off Route 6 (look for brown and white Visitor Center sign).
- Safety:** Observe posted speed limits (this section of road can be congested at times). Do not unload at Visitor Center main walkway (use designated unloading zone).
- Other:** Restrooms available year round. Large numbers of passengers, however, can cause long lines.
- Tips:** Most vistas of the area will be to the right, with the exception of the Eastham Windmill, which is to the left, just past the first set of traffic signals (directly across from the town hall and fire station). Salt Pond Visitor Center is a primary orientation facility for bus groups. It offers restrooms, bookstore, museum exhibits and orientation films on the hour and half-hour.
- Time Frame:** 45 minutes to one hour. (If congested during morning hours, groups may wish to return in the afternoon, after touring northern half of the park.)
- Notes for Educators:** Salt Pond Visitor Center is an excellent starting location for field trips. Special videos (e.g., plovers, archeology and marine debris) can be shown on the lobby TV monitor, if time/staffing permits. Salt Pond and the Nauset Marsh and Buttonbush Trails are adjacent to the Visitor Center. Plan on one to 1½ hours to walk them. The outdoor amphitheater is a good spot for lunch (please recycle and securely bag all trash).
- Highlights:** Eastham Windmill (oldest operating windmill on Cape Cod)  
View of Salt Pond (to the right of Route 6)  
Salt Pond Visitor Center  
Nauset Marsh  
Nauset Marsh Trail  
Buttonbush Trail (with features for the visually impaired)  
Old Schoolhouse Museum (across from Visitor Center; operated by Eastham Historical Society)



## **Salt Pond and Nauset Marsh**

- **The Nauset Marsh Trail** is a 1½ mile loop trail that skirts the edge of Salt Pond and Nauset Marsh and returns through transitional forests and fields (once a golf links and previously farmed land). The trail starts directly below the Salt Pond Visitor Center. The area is well-suited for studies of salt marsh ecosystems and upland plant succession. The area is also excellent for birdwatching.
- **The Buttonbush Trail** is a multi-sensory ¼ mile loop trail which highlights nonvisual features. It provides a guide rope and text panels in Braille and large lettering. Groups often have students wear blindfolds (made of strips of cloth) while walking the trail. A teacher (or nonblindfolded student) then reads the text. Students often remark that this is one of the most memorable experiences of their trip.
- **Salt Pond** is a forty-foot deep glacial kettle hole that has been breached by the sea, hence it is a tidal saltwater body. The margins of the pond offer a broad and stable wrack line that is easy to walk on and allows for close-up observation of salt marsh grasses, flats and edge communities.
- **Salt Pond Visitor Center** offers a variety of natural history educational resources. The Park's main orientation film, *The Sands of Time*, on the geological formation of Cape Cod is shown regularly. A touch box with shells and other natural items of interest is located in the hallway, and the main museum hosts a variety of exhibits on Cape Cod natural resources. On occasion, topical educational video tapes (e.g., piping plovers, marine debris) are shown on the TV monitor in the Visitor Center lobby.







## **Salt Pond and Nauset Marsh**

Nauset, the name of the local Wampanoag natives, was the first placename selected by the English settlers who came here from Plymouth in 1644. The town's name was later changed to Eastham, but many reminders of the original namesake remain.

One of the most prominent is Nauset Marsh, the dominant natural feature of the area.

Traveling northward (on Route 6), the first historic feature visible in this area is the Eastham Windmill (located to the left of the roadway).

A quarter-mile further on the right is the first view of Salt Pond, a tidal pond adjoining Nauset Marsh. The scene unfolds further at the Salt Pond Visitor Center, which offers a spectacular view of Salt Pond, Nauset Marsh and the ocean horizon.

### **500,000 Visitors a Year**

The National Park Service built the Salt Pond Visitor Center in 1965, and it has served close to 500,000 visitors annually ever since. It is Cape Cod National Seashore's main visitor facility, with orientation movies on the half hour, a well-stocked bookstore, a comprehensive museum and restroom facilities. The museum features exhibits on both the Cape's natural and cultural history, and is a popular starting point for travelers.

Just outside the Visitor Center are two popular nature trails. The 1½ mile Nauset Marsh Trail skirts the Salt Pond and provides vistas of Nauset Marsh and Nauset Spit. The Buttonbush Trail, a shorter ¼ mile pathway, is a multisensory trail featuring a guide rope and text panels printed in large lettering and Braille.

The Salt Pond is a tidal basin that feeds into the Atlantic Ocean. The Town of Eastham regulates shellfish resources here, and raises and re-stocks the ever-popular quahog and other clam species. Town permit holders can collect specified amounts of shellfish here at low tide on Sundays.

The marsh area adjacent to Salt Pond provides a wealthy habitat for a variety of living organisms. In addition to clams, the marsh serves as a nursery for lobsters and some fifty species of fish. The marsh ecosystem is enriched by the rich growth of salt marsh grasses and twice-daily flooding and draining by tides.

The area is renowned for bird life, and at various times of the year, one might see white-patched bufflehead ducks, graceful great blue herons, or snowy egrets.

Two paved bicycle trails also are located in this vicinity. The Cape Cod Rail Trail, operated by the State, intersects the Cape Cod National Seashore boundary just north of the Salt Pond Visitor Center. The Nauset Bike Trail is operated by Cape Cod National Seashore, and extends between the Salt Pond Visitor Center and Coast Guard Beach. It transverses woods, fields, and, at one point, travels over a bridge across the eastern edge of Nauset Marsh.





## **Salt Pond Visitor Center Museum**

Salt Pond Visitor Center was opened to the public in 1965. The museum portion of the Visitor Center was upgraded in 1989 to reflect the vast range of natural and cultural themes represented on Cape Cod.

As you enter the museum, you are greeted by a large photo mural showing ocean, beach, and cliffs, incorporating a quote from Henry David Thoreau, *The seashore is a sort of neutral ground, a most advantageous point from which to contemplate this world.*

Throughout the museum, other quotes highlight themes that the museum's exhibits encompass, along with artwork from prominent artists.

The exhibits offer highlights of the Cape's complex natural composition. Realistic molds of native plants and mounted animal specimens emphasize the rich and diverse natural history of the Outer Cape. Displays in this section cover salt marsh plants and animals, beach dynamics, upland plant communities and prominent residential and migratory birds.

The remaining sections of the museum deal with the Cape's rich cultural heritage, always keeping in mind an interconnection with the area's natural history.

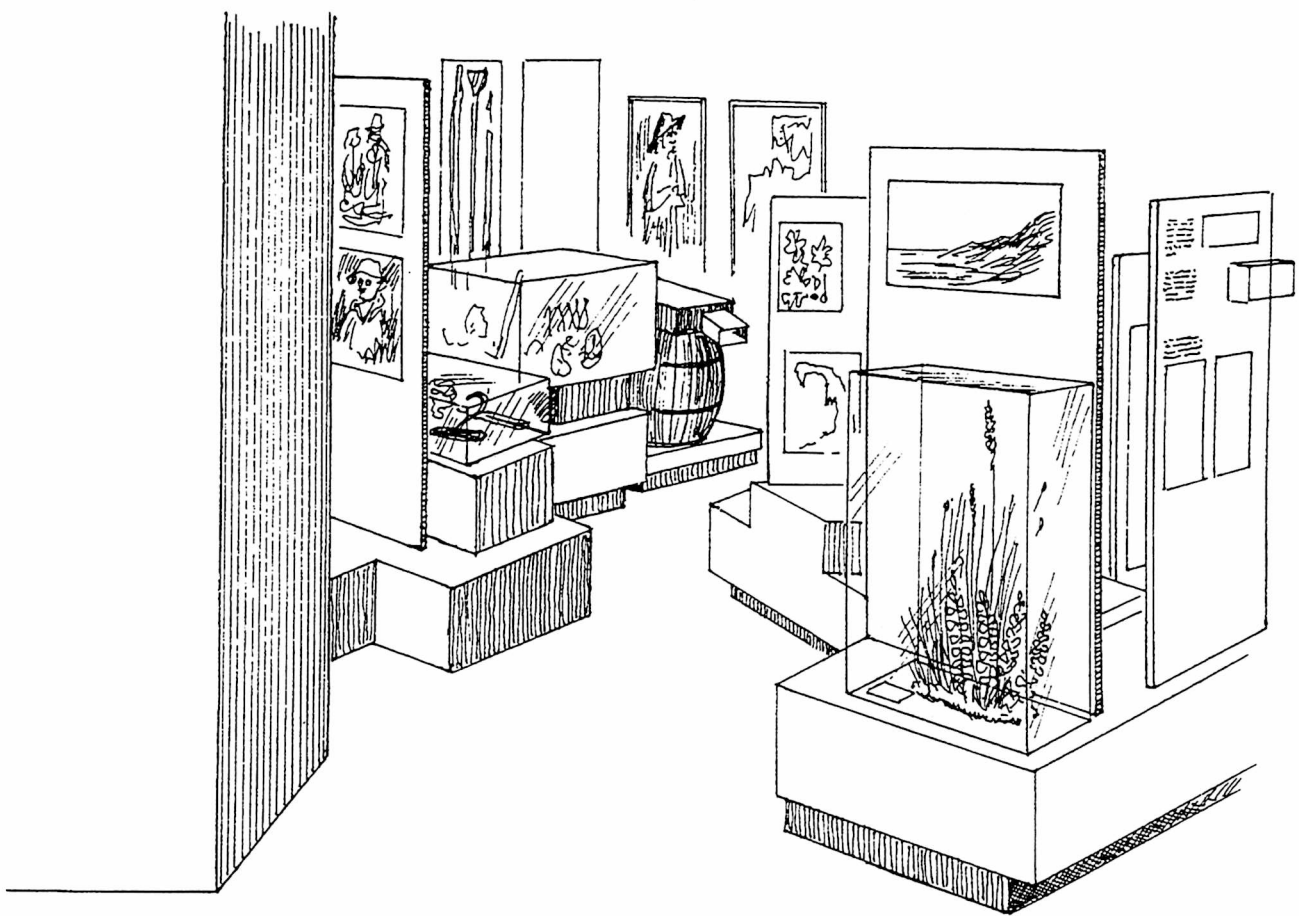
Portions of one section offer an extensive display of scrimshaw and other artifacts relating to the Cape's whaling era history. Included in this section are an account book and journal of Captain and Mrs. Edward Penniman—local residents who figured prominently in the whaling industry between the 1860's and the turn of the century. Other themes in this section include displays of artifacts relating to the Cape's diversified fishing heritage, including a full-size dory, and artifacts from Cape Cod historic and prehistoric resources that relate to the maritime theme.

Additional sections of the museum deal with the Cape's noted architectural heritage, including the internationally renowned "Cape Cod" house. Artifacts also reveal the Cape's significant involvement with lighthouses and Life Saving Service operations.

The Outer Cape's agricultural, transportation, commercial and religious heritage are also touched upon by the museum's exhibits, as is the evolution of the Cape as a place for recreational pursuits.

Recreation and restoration was a theme which Thoreau envisioned for the Cape when he visited and wrote about the area in the 1850's.

It is still a prominent theme, one recognized and represented today by the establishment of Cape Cod National Seashore with its various features and facilities.





## *Salt Pond Visitor Center Museum Quizzes — continued*

15. In order to find a desired latitude while sailing, you would use an instrument called a \_\_\_\_\_.
16. What kind of lens was used in a lighthouse that was at Nauset Light Beach?  
\_\_\_\_\_
17. Draw a picture of a tool that a shipwright might use. Be sure to label it!
18. Name one of the hundreds of ships that have wrecked off Cape Cod.  
\_\_\_\_\_
19. What months did the Lifesavers patrol the shores of Cape Cod for shipwrecks?  
\_\_\_\_\_
20. How many children are in the picture of the Wellfleet School that was taken in the 1800's?  
\_\_\_\_\_ How does that compare with the number of children in your class?  
\_\_\_\_\_
21. What is the difference between a bike you might ride today and the one found in the museum?  
\_\_\_\_\_
22. How old was Captain Edward Penniman when he first went to sea? \_\_\_\_\_
23. Draw a picture of the hat that Captain Penniman wore.
24. One type of harpoon used in whaling was called a \_\_\_\_\_.
25. Which whale is the rarest in the north Atlantic? \_\_\_\_\_
26. Why did people burn whale oil? \_\_\_\_\_
27. What were some of the uses of baleen? \_\_\_\_\_  
\_\_\_\_\_
28. What kind of things did archeologists find at the Great Island Tavern site? \_\_\_\_\_  
\_\_\_\_\_
29. A boat that is often used by fishermen is called a \_\_\_\_\_.



## **Salt Pond Visitor Center Museum Quizzes**

### **Scavenger Hunt No. 1**

1. Dusty Miller
2. Detritus
3. Bogs
4. Eelgrass
5. Duck Potato
6. Nitrogen
7. Silk
8. Gaff
9. Fifty-six feet
10. To fill in the time between hunts; to relieve long hours of boredom
11. Binnacle
12. Drawing of lifesaver's check
13. To get breeches buoy out to wrecked ship
14. To open grommets and to splice rope
15. Octant
16. Fourth Order Fresnel Lens
17. Drawing of tools, i.e., chisel, plane, half hatchet
18. *Somerset, Eldia*
19. August to May
20. Thirteen children in picture
21. Many parts were made out of wood; newer bikes have better brakes, etc.
22. Eleven years old
23. Drawing of a top hat
24. Double flue harpoon; toggle iron, etc.
25. Right whale
26. Produced brighter light, burned without smoke and with less odor than anything else that was available
27. Corset stays, collar stays, umbrella ribs, buggy whips, hair brushes, fishing poles, etc.
28. Parts of clay pipes, glass and pottery from drinking vessels, whale vertebra chopping block, etc.
29. Dory



## Salt Pond Visitor Center Museum Quizzes

### Scavenger Hunt No. 2

1. Plants which can live in the foredunes on Cape Cod are \_\_\_\_\_.
2. Carvings made from the teeth of sperm whales are called \_\_\_\_\_.
3. A hardy ground cover plant which grows widely on Cape Cod and helps stabilize the open sandy areas behind the dunes is \_\_\_\_\_.
4. A plant which grows better when lightly covered by blowing sand is \_\_\_\_\_.
5. Seafarers used an \_\_\_\_\_ to find their latitude by measuring the angle of the sun or polaris (the north star) from the horizon.
6. This seafood product is expensive today, but in 1860, they sold for about a penny apiece.  
\_\_\_\_\_
7. This piece of navigational equipment (two words) was used to determine the speed of a vessel at sea. \_\_\_\_\_
8. Name a habitat on Cape Cod which is highly acidic. \_\_\_\_\_
9. What cultivates and fertilizes salt marshes? \_\_\_\_\_
10. A nutrient-rich deposit which forms on the bottom of salt marshes (also on the bottom of ponds and other bodies of water) is called \_\_\_\_\_.
11. The Nausets used weights made of \_\_\_\_\_ in their fishing gear.
12. \_\_\_\_\_ was used to preserve cod and mackerel caught on the Grand Banks.
13. \_\_\_\_\_ (two words) were used to keep horses working in wet areas from sinking into the salt marsh.
14. \_\_\_\_\_ (two words) were invented in 1848 and were more effective than simple harpoons for killing whales.
15. A stationary trap for catching fish was called a \_\_\_\_\_.
16. The gray/green fruits of this plant are used for making candles. \_\_\_\_\_
17. The wood of this tree was prized for its resistance to decay. \_\_\_\_\_
18. This plant (two words) indicates poor soils. \_\_\_\_\_
19. European settlers cut down the trees on Cape Cod and used them for (at least three uses):  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
20. The small cannon (two words) used for firing a projectile over the rigging of a ship which had grounded was called a \_\_\_\_\_.

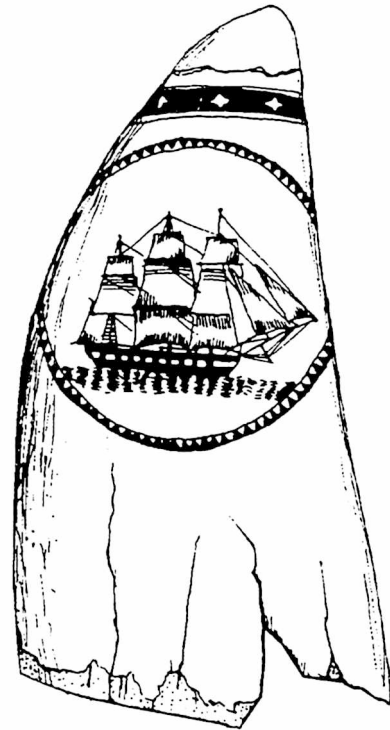




## **Salt Pond Visitor Center Museum Quizzes**

### **Scavenger Hunt No. 2**

1. American beach grass, dusty miller or beach wormwood, sea rocket
2. Scrimshaw
3. Bearberry
4. Wild cranberry
5. Octant
6. Lobsters
7. Taffrail log
8. Bog (kettle pond or cranberry bog is acceptable)
9. Tides
10. Detritus
11. Stone
12. Salt
13. Bog Boots
14. Toggle irons
15. Weir
16. Bayberry
17. Atlantic white cedar
18. Poverty grass or beach heather
19. Fuel, building houses, fences, barrels, ships, in tanning leather, export to England, firing the tryworks for rendering whale blubber into oil, in evaporating salt from sea water.
20. Lyle gun





## **Salt Pond Visitor Center Museum Quizzes**

### **Scavenger Hunt No. 3**

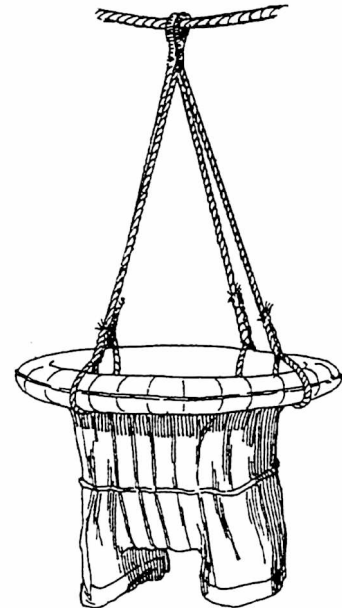
1. A plant which grows in nutrient poor soil is \_\_\_\_\_.
2. A freshwater plant which grows large tubers and which was used by Native Americans for food.  
\_\_\_\_\_
3. Young bay scallops are protected by a saltwater flowering plant called \_\_\_\_\_.
4. This bird fishes for a living. \_\_\_\_\_
5. These small crustaceans live in the beach wrack (seaweed which has been left by high tide).  
\_\_\_\_\_
6. These small fish live in the ocean as adults, but return to freshwater, including ponds on Cape Cod, to spawn. \_\_\_\_\_
7. In 1878, 63 vessels out of Provincetown returned to port with 7½ million pounds of this fish, salted and dried. \_\_\_\_\_
8. The fuel for lighting the earliest lighthouses on Cape Cod was \_\_\_\_\_.
9. A \_\_\_\_\_ was used to haul halibut aboard a fishing vessel.
10. Fishermen carried out hand lining from small boats called \_\_\_\_\_.
11. Thick stands of this shrubby tree grow on the highlands which face the ocean and on secondary dunes. \_\_\_\_\_
12. This clam was (is) often taken with clam rakes. \_\_\_\_\_
13. Fewer than 400 of these whales survive in the North Atlantic, due to human exploitation of the species. \_\_\_\_\_
14. An organism which lives in a salt marsh. \_\_\_\_\_
15. The building of the Cape Cod railroad closed off tidal flow to many \_\_\_\_\_.
16. What were two uses for baleen? \_\_\_\_\_
17. The name of the lens used in lighthouses. \_\_\_\_\_
18. In the 1880s, Cape Codders began raising this plant as a commercial crop.  
\_\_\_\_\_
19. After the early European settlers had removed most of the trees from Cape Cod, they found another method for obtaining salt from seawater. What was the method used after roughly 1776?  
\_\_\_\_\_
20. The beach apparatus sometimes used to rescue people from shipwrecks was also called a  
\_\_\_\_\_.



## **Salt Pond Visitor Center Museum Quizzes**

### **Scavenger Hunt No. 3**

1. Bayberry, poverty grass or beach heather
2. Arrowhead, cattail
3. Eelgrass
4. Belted kingfisher, great blue heron
5. Beach hoppers or sand fleas (amphipods)
6. Herring
7. Cod
8. Whale oil
9. Metal gaff, gaff hook
10. Dories
11. Bear oak
12. Quahog, cherrystone, littleneck
13. Right whales
14. Crab, flounder, striped bass, marsh periwinkle
15. Salt marshes, estuaries
16. Corset stays, umbrella ribs, buggy whips
17. Fresnel
18. Cranberries
19. Evaporation
20. Breeches buoy





## **The Buttonbush Trail Guide**

The Buttonbush Trail was initiated by various members of the blind community and the National Park Service in the early 1970's.

The physical design of the Buttonbush Trail is simple. It is a quarter-mile loop trail which has a guide rope and text panels in both Braille and large lettering along its route. As users walk along and read text panels, they learn about the nature and history of the area through touching, feeling, hearing and smelling.

Since the Buttonbush Trail has been designed to encourage multiple sensory experiences, it has become popular with a wide variety of Park users. It is used routinely by fully-sighted educational and family groups, who often follow the guide rope in teams of two—with one person blindfolded (or with eyes closed) leading, and the other following and reading the text on the panels out loud.

An abbreviated text for each station along the trail follows:

1. **Welcome to the Buttonbush Trail.** Stop often to look, listen, smell and feel. These senses will add pleasure to your walk. Follow the guide rope in front of you along a path three feet wide. A smooth bump on the guide rope indicates a step ahead. A round marker indicates a trail sign with information about natural or historical features. Enjoy yourself!
2. The trail winds through a freshwater environment, yet a saltwater pond connected to the ocean is only 300 feet behind you; two natural conditions so close, yet so different.
3. Gently touch the branches of a nearby red cedar tree.
4. Reach out and feel the reddish brown bark of a red cedar tree.
5. Feel the dull, smooth, gray bark of the black alder (or winterberry).
6. You have come to the Buttonbush Pond. You will cross on a wooden bridge with guard rails on both sides.
7. This pond is filled with buttonbush shrubs, hence its name. These evenly topped, 3 foot tall shrubs have many slender, brownish-gray branches that make good nesting places for red-winged blackbirds in spring.
8. Male red-winged blackbirds are black, except for the unmistakable bright red patches located on their shoulders just above the wings. Listen.
9. You have reached the end of the Buttonbush bridge. You are almost halfway around the trail. There will be several steps on the pathway ahead. They are marked by a smooth bump on the guide rope. If you wish to avoid these steps, you can turn around at this point and return to the beginning of the trail.

## *The Buttonbush Trail Guide — continued*

10. The locust tree behind you has fragrant clusters of white flowers in early summer. Reach across the path and feel its deeply ridged bark.
11. Where you are standing a Nauset Indian might have stood many years ago, cutting the type of shrub in front of you for arrow or spear shafts. It is called arrowwood.
12. In 1644, seven families came from Plimouth (Plymouth) to Nauset, now called Eastham, to farm the land. The tangle of small pink roses and grape vines near you is evidence of past human use of this area.
13. The old, gnarled apple tree in front of you is another trace of past farming on this land.
14. Nauset Road, which leads to the Atlantic Ocean, is only 100 feet to your left. At this point, reach across the path several steps to your right for the guide rope and continue your journey.
15. The tree in front of you is a pitch pine. Reach out and touch its rough bark.
16. Does the tree in front of you feel familiar? It is a red cedar.
17. Reach across the path several steps to your left for the guide rope and continue your walk.
18. The woody shrub in front of you is beach plum.
19. The gentle rolling land in front of you is covered with red cedar, oak and pine trees. Bayberry and beach plum shrubs are also abundant. These hills slope down toward another pond that is filled with seawater, hence its name "Salt Pond."
20. Knock on the trunk of the maple tree in front of you. Can you sense how hard its wood is? Maple sap can also be boiled into delicious syrup!
21. In front of you is a black cherry tree.
22. There are two main types of oaks on Cape Cod, black and white. Black oak leaves have sharply pointed edges, while white oaks have smooth, rounded edges.
23. Reach out and feel the rough bark of the nearby tree. Do you remember this tree? It is a pitch pine.
24. In front of you is another reminder of previous uses of this land. The pear tree nearby looks very much like an apple tree, but its fruits are shaped and taste somewhat different.
25. There are some interesting additional features. If you feel adventurous, you may wish to investigate. A short length of guide rope, several steps behind you, leads to an additional trail sign.
26. In front of you is a low shrub called bayberry.
27. This ends your walk on the Buttonbush Trail. This is a fragile place, where people are learning how to appreciate history and nature in a setting to be enjoyed and cared for by everyone as part of the Cape Cod National Seashore. Please visit again!



## **The Nauset Marsh Trail Guide**

### **1) Salt Pond — A Kettle of Sea Water**

As the glaciers of the Ice Age receded about 18,000 years ago, huge chunks of ice were left scattered across the landscape. When these ice blocks melted, they left depressions in the earth. Then, as the Cape's water table rose, numerous "kettle ponds" began to appear.

Salt Pond was originally a freshwater kettle, but eventually the ocean broke through and formed a narrow channel connecting Nauset Marsh and the pond.

Salt Pond is enriched twice daily by tidal action, and supports a diverse community of marine life. Quahogs, oysters, mussels, fish, shorebirds, plants of the marine environment, and animals—including humans—all mark the change from fresh to saltwater. But Salt Pond is continuing to change, its entrance gradually filling with sand.

### **2) Bridge Across Tidal Waters**

Originally constructed to impound brackish water, the dike adjoining Salt Pond has ceased to function.

Sheltered and within range of the changing tides, the area was also once the site of a tide-powered mill. The dike, however, was added in more recent years to attract waterfowl for hunting. If left contained, the water here would turn fresh, a fact attested to by the fresh ground water seeping out of the hillsides.

Now the human uses of the pond are more subtle, devoted mainly to occasional boaters, hikers and Sunday clammers. Careful examination also reveals mosquito drainage channels and square greenhead fly traps in summer, a more environmentally acceptable method of control than spraying or filling. The quahog "seed" rafts floating in Salt Pond insure a bountiful return of a once almost depleted resource.

### **3) Nauset Marsh Overlook**

When Nauset Marsh was charted by the French explorer Champlain in 1605, it was a navigable bay. The explorer also noted a number of beehive-shaped homes on the hillsides, placed there by the native Nausets.

What is now Nauset Marsh was once a vast freshwater system, until the eroding shoreline connected this area to the ocean.

As time passed, ocean currents developed a narrow stretch of sand along the outer shore. We now know this as Nauset Spit. The spit acted as a protective arm, or barrier beach, and this allowed the extensive salt marsh to develop.

## *The Nauset Marsh Trail Guide — continued*

Typical of salt marshes, the area is a full-scale nursery for oceanic fish, shellfish and microscopic plankton. It also serves as an important habitat along the Atlantic flyways for shorebirds, wading birds and waterfowl.

Shallow enough to allow marsh grasses to establish roots, the tidal flats are actually stabilized by the extreme conditions that exist there. Ranging from hourly changes in the water level to infrequent but often catastrophic winter storm effects, the salt marsh environment is uniquely suited for specific organisms. Nourished and then flushed twice daily by the tides, the marsh yields abundant nutrients, especially from decaying salt marsh and salt meadow cord grasses, which feed into a vast food chain. The aromas of this activity are most noticeable in the fall.

### **4) The Cedars of Nauset Links**

Traveling inland from the marsh, the landscape changes rapidly into an area of red cedar and aromatic bayberry. The red cedars (actually junipers) are sun-loving trees, quick to take over fallow fields and barren grounds of the Cape.

But they also serve as clues to a past human influence. Until the early 1930's a private golf course was here, complete with sand traps, open fairways and putting greens. Much evidence of this past activity can still be seen amid the landscape.

Once abandoned, the cedars quickly filled in the course as their seeds were distributed by gravity, birds and animals. Red cedars, however, do not tolerate shade. And as the area fills in, other trees such as white and black oak begin to dominate. Eventually, maple and beech trees, with seedlings that grow well under their own shade, will someday again be the most prevalent trees on Cape Cod.

### **5) The Old Farmstead**

Between the bicycle path and the roadway is an extensively altered landscape that was once a farm. As vital soil nutrients were removed by continual use and re-use, the land lost fertility and had to be abandoned. Black locusts, with their ability to fix nitrogen into the soil, were introduced to replenish the land. Today, these tall, thin trees manage to perpetuate their own setting by allowing little or no undergrowth beneath them.

Black locust, originally from the southern part of our nation, shares this area with other nonnative plants, including the smooth-barked tree of heaven, fruit trees and garden plants, amid remnants of old man-made structures.

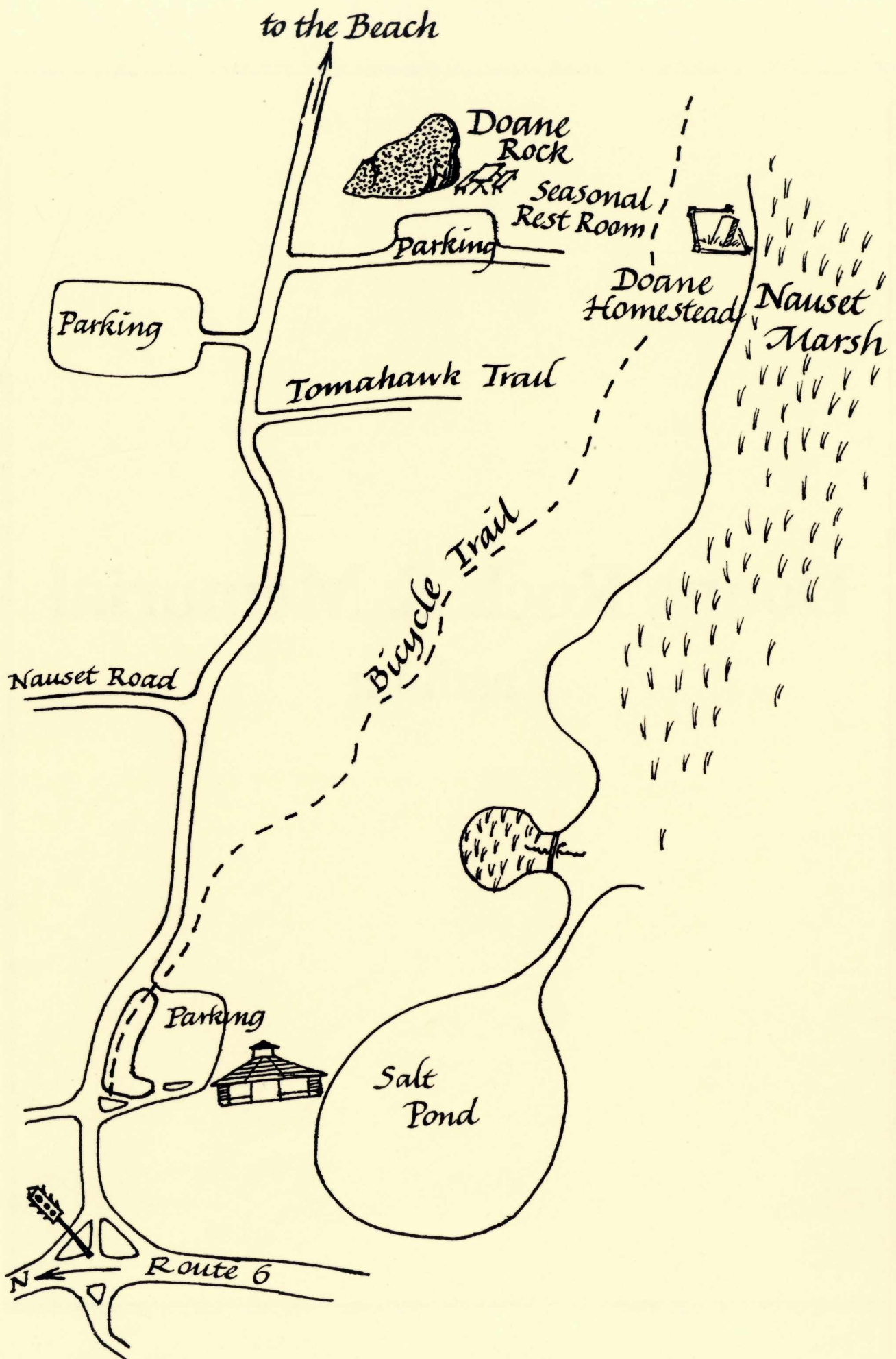
Diversified areas like these, and fringe areas of beach plum, black cherry, bayberry and pitch pine, provide important habitat for songbirds, quail, raccoons, rabbits, foxes, squirrels and deer.

Humans, too, are part of this environment. And through lighthouses, windmills, old homes and fields, we intentionally preserve certain reminders of our ancestral heritage.



# **Doane Rock & Memorial**

## **Eastham**





## **Doane Rock and Doane Memorial**

- Directions:** East on Doane Road, one mile from Salt Pond Visitor Center (on road to Coast Guard Beach). Look for brown and white picnic area sign.
- Safety:** Obey posted speed limits. Be especially careful of bicyclists and walkers along roadway.
- Other:** Seasonal restrooms and paved wheelchair accessible loop trail at Doane picnic area.
- Tips:** Doane Rock, the largest glacial boulder exposed on Cape Cod, can be seen from the main roadway to the right. Here, private homes border the roadway, a unique feature of the make-up of Cape Cod National Seashore. This is also a good location to park and walk to Coast Guard Beach. (Be aware, however, of posted parking time limits here.)
- Time Frame:** Five-minute narration time on board bus. Fifteen to 25 minutes needed if stop made to see Doane Rock or memorial.
- Notes for Educators:** The Doane area features Doane Rock, the premier example of a glacial “erratic” boulder (transported by ice), as well as the Doane homestead site.
- Highlights:** Doane Rock  
Paved wheelchair accessible loop trail  
Picnic area and seasonal restroom  
Doane homesite memorial



## **Doane Rock and Doane Memorial**

- **Doane Rock** is the largest exposed glacial boulder on Cape Cod. It is accessible by a short pathway from the area's first parking lot. The rock and glacial forces that moved it are explained in an on-site wayside exhibit panel.
- **The Doane Loop Trail** is a paved, wheelchair accessible trail that meanders through the emerging pine-oak forest. Other trails in the vicinity lead to Salt Pond Visitor Center and to Coast Guard Beach. A mixture of upland vegetation includes concentrations of bearberry, bayberry and beach plum.
- **Walking trails to Coast Guard Beach.** (Caution: Walk only on designated shoulder portions when trails adjoin Nauset bicycle trail. Stay in single file, off pavement.)

**Watch out for ticks and poison ivy.**





## **Doane Rock and Doane Memorial**

Doane Rock protrudes above the otherwise level ground surface of the Eastham plain. This glacial boulder attests to the massive scale of the glacial ice sheets that covered Cape Cod some 18,000 years ago. Boulders of varying sizes were transported from their original location as the great ice sheet, sometimes up to two miles thick, crept slowly southward. Doane Rock is the largest exposed boulder on Cape Cod.

Over time, the landscape here has seen many changes. When the glaciers retreated, northern vegetative types predominated. Then, as the climate warmed, more southern species arrived. The landscape contained a mix of both types until the arrival of Europeans, who dramatically altered the scene.

Deacon John Doane was one of the first of seven families from Plymouth Colony to settle in this area in 1644. A memorial stone was erected some two hundred years later by Doane family members.

Doane was a prominent member of the Pilgrim Church, and took on a number of leadership roles in the Plymouth Colony's government. Doane descendants are still prominent on Cape Cod. Some Cape Cod Doanes also resettled in Nova Scotia at the time of the Revolutionary War.

In Deacon Doane's days, the land was rich and fertile, but English land clearing and farming practices exhausted the soil, leading to a barren landscape. In the mid-1800's, Doane Rock (also known as Enoch's rock), stood starkly above a treeless horizon.

### **Freeze on Development**

Gradually, the landscape recovered, and a pitch pine and oak woodland became established on top of the sandy soil. Houses, too, began to spring up in the 1950's, and it was soon realized that the quaint remoteness of old Cape Cod was quickly becoming a thing of the past. One of the motives behind the creation of the Cape Cod National Seashore was to freeze development. A unique arrangement called for towns to set zoning standards to restrict future building within the Seashore's boundaries, while also allowing (in most cases) for pre-1959 structures to remain in private ownership. Thus, the homes that occasionally dot the roadways within the Seashore boundary are, in themselves, a part of the preserved landscape, allowed to be bought and sold privately, but not intruding on the scene of Cape Cod beyond the area's appearance prior to 1959.

Today, Cape Cod National Seashore is one of over 360 units of the National Park Service, which started with the establishment of Yellowstone National Park. It is interesting to note that in the late 1860's Lt. Gustavus Doane, a direct descendant of Deacon John Doane, headed the government expedition into the Yellowstone region that led to the establishment of Yellowstone National Park, the nation's first, in 1872.



## Deacon John Doane

On September 10, 1869, the Doane family of Eastham and adjoining towns held a meeting at the place where once stood the residence of Deacon John Doane, one of the seven first settlers of the town. The purpose was to witness the erection of the granite stone seen there today.

The inscription on the stone reads:

*Dea.  
John Doane  
Born, 1590  
Here, 1644  
Died, 1685*



Henry David Thoreau was also sufficiently impressed by the legacy of John Doane that he commented on him in his writings about Cape Cod in the mid 1800's. Thoreau's sources were based on legend, and stray somewhat from fact. But his account accurately defines this "New England Saint's" character. Thoreau states:

*One of the first settlers of Eastham was Deacon John Doane, who died in 1707, aged one hundred and ten. Tradition says that he was rocked in a cradle several of his last years. That, certainly, was not an Achillean life. His mother must have let him slip when she dipped him in the liquor which was to make him invulnerable, and he went in, heels and all. Some of the stone-bounds to his farm which he set up are standing to-day, with his initials cut in them.*

### A Founder of Eastham

Doane did not live as long as Thoreau attributes, but, indeed, was a most prominent figure in the Pilgrim Church and Colony, and a premiere founder of Eastham. Historian Josiah Paine of Harwich says that John Doane was the eldest of Eastham's seven first settlers, and was undoubtedly next in rank to Governor Prence. These two (Prence and Doane) he wrote, *were the only persons of that band whom the records of that period honor with the prefix of Mister ... given only to men of means, magistrates and ministers.*

The date John Doane came to Plymouth is not known, according to Paine. Pratt, Eastham's most prominent historian, says that Doane came over in one of the first three ships, but Paine questions this, pointing out that Doane came over sometime between 1630 and 1633. In more recent studies, historian Eugene Stratton also concludes that Doane arrived at Plymouth sometime between 1627 and 1634.

Doane accumulated much land in Plymouth and Eastham. Paine states that the Deacon did not come to Eastham until 1645, not 1644, as the marker states. However, Stratton notes that Doane was *one of the men appointed to buy land at Nauset [from the natives] ... and became one of the first settlers there.*



## *Deacon John Doane — continued*

John Doane's life was long and useful—he held many offices in town and colony. He was appointed as a deacon of the church as early as 1634. He also served as one of seven assistants to the governor, was given tax assessment responsibilities, and was appointed to serve on several special committees to make recommendations regarding laws, wages and rates for goods. Doane was nearly 84 years of age when he retired from the town board of selectmen. He was called on as moderator in numerous disputes.

John Doane was known to be somewhat tenacious, and although a prominent figure in the church, not above the use of civil litigation to his own advantage. There is an account of his suing the widow Ellen Billington in 1636 for slander. The widow was subsequently sentenced to pay Mr. Doane five pounds, and to sit in the stocks and be whipped. He was also licensed to sell wine in 1639, and appears to have been involved in several other business activities.

Doane's earliest known wife was Ann, and later records show him as being married to Lydia. His children included Abigail, John, Daniel, and Ephraim. According to Pratt, the Deacon owned at least 200 acres of land in this vicinity. Pratt, like Thoreau, stated that Doane was around 110 years old when he died. Paine and Stratton attribute the Deacon with a somewhat more modest life span. Doane was probably about 96 when he died, still a ripe old age by any standard.

There are many descendants of this remarkable man. From his three sons have descended the Doanes of the Cape and widely scattered areas in the United States and Canada. As a visitor stands at the Doane marker, surrounded by the Cape Cod National Seashore, it is interesting to recall that a young second lieutenant, Gustavus C. Doane, wrote such a classic report of accuracy on and admiration for the Yellowstone area that his report was beyond doubt the leading factor in the creation of our first National Park, Yellowstone, in 1872.





## **Why a National Seashore?**

Although since 1872 Congress has been steadily adding wilderness areas and historical sites to the National Park System, it was, as recently as 1954, short on shoreline scenery. Only 240 miles of the 3,700-mile coastline between Canada and Mexico were set aside by either a state or federal government for preservation and public recreational use. (Three national park areas—Cape Hatteras National Seashore in North Carolina, Everglades National Park in Florida, and Acadia National Park in Maine—were included in this 240 mile area, but occupied little more than half of it.) When in 1954 a survey was made as to which shoreline sites would be most suitable for the National Park System, the Great Beach at Cape Cod, between Chatham and Provincetown, was placed at the top of the list.

With its forty miles of unbroken beach backed by spectacular dunes, this was scenery which deserved to be both protected and shared with all Americans. Certainly, the history of Cape Cod, which springs from the very heart of the American story, deserves to be known and preserved. In every way, the Cape Cod shoreline met the requirements for a national park: a place whose scenery and whose natural and historic resources should be conserved for the enjoyment, not only of people today, but for people in the future. And beachfront property was becoming scarce. It was important that the land be set aside soon.

### **43,557 Acres**

Fortunately, it was not too late to save the Great Beach of Cape Cod. On August 7, 1961, President John F. Kennedy signed the Cape Cod National Seashore Bill. (He used 22 pens so he could give them away as souvenirs to those who were at the signing.) From then on, 43,557 acres of the Outer Cape would be under the jurisdiction of the National Park Service, U.S. Department of the Interior, for the benefit and enjoyment of everyone.

Certainly, the land has benefitted from becoming part of the National Seashore. Forests which were cut down by colonists for firewood have begun to come back. And certainly the American people benefit from the creation of the Cape Cod National Seashore. There are more than five million visits to the Seashore each year. People admire the spectacular ocean views, and enjoy the long stretches of unspoiled beach. No matter the number of visitors, there is an opportunity to feel a sense of solitude with nature. In the spring, visitors may observe tern nesting grounds, watch warblers in migration, or greet ducks and geese as they arrive from the south. Occasionally, a visitor may spot an eagle or an osprey.

Rangers at the National Seashore offer programs and informational material to help visitors appreciate the history and natural environment of the Cape.



## **Cape Cod National Seashore Land Ownership**

“Where is the park?” first-time visitors to Cape Cod National Seashore often ask. When a Park Ranger replies, “You’re in the middle of it,” the visitor asks, “Then what are all these houses doing here?”

These questions result from the pioneering approach Congress took when it authorized Cape Cod National Seashore. This approach necessitated agreements and concessions among federal, state and local governments as well as private landowners. Most of these groups shared the belief that the Seashore’s wooded hillsides, dunes, marshes and forty miles of undeveloped beach were worthy of preservation. However, Cape Cod land had been occupied and owned almost since the day Europeans first arrived in North America. So, most asked, “How can preservation be accomplished?”

In the early days of the National Park Service, the process was initiated by the government’s claim of mostly unoccupied western land. Parks like Yellowstone and Yosemite resulted from this approach. Today, parks are often carved out of heavily-settled and privately-owned land. Achieving preservation now usually begins with the acquisition of land through transfer from other federal agencies, donation, purchase, or occasionally, condemnation. In the case of Cape Cod, the National Park Service used all of these contemporary methods, plus a uniquely different one. When it authorized Cape Cod National Seashore, Congress declared that homes constructed prior to September 1, 1959, considered to be “improved property,” could always remain in private ownership, subject to specific guidelines. Through this legislative avenue, nonfederal land within the boundaries of the National Seashore could be managed according to standards set forth by the Department of Interior, and homes that had been in families for generations could remain so.

Unraveling and connecting these disjointed parcels of land to create the National Seashore was costly and time consuming, yet, most would agree, worthwhile.

### **A Patchwork Quilt**

Today, the National Seashore is like a patchwork quilt with its edges at the authorized boundary. Within this boundary lie about 43,557 acres (one acre equals about 3/4 of a football field). The National Seashore presently holds title to 27,000 acres of this land, and will purchase 400 acres in the near future. Another 350 acres are protected by Park ownership of scenic easement. The five Outer Cape towns and the Commonwealth of Massachusetts own another 14,500 acres. The remaining 1,200 acres consist of improved properties that may always remain in private ownership.

Town-owned property consists mainly of roads, ponds, and recreational beaches. The town of Wellfleet, for example, retains ownership of four beaches within the National Seashore and sets the fee for their use. Title to most of the oceanside beach, however, is

## ***Cape Cod National Seashore Land Ownership — continued***

held by the National Seashore. Property under jurisdiction of the Commonwealth consists primarily of submerged land lying within the Seashore's quarter-mile offshore boundary.

Private improved property owners may sell their land or pass it on as an inheritance. Expansion and renovation of existing structures is allowed as long as it is done in compliance with local zoning and building codes. Construction cannot be for commercial purposes.

At present, approximately six hundred parcels of improved property remain privately owned within the boundaries of the National Seashore. Most of this land lies in the towns of Eastham, Wellfleet and Truro. Among these is one dune shack in the Province Lands.

Some additional developed parcels of land exist, but are not considered improved property because their structures were built after September 1, 1959. While these additional developed properties belong to the National Seashore (a portion of the 27,000 acres), the original owners may use or occupy them until a date agreed upon at the time of purchase. This use and occupancy "reservation" is either for up to 25 years, or for the lifetime of the titleholder listed on the Deed of Record. Most of this property will be turned over to National Seashore administration before the year 2000.

Commercial development does exist within the boundaries of the Seashore, but only on a limited basis. Ten certificates for commercial use have been issued to owners whose business operations preceded the authorization of the Seashore. These certificates are issued for a specific use and period of time.

### **Breakdown of Land Ownership**

|                                     |              |
|-------------------------------------|--------------|
| National Seashore                   | 27,052 acres |
| Scenic easement held by Seashore    | 346 acres    |
| Private Land (improved property)    | 1,610 acres  |
| Public (state, town, other federal) | 14,561 acres |

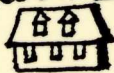
# **Coast Guard Beach**

## **Eastham**

Atlantic Ocean

Coast Guard Beach

Seasonal  
Rest Rooms



Ocean View  
Drive



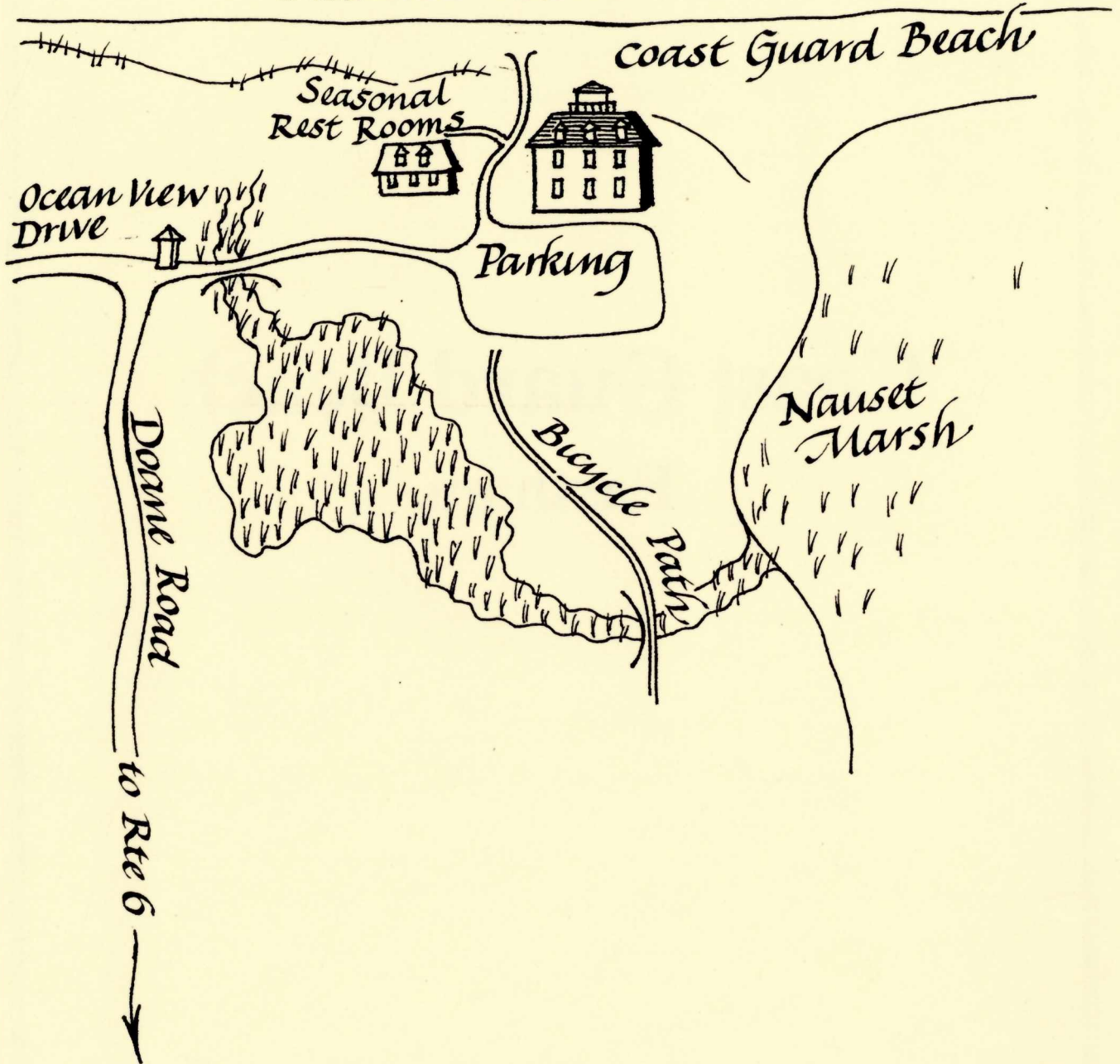
Parking

Downe Road

to Rte 6 →

Bicycle Path

Nauset  
Marsh





## **Coast Guard Beach**

- Directions:** One and one-half miles East on Nauset and Doane Roads (on road to beach from Salt Pond Visitor Center). Look for brown and white signs.
- Safety:** Observe posted speed limits; watch out for bicyclists and walkers.
- Other:** Coast Guard Beach is a prime swimming beach during the summer season. From mid June to Labor Day, the parking lot at this location is closed, and access is provided by shuttle bus from the Little Creek parking area (across from the Doane Area). Although the parking lot at Coast Guard Beach is open the remainder of the year, parking is limited. There are seasonal restrooms and a wheelchair accessible rampway to the beach.
- Tips:** Prepare passengers for upcoming scenic view of Atlantic Ocean after departing Doane Rock. Buses are encouraged to turn around in the circle just below the parking lot behind the former Coast Guard Station.
- Time Frame:** Five-minute narration on bus. Twenty minutes to one hour if stop is made at this site.
- Notes for Educators:** Coast Guard Beach and Nauset Spit offer an excellent setting to get the group out onto the sandy beach. This area is the site of the discovery of an 8,000 year old Native American habitation exposed by shoreline retreat. It is also a good area to hike along the outer beach, and observe along-shore transport of sand (through wind and wave action), coastal erosion, and dune building/barrier beach processes. Wayside exhibits help to tell these stories.
- Highlights:** First vista of Atlantic Ocean  
Former Coast Guard Station  
The Great Beach  
Nauset Spit  
Outermost House Site  
Carns Archeological Site

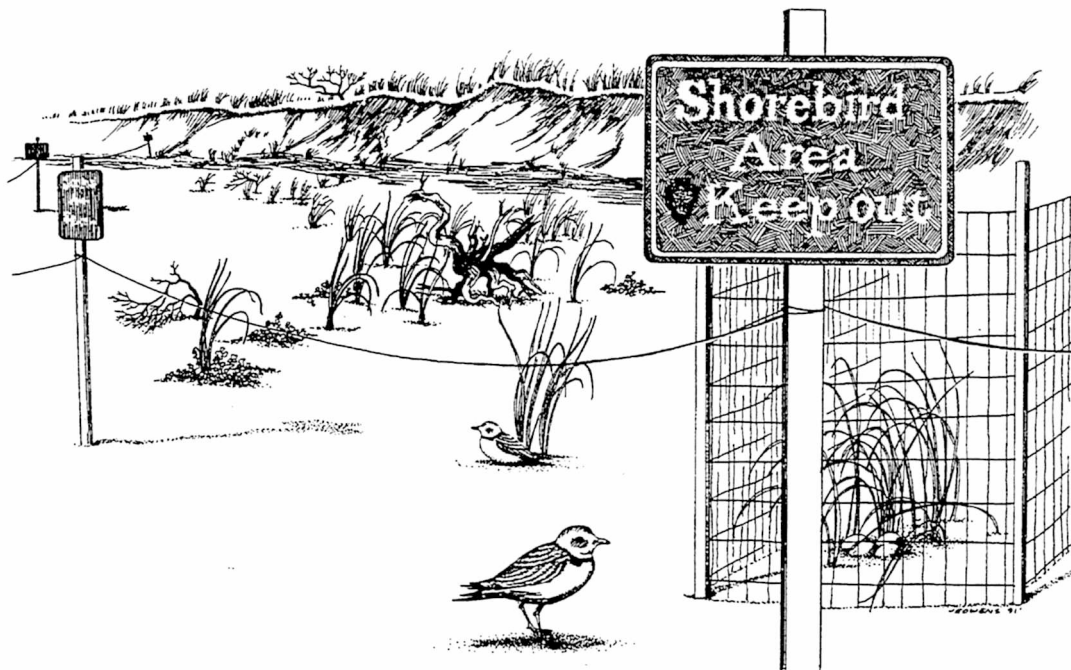




## Coast Guard Beach

- **The Great Beach**, so named by Henry David Thoreau, starts here. This sandy strand offers opportunities to study coastal beach processes, including along-shore transport of sand and coastal erosion.
- **Nauset Spit** offers the opportunity to walk directly onto a barrier beach system and observe shorebirds and, during the winter months, seals. The inlet into Nauset Marsh is at the southern end of Nauset Spit. World-renowned nature writer, Henry Beston, wrote *The Outermost House* from his beach cottage located here.
- **Nauset Marsh** is located behind the former Coast Guard Station. It is accessible by a pathway that leads to the bicycle trail bridge. Here, one can see shorebirds working the tidal flats in the warmer months and observe salt marsh grass systems close up.
- **Nesting plovers** and terns frequent this area in the early spring to early summer. Plovers are listed as threatened under the Endangered Species Act.
- **Seals** can often be sighted at the end of Nauset Spit during the winter months. Generally these are harbor seals. At low tide, they can sometimes be seen “hauling out” onto the marsh.

**Beware of tidal rip currents and stay a proper distance away from nesting shorebirds and resting seals.**







### **Coast Guard Beach**

Coast Guard Beach offers the first sweeping vista of the Atlantic Ocean at Cape Cod National Seashore. And a spectacular vista it is! This is the beach the Pilgrims first saw from the *Mayflower* in November 1620, which indicated they had arrived in the New World. This is also a beach that Henry David Thoreau and Henry Beston walked on and wrote about.

Coast Guard Beach got its name from the former U.S. Coast Guard Station here. The outer beach is notorious for shipwrecks, and in 1872, the U.S. Life Saving Service was established by the federal government to provide some means of relief. Nine stations were built at this time on Cape Cod—the one located near here being named the Nauset Station.

The Life Saver's station here served well, making numerous rescues. The current building replaced the original one in 1936. It is a "surf station" where all rescue activities were carried out from shore either by oar-powered boat or line-throwing cannon.

With advancing technology, and with less off-shore shipping traffic (due to the completion of the Cape Cod Canal in 1914), fewer and fewer stations were needed on Cape Cod. The Nauset Station was decommissioned in 1959, and served as the first headquarters for the newly-formed Cape Cod National Seashore after 1961. Today it functions as a residential environmental education facility.

#### **House on Nauset Spit**

Henry Beston visited the former Nauset Station in the 1920's and 1930's during his stays at the Outermost House, his dune cottage on Nauset Spit. Beston's book, *The Outermost House* has become a literary classic on natural themes.

The house remained under the ownership of the Massachusetts Audubon Society and stood on Nauset Spit until the Great Storm of 1978. The Outermost House was washed out to sea along with nearby facilities built by the National Park Service at Coast Guard beach.

Today, a shuttle bus transports summer visitors to Coast Guard Beach from an inland parking lot, eliminating the blemish that a replacement parking facility, and bulwarks to protect it, would have made on this spectacular stretch of beach.

The birdlife observed by Beston is still diversified, but is impoverished and in need of protection. Such is the case with piping plovers and several species of terns which receive special protective management actions, such as marking off and restricting access to shorebird nesting sites in the spring. Population levels have increased through such initiatives. Similar protection activities have led to the return of seals to this area during the winter months. In Beston's days, seal sightings along Cape Cod's outer beaches were on the decline, but today large numbers of seals can be seen on occasion at the end of Nauset Spit on sunny, mid-winter days at low tide. Indeed, this is an area of inspiration as well as change.



## **Coast Guard Beach**

### **Mayflower Landfall**

On November 9, 1620, a ship named the *Mayflower*, 65 days out from Plymouth, England, made her landfall in the New World at what is now Coast Guard Beach. Captain Jones, knowing that his Pilgrim passengers were supposed to settle in northern Virginia, headed southeastward. Although he stood well offshore to avoid shoal waters, his ship soon became enmeshed in the worst shoals in the area, Pollock Rip. A miraculous change of wind enabled Jones to sail his ship free of the shoals, and he then turned northward to anchor in Provincetown Harbor, November 11, 1620.

### **The Outer Beach**

The outer beach, or “backside,” of Cape Cod has been the notorious graveyard for more than 3,000 ships since the wreck of the *Sparrowhawk* in 1626. The high cost in lives and property demanded by the sands of Cape Cod led to the establishment of the Massachusetts Humane Society in 1786, the first organization in the nation devoted to the rescue and assistance of shipwrecked mariners. The Humane Society established shelter huts along the coast; later, it built lifeboat stations where surfboats, line-throwing guns, and other lifesaving gear were stored for the use of volunteer crews in times of emergency.

In 1848, the Congress appropriated funds for the first time to construct, equip and maintain similar stations in New Jersey. From 1848 until 1872, Congress provided the money to build more stations along the eastern seaboard and the Great Lakes. The stations in Massachusetts continued to be administered by the Massachusetts Humane Society, but the federal government subsidized its operation. The continued frequent loss of life along the nation’s shores led Congress, in 1871-1872, to reorganize the Life Saving Service and place it on a full-time professional basis. The construction and manning of nine stations on the “backside” of Cape Cod was provided for in the Federal budget of 1871.

One of the original nine stations was constructed at Nauset. It was located about 350 yards southeast of the present building. Shoreline erosion compelled the construction of a new station which remained in service until 1937, when it was replaced by the present structure. The present building was in service as a Coast Guard Station until 1958.

The first headquarters of the Cape Cod National Seashore opened in this building in 1961. Currently, the building is being used for the NEED (National Environmental Educational Development) program.

### **The Outermost House**

About two miles south, on the outer beach, stood the cottage where author Henry Beston lived while gathering the material for his book, *The Outermost House*, published in 1928. The book describes life on the outer beach during all four seasons.

## ***Coast Guard Beach — continued***

The house was designed by Henry Beston in 1925. He took meticulous care with every detail because he intended his house to sit on the dune solid as a good ship. The little house, called the Fo'c'sle by Henry Beston, was 21 ft. long by 16 ft. wide and consisted of two rooms, a main room and a bedroom. There were windows on all four sides, giving wonderful views of the entire area, and a little porch along the front.

Henry Beston gave the property to the Massachusetts Audubon Society in 1959. It was occupied in summer by Audubon members.

### **The Great Storm of 1978**

It was more than people expected, and yet Cape Cod was lucky. For despite all the damage, the worst of the storm lay to the west.

On the Cape, it was still no picnic. The winds peaked at 92 miles per hour.

Coastline damage was inevitable. Wind was the destructive element Monday, but, beginning at midnight, a high tide on a new moon combined with the storm-generated waves to produce a tide some 14.5 feet above mean low water. The storm waves pounded the Great Beach with as much impact and overwash as any storm in this century.

Curiously, the eye of the storm passed over the Outer Cape on Tuesday, and the day brought beautiful blue skies even as snow was still burying inland areas. It was perfect weather for storm watchers and more than one hundred gathered in front of the former Coast Guard station at Coast Guard beach. In a mixture of awe, excitement, and helplessness, they watched as the storm waves virtually obliterated the parking lot and changing room complex at Coast Guard beach.

Waves repeatedly swept over most of Nauset Spit as well. In the process, four houses were destroyed, including The Outermost House, made famous by Henry Beston's book of the same name. Most of the wind-built dunes of Nauset Spit were reduced to low mounds. Now, they barely rise high enough above high tide to separate Nauset Marsh from the sea.

This process of overwash is normal—in the geologic sense. It is the way a spit retreats when it is attached to a retreating coastline. In effect, the sand that comprises the spit is turned over upon itself. The spit retains its shape, and in this case, the marsh behind it remains protected and continues to be an incredibly rich, productive marine nursery for such animals as flounder, striped bass, scallops and quahogs.

The concern now is to see the beach recover sufficiently to protect Nauset Marsh. For, without the spit, the marsh would no longer exist. This recovery process involves the build-up of dunes behind the beach by the wind, and the stabilization of these dunes by the growth of beach grass.

In the 1980's, the National Park Service built a new parking lot well away from the beach, to allow the natural give-and-take processes of erosion to continue in this area.



## **Archeology at Coast Guard Beach**

On the day after Thanksgiving 1990, National Park Service archeologists began salvaging an archeological site believed to be a prehistoric dwelling located at the high tideline on Coast Guard Beach in Eastham. Although only preliminary laboratory work has been done, artifacts found at the site suggest that it dates from the Middle Archaic period of 6,000 to 8,000 years ago. Records show that no undisturbed site of this age has previously been found on Cape Cod.

Initial salvage work was concluded after thirty days of continuous excavation. During this period, all of the Middle Archaic deposits exposed on the beach were removed. Artifacts—which include stone tools and pottery fragments—will undergo further study in the laboratory, as will soil samples from which the recovery of charcoal for radiocarbon dating will be attempted. Several earthen features were demolished as successive strata of the deposit were excavated. All were measured and their exact locations recorded.

### **The First Discoveries**

The first feature discovered and excavated was a hearth that consisted of a pit into which rocks heated in a nearby fire had been placed in order to cook food. The apparent floor of a dwelling unit was marked by the presence—atop the original glacial soil—of a rich organic layer several inches deep. This layer contained few artifacts. Had this deposit resulted from the disposal of trash and garbage, it likely would have contained a number of broken and discarded tools or other artifacts. Such objects were instead found outside the perimeter of this dark deposit. Seven post molds—topsoil-filled cavities left after the buried ends of wooden posts have rotted away—also fringed this surface, suggesting where walls or other supports for a roof may have stood.

The artifacts found are of little or no monetary value. They primarily are small stone chips from tool making or repair. The significance of this site lies in its undisturbed strata and the information that can be gained as artifacts are unearthed. This information may also help archeologists decipher less complete sites in other localities.

In addition to the Middle Archaic features, artifacts dating from more recent prehistoric periods were also found. These were at higher elevations in the sand cliff above and behind the Middle Archaic site. These artifacts suggest that this location probably remained an attractive place to live for thousands of years.

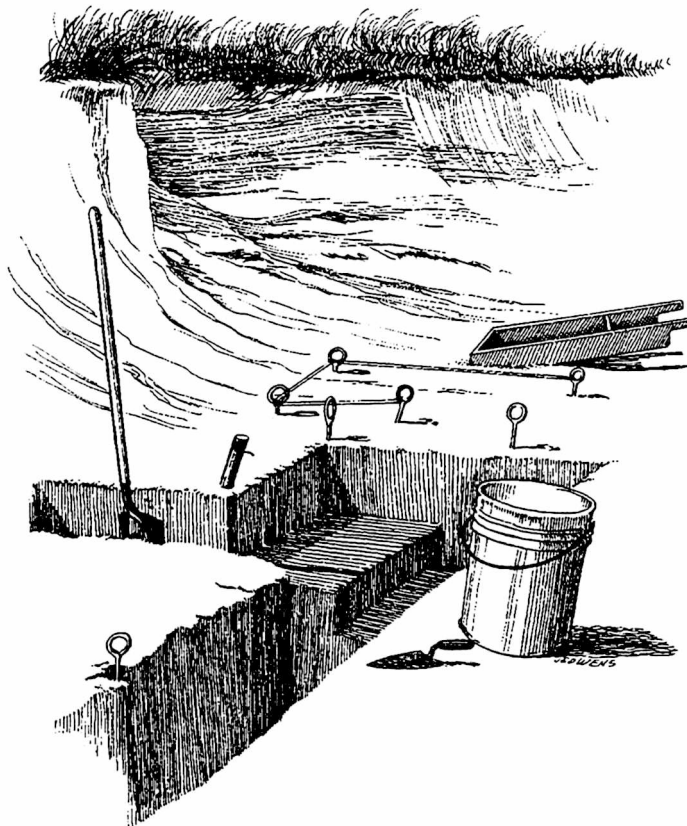
Exceptionally high tides during the full moon on December 2 and 3, 1990 undercut much of this material, which was removed in blocks and jacketed in plaster of paris. It will undergo laboratory excavation in the future. It had been expected that the tides would wash away most of the Middle Archaic deposit, but instead, more was exposed by the erosion of the overlaying sand cliff. Park Service archeologists concluded their initial investigation of the site in May 1991, and by June of that year, the area was again

## *Archeology at Coast Guard Beach — continued*

covered by a deep layer of beach sand, and the site was virtually undetectable to the casual observer.

Almost a year from the initial discovery, on October 31, 1991, a severe gale hit the New England shoreline, re-exposing the site. A crew of National Park Service archeologists was again assembled, and by mid November, were conducting a full-scale investigation of areas exposed by the storm. Some loss of resources occurred during the gale; however, new portions of the site were also exposed. During December, shelters were set up on-site to enable the archeologists to work throughout the winter. The archeologists concluded this portion of their investigation in March 1992. Throughout the summer, the site was again covered by a thick layer of sand. Additional exposures due to periodic storms have called for continued short-term visits to the site by professional archeologists. Since the original discovery, ongoing laboratory work and study of the site has focused on soil materials, as well as phosphate, Carbon 14, and pollen analysis.

Although the site was at the beachfront when discovered, this dwelling area would have been at an inland location. Sea level rise and resulting erosion have brought today's shoreline several miles west of its position 8,000 years ago. A thick layer of wind-blown sand which accumulated on top of the site over the years protected it from inadvertent disturbance (especially by farming activities) and kept it from previously being detected.





## **Beaches and Breaches**

Two hundred years ago, Ben Franklin noted that the only thing constant is change. The recent breaks in the barrier beaches at Chatham and Orleans demonstrate the truth of this statement. Prior to 1987, the narrow strip of sandy land that comprised Nauset Beach stretched unbroken from Orleans to Chatham.

Changes to the area, known as “North Beach,” came almost overnight. On January 2, 1987, an unusually high tide occurred simultaneously with high onshore winds which produced extraordinarily high sea levels. High waves breached the barrier beach at its narrowest point, allowing the sea to flood into the bay on the other side. However, unlike most overwash events, bay water flooded through the same breach at low tide, both widening and deepening it. Eventually, after several northeasterly storms, a new inlet formed almost directly opposite the Chatham Lighthouse.

### **Forces of Change**

This event revealed to the average citizen what geologists have known for years—that beaches can change quickly and constantly, and often do so to the dismay of human occupants. The millions of sand grains that comprise a beach are constantly being shifted, sorted and transported by the same forces that create the beach—wind and waves.

This new inlet was anticipated by many who had studied the coastal changes of Nauset Beach. This prediction was based primarily on three interacting natural factors.

One of these factors is “littoral drift,” the process that initially establishes all barrier beaches. Approximately 8,000 waves strike a beach each day, with each wave moving hundreds of sand grains at a time. Since waves tend to strike at an angle (the angle depending on the direction of their origin), sand suspended in the waves moves parallel to the beach (either to the right or left), as well as onto or off of the beach. Thus, sand removed by the ocean from the cliffs in Eastham might well end up at the southern tip of Nauset Beach, lengthening the beach in the process. Similarly, sand from Truro often feeds beaches in Provincetown. In the case of North Beach, as the beach lengthened the previous inlet moved southward. Consequently, the trip became longer and longer for waters exiting through the mouth of Pleasant Bay inlet at ebb tide to reach the open ocean.

Acting alone, littoral drift could result in an unbroken strip of sand stretching from Orleans to Monomoy Island. However, like most things in nature, barrier beaches are also influenced by other factors—in this case, tidal flow and barrier beach migration.

Prior to 1987, tidal flow entered and left Pleasant Bay only through an inlet between Morris Island and Monomoy Island. This daily scouring by rushing tidewater maintained the passageway. Without this action, sand deposited by littoral drift may have gradually sealed off the inlet. However, when circumstances changed, as they often do on barrier beaches, the original inlet was not sufficient to provide for adequate tidal



## ***Beaches and Breaches — continued***

flow to remain the primary passageway. It is the interaction of the third factor, barrier beach migration, that made the conditions at Chatham even more suitable for the formation of a new inlet.

### **Migration of Beaches**

While beach formation is caused mainly by wave action, barrier beach migration results from the transport of sand by wind, the overwash of beaches during severe storms, and the gradual accumulation of sand deposits around inlets. Grain by grain, beaches and their associated dunes inch landward in reaction to these phenomena. The westward migration of Nauset Beach became obvious with the discovery of the *Sparrowhawk*, a ship which wrecked in 1626. In 1863, the vessel emerged from the shifting sands on the east side of Nauset Beach. It had wrecked 273 years before on the opposite side of the beach. Studies revealed that the beach was moving at a rate of five to ten feet per year. This movement served to narrow and consequently weaken areas of the barrier beach.

On that stormy January night in 1987, an interaction of these factors culminated to create a new inlet on Nauset Beach. Storm waves washing across the barrier beach had already weakened a link in the chain of sand east of the Chatham lighthouse. When the tide dropped, the waters leaving Pleasant Bay found a closer, hence more efficient exit into the open ocean. Six hours later, the exit became an entrance for waters flooding into the bay. Further tidal cycles expanded this opening (in saw-like action), and the new inlet was born.

The break, now more than a mile wide, has impacted the lives of a number of local residents. Part of the previously sheltered coastline is now eroding at a much more accelerated rate, threatening some seaside homes.

While Chatham fishermen have gained a new inlet into the open ocean, submerged bars created from the constantly shifting sands make their trips more treacherous. Likewise, shellfishing has been affected in some locations, due to the disturbance of shellfish beds in the once quiet waters of Pleasant Bay.

However, while the increased water turbulence is presently disturbing some shellfish beds in the bay, the cleansing process inherent with the break may eventually benefit the greater shellfish population.

The irony of the Chatham saga is that the story is recurring. The 1987 breakthrough was preceded by several others, one occurring in the 1840's approximately one-half mile north of the present breach. Likewise, as recently as 1930, the main inlet, known as "Old Harbor," was also in the vicinity of the recent breach. Studies conclude that the beach revolves around a 150 year cycle—a cycle which, some scientists speculate, could shorten due to the effects of the rising sea level.





## Henry Beston

Although born in Quincy, Massachusetts in 1888, Henry Beston spent most of his adult life on a farm in Maine. After *a New England boyhood of sea and shore*, he attended Harvard graduate school, taught in France for a year and served in the army and navy during World War I. A year after living on the spit in Eastham, he married Elizabeth Coatsworth, an author of over ninety books, and three years later, the couple moved to Chimney Farm in Nobleboro, Maine, where they remained until Beston's death in 1963. During his years in Maine, he wrote *Herbs and the Earth*, *White Pines and Blue Waters* and *The Saint Lawrence*.

Beston built the house on the spit in Eastham when he was in his middle thirties. At the Fo'c'sle, as he called the house, with its ten windows opening to the ocean and marsh, he lived alone for a year between 1926 and 1927. Two miles from his nearest neighbors, Beston could, "observe carefully, brood long and write slowly."

### The World Around Him

Beston was motivated by a desire to explore the "relation of nature to the human spirit" and to see what effect living closely to the ocean, isolated from people and town, would have on him. In spite of being alone, he claimed, *there was always something to do, something to observe, something to record, something to study and something to put aside in the corner of the mind*. Besides his writing, he collected driftwood, cooked and went to town for groceries. This involved a two-mile hike through the dunes to the Coast Guard Station, a taxi ride to town, and a walk back with his knapsack of groceries.

Unlike Thoreau, Beston did not write about the Cape Cod villagers and he did not seem to be interested in the rest of the Cape. However, the men at the Coast Guard Station do appear in *The Outermost House*. The only people mentioned in the entire book, the men are regarded by Beston as neighbors, friends and protectors. In the chapter, "Lanterns in the Night," he tells about their visits each night, as the Fo'c'sle was on the route of their patrols. He appreciated the company at the end of the day and often joined them on their tours.

Although Beston's writing lacks the diversity of Thoreau, it has a clearly-defined focus on natural forces. In *The Outermost House* Beston concentrates on images of sight, sound and smell. The chapters on autumn and spring describe visiting birds, and have many references to the ways the sea looks, such as, *the surf flings its spray against the sun*. Summer was the season of smell, *aroma of beach vegetation in the sun...and cool breath of eastern ocean*. But the dominant images are the storms of winter, summarized in *the sea has many voices*.

*The Outermost House* should be read with a quote from his wife in mind. *Perhaps his greatest gift was to call attention to things that had always been there, but whose signif-*

## Henry Beston — continued

icance had gone unnoticed until he spoke or wrote about them. He was a great opener of windows.

If you search the spit at Eastham, you won't find the house. It went to sea in the storm of 1978, a fate that Beston might well have thought an appropriate end to his experiment.

Thoreau was another writer on Cape Cod. Thoreau's book, *Cape Cod*, is a series of essays about his three meandering walks in 1849, 1850, and 1855 on the beach from Eastham to Provincetown. Beston, in *The Outermost House*, describes his experiences living in a house on the dunes of Nauset spit in Eastham during the years 1926-1927.

### Traveling a Desert

The beach is the central theme of both books, but what the authors saw and wrote about was distinctly different. Thoreau, a more complex writer, focused on the "savage ocean" and "naked nature." Beston perceived a gentler shore. Indeed, the landscape that Thoreau saw in the middle of the nineteenth century was far different from the scene at the beginning of the twentieth century during Beston's stay. Thoreau described the area as barren and desolate, and compared crossing it to "traveling a desert." His descriptions are accurate, as the Cape in the 1800's was one huge sand dune, as a result of the destruction of the forests. But by the time Beston visited Eastham, trees were starting to again cover the Cape. People no longer had to search the beach for driftwood and had begun to depend on private woodlots for their supplies of firewood.

Thoreau's visit in the 1850's was the end of a period of prosperity called the golden age of Cape Cod. The prosperous maritime economy of fishing and worldwide whaling, evidenced by the ship captains bringing home wealth in money and treasures, was declining. But shipwrecks remained a common sight, because the route for all ships led along the treacherous shoals of the backside of the Cape and around Provincetown.

Seventy-five years later, during Beston's stay, the Cape's complete dependence on the sea was over. The railroad had been built, making feasible the shipment of market game and farm produce to Boston and New York City. The opening of the Cape Cod Canal (1914) significantly reduced the number of shipwrecks—and the number of wreckers and beachcombers—because ships no longer had to travel around the tip of Provincetown. By the 1920's, tourists were starting to find the Cape by train and automobile, fulfilling Thoreau's prophecy: *The time must come when this coast will be a resort.*

The 75 years between Thoreau's long walks and Beston's stay were marked by radical changes in the economic life of the Cape and in the area's landscape. But there were also sharp differences in the perspective and interests of the two authors. Together, these differences make *Cape Cod* and *The Outermost House* very different books.



## **Seals**

After the last summer vacationers have abandoned the beaches of Cape Cod, another group of travelers begin to arrive on the shores of Massachusetts. Ignoring the inclement weather, these visitors enjoy many of the same activities that their summer compatriots do: relaxing on the sandy beaches, basking in the sun, and splashing through the blue waters of the ocean. After a southern migration, seals spend the winter months on Cape Cod.

The harbor seal, by far, is the most common seal to be seen on the Cape. An aerial survey performed in 1992 recorded 4,000 to 5,000 harbor seals in and around Cape Cod and the Islands.

Fully grown, an adult harbor seal can reach five feet in length and weigh up to two hundred pounds. Their coat is light gray in color and mottled with small, dark spots. A concave muzzle and nostrils positioned in a “v” shape gives these seals the appearance of an earless cocker spaniel.

A less common sight on Cape Cod is the gray seal. Possessing a distinctive Roman nose, this seal used to be known as a “horsehead” seal. It is larger than the harbor seal. Male seals can grow as long as eight feet and weigh nine hundred pounds. Though juveniles are often mistakenly identified as harbor seals, the fur pattern of the adult gray seal is bolder than their smaller cousins.

Hooded seals and harp seals have been observed locally, though only on very rare occasions. These seals spend their lives on the pack ice of the Northern Atlantic, and will travel south only if they are lost or injured.

Seals are mammals which are well-adapted to survive in very cold water. The layers of fat, or blubber, which make up 50 percent of their weight help to keep them warm. They also have a well-developed circulation system which allows them to stay under water for long periods of time while looking for food. Blood flow, which brings oxygen, can be restricted to all but vital organs such as the lungs and heart, making it possible for them to hold their breath much longer than we can.

Seals are carnivorous. Their diet consists of fish and invertebrates, including mackerel, herring, squid, flounder and skate. Gray seals are known to supplement their diets with small ducks. Because of its abundance, a small fish called a sandlance, a fish that is not commercially valuable, is the predominant food for seals during their stay on Cape Cod. Seals are known to eat ten to twelve percent of their body weight in food every day.

## *Seals — continued*

### **Hauling Out**

When they are not feeding, seals are often observed laying on the beach away from the water. This behavior is known as “hauling out,” and seals will spend up to 80 percent of their day performing this activity. While hauled out on land, the animals get a chance to sleep and rest, while conserving energy and gaining body heat and vitamin D from the sun.

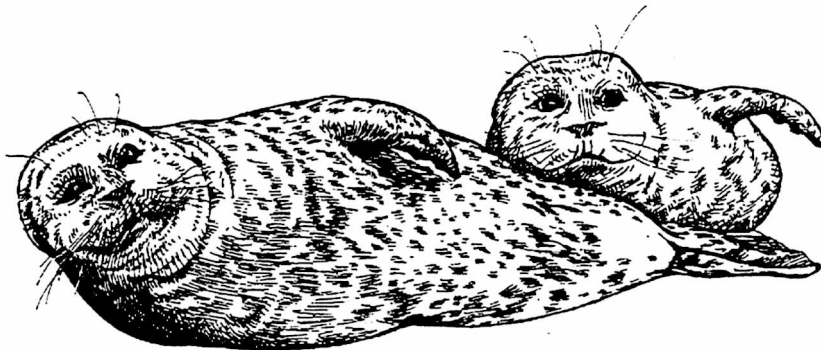
Seals begin to arrive in the waters of Cape Cod, generally, between September and October. They will spend their winters in Massachusetts. Then, in April, they will begin a northern migration to Canada and Maine where they will stay for the summer. It is unusual for seals to spend the entire year in this area.

Historically, large colonies of seals were year-round residents of Cape Cod. However, they were believed to be a threat to commercial fishing; therefore, beginning in the mid 1800's, they were hunted for a bounty, resulting in the decimation of their population on the Cape. Seals didn't return to this area until Massachusetts stopped bounty hunting in 1962, and the animals were afforded federal protection under the Marine Mammal Act of 1972.

Even though their numbers have increased, it is doubted that seals will ever recolonize Cape Cod year-round. The large, summer crowds of boaters and sightseers disrupt the animals.

A great place to observe the visiting harbor seals is on Nauset Spit. From Coast Guard Beach, it is a 30-minute walk to the Nauset Marsh inlet. There, the seals can be observed resting on the opposite shore or swimming in the channel. If you plan to take this hike, remember to dress warmly and bring a pair of binoculars. Other areas for seal viewing include the Chatham Fish Pier, where seals have been sighted on a regular basis. Also, the Massachusetts Audubon and Cape Cod Museum of Natural History occasionally offer seal cruises to Monomoy Island.

**Caution: Do not approach seals. They can bite!**

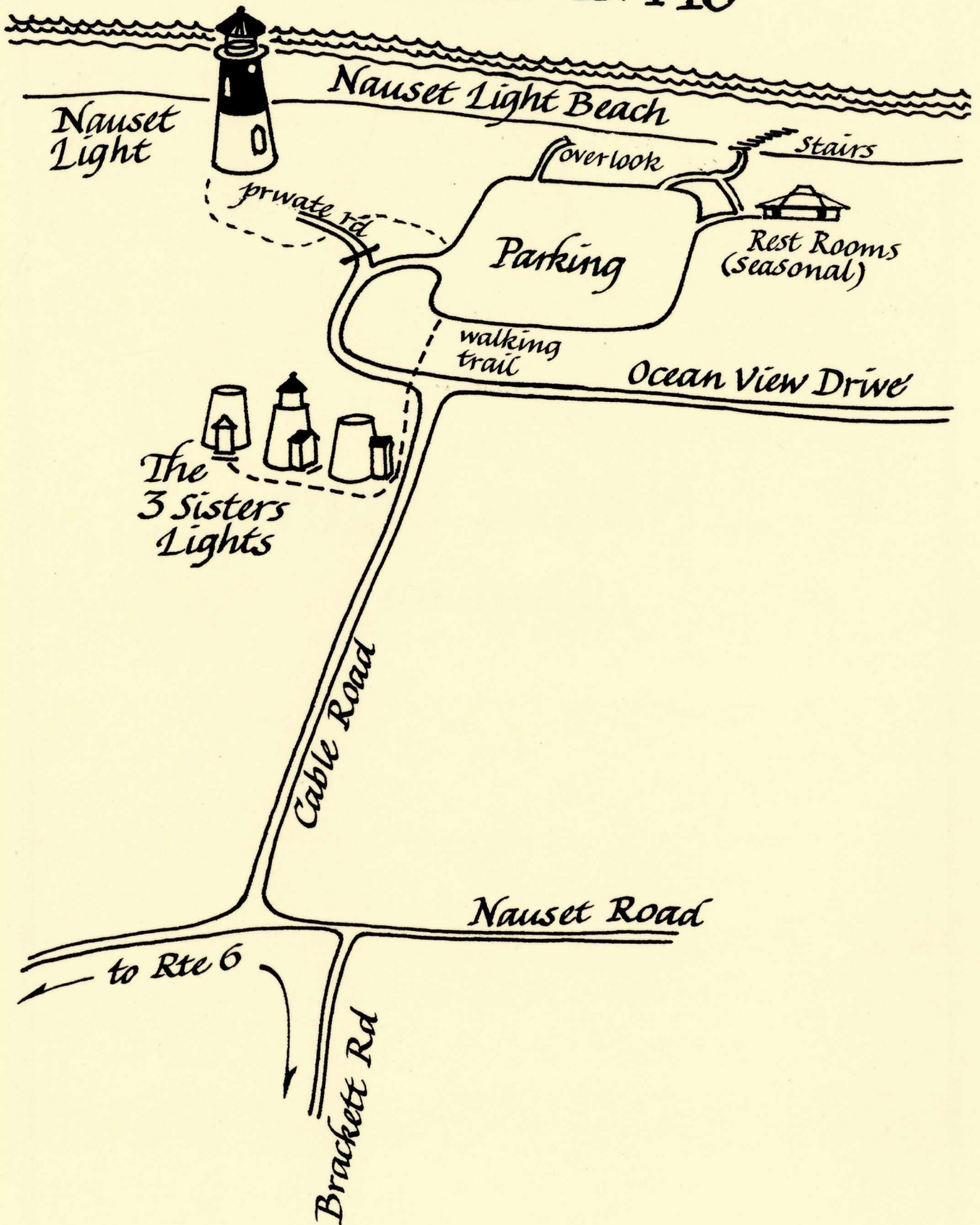


# **Nauset Light**

## **Eastham**



# ATLANTIC



## *Cape Cod National Seashore Location Summary*



### **Nauset Light**

- Directions:** One mile north of Coast Guard Beach on Ocean View Drive in Eastham.
- Safety:** Watch out for bicyclists and walkers.
- Other:** Restrooms open seasonally.
- Tips:** Ocean View Drive offers one of the few roadside vistas of the Atlantic Ocean on the Outer Cape.
- Time Frame:** Five-minute narration time on board bus. Ten to thirty minutes if stops made to observe lighthouses or other features of the area.
- Notes for Educators:** This area is the first visible portion of the glacial scarp (cliff) that drains from east to west between Eastham and Truro. This is a good place to conduct studies on marine communications (French cable operation and lighthouses) and coastal erosion.
- Highlights:** Ocean View Drive  
Nauset Light Beach  
Nauset Lighthouse  
Three Sisters Lighthouses  
French Cable Station Site  
Glacial scarp and beach





## **Nauset Light**

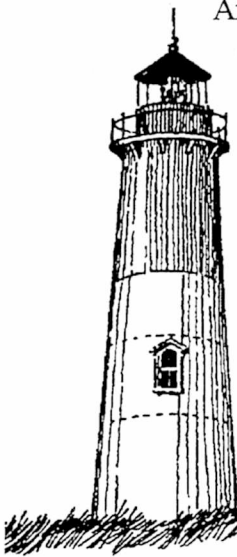
- **Nauset Light Beach** consists of a broad, sandy beach that is contained by a steep glacial scarp behind it. During winter months, the beach profile is considerably lowered, sometimes exposing features such as the brick foundation of one of the earlier Three Sisters lighthouses.
- **The trail to the Three Sisters lighthouses** travels through the emerging pitch pine forest.
- **Piping plovers**, a threatened species under the Endangered Species act, nest on the outer beach from early spring to early summer. Nest sites are marked in order to keep visitors at a proper distance.

**Avoid nesting shorebirds in spring (no dogs or kite flying allowed near nesting areas at this time).**





## Nauset Light



After turning north onto Ocean View Drive, a spectacular vista of the Atlantic Ocean appears. The view is enhanced by the gradual rise in elevation between Coast Guard Beach and Nauset Light Beach. The reason for this is that the roadway hugs the outer edge of the glacial scarp (or cliff face) left behind during the last glacial ice period some 18,000 years ago.



The glacial scarps here are cliffs, not dunes, composed primarily of sand and gravel, which washed from a lobe of a great ice sheet that was located to the east of here. As sea level rose at the end of the ice age, the eastern most glacial deposits were washed away, leaving the remaining bulk of the Outer Cape as an east/west sloping plain of glacial outwash materials.

As the ocean cut into this formation, it created a steep cliff face that, in turn, supports a broad, sandy beach at its base. Wave and wind action separate sand from gravel and rocks, leaving the beach at the base smooth and even during the summer months. Additional wind and wave action transports sand into offshore sandbars, as well as north and south along the Cape Cod coast.

### Three Sisters

Shipping was greatly affected by sandbars off the Cape Cod shoreline, and in 1838, local citizens convinced the federal government to build a series of three lighthouses in this vicinity to forewarn local mariners of the dangers. Three lights were needed to differentiate between the single light of Highland light in Truro and the two lights of the twin lights in Chatham. The first lighthouses at Nauset consisted of fixed lights in three white-painted-brick towers. The three stationary lights became known as the "Three Sisters" because, from the horizon, they resembled ladies in white formal dress with black top hats. But coastal erosion (which averages three feet a year along the outer Cape) eventually threatened these towers, so three wooden "moveable" towers were constructed to replace them in 1892.

In 1911, erosion once again threatened the lights, but this time, it was decided to move one tower back, equip it with a triple flash, and auction off the remaining two towers. (These were purchased by a local landowner and moved to their present site on Cable Road which is accessible by a footpath from the beach parking lot.)

In 1923, the last wooden tower was replaced by one of the "twin" towers from the Chatham Light. This cast iron tower was painted red and white and retained the triple flash to continue the lineage of the "Three Sisters of Nauset." In 1981, the triple flash lens

## *Nauset Light — continued*

was removed (and is on display in the Salt Pond Visitor Center) and was replaced with an alternating red and white flashing light.

Another feature of maritime communications at this site is the remains of the French Transatlantic Cable Operation, which was set up here in 1879.

The 3,000 mile long underwater cable stretched between France, the St. Pierre Islands off Newfoundland, and Eastham. Cable operators at the Cape Cod site were responsible for sending, deciphering and re-transmitting messages. In 1899, a newer station was built in Orleans (now the French Cable Museum). The cable operated up until World War II, when France was occupied by Germany. The only remains of the operation at Nauset Light Beach is a small workers' hut, under which land and sea sections of cable were coupled.



## **The Three Sisters of Nauset Lighthouses**

The Three Sisters are a prominent part of local history. As one historian remarked, *The station got its nickname early on ... from offshore, the three towers looked like ladies in white dresses with black dress hats and veils peering over the edge of the cliffs...* Their history is equally interesting.

In the first sixty years of the national government's control of lighthouses, the location and construction of lights usually evolved from local requests made to Congress. In the March 3, 1837 appropriation, Congress called for a board of naval commissioners to examine the proposed sites and determine the necessity for a light at each one.

### **The First Nauset Beach Lights**

Among those new lighthouses for which Congress made an appropriation in the March 3, 1837 act, \$10,000 was awarded for three designated lights at Nauset Beach on Cape Cod. The request for these lights evolved from a study made by the Boston Marine Society.

The rationale for lighting Nauset Beach was not one of providing top-of-the-line lighthouses. Oceangoing vessels that did not come close to shore at Nauset Beach could observe the Highland and Chatham lights and thus chart a course beyond the Nauset shoals. Only those coastal and fishing vessels that hugged the shore needed to be forewarned of the dangerous sandbars.

Congress approved the funds for the Nauset lights contingent upon an inspection of the site by a naval officer. Captain John Percival of the navy inspected the site and approved it as a necessary location for lights. David Henshaw, the Boston customs collector who acted as the area superintendent of lights, purchased approximately five acres of land at the Nauset site from Benjamin H. A. Collins of Eastham on September 14, 1837.

Winslow Lewis, as low bidder, signed the contract on May 16, 1838. The contract called for three, round brick towers each fifteen feet high from the ground to the top of the walls.

Lewis' construction crew of four masons, two carpenters, three laborers, and a cook arrived in June. During construction, which took only 38 consecutive days, the workmen often ignored the building specifications. David Bryant, the construction supervisor, felt that the work had been so poorly accomplished that he refused to sign the completion certificate presented by Winslow Lewis which stated that the terms of the contract had been honorably fulfilled. Instead, he referred Lewis to George Bancroft, the superintendent in Boston. Bancroft informed him that Stephen Pleasonton, controller of the lights, had accepted Lewis' word that the construction had been properly finished. As a result Bryant signed the certificate.

## *The Three Sisters of Nauset Lighthouses — continued*

Pleasanton, however, was not without his share of critics about the manner in which he operated the Lighthouse Establishment. Lieutenant Edward Carpenter was assigned as the inspector. He concluded, *I cannot believe that the Government will consent to consume 900 gallons of oil, when 300 or 360 will answer every purpose. Accordingly, I shall recommend the conversion of these lights into a single revolving red light.*

In May 1842, the secretary of the treasury appointed Isaiah W. P. Lewis, a civil engineer of unquestioned repute, to inspect the lights of Maine, New Hampshire, and Massachusetts and to report on their condition and management. Lewis, the nephew of Winslow Lewis, produced a document that did not flatter the Lighthouse Establishment or his uncle. He focused on the Nauset Beach lights as a typical example of fraud practiced by contractors. Lewis recommended that there be only one lighthouse at Nauset with a revolving light flashing every 1½ minutes.

### **The Wooden “Three Sisters”**

The Lighthouse Board annual report for 1892 stated, ... *three wooden movable towers were erected by hired labor, thirty feet to the westward of the old towers. This was done because of the washing away of the bank.* Despite the jerry-built construction methods, the old masonry towers served for 54 years. The lanterns from the brick towers were moved to the new lights on April 25, 1892.

The circular, wooden towers were taller than the ones they replaced. Raising the lights could perhaps have stemmed from the findings of the 1851 investigation which concluded that many lighthouses were too short to serve effectively. At any rate, the new lights were 22 feet to the top of the tower, with an additional seven feet to the lantern’s ventilator ball.

The fourth order Fresnel lenses, placed in the brick lighthouse lanterns in 1873, were transferred with the lanterns to the wooden towers. And in 1895, a storm porch was placed at the door of each tower.

By 1911, continuing erosion brought the Nauset Beach cliff to within eight yards of the north tower and eighteen yards of the one farthest south. As a result, it was decided to move the central light back from the cliff and use it as the only lighthouse into which a flashing light would be placed. Although technology had advanced to the point that a new, single flashing light could produce twenty times the brilliance as compared to that of the three lights combined, illuminating power was not the only reason to reduce the lighthouse number to one. Three lights could be mistaken for one or two if a vessel sailed by them at certain angles. In addition, the double and triple light systems in separate structures were being phased out for economic reasons.

The central tower of the “Three Sisters” was moved near the 1875 wood frame keeper’s quarters and attached to it by a short covered walkway. It rested on a solid brick foundation. The remains appear in the surf in winter at certain low tides. A fourth order Fresnel lens with a ball bearing flashing apparatus was installed. To retain a touch of the

## *The Three Sisters of Nauset Lighthouses — continued*

past, the light produced a triple flash every ten seconds when it went into operation on June 1, 1911.

Inspector H. C. Poundstone recommended that the two unused towers be torn down, but it was decided they would be sold at public auction. For some unknown reason, however, the sale was delayed.

Seven years later in 1918, the two lighthouses were sold. Helen M. Cummings, whose husband had previously inquired about the towers, bought the structures at a three-bid auction. She paid \$3.50 for both buildings and had to remove them from the property within ten days. They were removed within the allotted time and placed on a site near the French Cable Hut. In 1920, the two structures were moved inland, where they were butted into a 26 by 28 foot living room.

In December 1965, the National Park Service obtained the two towers from the Cummings' son, John. Since that time, in 1980, the additions have been removed, leaving the two structures freestanding.

The third of the "Three Sisters" remained in service until 1923. At that time, the disused cast-iron north tower at Chatham was moved to Nauset Light Beach and replaced the wooden third sister. Presumably, the fourth order lens was transferred to the metal tower at the time and is the one now on display in the Salt Pond Visitor center. In 1923, when the Chatham tower was moved to Nauset Light Beach, the 1875 keeper's dwelling was moved to a new location. A concrete foundation was laid for the cast-iron tower. In that same year, Albert Hall purchased the wooden tower with lantern and moved it. He built a single-story addition to the tower and named it the "Beacon." Hall's modifications were similar to those made by the Cummings. Windows were added at the ground floor and landing levels. The landing area was enlarged, but the wooden stairs remained in their original position.

Albert Hall's son, Harold, sold the structure to the National Park Service. In the summer of 1983, the one-story addition was removed, leaving the tower freestanding, and on September 13, 1983, it was moved to a site adjacent to the other towers.







## **The French Transatlantic Cable**

The French Transatlantic Cable was the first undersea communication cable between the United States and France.

In the 1870's, several communication corporations were formed as speculative ventures. One such organization, the Compagnie Francaise du Telegraphe de Paris a New York, began in 1879 with the objective of laying a transatlantic cable. In Great Britain, the company was known as the P.Q. Company after its president, Monsieur Pouyer-Quertier. Shortly after its inception, the corporation settled on a route from Brest, France, to the island of St. Pierre in the Miquelon Island group and then to Cape Cod. Using a cable built in England by the Siemens Brothers and an American ship, the *U.S.S. Faraday*, the cable was laid in four months. It stretched 2,242 nautical miles across the Atlantic to St. Pierre and 827 nautical miles from there to Cape Cod.

At the North Eastham terminal on Cape Cod, the company constructed a large building that served as a cable station. Here the messages were received in international code and, in turn, transmitted via an overland telegraph line to New York. The station had offices, quarters for the staff, and space for social gatherings. Because the cable arrived approximately two weeks before the structure was completed, office space was provided during that period in the basement of the Nauset Light Beach lighthouse keeper's dwelling. When the station was completed, the cable was transferred from the dwelling to the station.

The married workers built homes near the cable station at Nauset Light Beach. These men, however, subsequently complained that the isolated location created a hardship on them and their families. The school that their children attended, churches, and stores were far from their homes.

### **Building the Cable Hut**

Because of the workers' plight, the cable company decided to center its Cape Cod operation in Orleans, Massachusetts, and opened a new station house in March 1891. A cable from the old station at Nauset was laid across Nauset Marsh to the foot of Town Cove at Orleans and then to the new cable station house. Maintaining the large, old station merely as a connection point proved too costly, and, as a result, the Nauset station house was sold in 1893 to A. W. Reed. At the same time, a small hut that measured about ten by fifteen feet was constructed near the old station as a connecting point for the cable. That hut was formerly part of the structure known as the French Cable Hut. It was common practice to erect cable huts if the station house were set a distance back from the shore.

When the hut was constructed, it had shingle siding on the exterior and cedar shingles on the roof. The inside was not finished, with the studs visible. It was devoid of furniture.

## *The French Transatlantic Cable — continued*

Only a connection box, fixed to the corner of the southwest wall above where the cable entered the structure, occupied the room.

The French Cable Company operated the cable until France surrendered to Germany in June 1940 during World War II. While that war continued and for several years thereafter, the cable hut stood vacant. In the spring of 1949, Lorenzo Snow, who worked for the company, went to the cable hut and found it padlocked. After making an inquiry, he found that the hut had been sold to Dorothy LePage in 1946 for nonpayment of property taxes, even though the cable company had never been notified of such action.

### **Undersea Communications in General**

More than six hundred cables have been laid around the world. Between 1857 and 1928, 28 telegraph cables were placed across the North Atlantic between Europe and North America. After 1928, those cables which connected Europe and North America were designed for telephone use. The early cables ran between Great Britain and Newfoundland or Nova Scotia connecting overland to New York with two exceptions. An 1869 cable laid by the French Atlantic Telegraph Company connected Brest, France to Canada via St. Pierre Island and the Compagnie Francaise du Telegraphe de Paris a New York's 1879 cable connected Brest, France to Cape Cod via St. Pierre Island. This was the first submarine cable to connect the United States to Europe. In 1897-98, the French Cable Company (Compagnie Francaise due Telegraphe de Paris a New York) laid the first cable directly between the United States and Europe. It ran 3,173 nautical miles from Brest, France to Cape Cod. This second cable to Cape Cod did not pass through the cable hut. It went directly to the Orleans station. In 1899, a submarine cable was laid between the Orleans station and New York.

The 28 submarine cables laid between North America and Europe from 1857 to 1928 are:

|      |                                                                                                                                |
|------|--------------------------------------------------------------------------------------------------------------------------------|
| 1857 | Atlantic Telegraph Company                                                                                                     |
| 1858 | Atlantic Telegraph Company                                                                                                     |
| 1865 | Atlantic Telegraph Company                                                                                                     |
| 1866 | Anglo-American Telegraph Company (England to Hearts Content, Newfoundland)                                                     |
| 1869 | French Atlantic Telegraph Company (Brest, France to Canada via St. Pierre Island)                                              |
| 1873 | Anglo-American Telegraph Company                                                                                               |
| 1874 | Anglo-American Telegraph Company                                                                                               |
| 1874 | Direct United States Telegraph Company                                                                                         |
| 1879 | Compagnie Francaise du Telegraphe de Paris a New York                                                                          |
| 1880 | Anglo-American Telegraph Company (renewal of the 1866 cable)                                                                   |
| 1881 | American Telegraph and Cable Company (Cornwall, England to Canso, Nova Scotia. Connected from Nova Scotia to New York in 1889) |

## *The French Transatlantic Cable — continued*

|           |                                                                                                                    |
|-----------|--------------------------------------------------------------------------------------------------------------------|
| 1882      | American Telegraph and Cable Company (same route as its 1881 line)                                                 |
| 1883      | Commercial Cable Company (LaHavre, France to New York via England, Ireland, and Dover Bay, Nova Scotia)            |
| 1884      | Commercial Cable Company (same route as its 1883 line)                                                             |
| 1894      | Commercial Cable Company (same route as its two previous lines)                                                    |
| 1894      | Anglo-American Telegraph Company                                                                                   |
| 1897-1898 | Compagnie Francaise du Telegraphe de Paris a New York (First direct cable from Brest, France to the United States) |
| 1900      | German Atlantic Telegraph Company (Europe to New York via the Azores)                                              |
| 1900      | Commercial Cable Company                                                                                           |
| 1901      | Commercial Cable Company                                                                                           |
| 1903-1904 | German Atlantic Telegraph Company                                                                                  |
| 1905      | Commercial Cable Company                                                                                           |
| 1910      | Anglo-American Telegraph Company                                                                                   |
| 1923      | Commercial Cable Company (Europe to New York via the Azores)                                                       |
| 1924      | Western Union (Europe to New York via the Azores)                                                                  |
| 1926      | Western Union (same route as 1924 cable)                                                                           |
| 1926      | German Atlantic Telegraph Company                                                                                  |
| 1928      | Western Union (New York to Europe via Newfoundland and the Azores)                                                 |



## Piping Plovers



Piping plovers (*Charadrius melodus*) are special birds found at times on the beaches of Cape Cod. Since they are listed as *threatened* on the federal endangered species list, the National Seashore must do all it can to preserve and protect them while they are here. The question is: Why are they here only sometimes? One must explore the life cycle of the piping plover to come up with answers.

First, they are migratory birds. Those that come to Cape Cod do so to nest during the early spring to early summer. These birds migrate south along the Atlantic coast from North Carolina to Florida for the winter. But why leave Cape Cod?

Scientists feel that birds migrate in order to increase their chance of survival. When great ice sheets, or glaciers, covered New England—and created Cape Cod—the birds that lived here had to move south. Since other animals already lived in these southern areas, there was less food and living space to go around. So, as the glaciers slowly receded, those animals that had migrated south moved back. Some birds, like the plover, continue to migrate south for the winter months.

Try to imagine a Cape Cod beach. During the summer, tides deposit a line of seaweed and other treasures from the sea on a warm sandy beach. In and amongst this wrackline, the plover finds its favorite foods, beach fleas and insects, that also come to feed on the seaweed. But what does the beach look like during the winter? Cold and barren (though there is more there than meets the eye), and sometimes sea ice lines the shore. Though there is food, it does not equal the amount that can be found easily in the sunny south.

Habitat determines the number of birds that can live on a beach. For migrating birds like the plover, that means habitat in two areas: the nesting areas on the Cape and the areas where they winter in the south. If either of these areas is decreased by human activities or by some natural cause, the existing population will be threatened with extinction. Biologists for the National Seashore are now trying to figure out just how many plovers could successfully nest on Great Beach. In 1992, 27 pairs were found, almost twice as many as six years earlier. And the numbers have grown since then.

### Invisible to Feet and Tires

Piping plovers nest in the sand of the upper beach beyond the high tide mark, we hope. The nest itself is no more than a shallow depression, something like your footprint in soft sand. This type of nest is called a *scrape*. At times it may be shaded by American beach grass (*Ammophila breviligulata*). Four eggs are then laid in the sand. Both parents take turns sitting on the eggs. When an intruder gets too close to the nest, one parent will quickly run away from the nest, peeping the entire time. This is how the birds distract predators like foxes from their nests. The eggs are light-buff colored with brown spots,

## *Piping Plovers — continued*

effectively blending them into the sand. This protective coloration, as you may guess, has both good and bad points. While becoming invisible to predators in search of a meal, they are also invisible to feet and tires!

To help protect the nests, wire fencing, called a predator exclosure, is sometimes put up around each nest site that is found. The fence has holes big enough for the plovers to get in and out, but too small to allow entry to animals like foxes, skunks and raccoons trying to get to the eggs. Since the Seashore started this program, the number of chicks successfully fledging has increased from less than one chick per nest to almost three per nest.

When the fledglings begin to move away from the nesting area, their protective coloration stands them in good stead, as does their built-in fear response: duck and freeze. Often, the places that they choose to duck into are footprints or tire tracks in the sand. Because of this, the Park Rangers watch them closely and will close beach areas to over-sand vehicles (four-wheel drive cars and trucks) during this period.

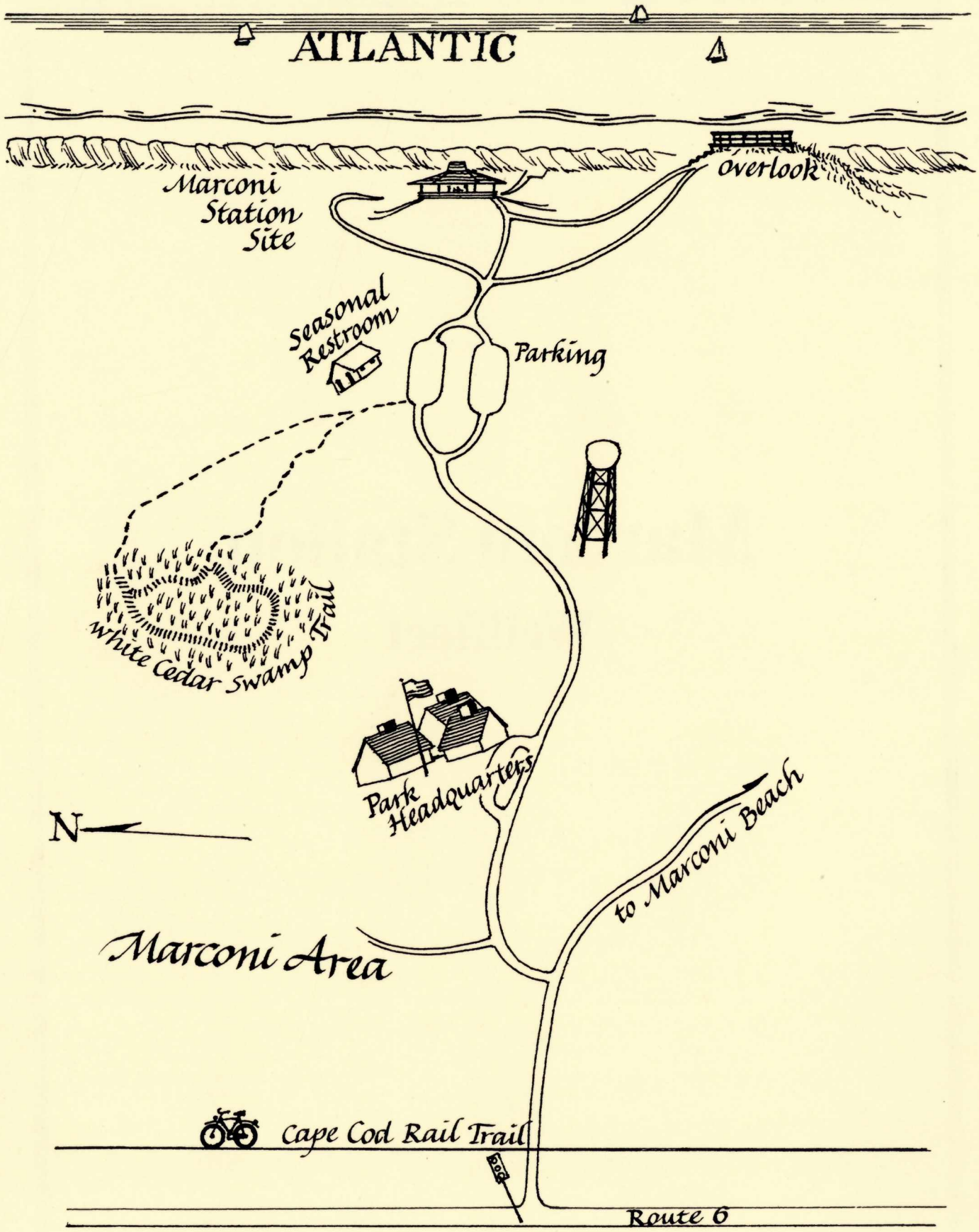
It is hoped these efforts will help the threatened plover from becoming another number on the growing list of endangered species. By being aware of what it takes to keep one species of bird alive, we can join in the effort to help preserve all of life.

**To help protect the nests, wire fencing, called a predator exclosure, is sometimes put up around each nest site. Please do not approach within 150 feet of exclosures.**

# **Marconi Station**

## **Wellfleet**





ATLANTIC

Marconi  
Station  
Site

overlook

Seasonal  
Restroom

Parking

White Cedar Swamp Trail

Park  
Headquarters

N

Marconi Area

to Marconi Beach



Cape Cod Rail Trail

Box

Route 6



## *Cape Cod National Seashore Location Summary*



### **Marconi Station**

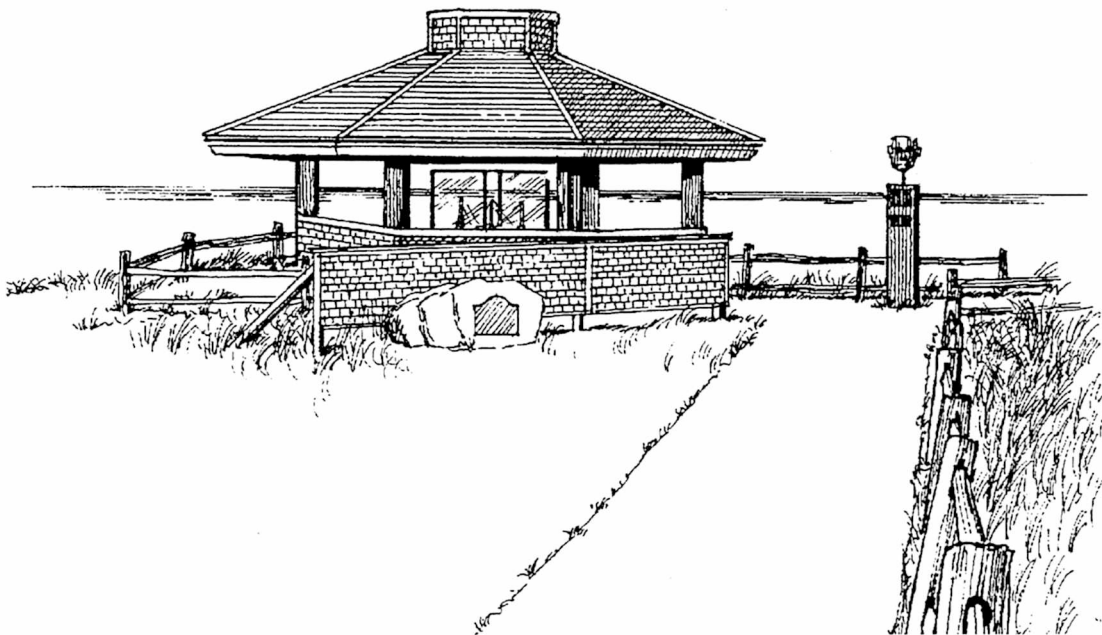
- Directions:** Six miles north of Salt Pond Visitor Center, off Route 6 in Wellfleet (look for brown and white signs).
- Safety:** Watch for bicyclists along Route 6, and where the bicycle trail crosses the Marconi area entrance road.
- Other:** Restrooms are available seasonally at the Marconi Station Site and Marconi Beach. (Limited visitor services are also available at Park Headquarters Monday through Friday 8:30 a.m. to 4:30 p.m.)
- Tips:** The Marconi Station Site offers a superb viewing area across this portion of the Cape from ocean to bay. The Atlantic White Cedar Swamp Trail also begins here.
- Time Frame:** Five-minute narration on bus. Fifteen to thirty minutes, if stop is made at either the station site or the beach.
- Notes for Educators:** The overlook at the Marconi Site offers a full ocean to bay view across the Cape. The Marconi Site offers lessons on the history of radio communication, and the Atlantic White Cedar Swamp trail displays a unique cross section of Outer Cape vegetative communities.
- Highlights:** Marconi Station Site exhibits  
Observation platform  
Atlantic White Cedar Swamp Trail  
Marconi Beach  
Park Headquarters Building  
Former site of Camp Wellfleet  
*Whydah (Whidah)* pirate ship wreck site  
Fresh Brook Village site



## **Marconi Station**

- **The cliff** rises 85 feet above the beach. The elevated plain at the top slopes gradually toward Cape Cod Bay. This is a good location to observe and discuss the east-to-west flow of glacial outwash.
- **The Atlantic White Cedar Swamp Trail** is a 1½ mile nature trail that descends gradually in elevation into the swampy environment that hosts Atlantic white cedar and red maple trees. The trail offers an excellent view of different plant communities, starting out with heathlands, then stunted pitch pines and bear oak, taller pitch pines and black and white oaks, and finally the white cedar-red maple community.
- **An observation platform** at the Marconi Station site offers an excellent overview of the Outer Cape, including both ocean and bay.
- **The Marconi site uplands** are a landscape slowly recovering from European land-use practices, which stripped the landscape of topsoil, and then further from the effects of Camp Wellfleet, which further impoverished the vegetative cover during World War II. The landscape today, however, serves as an important upland heath community, which harbors several rare species, including broom crowberry and two types of poverty grass.

**Do not walk on the edge of, or beneath, cliff faces.**





## **Marconi Station Area**

The Marconi Area obtained its name from the famous Italian inventor, Marconi. From a site here, Marconi successfully completed the first transatlantic wireless communication between the U.S. and England in 1903.

Here, the outer beach is famous for the steep, forty-foot sand cliff (or scarp) located behind it. Swimmers and beach walkers feel a sense of solitude here because the scarp and ocean provide an unbroken, pristine natural scene in all directions.

The uplands above the beach slope gradually westward, and provide a graceful vista of both the bay and sea horizons of this portion of the Cape.

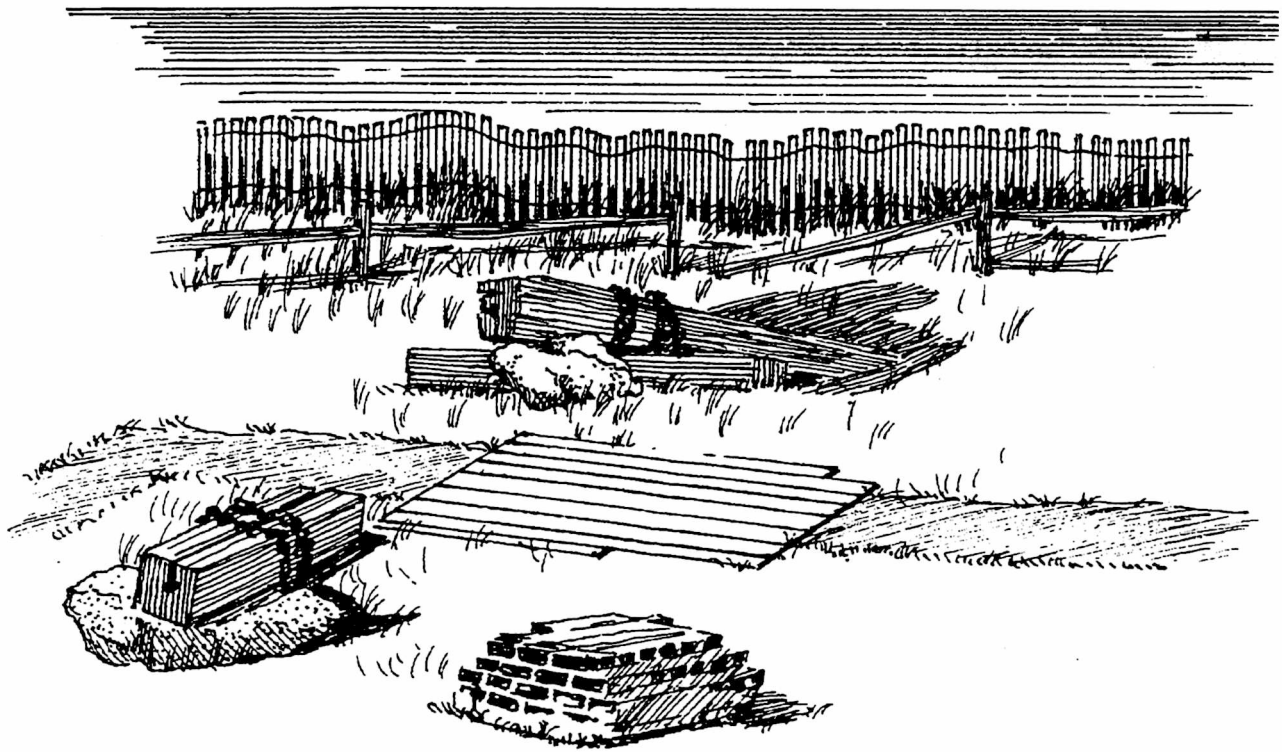
A platform above the Marconi station site enhances this view, and offers vistas southward to Eastham, and northward to Truro.

The Marconi operation at this location was initiated by the young inventor in 1901. However, in December of that year, due to a number of setbacks, he had to use temporary facilities on St. John's, Newfoundland to prove his theory—wireless could cross the Atlantic! Meanwhile, a new station was built in Nova Scotia while repairs were being made to the Wellfleet station, and the first two-way, transatlantic wireless message was made at Glace Bay, Nova Scotia, on December 17, 1902. Not long after, the Wellfleet Station was ready, and on January 18, 1903, Marconi staged another world's first (and a bit of a media event) by successfully transmitting messages between the president of the United States and the king of England. With rapid advances in technology, the station became outdated in a matter of a few years, and was replaced by a newer station in Chatham, Massachusetts.

Marconi chose this site because of the barrenness of this elevated table land overlooking the ocean. The government chose the area for similar reasons during World War II, and established Camp Wellfleet at this site to serve as an artillery training facility. The military camp eventually outlived its need, and the property was transferred to the National Park Service with the creation of Cape Cod National Seashore. The Park's administrative headquarters located here in 1965.

The Atlantic White Cedar Swamp Trail, which was given an award by James Watt, Secretary of the U.S. Department of Interior, is located here, providing a cross-section look at much of the Cape's upland vegetative communities.

On the bluff overlooking the vast Atlantic is the drama of sand and surf. Dubbed the "graveyard of the North Atlantic," the off-shore sand bars here doomed many ships, including the pirate ship *Whydah* (or *Whidah*), wrecked in 1717, and the *Castagna*, which wrecked while the Marconi Wireless Station was in operation.





## **Marconi Station Area — South Wellfleet**

### **Marconi Station**

Guglielmo Marconi searched the east coast of the United States and Canada for sites suitable to prove his theory that radio waves could be transmitted long distances beyond the line-of-sight. Marconi settled on two sites—one at St. John's, Newfoundland, and the other here at South Wellfleet. The St. John's station sent the first readable message on December 16, 1902, to Poldhu, England. Four weeks later, January 18, 1903, the first transatlantic wireless message was sent from the United States to Europe.

Two famous shipwrecks occurred near this site. On April 26, 1717, the 300-ton galley *Whydah*, commanded by the notorious pirate Samuel Bellamy, drove ashore and went to pieces. All but two of the crew of 146 were drowned. The *Whydah* has been the object of much activity on the part of treasure seekers, as she was reputed to be carrying 20,000£ in English Gold.

Directly below the towers at the Marconi station, the Italian bark *Castagna* came ashore during a bitter winter gale on February 17, 1914. Because of the intensity of the gale, no one was aware of the disaster until the following morning. The crew, fearing that the ship would soon break up, took to the rigging. Several of the crew were found frozen there. The rescuers brought the survivors to the Marconi station where they were cared for until they recovered from the ordeal. The *Castagna* was the last square-rigged vessel to be wrecked on the shores of Cape Cod.

### **Blackfish Creek**

Various drainages intersect the Outer Cape, generally running in an east to west direction. These drainages are the result of water coursing off the ice front and over outwash materials that abutted the massive glaciers located here some 18,000 years ago.

When the glaciers melted and sea level rose, these drainages became estuarine at their western terminus. Blackfish Creek is one such notable feature in Wellfleet. This drainage connects with a broad salt marsh environment at its western end, which is visible from Route 6.

This shallow meandering portion of Blackfish Creek became noteworthy because of its configuration, particularly in association with mass strandings of pilot whales, or blackfish (hence its name).

For reasons still undetermined by scientists, whales and dolphins frequently strand on Cape Cod bayside shores. The possibility is that sickly individuals lead other members of the pod ashore. Another theory is that these marine mammals, which navigate by echolocation, become confused by the meandering configuration of such drainages, and get caught by rapidly falling tides. Thousands of pilot whales have stranded in the vicinity over the years. Noted author, Henry David Thoreau, even wrote about one such stranding.

## *Marconi Station Area — South Wellfleet — continued*

### **Fresh Brook Village**

Another drainage, just off the highway in the woods to the east, harbored an early settlement known as Fresh Brook Village. It stood astride an ancient road known by the settlers as the Old Kings Highway.

Settled about 1730 by people from Eastham, the village was occupied by perhaps a dozen families at its peak. It was a quiet place where fishermen came home from their labors in small boats in the Bay. The houses were small and usually included enough land for a small garden plot. There was a store and Aunt Lydia Taylor's tavern where travelers using the stage along the Kings Highway might stop for refreshment. Children attended a one-room school nearby. By 1872, the Cape Cod Railroad was extended toward Provincetown, and Fresh Brook was crossed with a culvert that restricted the size of the passage under the tracks. Not long afterward, fishermen began to use power boats and people moved away from the village. By 1900, only two families remained at Fresh Brook. The last resident, Asa Cole, died in 1905.

About this time, a Boston sport-fisherman purchased 85 acres and created a fishing camp for himself and his friends. Fresh Brook was stocked with trout, and for the next twenty years or so, he and his friends enjoyed this peaceful area.

Today, the old village lies in the woods and shows few signs of its long human occupation. All that remains of the early settlers' homesites are depressions marking their cellar holes. The Old Kings Highway is a narrow dirt road used for fire patrol by Park Rangers. The lesser roads are paths through the woods or have disappeared in the forests. Hikers who are quiet enough sometimes see small game, including fox, and, once in a while, a coyote.

Most of the early inhabitants are buried in the cemetery of the old South Wellfleet Congregational Church, just north of the village. The graves are marked, and one, that of John Taylor, Aunt Lydia's husband, usually has a tiny flag and is marked by an inscription that lists him as one of General Washington's honor guard during the Revolution.

### **Camp Wellfleet**

Just before World War II, the Army took possession of the land from the Eastham-Wellfleet boundary from Route 6 to the Atlantic. Barracks, mess halls and other buildings were erected to serve the thousands of troops who were stationed here during and after the war, primarily for anti-aircraft artillery training. Today, former soldiers from Camp Wellfleet occasionally visit their old training ground. There are few visible signs of it today—the water tower off the road to the Marconi site, a few fire hydrants in the open fields that were used for the tents and barracks, a pump house south of Park headquarters, and a few of the old roads are all that remain.

After the creation of Cape Cod National Seashore in 1961, title to this area was transferred from the Army to the National Park Service.





## **Marconi**

### **Birth of an Idea**

The experiments of Heinrich Hertz inspired the idea. This German physicist first demonstrated the existence of electric and magnetic waves, and with this revelation young Guglielmo Marconi began dreaming of a way to send messages from transmitter to receiver without the aid of wires.

In 1894, Marconi retreated to a top floor laboratory of his family's Villa Grifone near Bologna, Italy, and at the age of twenty, began his experiments in earnest. At first, Marconi used homemade equipment, testing and repeatedly modifying it, each time stretching to greater limits the distances that signals could be received from a transmitter. That first winter, it was thirty feet. In 1895, it was one mile. Then, using more powerful equipment, it was ten, then twenty, then fifty miles. And, by 1901, a two hundred-mile range was achieved. Wireless telegraphy was suddenly the rage of Europe—and then of America.

### **Spanning the Ocean**

For Marconi, the "great thing" was to transmit wireless signals across the Atlantic. So to accomplish this, stations were built at Poldhu, England, and South Wellfleet, Massachusetts. Huge rings of masts were installed to support the needed antennas, but these were destroyed by storms.

As an interim step, Marconi used a kite aerial at Glace Bay, Nova Scotia, to detect transmissions from Europe. On December 1, 1901, he succeeded in hearing the letter "s"—the first transatlantic reception.

Then he and his crew worked furiously to reestablish the damaged towers in Poldhu and South Wellfleet. The new antennas consisted of sets of four wooden towers, each 210 feet high. Within each powerhouse, two kerosene-burning engines produced 2,200 volts of power. When fed to a Tesla transformer, the power was stepped up to 25,000 volts—the energy needed to transmit long-wave signals so far. To improve his operation, a new station was constructed at the same time in St. Johns, Newfoundland. Here, a successful two-way exchange of messages was made on December 17, 1902.

On January 18, 1903, the first United States attempt was made. Messages were broadcast in international Morse code, and with elation, the official communiques of President Theodore Roosevelt and King Edward VII were successfully exchanged by the two stations. It was the first two-way wireless communication between Europe and the United States.

## *Marconi — continued*

### **The Years of Operation**

Within months, the South Wellfleet station was regularly sending American news through Poldhu to *The London Times*. And, in return, a telegraph line connected Cape Cod's wireless stations with the South Wellfleet telegraph office, which relayed European messages to *The New York Times*.

Oceangoing vessels quickly adopted Marconi apparatus to receive news broadcasts, and soon, the ship-to-shore transmittals were a major operation; business and social messages could be sent for fifty cents a word. The station's effectiveness was limited, however, so broadcasts were made between 10 p.m. and 2 a.m. when atmospheric conditions were best. This brought little enthusiasm from local residents, for the great three-foot rotor, supplied with 30,000 watts of power, produced a crashing spark heard four miles downwind.

Novel objects have a way of becoming routine, and so it was with wireless telegraphy. The romance of communication with ships at sea remained high, however, and rose higher with repeated sea rescues. Interest reached a dramatic level with the *Carpathia's* wireless-aided rescue of over seven hundred people from the *Titanic* in 1912.

### **Demise**

For fifteen years, the South Wellfleet spark-gap transmitter continued in commercial use, primarily for ship-to-shore transmissions. Skilled telegraphers sent out messages at the rate of seventeen words a minute, and station CC served in effect as the first "Voice of America." But, its end was inevitable. The sea cliff of South Wellfleet was eroding three feet each year, and by 1916, the easternmost towers were threatened with collapse. The station was closed the following year by the Navy to ensure security and news censorship during World War I, and all the while, successive inventions were making spark-gap transmission obsolete.

The station never reopened, and in 1920, it was scrapped. The barn-red towers were dismantled, useful equipment was salvaged, and the buildings, once filled with the excitement and familiar sounds of wireless communications, were abandoned.

WCC in Chatham replaced old CC, and remained one of the most heavily used ship-to-shore radio stations on the east coast.

### **A Changed World**

It was an era of new achievements and new horizons. Communication by wireless was a part of this, for it affected the way the world was viewed and how societies worked. It heightened interest in events beyond the bounds of daily contact. It affected national unity. It raised new possibilities of what could be accomplished. It brought new efficiency to business—and to warfare.

Marconi's impact was great. And, when he died, a final respect was paid as all wireless around the world were silenced in his honor. No other person had ever received such recognition. No others have received it since.



## **The Marconi Station**

### **South Wellfleet, Massachusetts 1901-1920**

In November 1901, the original Marconi Wireless Station, South Wellfleet, Massachusetts, was nearly complete. Before a single signal could be sent, a storm in that month destroyed the original masts, a circular arrangement of twenty single poles, 200 feet high. The powerhouse, connecting corridor and transmitter house were undamaged, however, and, in 1902, Marconi instructed his engineers to erect four 200-foot high wooden towers around the buildings which occupied the center of a square measuring 200 feet on a side.

On January 18, 1903, with Marconi himself reputedly operating the key, the first transatlantic wireless message from the United States was sent and received, a message from President Theodore Roosevelt to the King of England. (This was one month later than the first North American message, which was sent and received in Europe from Glace Bay, Nova Scotia in December 1902.)

The Marconi spark-gap transmitter operated successfully until 1917, when three unrelated factors resulted in the dismantling of the equipment about 1920:

1. Censorship imposed by World War I.
2. The erosion of the sea bank, endangering the two outermost towers.
3. The American Dr. Lee DeForest's invention of the vacuum tube, which made spark-gap transmission obsolete.

In 1920-21, the towers were cut down and the machinery scrapped. All that is left today are remains of the transmitter house base, part of the corridor which connected the transmitter house with the powerhouse, and the two western tower bases. The eastern ones are now on the beach forty feet below, where they are sometimes visible. As early as 1906, Marconi's engineers stated that the eastern towers had been placed too close to the ocean.

There is no trace of the frame house or "station quarters," where the manager, two engineers, and three operators lived. A direct-line telegraph connected this building with the South Wellfleet telegraph office in the railroad station. News from *The New York Times* was punched out on tape (Continental Code) and transmitted from Marconi's station from 10:00 p.m. to 2:00 a.m. These messages could be picked up by any ship equipped with Marconi apparatus. Private messages could be sent for fifty cents a word.

The South Wellfleet station operated in a limited way under Navy control from 1917 to 1920, when the station was finally abandoned.





## **Atlantic White Cedar Swamp Trail**

Life is harsh at the edge of the sea. The soil is nothing more than windblown sand, with little ability to hold water. There are few nutrients in the granitic soil. The winter gales prune any plant exposed more than others. Salt spray whipped out of the surf will inhibit or kill all but the most tolerant plants.

But, further inland, these conditions soften. The dehydrating effects of salt spray lessen; a downwind slope provides shelter from the pruning effects of salt spray and wind; and toward the cedar swamp, there is a change to a richer soil, able to hold more water.

One condition grades into another. And, likewise, there is a transition of plants best suited to the requirements of each place along the way.

### **Life Behind the Dunes**

A low-growing community of bear oak, golden beach heather and broom crowberry survives behind the dunes. Stunted pitch pine grow here, too, but they are progressively taller as the trail descends (both stunted and tall trees are about 75 years of age).

The pines are still taller where there is more moisture; and beneath them, thrive young black and white oak in place of bear oak. Larger, older oaks grow nearer the swamp, and below them, there appears a new ground cover—checkerberry, wild sarsaparilla and mayflower, which grow in the acidic soil produced by decaying oak leaves. Red maples prosper in the wettest soil close to the swamp, accompanied by still another array of understory plants—sweet pepperbush, inkberry, and sheep laurel.

Changes are also a product of time, for nothing in nature is constant. All of this land was barren in the 1850's—a result of years of overuse. And, it was only in the last century—as the land was abandoned—that it began to recover.

Pines tower above young oaks, and they grow among the larger oaks today, but their demise is certain. Pine seedlings cannot grow in the deep shade of summer, and so as the older pines age and die, they will not be replaced by their own kind.

In the short run, an oak forest will emerge to cover more and more land. In the middle run, a beech forest may appear. And, in the long run, all of it will succumb to the advancing sea.

### **The Cedar Swamp**

When the last glacier retreated, only a dry, shallow depression here in the barren debris marked where a block of ice once lay. There were no ponds, because glaciers still locked up much of the world's water—and the Ice Age sea stood four hundred feet lower



## *Atlantic White Cedar Swamp Trail — continued*

than today. But, as the ocean rose, the freshwater table of land was lifted. And so, at last, fresh water intersected this “kettle” about seven thousand years ago.

Plants of both land and water added their debris to the depression. Today, this layer of peat is 24 feet thick.

Northern plants were the first to appear after the glacier’s retreat. But, as the climate warmed repeatedly over the centuries, southern plants entered the landscape. Perhaps five thousand years ago or so, Atlantic white cedar began to grow on Cape Cod wherever there was wet ground or a swamp.

Of course, the forested swamps were quickly cleared once European colonists arrived in this new world.

Settlers dreamed of such a wood. It was light, it resisted decay, and it was easy to shape. And so its products quickly found their way into every avenue of colonial life. The lumber was split into boards for houses and farm buildings. It was used for joists and frames, for doors and rafters and floors (because it scoured so white), and tanks to hold whale oil. Its posts fenced fields, its poles supported garden vegetables and flowers, and its slats became laths and boxes and woodenware. Organ pipes and water pipes were Atlantic white cedar—and during the Revolution, even gunpowder was produced from its charcoal.

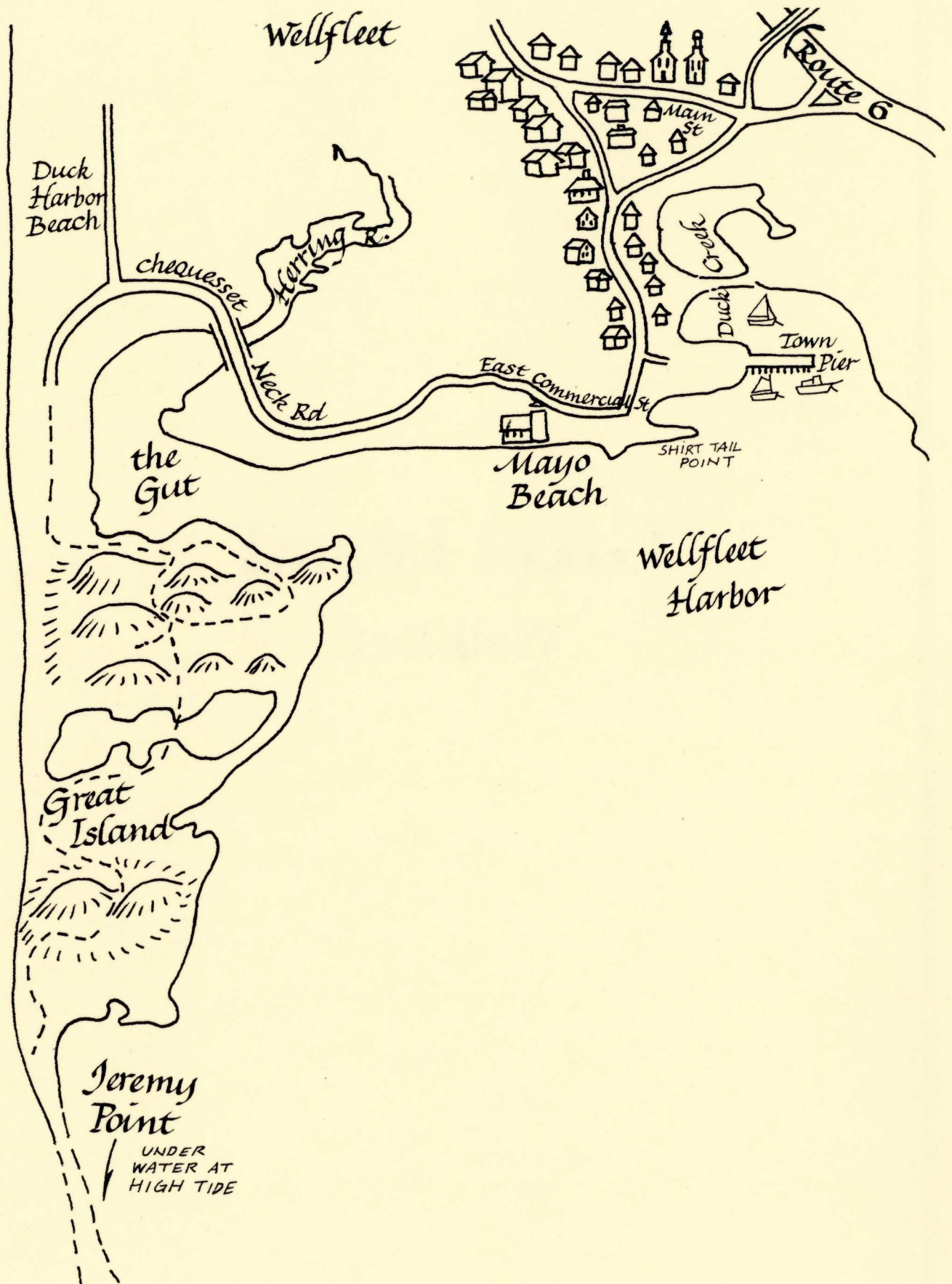
At first, white cedars three to four feet thick had been logged from swamps like this one. Later, the succeeding generations of smaller trees were cut. From the original forest, almost no trees survived.

It is the nature of the Atlantic white cedar to invade swamps. Fires, storms, or logging may repeatedly level such a forest, but this tree will return again and again. Indeed, without catastrophes to repeat the process of invasion, red maple and tupelo will, in turn, become invaders. The red maple invasion has already begun, but it is a gradual thing. The seedlings of Atlantic white cedar, like pitch pine, will eventually fail to grow in the deep shade. Still, only if there are several centuries without disturbance (a rare thing in nature) will there be a complete change.



# **Great Island**

## **Wellfleet**





## **Great Island**

- Directions:** To reach Great Island, turn left off Route 6 to Wellfleet Town Center (look for green and white sign for Town Center). Turn left onto East Commercial Street. At town pier, turn right onto Kendrick Road, then left onto Chequesset Neck Road to the Great Island parking lot, 3½ miles from traffic light on Route 6. Driving hint: Water view will generally be on your left.
- Safety:** Wellfleet town roads are narrow and windy, and are not well-suited for larger vehicles.
- Other:** Picnic tables are located at the Great Island parking lot, and portable restrooms are provided seasonally.
- Tips:** Tell the Blackfish Creek, Great Island and Cape Cod architecture stories on the bus on Route 6. Look for examples of Cape Cod architecture along Route 6 between Wellfleet and Truro.
- Time Frame:** Five-minute narration if bus remains on Route 6. Thirty minutes to one hour needed if group goes to Great Island.
- Notes for Educators:** The Great Island Trail is a prime location for isolated marsh, tidal flats, upland and dune ecology studies. Fiddler crabs can be seen at the base of the trail where it skirts the marsh (in the warmer months). A memorial to a Wampanoag woman at the head of the trail, and a memorial to Governor Bradford several miles inland offer historical perspective. A wayside exhibit explains the significance of the Great Island Tavern site.
- Highlights:** Blackfish Creek  
Herring River Drainage  
Tidal Flats (oyster beds)  
Great Island



## Great Island

- **Kame (or Knob)** is the name given to the large mounds of glacial debris that have become the “islands” in this area. Here, they have gone through a series of being isolated and then reconnected, due to various coastal geologic processes.
- **The Herring River drainage** is an east to west drainage. It once flowed directly west to Cape Cod Bay, isolating Great Island. Its estuarine tidal flats provide a rich habitat for oysters, and the edges of the adjoining marsh are home to many tidal species, including fiddler crabs, which frequent the shoreline during summer.
- **The tombolo formation** that connects the main body of the Cape to Great Island is another prominent geologic feature of the area. It is a formation that has arisen because of specific sediment deposition and current patterns.
- **The Great Island forested uplands** consist primarily of even-aged pitch pines, due to replanting activities at the end of the 19th century. Bearberry stands and other low growing species attest to the previous impoverished condition of this setting, while occasional white pine stands and one or two struggling American chestnut trees attest to the area’s even earlier plant diversity.

**Be careful to avoid stepping on fiddler crabs (or their holes) during spring and summer when walking along marsh areas here.**





## Great Island

Traveling north from Eastham on the way to Great Island, there are a number of noteworthy features.

In the central and northern portions of Wellfleet, the Cape Cod National Seashore stretches from ocean to bay. A rich diversity of natural and cultural features lie within this range.

The first glimpse of this diversity can be seen 3/4 of a mile north of the Marconi Area along Route 6, where Blackfish Creek and its salt marshes appear to the left of the roadway. (Blackfish Creek was named for the repeated strandings of pilot whales, or blackfish. This phenomenon is still not fully understood by scientists.)

The drainage of the outwash plain from east to west is very apparent at several places on the Outer Cape, like Blackfish Creek. (The most prominent is the Pamet River, eight miles to the north.)

LeCount Hollow Road, 1/2 mile further to the right, offers a connection to Wellfleet's portion of Ocean View Drive (the only road other than Ocean View Drive in Eastham that flanks the ocean).

Further north, and to the west of Route 6, is Wellfleet Center. Wellfleet was once a part of Eastham, but developed a center around its harbor. (The clock in the town's Congregational Church strikes in ship's time, and evidence of maritime activities can still be found along the waterfront).

The earlier name for this area was Billingsgate. Earlier still, it was the home of the Punonakanits (Wampanoag) people. Both Native Americans and European settlers took advantage of various marine resources, including stranded pilot whales. Gradually, whaling activities increased, as larger whales were driven ashore from Cape Cod Bay.

Great Island looms off to the west of Wellfleet Center. A tavern existed on Great Island, apparently to serve mariners, in the late 1600's and early 1700's. In time, both the soils of Wellfleet and the abundance of whales in the bay gave out, forcing Wellfleet residents to make the same adjustments made by residents of other Cape towns. Wellfleet became the home of fishermen, whalers, and other deep-water mariners throughout the 18th and 19th centuries.





## **Great Island**

### **The Marsh**

Oysters, soft shell clams, quahogs, fiddler crabs, herons, egrets and marsh grasses abound here because of the special configuration of the land. It was gradual sea-level rise on the sloping outwash plain that allowed for the development of most of the rich salt marsh areas visible today. Changes in upland drainage patterns also enhanced the connection of various bayside “islands” through movement and deposition of sand. This process further stabilized the marsh area fringing the “tombolo” formation (known as “The Gut”) that stretches between Griffin and Great Island. Two more similar concave shaped “salt marsh harbors” are sheltered southward between Great Beach and Little Beach hills.

Wellfleet oysters, which thrive in the flats adjacent to the marsh at this location, have been world renowned. Native peoples used oysters in their diet, and Pilgrim settlers soon discovered their commercial value. Oyster shells were also burned to make lime for mortar. However, it was not always understood that oysters need old shell surfaces to propagate their spat. This, and possibly other factors, caused the dramatic disappearance of this delicacy from local waters in the mid 1800’s. Reintroduction of oyster stock from southern U.S. coastal areas reestablished this species locally—but it will never be known if the replacement stocks can match the flavor of the famous Wellfleet oysters of old.

### **Billingsgate Beach**

The ancient name for the farthest point south of Great Island was Billingsgate Beach. Initially, the chain of outwash mounds located here gradually became islands some 18,000 years ago as the glacial period ended and sea level rose. Then these same islands became reattached to the land by sandy bridges (causeways) due to migration caused by wind, waves and currents. The sandy attachments between these islands are known as “tombolos” by geologists. However, “The Gut,” one of the most extensively formed tombolos on the Cape, did not form fully until after the 1850’s, when the Herring River was altered by a dike built to support railroad tracks (and also used to limit salt water circulation upstream).

Billingsgate Point eventually became an island again in the late 19th century. At that time it even hosted a lighthouse and several dwellings. Currents, and other erosion factors, however, claimed the entire land mass in the early 20th century. Jeremy Point is now the namesake of the less distant end of the remaining stretch of beach—which today is subject to being submerged at high tide.

### **A Tavern Tale**

Whaling was indeed a lucrative enterprise in this vicinity. The Native Punonakanits took advantage of stranded whales, as well as those in the adjacent bay that could be driven into the shallows. The Pilgrims observed Natives harvesting a blackfish (or pilot



## *Great Island — continued*

whale) during their exploration of this part of the Cape in December 1620. This was a memory they saved for later. Whales have often frequented Cape Cod Bay, but for reasons still unknown, they occasionally strand on the bay's shallows. Blackfish have been particularly vulnerable, stranding in the thousands at times. The early Pilgrim Cape Cod settlers saw this as a natural bounty, and throughout the 1600's, Great Island was set aside as a "common land" for both local Native and European inhabitants to partake in whaling activities.

Great Island offered several advantages—closeness to whales in the bay, gently sloping beaches on all sides (well-suited to pulling harvested leviathans onto), and abundant wood to fire tryworks to boil out the oil. "Whale Houses" to store gear and "trywork kettles" were permitted to be constructed around the perimeter of the island. However, the construction of a tavern remains somewhat of a mystery. Archeological evidence indicates the most probable date of the tavern's operation to be between 1690 and 1740. However, Plymouth Colony records show that the land was not subdivided into private parcels until 1715. Hence, construction of an upland dwelling on the island in earlier times would have required some "legal" exceptions. Furthermore, near-shore whaling declined soon after the land was subdivided, due to the depletion and loss of the wood supply needed to fire tryworks on Great Island.

While Samuel Smith became a later landholder of much of Great Island, tradition holds that he operated the original tavern. But, if this is true, it was at the end of Great Island's golden era of near-shore whaling, and the beginning of its transformation to a depleted (and then protected) landscape.

### **The Punonakanits**

A proud people lived here, utilizing the resources of bay and shore to accommodate their year-round settlement well before the arrival of Europeans. The local Natives, known as Punonakanits, were members of the Wampanoag federation. Shell middens and other remains from these people and their predecessors indicate a sophisticated and stable social structure. An ossuary, discovered in the late 1970's on Indian Neck, points to an advanced, well-developed society. During the woodland period, these people used agricultural practices to sustain them throughout the warmer months, and they supplemented their diets with shellfish and other marine resources in the winter.

Surprisingly, the Punonakanits population remained relatively stable throughout the 1600's, although competition for land and resources undoubtedly put pressure on their means of livelihood. Pilgrim laws assured the sharing of certain resources, and for many years, these two peoples lived peacefully side by side in this area. However, the great smallpox epidemics of mid-1700's had a bad effect on both groups of inhabitants, and was particularly devastating to the Punonakanits population. Despite noteworthy efforts by local townspeople to aid their Native neighbors, the Punonakanits population declined to a point where only a handful survived into the 1800's. Thus, a proud people disappeared from a land of which they once were very much a part.



## **The Pilgrims in Wellfleet**

The Pilgrims were not the first Europeans to visit this area. Gosnold affixed the name Cape Cod in 1602 as a memento of the abundance of codfish caught in the bay, and Champlain dubbed the area Port Aux Huitres in recognition of the fine oysters found in the harbor located here.

Although the Pilgrims bypassed the shores of Great Island in 1620, by 1644 memories of the richness of Cape Cod lured seven prominent families from Plymouth to resettle in the Nauset area (later named Eastham). Eastham's jurisdiction stretched, at one point, from Provincetown to Plymouth. The Billingsgate area was named early on because of its abundance of oysters and marketable fin fish (in honor of the famous Billingsgate fish market district in England). Billingsgate remained a district of Eastham until the mid-1700's, despite efforts to separate off earlier. It was then named Wellfleet, probably again to capitalize on old world "Wellfleet" oysters sold in Europe. (Oysters could be shipped for several months and yet stay fresh, thus they were a good long-distance market commodity.)

Great Island, however, deteriorated from being an asset to being a liability to the new town. Overharvesting and unchecked grazing not only depleted the abundant woods but the native grasses and topsoil as well. There were real fears that sand blowing from the wasting Great Island would clog the harbor and possibly even threaten the oyster beds. Protective laws were passed, and in the late 1700's reforestation efforts (by planting pitch pines) were taken in earnest. The few families allowed to live on the island in the late 1700's were charged to also serve as caretakers. As the island gradually recovered, later residents, such as the Hendersons, witnessed the beauty of the area return. In the 1960's, with the establishment of Cape Cod National Seashore, residency on Great Island ceased. A memorial to Governor Bradford and other Pilgrim followers, erected on Henderson family property on Great Island, completes the circle of European settlers' recognition of the special spiritual bounty of this land—similar to the connections with the earth expressed by original Native American inhabitants.





## **Cape Cod's Whaling Era**

### **Not Ready for Whales**

The *Mayflower* was welcomed to the New World by a school of whales. They frolicked all around the ship as it lay anchored off Cape Cod, but Captain Jones, master of the *Mayflower*, did not appreciate them. He was on a ship that didn't have a single harpoon. His passengers, farmers for the most part, had been more concerned with bringing ploughs, axes, and pitchforks than they had with bringing a complete line of fishing gear.

### **Drift Whaling**

Actually, there was a way to catch a whale without a harpoon. The Pilgrims discovered this later when they moved to the Cape. Indeed, a person didn't have to be a fisherman to catch what was called a "drift" whale. A person could do it without even getting his/her feet wet. Drift whales were whales that ran into trouble on the sandbanks along the Cape coast, just as many ships did. And, like those ships, they'd be cast ashore before they could escape to deep water.

"Whale in the Bay!" a Cape Coddler would sing out when he saw a whale struggling in shallow water. The cry would bring neighbors running. Sometimes a whole school of blackfish (a type of small whales) would be washed ashore which would be an especially lucky catch. For a blackfish not only has oil that can be boiled out of its blubber or fatty parts, it has in its head, a "melon" full of particularly valuable oil. But, in colonial days, any kind of whale oil was prized, for it was with whale oil, rank-smelling as it was, that Americans and Europeans lighted their lamps.

So profitable was the business from drift whales that some towns appointed men to serve as whale watchers. (In 1661, Ralph Smith of Eastham was fined twenty shillings for neglecting his duty as a whale watcher.) As soon as a whale was beached, the citizens went to work on it—cutting it up, removing the blubber, and building fires on the sand where iron pots (try pots, they were called) were set for boiling the oil out of the blubber.

After a while, Cape Coddlers decided it was foolish to wait for blackfish to run into trouble. Why not help them along? So as soon as they spotted a school, they would jump into their dories, row into the bay, and form a half-circle behind the blackfish. Shouting, hallooing, and clacking their oars flat on the water, they would drive the blackfish right up on the beach.

One barrel of oil from each whale had to go as a tax to Plymouth, the capital of the Old Colony. But, there must have been plenty of barrels, for in 1688, the secretary of the colony wrote: *Now Plymouth Colony have great profit by whale killing. I believe it will be one of our best returns.*

## *Cape Cod's Whaling Era — continued*

### **Shore Whaling**

It was some fifty years after Captain Jones had sighted that first school of whales that the real art of whaling was introduced on the Cape. Ichabod Paddock of Yarmouth was one of the first to master the use of harpoon and lance, and after this method—shore whaling, it was called—caught on in Cape Cod Bay, fishermen in Nantucket invited Ichabod to come there and teach it to them. Cape Codders were carrying casks in their boats now to hold blubber that they cut up at sea. Soon they began to build try works for boiling blubber right into the decks of their boats.

The shore whalers didn't go far, but they were thorough. By the middle of the 1700's, the bay was cleaned out of whales. Some families moved off the Cape. When the economy declined further, many families who lived on Long Point (out of Provincetown) put their houses on rafts and floated them across to the town itself. (Many of these houses are still standing in Provincetown. They are marked with a blue and white plaque, showing a picture of a house on a raft. At the Provincetown Museum, there is a diorama of the Long Point settlement as well as a full scale replica of a whaling captain's quarters.)

### **Deep Sea Whaling**

Other fishermen followed the lead of Nantucket mariners who had discovered that in the deep waters of the ocean there seemed to be an unlimited supply of whales. The business reached its peak in the 1840's when there were more than 700 American whaling vessels with between 15,000 and 20,000 men at sea. Whaling masters came home after years at sea with new ideas and generally with lots of money.

For the crew of a whaler, the years at sea were lonely and boring. To keep themselves busy, the men would often carve and decorate whale ivory into various knickknacks. This practice is called scrimshaw. Frequently, sailors scrimshawed gifts for their wives or sweethearts.

After mineral oil was discovered in Pennsylvania, the demand for whale oil dropped off, and the business declined. Even today, some foreign countries kill whales for commercial purposes, although it is known that many whales are in danger of becoming extinct. Cape Codders and Cape visitors generally respect whales. If a whale accidentally swims into the bay, they will try to save it. And, in the spring when herds of migrating whales pass Cape Cod, boatloads of sightseers go to watch them, to welcome them, to wish them well. Race Point Beach is an excellent spot to look for whales.



## **Great Island Tavern**

In the late 1600's, whales were so plentiful here that they regularly appeared in Wellfleet Harbor. Lookouts posted on high ground alerted the whalers who pursued the great mammals in small boats.

Local tradition holds that whalers often retreated to a tavern on the secluded bluffs of Great Island. Here, they could recount their adventures, fortify themselves with toddy, and consort with sympathetic ladies, while lookouts watched for whales nearby.

During the summer of 1970, archeologists from Plimouth Plantation located and excavated the foundation of a building on Great Island that may have been such a tavern. More than 24,000 artifacts were uncovered. Evidence indicates the building was used between 1690 and 1740.

According to legend, the following message welcomed thirsty patrons en route to the tavern on Great Island:

*Samuel Smith, he has good flip,  
Good toddy if you please,  
The way is near, and very clear,  
'Tis just beyond the trees.*

In the whaling days, Great Island was completely surrounded by water. Shifting sand transformed it into a peninsula.

Representative artifacts found at the Great Island Tavern site include:

*Rat-tailed pewter spoon*

*Free-blown wine glass stem*

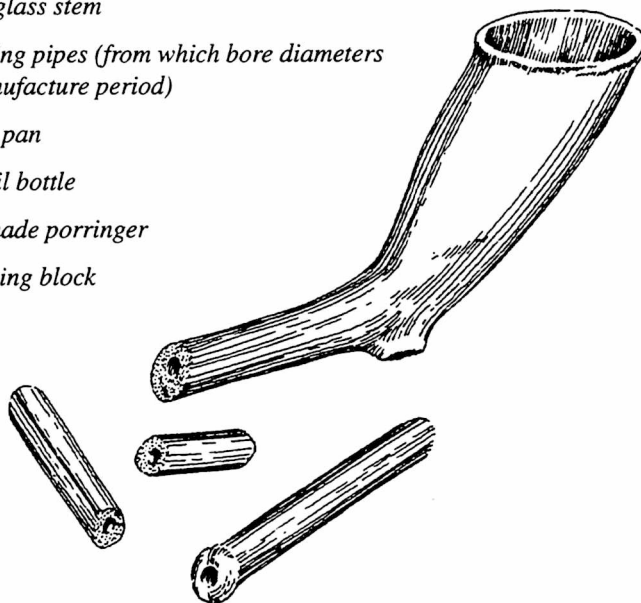
*British clay smoking pipes (from which bore diameters  
can signify manufacture period)*

*Redware pudding pan*

*Neck of wine or oil bottle*

*Piece of locally-made porringer*

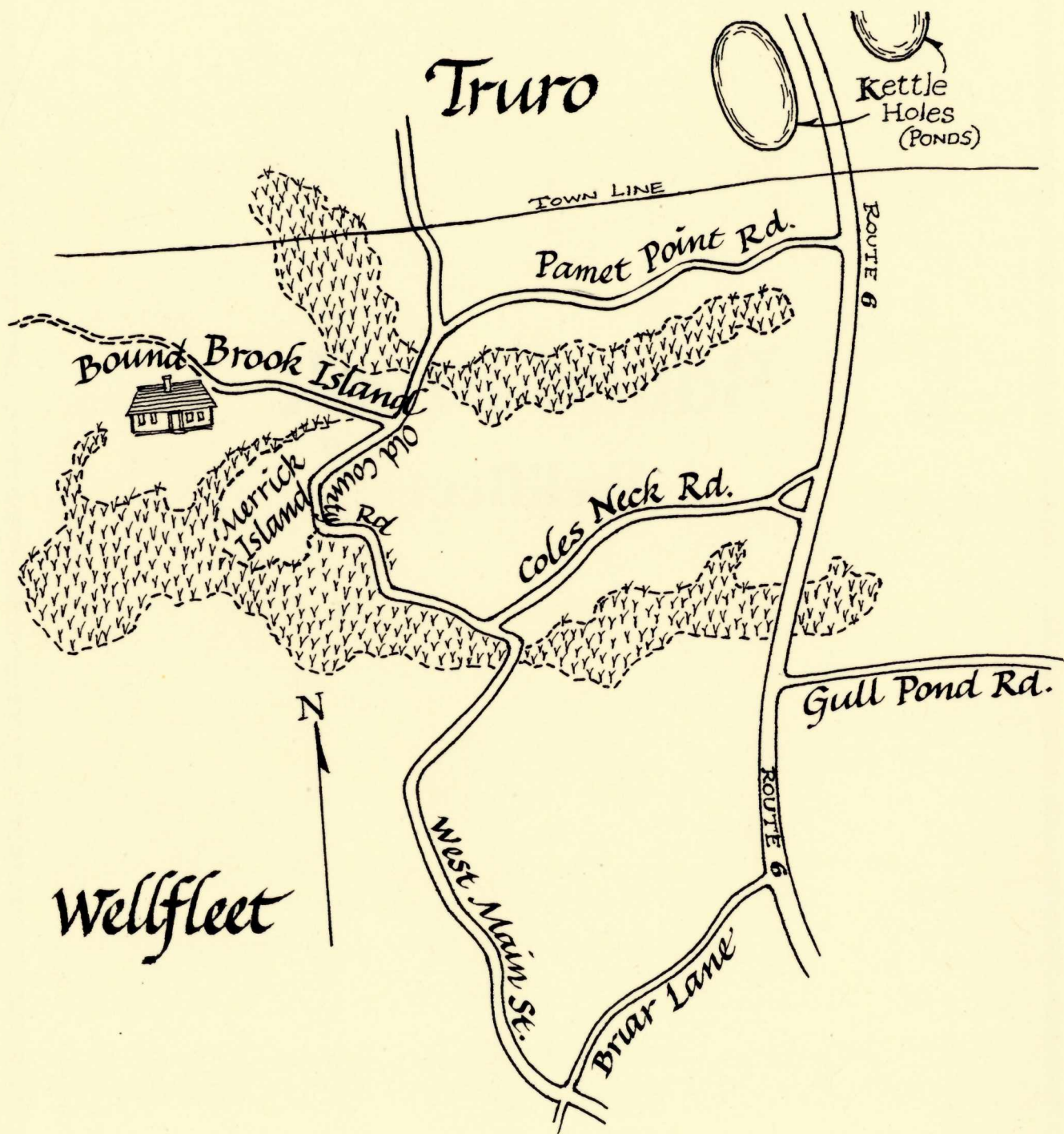
*Whalebone chopping block*





# **Bound Brook**

## **Wellfleet**





## **Bound Brook**

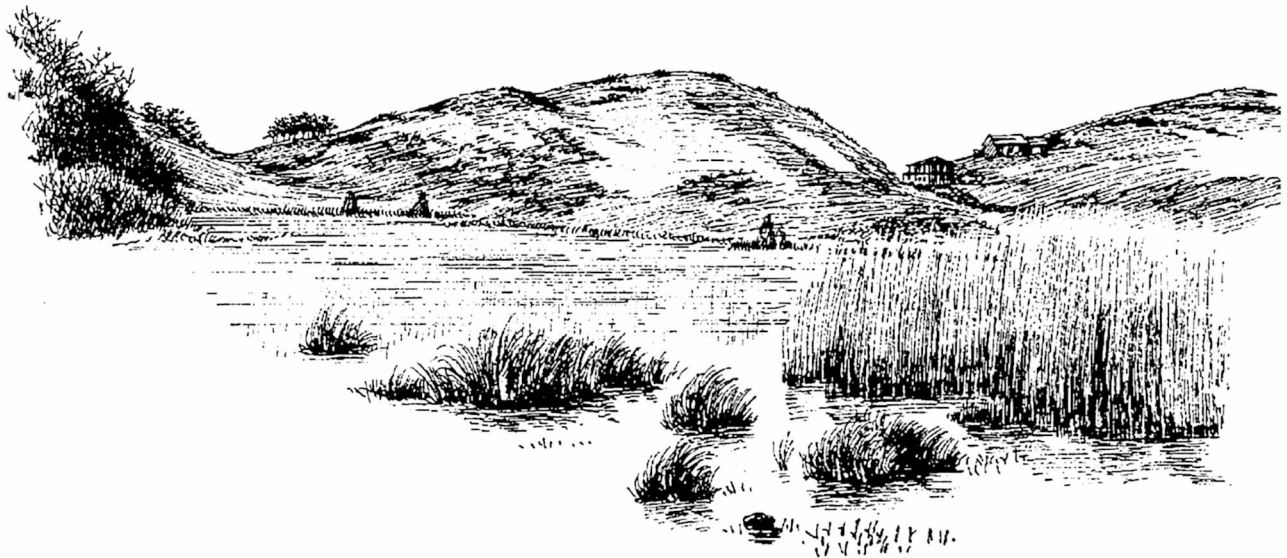
- Directions:** Bound Brook Area can be reached by turning left off Route 6 onto Coles Neck Road and returning to Route 6 via Pamet Point Road.
- Safety:** Wellfleet town roads are narrow and winding, and are not well-suited for larger vehicles.
- Other:** Atwood Higgins House is accessible only during limited tour periods seasonally, and by reservation.
- Tips:** Tell the Cape Cod architecture stories on the bus on Route 6. Look for examples of Cape Cod architecture along Route 6 between Wellfleet and Truro. Two kettle ponds will also be visible on the right and left side of Route 6, just after passing into Truro.
- Time Frame:** Five-minute narration time if bus remains on Route 6. Thirty minutes to one hour needed if group goes to Bound Brook area.
- Notes for Educators:** The Atwood Higgins house exemplifies sound environmental principles learned by early Cape Codders in constructing their homes. The central chimney and south-facing facade provided passive heating enhancements. Furthermore, these houses were often situated on the leeward side of hillsides for additional shelter. The Atwood Higgins house is situated off Route 6 and difficult to reach because of narrow roads. Numerous examples of Cape Cod architecture abound along area roadways.
- Highlights:** Cape Cod House Architecture  
Other architectural styles, e.g., Victorian era  
Kame formations and marsh habitat in Bound Brook area  
Kettle Ponds (visible from Route 6 across Truro line.)



## **Bound Brook**

- **Kames (or Knobs)** are prominent along Old County Road. These elevated mounds of glacial debris are a result of retreat of the ice front some 18,000 years ago.
- **Pamet Point Road** follows a dry glacial drainage channel (called hollows in other portions of Cape Cod).
- **The Herring River system** adjoins the Bound Brook area. This area has undergone alternate isolation and attachment because of transportation and deposition of sediments.

**Watch out for ticks and poison ivy.  
Mosquitoes can also be numerous here during summer months.**





## **Bound Brook**

The landscape of this portion of the Cape reveals another aspect of the glacial history of Cape Cod—mounds of sand, rock and gravel (known to geologists as “Kames,” which became islands on the bayside), and the freshwater and estuarine systems associated with the Herring River.

The early English residents of this area built homes that became renowned for their architecture. (Many such homes are still evident along Route 6 throughout Wellfleet.) This architectural form became known as the Cape Cod style, and consists of a central chimney, steep pitched roof, and central doorway. Variations consist of the half, three-quarter, and full Cape house.

An example of a house that went through all such phases, known as the Atwood Higgins house, is preserved by the Cape Cod National Seashore and located on Bound Brook Island.

Bound Brook, Great, and other such “islands” now are accessible by roadway, as sand deposition and marsh deposits have rejoined these once isolated land forms with the rest of the Cape.





## **The Cape Cod House**

Early descriptions of the Cape Cod house came from 19th century literary and historic figures such as Timothy Dwight, Henry David Thoreau, Frederick Freeman, Shebnah Rich and Charles F. Swift. Some of their comments, while clever, do not define the features of this house. Thoreau, for example, said the gable windows looked as if each occupant *punched a hole where his necessities required it, and according to his size and stature, without regard to outside effect*. Some descriptions of room arrangement and uses were made by these writers.

Historical definitions of the Cape Cod house are varied. However, one can summarize some basic features:

- The Cape Cod house was identifiable as such by the end of the 18th century.
- The plan of two south rooms and a north kitchen flanked by two bedrooms and a buttery or pantry, was arranged around a central chimney. This was known as a “double house” with a central front doorway and two windows on either side. Today, we call it a “full Cape.”
- A “house-and-a-half” had an off-center doorway flanked by one window on one side and two on the other. The chimney was over the doorway. We call it a “three-quarter Cape” today.
- A dwelling called simply a “house” had a doorway at one end, two windows between it and the other end, and a chimney centered over the door. We call it a “half Cape.”
- Exterior walls were most frequently shingled.
- The front facade faced south and was often faced with clapboards.
- Gable ends often had two larger and two smaller windows.

All historical sources have contributed something to our knowledge of the Cape Cod house, despite frequent inaccuracies.

### **Architectural Heritage**

Most architectural historians have ignored the Cape Cod house, but in the 1960's, Ernest A. Connolly and Richard M. Candee contributed important additions to our knowledge of this style of architecture. Connolly was involved in a study of Outer Cape architecture for the Historic American Buildings Survey and authored an article in the *Journal of the Society of Architectural Historians*. He called the Cape Cod house one of the best known and most frequently imitated forms of American architecture. In his view, examples of half-Cape, three-quarter Cape and full Cape existed at the same time. A house grew from one to the other because of the needs of a family, not because of stylistic desires. This house form is simple and flexible. Builders of earliest houses were



## *The Cape Cod House — continued*

not concerned with symmetry for doorways and windows on front facades and had window lintels up to the eave line. Newer houses can be spotted by symmetrical facades and lower window lintels.

Richard M. Candee wrote for *The Bulletin of the Society for the Preservation of New England Antiquities*. He wrote that architecture of the Plymouth Colony (of which Cape Cod was a part) was a unique form of New England house style, partly because of vertical plank wall boards. Founders of the Plymouth Colony—English Separatists—spent twelve years in Leyden, Holland, prior to embarking on the *Mayflower*. Vertical plank wall boards are common in Holland. Post-and-beam framed construction, typical here, is also found in other parts of New England, but a dwelling with one story with an attic under a gable roof really distinguishes the Cape Cod house. Possibly the severe winds on and near the Cape dictated building houses low to the ground with minimum vertical surfaces.

In New England, a region noted for good domestic architecture, replete with many fine examples of Georgian, Federal and Greek Revival houses, another distinct style—the Cape Cod—has flourished. There is no evidence that it actually originated on the Cape, or that it did not. The oldest examples still standing are probably in Connecticut. Here on the Cape, many examples are found in all the towns, but the greatest concentration is on the Cape Cod Bay side, on or near Route 6A, as the early settlers quite literally turned their backs on the cold, windy “back” or ocean side of the Cape.





## **The Atwood Higgins House**

The early settlers found several determining conditions for house building—climate, topography, and prevailing winds. They also had other needs, such as food and shelter, to consider when choosing locations. Therefore, they built among the sheltering hills, usually facing South, and near harbors for access to fishing and transportation. What they built was influenced by custom and available materials.

The very first such houses were wigwams, copied from the Native Americans. The English settlers used the wigwams only for a short period of time, perhaps for their first winter or two.

In time, the Cape developed an interesting mixture of architectural styles, including the Cape Cod cottage, still the most popular form on Cape Cod. The first of these appeared as one-room framed structures and were built in the post-and-beam method of construction, with walls made of vertical planks.

These houses often grew from a one-room dwelling, or “half house” to a seven-or eight-room, story-and-a-half Cape Cod cottage. An intermediate step was often to a three-quarter Cape Cod house. We can still see many of these various forms on the Cape, and such is the story of the Atwood Higgins house. This house is located on what was once an island in Wellfleet, its first portion constructed around 1730.

### **Land Based and Marine**

The site of the Atwood Higgins house on Bound Brook Island was chosen wisely to take advantage of various natural resources. The location satisfies all the criteria for subsistence living of the period, both land-based and marine. The fact that this area was an island solved one problem of making a living for the resident mariners and captains by allowing them access to the sea either through the adjacent shoreline or via the Herring River.

The Atwood Higgins half-Cape house of the early 1700’s grew to a full Cape house by the end of that century. During this period, the house also began to go through a variety of ownerships between the Atwood and Higgins families. The facade of the structure has a central front door, flanked by two windows on each side, with a massive chimney. Clapboards covered the front. However, the side and rear outer walls were shingled, which was a common practice attributed to frugality expressed by New Englanders at the time.

The changes in the styles and types of the homes on Cape Cod can be divided into chronological periods, remembering that they are not static and actually overlap. The Cape Cod cottage and the Colonial form which expanded into a saltbox style are representative of the Colonial Period from around 1630-1770. The extreme pitch of the roof and plain, simple details are important characteristics of this form.

## *The Atwood Higgins House — continued*

The periods of expansion of the Atwood Higgins house coincided with replacement work in the interior, so we can explain why the 1800's doors are different from the original one in the kitchen. Meanwhile, the attic was undergoing the same expansion, still with similar construction techniques.

A refinement of the Colonial period can be found in the homes from the Federalist Period, dating between 1775 to 1820, and named after the emerging government. Clues to identifying this style are "light columns" (consisting of windows in vertical rows), "fanlights" over central doors, a lower-pitched roof and two chimneys, one on either end, instead of a central chimney common to the earlier houses.

### **Change and Expansion**

During this period and subsequent ones, most existing Cape Cod houses also underwent individual modification. This can be seen in the Atwood Higgins house where, during the 1800's, structural components built during this period became concealed, beams were no longer visible, posts were smaller, and there were more detailed cornices and mantels. Also, at the Atwood Higgins house, the four fireplaces became subjected to constant tinkering and repairing. They, and the two beehive ovens, were all fed into one chimney with separate flues, some joining above the attic floor.

As a sign of wealth from the successful exporting trades, whaling, and fishing industries, the structures built during the Victorian age from the 1830's into the 1900's showed an increasing number of ornate architectural details. The pediments, pilasters, columns, and houses turned "end-on" were evidence of the classic Greek influences during the Greek Revival Period.

As noted earlier, many traditional Cape Cod cottages also changed and expanded during this time. The addition of an ell to the Atwood Higgins house included a second pantry and another bedroom. Under the pantry was a beanpot cellar for vegetable storage. It was circular to minimize the effect of sand caving it in. A straight pair of stairs replaced the old winder stairs which were eliminated by the second kitchen's fireplace.

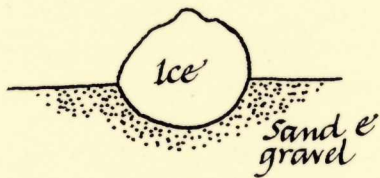
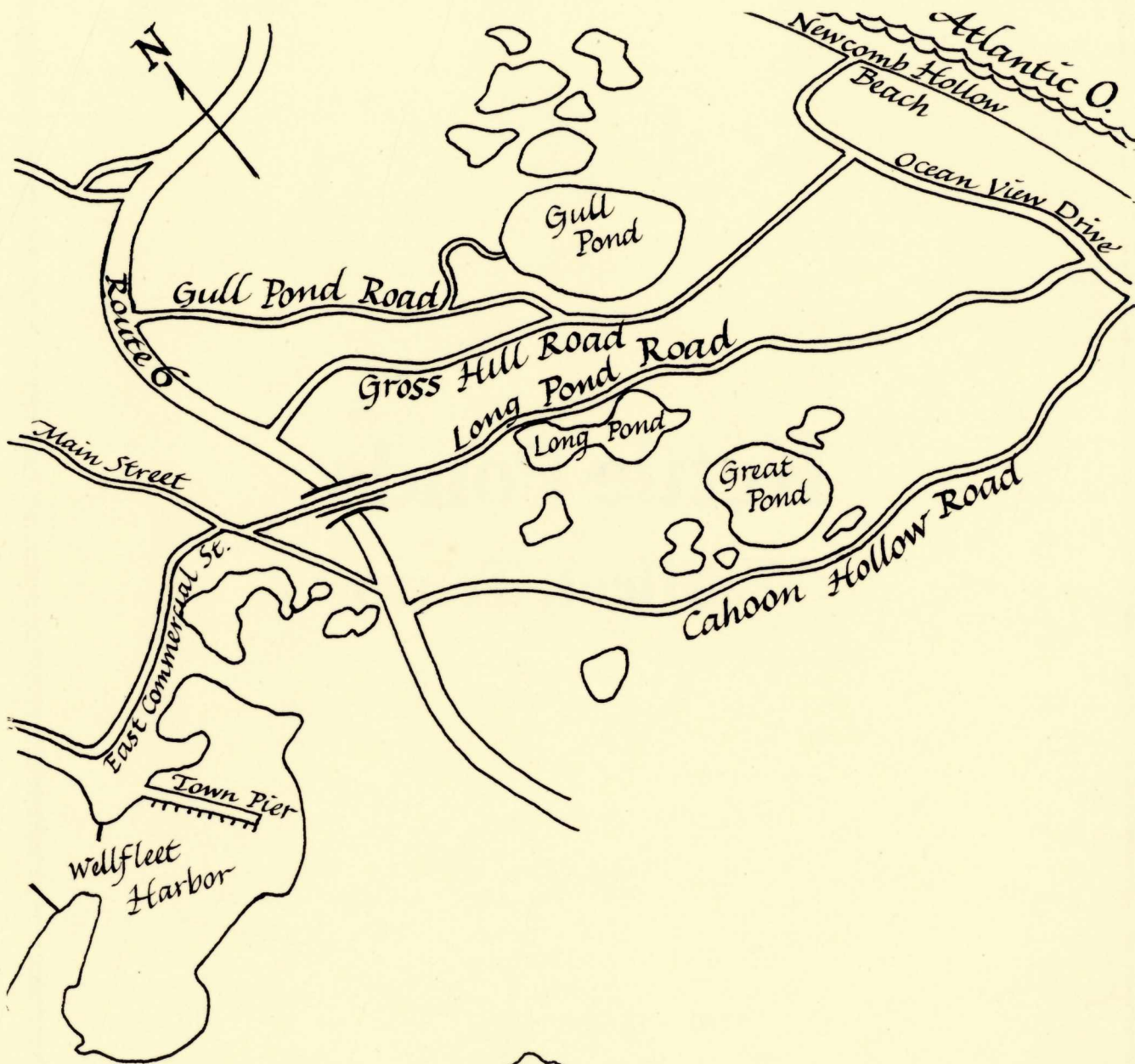
Possibly two Atwood families occupied the home from 1825 to 1873, when it was no longer used as a year-round residence. But, before the Atwood Higgins house ceased to be occupied year-round, the train reached Wellfleet and came through the Atwood Higgins property, bringing about yet another era in Cape Cod lifestyles and architecture.

As it stands, the Atwood Higgins house is a fine example of a properly framed Cape Cod cottage which grew from a half house in the early 1700's to a full Cape with eight rooms by the 19th century.

George Higgins, a distant relative of the original builder, assumed ownership of the house in 1919 and restored it according to his ideas of an 18th century house. The barn, woodshed, guest house, and store were added by George Higgins in the 20th century to fulfill his concept of a northern New England farm settlement. In 1961, Cape Cod National Seashore, as an agency of the Department of Interior, became the guardian of the house and site.

# **Kettle Ponds**

## **Wellfleet, Truro**







## **Kettle Ponds**

- Directions:** Two ponds are visible off Route 6, just north of the Wellfleet/Truro boundary: Round Pond and Snow Pond. (Other ponds are on secondary roadways to the east of Wellfleet Center.)
- Safety:** Watch out for heavy traffic on Route 6.
- Other:** Salt ponds are also kettle ponds, but are connected directly to ocean waters. Many freshwater ponds are operated as town swimming beaches. Ponds generally have only limited parking. Access in summer is usually restricted to residents or permit holders.
- Tips:** Alert passengers to views of ponds at Truro boundary to avoid having to slow down in traffic on Route 6.
- Time Frame:** Five-minute narration time on board bus. Forty-five minutes to one hour needed if on-site visit is made to ponds.
- Notes for Educators:** Ponds are an important component of the Cape's natural landscape. Access via town swimming beaches can often be arranged during off season (September-May) periods. Freshwater studies can be conducted at Seashore sites, such as, the Red Maple Swamp, Atlantic White Cedar Swamp, and Buttonbush Trail. Ponds are also a mirror of Cape Cod drinking water quality.
- Highlights:** More than 365 ponds on Cape Cod.  
Thoreau visited Wellfleet ponds.  
Pond studies reveal Cape Cod's past natural history.  
Various Seashore sites contain freshwater habitats.  
Ponds reflect status of Cape Cod's drinking water quality.





## **Ponds**

- There are some 365 freshwater ponds on Cape Cod. Most of these are kettle ponds, formed when blocks of ice from the last glacier became imbedded or covered by outwash materials, leaving depressions that filled with fresh water when ground water rose to intersect them. A variety of deep, pristine kettles are located within the National Seashore's boundaries, including Gull pond off Gross Hill Road in Wellfleet, and Snow and Round Ponds which are visible from Route 6.
- **Freshwater kettle ponds** fill in through natural processes and provide different habitats. Shallow, one-to-two foot deep ponds may harbor buttonbush shrubs (Buttonbush Trail, Eastham). Foot-deep or less ponds often harbor water-tolerant red maple trees on their margins (Red Maple Swamp, Eastham). Other swampy portions of former deeper kettles serve as habitat for Atlantic white cedars, a species that is more prominent in southern regions of the U.S. (Atlantic White Cedar Swamp, Wellfleet).
- **Freshwater ponds** also occur amid dunes, where freshwater tables are supported due to density differentials between saltwater and freshwater regimes. Such areas may provide habitat for additional vegetation types. The Beech Forest pond, for example, harbors a number of golden club plants within its quiet shallows. These plants are visible during the spring as yellow spikes protruding at an angle out of the water.

**Kettle ponds need care in order to keep them pristine.**

**Bathers should not use soap.**

**Use restrooms located away from ponds.**

**Pets are restricted from pond areas seasonally.**



## **Ponds of the Wellfleet/Truro Area**

Cape Cod is blessed with a great many freshwater kettle ponds (as many as 365—one for every day of the year, according to one source). These ponds are unique, in that many of them have remained in a clear, pristine, natural condition.

The ponds on Cape Cod are a product of the Ice Age. When the glacial ice front retreated some 18,000 years ago, it left behind huge chunks of ice that were wholly or partially buried in the sandy outwash plain. As these ice blocks melted, the ground surface became indented.

Numerous “kettle holes” subsequently dotted the emerging Cape Cod landscape. Those with a layer of clay beneath them collected water early on. Others filled up when the freshwater table rose, and the bottoms of the kettles intersected the rising water level. This was enhanced, in part, by sea level rise (sea level was 400 feet lower during the end of the glacial period 18,000 years ago). The fresh water captured by rainfall in the sandy soil of Cape Cod is buoyed up above sea level partially because fresh water is approximately  $\frac{1}{40}$ th lighter than salt water (and partially due to the capillary action of the sandy soil).

### **Vernal Pools**

Seasonal impoundments of water are known as “vernal pools.” These become important breeding grounds for many of the Cape’s amphibians, including the spring peepers, spotted salamanders, and the illusive spadefoot toad.

More permanently wet depressions in the Cape’s landscape play host to a variety of bog habitats, including quaking bogs and Red Maple and Atlantic White Cedar Swamps.

Deeper ponds provide a much different environment. Freshwater ponds that are connected by active creeks or brooks to saltwater often serve as the final destination for herring (alewife) runs. During the spring, literally thousands of these “anadromous” fish return to their place of origin to spawn and lay eggs (and often die in the process) to renew the cycle that will begin with new “fry” returning to the ocean at the end of summer.

Many deep freshwater ponds, however, are not connected to other bodies of water, and rely solely on the flow of groundwater for inward and outward flow. Most of these ponds on the Outer Cape are still pristine. Henry David Thoreau stayed at the home of an old Wellfleet oysterman on one of these ponds during a visit in the mid-1800’s.

Today, Cape Cod National Seashore is working with local town and private co-owners of ponds located within the boundaries of Cape Cod National Seashore to encourage practices (such as restricting use of soap and the bringing of pets to ponds, etc.) that will assure long-term water clarity and purity.

## *Ponds of the Wellfleet/Truro Area — continued*

Scientists have found that Cape ponds also hold an unusual source of information. Pollen, diatoms and other remains of living organisms trapped in layers on the bottoms of these ponds serve as a historical record of vegetative types and climactic patterns. Pitch pine, for example, has generally been less abundant than today. More southern species, such as Atlantic White Cedars, were in greater numbers during warmer periods. One surprise is that Cape ponds have shown a history of being highly acidic—a natural condition that should not be altered.

Ponds are also a mirror of Cape Cod drinking water quality, as all Cape groundwater comes from rainwater and is subject to the same conditions that affect pond quality.





## **Kettle Ponds and Water Quality**

Scattered through Cape Cod National Seashore are twenty kettle ponds ranging in depth from six to sixty feet. The geologic origin of these ponds not only explains their existence, but why keeping them clean is so essential to the Cape's freshwater supply. This combination of factors also produces the coastal plain pondshore community with several plant species that have been designated as rare or threatened by the Massachusetts Natural Heritage and Endangered Species Program.

When the glaciers that formed Cape Cod retreated 18,000 years ago, huge chunks of ice broke off. Melting glaciers left deposits of dirt, sand and rock that surrounded and covered these ice "cubes." Some of these chunks lasted hundreds of years. When the ice chunks finally melted, depressions formed as the glacial debris collapsed down into the area the ice once occupied. These holes are called kettles. In areas where they are deep enough to intersect the ground water, kettle ponds are formed.

All of the Cape's drinking water comes from a single source aquifer, a thin (usually less than three hundred feet thick) freshwater layer that floats on top of the denser salt water that surrounds us. You may be able to visualize this by thinking of a child's swimming pool filled with saltwater (the ocean). Cape Cod is like a mound of sand that reaches above the water. The spaces between the sand grains below the surface of the water will be filled with saltwater. When it rains, freshwater percolates down until it collects between the grains of sand above the saltwater, since freshwater is less dense than saltwater. This layer of freshwater is called the ground water. The top of this layer is called the water table. The only way more freshwater is added to this supply is through rain or other precipitation.

### **Windows to Our Drinking Water**

Kettle ponds have been called "windows to our drinking water." The surface of the kettle pond is the surface of our ground water which is the source of our drinking water. Therefore, anything that is put into a kettle pond is eventually added to our drinking water. And, anything that affects our ground water (including any pollutants spilled onto the ground) will eventually reach our kettle ponds. Unlike a flowing river or stream, which may flow at three feet per second, anything introduced to this system will remain for a very long time, since the rate of ground water flow is only three feet per day maximum.

There is a natural cycle for most ponds. In their youth, they are generally clear. As more plants and animals live and die in the pond, their remains decompose and provide food for other creatures as well as filling in the pond. A pond nearing the end of its life will be shallow with lots of plant life and will eventually fill in to become a marsh or swamp. This cycle may take thousands of years to naturally occur on Cape kettle ponds. The deep kettle ponds on the cape are known for their clarity. On some ponds, there are times when you can see fish swimming thirty feet below. Why so clear? The Cape's

## *Kettle Ponds and Water Quality — continued*

sandy soils are nutrient-poor. The small amount of natural fertilizers limits the growth of the algae. However, humans can greatly accelerate it by adding nutrients to the ponds. How does this happen?

Most people are aware that introducing any type of soap (even biodegradable ones) to a pond will degrade its clarity. So will swimming in a pond after swimming in the ocean, if the salt is not rinsed off first. Wastes entering the system due to improper septage systems or urinating or defecating by humans or pets in or near the pond also fertilize it. If people trample plants near the pond edge, soil is eroded into the pond. All of these activities can cause the overgrowth of algae.

Ownership of ponds within the National Seashore is quite complicated. One pond may be shared by private owners, the towns and the National Park Service. Therefore, we all own responsibility for the care of these special places.

Questions to see who's been paying attention to their Cape Cod geology:

1. Kettle Ponds are not found north of High Head in North Truro. Why? This area was not here when the glaciers retreated. It was formed later from sediments eroded from south of High Head and redeposited as the Province Lands sand spit.
2. Salt Pond, located behind the Visitor Center in Eastham was once a freshwater kettle pond. What happened? The coastline was once two miles out to sea. The sea broke through the barrier beach dune system to form an inlet, changing the freshwater pond to saltwater.



## Henry David Thoreau

Henry David Thoreau (1817-1862), a historian, journalist and exceptional naturalist grew up in Concord, Massachusetts. He graduated from Harvard College, worked in his family's pencil business, taught school for a year and wrote for a magazine. *Walden*, his best known work, is an account of the two years he lived in a hut on Walden Pond in Concord. His famous essay, "Civil Disobedience," was important to the world as a guideline for later leaders, such as, Mahatma Gandhi and Martin Luther King, Jr.

Thoreau came to the Cape with the mind and eyes of one who had lived an inland life. The "naked nature" of the beach and ocean, and the habits of the Cape's natives sharply contrasted to the quiet of Walden Pond, the coziness of his hut at the edge of the pond, and the flourishing and civilized culture of Concord.

### "Scrabble" for a Living

In *Cape Cod*, he writes about the interaction of the people and the harsh natural conditions. He explains what he perceived as the strange and alien ways of the residents as being caused by a *nature that was hostile and indifferent to human life*, and one that made Cape Codders *scrabble* for a living from the sea, shore and barren land. He saw a desert-like land without fence or tree in the plains of Nauset, and *winds that howl and snow that blows right merrily in the face of the traveler*.

Although his attention centered mainly on nature, he took notice of anything else on the Cape that touched his curiosity and imagination. He had little interest in the prosperous towns and the beautiful homes built by the successful sea captains, but he was fascinated by the beachcombers, wreckers and oystermen who wrestled a living from the ocean. Lighthouses, humane-society huts (built to provide shelter for shipwrecked crews) and saltworks that then made up a two-million dollar business on the Outer Cape, were all part of Thoreau's Cape Cod. The quotation that *lighthouse or fisherman's hut is the true hotel* gives a sense of what Thoreau regarded as important. As to houses, he found the *old-fashioned and unpainted houses the most comfortable*.

Much of what Thoreau wrote about is no longer on the Cape. But his writing is timeless, spurning the sentimentality of nineteenth century writing. *Cape Cod* is not a funny, sunny tale. Thoreau often critically evaluates and describes people. For example, in the chapter on the Wellfleet oysterman (who lived on a pond in Wellfleet), Thoreau's tone in portraying the family is harsh, without even gentle humor.

It rained on most of Thoreau's hikes: *We walked with our umbrellas behind us*. But many of us will agree with his thought about the Cape: *A storm in the fall or winter is the time to visit it*.



## *Henry David Thoreau — continued*

### **From Henry David Thoreau's Book, *Cape Cod*:**

*Every landscape which is dreary enough has a certain beauty to my eyes, and in this instance its permanent qualities were enhanced by the weather. Everything told of the sea, even when we did not see its waste or hear its roar. For birds there were gulls, and for carts in the fields, boats turned bottom upward against the houses, and sometimes the rib of a whale was woven into the fence by the roadside ...*

*The great number of windows in the ends of the houses, and their irregularity in size and position, here and elsewhere on the Cape, struck us agreeably,—as if each of the various occupants who had their cunabula behind had punched a hole where his necessities required it, and according to his size and stature, without regard to outside effect. There were windows for the grown folks, and windows for the children,—three or four apiece; as a certain man had a large hole cut in his barn-door for the cat, and another smaller one for the kitten. Sometimes they were so low under the eaves that I thought they must have perforated the plate beam for another apartment, and I noticed some which were triangular, to fit that part more exactly. The ends of the houses had thus as many muzzles as a revolver, and, if the inhabitants have the same habit of staring out the windows that some of our neighbors have, a traveler must stand a small chance with them.*

*We knocked at the door of the first house, but its inhabitants were all gone away. In the mean while, we saw the occupants of the next one looking out the window at us, and before we reached it an old woman came out and fastened the door of her bulkhead, and went in again. Nevertheless, we did not hesitate to knock at her door, when a grizzly-looking man appeared, whom we took to be sixty or seventy years old. He asked us, at first, suspiciously, where we were from, and what our business was; to which we returned plain answers.*

*"How far is Concord from Boston?" he inquired.*

*"Twenty miles by railroad."*

*"Twenty miles by railroad," he repeated.*

*"Didn't you ever hear of Concord of Revolutionary fame?"*

*"Didn't I ever hear of Concord? Why, I heard guns fire at the battle of Bunker Hill. [They hear the sound of heavy cannon across the Bay.] I am almost ninety; I am eighty-eight year old. I was fourteen year old at the time of Concord Fight—and where were you then?"*

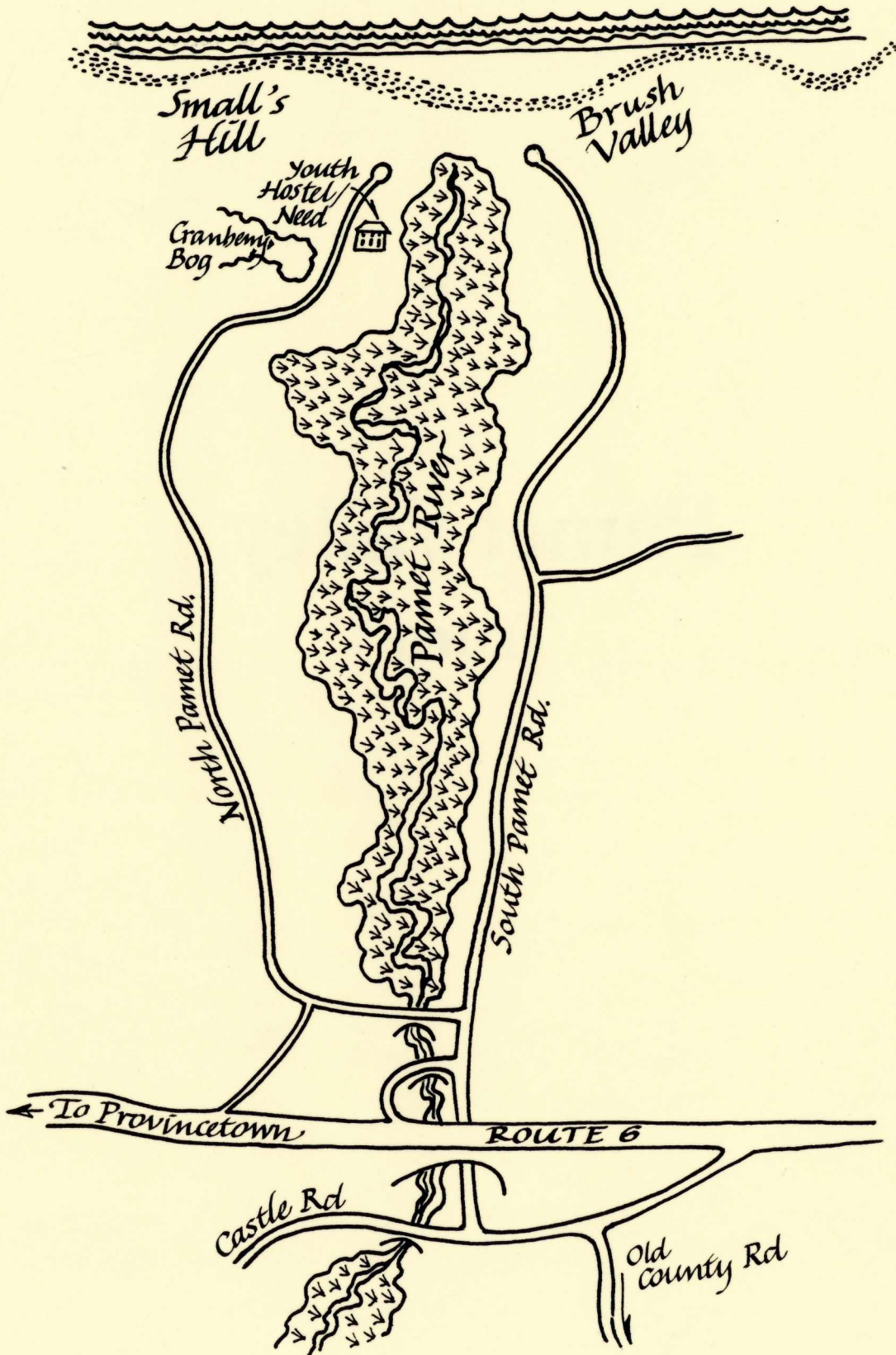
*We were obliged to confess that we were not in the fight.*

*But this shore will never be more attractive than it is now. Such beaches as are fashionable are here made and unmade in a day, I may almost say, by the sea shifting its sands. Lynn and Nantasket! this bare and bended arm it is that makes the bay in which they lie so snugly. What are springs and waterfalls? Here is the spring of springs, the waterfall of waterfalls. A storm in the fall or winter is the time to visit it; a light-house or a fisherman's hut the true hotel. A man may stand there and put all America behind him.*

# **Pamet Valley**

## **Truro**

# ATLANTIC



## *Cape Cod National Seashore Location Summary*



### **Pamet Valley**

- Directions:** Traveling north, the Pamet Valley crosses Route 6 in Truro center, 2.2 miles north of the Wellfleet/Truro line. Take the “Pamet Roads/Truro Center” exit for access to the Pamet Valley Area (look for green and white highway signs).
- Safety:** Both roads leading into the area (north and south Pamet Roads) are narrow, dead-end, and are heavily traveled in the summer.
- Other:** There are no public restrooms in the area and no bus turnaround at the end of North Pamet Road. The turnaround at the end of South Pamet Road is available in the off-season only. Do not park in the Youth Hostel/NEED parking lot.
- Tips:** Start telling the Pamet Valley Area story at the Wellfleet/Truro line. The valley crosses the forearm of the Cape and has a small river running through it.
- Time Frame:** Five to ten minute bus narration. Fifteen to 25 minutes if stops are made at the Ballston Beach overwash or Pamet Cranberry Bog Trail.
- Notes for Educators:** Pamet Cranberry Bog Trail and Ballston Beach are located in the Pamet Valley. Plan 30 minutes for each. The Truro NEED Center at the end of North Pamet Road serves numerous school districts on Cape Cod and is not open to the general public. In summer, it is a Youth Hostel.
- Highlights:** Pamet Cranberry Bog Trail  
Ballston Beach Overwash  
Glimpses of Pamet River Valley and historic homes  
Truro NEED center/Youth Hostel



## **Pamet Valley**

- **The Pamet Cranberry Bog Trail** is a short, half-mile trail that provides a scenic overview of the knob-and-kettle landscape that gave rise to the cranberry industry on the Outer Cape in the 19th century. Wild Cranberries can be found in the lowlands near Province Lands Visitors Center (Race Point Road, Provincetown).
- **Ballston Beach** exemplifies coastal beach processes. While the dune has been breached by the ocean several times in recent years, coastal transport of sand (along-shore transport) has reestablished the barrier beach at this location.
- **The Pamet River Valley** is a prominent drainage that is a result of meltwater runoff from east to west during the last glacial period. The system is an estuary in its westward section, and a freshwater habitat in its eastern portion.

**Do not cross over dune areas that do not have established (or designated) walkways. Use caution not to damage beach grass.**







## **Pamet Valley**

The Pamet River Valley cuts across the forearm of the Cape from ocean to bay. It is a valley filled with 18th Century homes, rich human history and a dramatic geologic story. Two roads lead down either side of the valley and dead end at Ballston Beach.

Traveling north on Route 6, 2.2 miles from the Wellfleet/Truro line, the highway begins a moderate descent into the Pamet Valley, an ancient meltwater channel sculpted from the land thousands of years ago by melting glaciers. From the highway, you can quickly glimpse up and down the valley. Running through the valley is the Pamet River, a meandering creek that begins near the ocean and empties into Cape Cod Bay at Pamet Harbor. The river turns from freshwater to brackish and then salt by the time it reaches the bay. In the early 19th Century, the river was wide and navigable. Houses could be floated on it to new locations.

A trip to the end of South Pamet Road ends at Ballston Beach. Along the way are numerous 18th and 19th Century houses, one of which was a stage coach stop at the corner of Collins Road (formerly a portion of the Old King's Highway).

### **Wreck of the *Jason***

Named for "Ozzie" Ball, Ballston Beach was home to an extensive summer resort established in 1900 that included cottages, a community center/dining hall and bowling alley. Nearby was the Pamet Lifesaving Station (1872) that housed lifesavers to assist shipwreck victims. None of these buildings survive today. Just offshore of Ballston Beach, in thirty feet of water, lies the wreckage of the *Jason*, an iron full-rigged ship that wrecked in a blizzard in 1893. Only one of a crew of 25 survived. The crew of the Pamet Station worked in vain to rescue the others.

The large open sand area behind the beach was caused by several overwashes of the dune system during ocean storms, the first overwash occurring in 1991. Saltwater poured into the Pamet River as a result. These overwashes are part of the natural process of coastal erosion, which claims an average of three feet a year of coastline. One casualty of this erosion is Pamet Road itself. North and South Pamet Roads used to be linked here until recently, but the road now lies under tons of sand and dune.

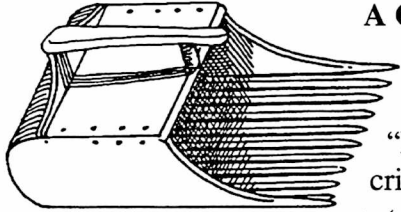
North Pamet Road leads to the NEED Center (National Environmental Education Development Collaborative), an environmental education center that is housed in a 1930's Coast Guard building. In the summer, it is a Youth Hostel. The Pamet Cranberry Bog Trail also begins here. The trail meanders through an abandoned commercial cranberry bog and includes a bog house that was in operation until 1961. In addition, there is an extensive system of dirt fire roads that link up with Higgins Hollow Road to the north.

**Parking and turn around space is extremely limited here. Do not drive on fire roads. Respect private property rights.**





## Cranberries on Cape Cod



### A Cranberry Fable

In the Great Marshes, between solid ground and the swampy waters of the old marsh, lived woman Granny Squannit, where "First Cranberry" was born. Granny had cut her finger, and she cried out to her brother, Maushop the Giant, *The water is pouring out of me! Soon, I will be no more.* Maushop, knowing that his sister had no blood with which to stop the wound, pricked his finger and stretched his arm across the swamp. But, the wind caught the drop of blood and blew it into the cattails. Maushop sealed Granny Squannit's wound with a second drop, but that first drop of blood took hold in the boggy soil and became First Cranberry.

With this legend, the Wampanoags described where wild cranberries are found. Like cattails, cranberries need to grow close to freshwater. Patches of low-growing wild cranberries are in the valleys between the dunes of the Province Lands, where these natural "bogs" are occasionally covered with a fine sifting of sand. Ocean breezes maintain a moderate temperature, and the dunes protect the cranberries from harsh storm winds.

Often, cranberry is confused with bearberry. Look for this dry, cotton-tasting berry, called "hog cranberry" by many Cape Codders, on higher, upland, sandy areas.

### Taming the Wild Cranberry

A Cape Codder's observation of natural events affecting cranberries in the wild led to the successful cultivation of cranberries. Between 1813 and 1816, Henry Hall of Dennis noticed that sand blown across cranberries produced a better crop. Word spread quickly, and sanding the bogs became a regular practice.

Wild cranberries grow in low, damp areas that are dry in the growing season. So, in cultivated bogs, ditches are dug around the perimeter and across the bog to regulate the water level. These ditches were also used to flood the bog when frost threatened, although sprinkling systems are commonly used now to prevent frost damage.

Harvesting methods have also changed. In the early 1800's, the harvesters, usually women, wrapped linen strips around their fingers to avoid cuts from the woody vines. The harvesters then inched forward on knees covered with oilcloth aprons to gather the berries, row by row. The invention of cranberry scoops (open boxes with wooden "fingers") eased the work of the harvesters and increased efficiency. But today, even small bogs are harvested with mechanical pickers, and the cranberry scoops are relegated to antique shops.

## ***Cranberries on Cape Cod — continued***

Since that first commercial success, over one hundred different varieties of cranberries have been developed. Some are grown because they keep fresh longer. The Early Black cranberry, commonly grown because it ripens earlier, is a direct descendant of wild cranberries growing on Cape Cod.

### **A Cape Cod Industry**

In the early years, Cape Codders depended upon the sea. But mainland fishermen, using the modern fishing methods developed in the late 1850's, competed with the Cape fishermen who were financially unable to buy the expensive new equipment. The shipping industry declined, and after the Civil war many of the seafarers turned landward.

With cranberries in great demand, the fields of "red gold" became an integral part of the Cape Cod landscape. Later, the expanding industry brought many immigrants of African ancestry from the Cape Verde Islands to work in cranberry bogs. Cranberries helped to bring to America an ethnic group whose culture is now woven into the fabric of Cape Cod.

Although the cranberry industry on Cape Cod has declined, the bog acreage in the Plymouth area has increased. The Early Black and Howe cranberries discovered on Cape Cod remain the largest export crop of Massachusetts.

Cranberries were exported profitably even before they were cultivated. Because of their ability to remain fresh for as long as two years and their value as a scurvy preventive, the American cranberry was carried all over the world by sailing vessels.

As imported sugar became cheaper, the uses for cranberries expanded. Cranberry breads, pies, juices and cranberry sauce became American traditions, especially during the holidays. Today, Cape Cod produces about 10 percent of Massachusetts' crop of cranberries.

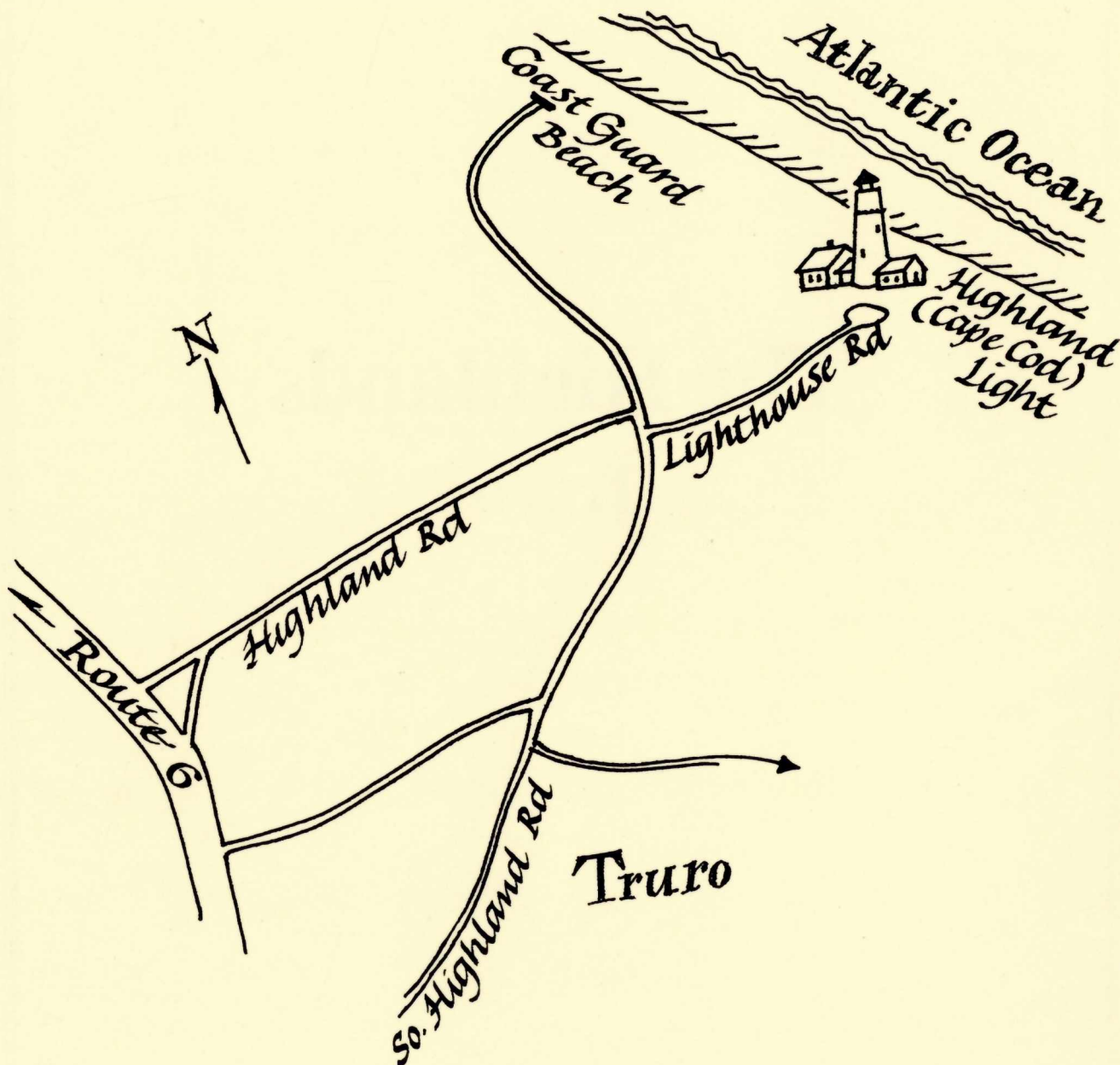
### **The Pamet Cranberry Bog**

Like many Cape Cod cranberry bogs, this swampy land was once covered with a forest of red maple. The pollen of these trees still remains as evidence in the thick accumulation of peat. But, during the 1880's, James Howe began his cranberry venture here and this became a cultivated landscape.

The bog was enlarged, it passed from company to company and from family to family until the land fell into disuse. It was sold to the federal government in 1963 for parkland. Forests have recovered much of the bog since then, but a small patch of cranberries is still preserved to recreate an historic landscape that is part of this land's heritage.

# **The Highlands**

## **Truro**





## **The Highlands**

- Directions:** Traveling north on Route 6, the Highland Lighthouse area is 3.3 miles north of Truro Center. Take the “Cape Cod Light/Highland Road” exit (indicated by green and white signs). Turn right onto Highland Road and follow to the Highland Lighthouse area.
- Safety:** There is ample bus drop-off and turnaround space at Highland Lighthouse. The area is heavily used in summer. Do not trespass onto the Highland Links golf course. There is no parking or turnaround for buses at the town of Truro’s Coast Guard Beach. Stay away from cliffs and other unstable areas. There are no access stairs for Coast Guard Beach. There is usually a steep drop from the parking lot.
- Other:** There are limited public restrooms in the area.
- Tips:** Start telling the Highland Lighthouse area story in Truro Center. Highland Lighthouse is also known as Cape Cod Light. Call ahead for Truro Historical Society Museum hours and days of operation.
- Time Frame:** Five- to ten-minute bus narration Thirty to forty minutes for museum.
- Notes for Educators:** Call ahead for Truro Historical Society Museum hours and days of operation. A one-hour round trip hike in loose sand down the beach below Highland Lighthouse via Truro’s Coast Guard Beach is an exciting activity. Views of the Clay Pounds and the lighthouse from the beach. Avoid time of high tide.
- Highlights:** Highland Lighthouse  
Truro Historical Society Museum  
Highland Golf Links  
Coast Guard Beach  
Jenny Lind Tower



## **The Highlands**

- The Highlands represent the northern terminus of glacial outwash materials that compose the spine of Outer Cape Cod. High Head displays an abrupt change in elevation. Here, the tip of Cape Cod changes from glacial to sand-deposition-based.
- The glacial scarp (cliff) on the ocean side of the Highlands is at its highest on the Outer Cape (exceeding one hundred feet above the beach in spots).
- The Pilgrim Heights and Small Swamp Trails offer a one-mile series of pathways through recovering forest and field habitats.
- The Pilgrim Spring area typifies the freshwater seepages that provided the Pilgrims with their first fresh water in the New World.

**CAUTION: Stay well back from cliff edges.**







## **The Highlands**

The Highlands area has not changed much in the last century. It is dominated by Highland Light, the first lighthouse built on Cape Cod (1797). The present 66-foot brick tower dates from 1857. Today, the lighthouse is automated, as are all the lighthouses on the Cape. In earlier years, fifteen whale oil lamps and later a huge Fresnel lens were used to light the way for mariners. Today, a 1,000 watt bulb does the job.

The Highland cliffs that tower more than one hundred feet above the ocean were once considered the ideal location for a lighthouse. Clay deposits in the cliffs, referred to as "Clay Pounds," were seen as a buffer against storm waves. Yet, it is clear today that the clay is unstable and slides off in tremendous chunks when undermined by waves. Of the ten acres of land originally purchased for the lighthouse by the U.S. government in 1796, less than four acres remain today. The lighthouse was moved 450 feet inland in 1996.

Highland Light also serves as a beacon for tourists. The Highland House, the long, rectangular building on the road to the lighthouse, was part of a larger resort complex that served tourists beginning in the late 1800's. Summer breezes, ocean vistas and the romance of Highland Light drew visitors via the new railroad link. A smaller lodge served visitors from as early as the 1830's, including Henry David Thoreau. Today, the Highland House is home to the Truro Historical Society Museum and houses an excellent collection of items relating to Truro's history, including wreckage from numerous shipwrecks.

The Highland Golf Links offers the earlier version of golf with rough fairways and ocean vistas reminiscent of Scotland. Dating from the turn of the century, it is the oldest golf course on the Cape. The medieval tower off to the south is locally known as the "Jenny Lind Tower." Originally part of the Fitchburg Railway depot in Boston, it was moved here in 1927 by Henry Aldrich. Aldrich was a fan of the famous Swedish opera singer, Jenny Lind, who performed in the hall above the station and is rumored to have sung from the tower to those unable to attend the concert.

There are a few pieces of the landscape that are missing from the Highlands today. At one time, numerous wind-driven grist mills dotted the area. The deck house of the barge, *Coleraine*, which wrecked below the cliffs here in 1915, was salvaged and used as a bar until the 1950's. The Highland Life Saving Station (1872) was located at the end of Coast Guard Road by the beach. Lifesavers from the station patrolled the beach on foot and rescued shipwreck victims with the surfboat and breeches buoy.



## **Touring Cape Cod Lighthouses**

Cape Cod is just the sort of place you would expect to find lighthouses, and you won't be disappointed. Sweeping far out into the ocean, Cape Cod is a substantial obstacle to navigation. Indeed, in the last three hundred years, there have been more than 3,000 shipwrecks along its coasts. A visit to seven lighthouses which still remain active on Cape Cod will take you from Woods Hole to Provincetown.

### **Nobska Light**

Nobska Light, located on Nobska Point overlooking Woods Hole harbor, warns mariners away from two dangerous shoals named the Hedge Fence and L'Hommedieu. The first light station was built here in 1828. It was a keeper's house with a light tower on top. In 1876, a new metal tower, the same one you see today, was built in Chelsea and shipped in four sections to the Cape. The iron tower was lined with brick and a new keeper's house was built at this time. Later, in 1900, another keeper's house was added. Like all the lighthouses on Cape today, Nobska Light is unmanned. It was automated in 1985.

Nobska Light is 42 feet high and 87 feet above the sea. Its light flashes once every six seconds and can be seen from sixteen miles out at sea. Mariners in safe water see a white light, while those who are in danger of going aground on the shoals see a red light.

### **Chatham Light**

The next lighthouse still in operation as you proceed down Cape is Chatham Light. The first lighthouse was established here in 1808. It consisted of two brick towers and a keeper's house. Two towers were built to help mariners distinguish the light station at Chatham from the single beam of Cape Cod Light. How to distinguish one light from another was a problem in the early days of lighthouses before an easy way was found to make the lights in the tower flash a distinctive signal. Ultimately, it was decided that multiple lights like Chatham's were too expensive to maintain because of the additional fuel, personnel and supplies required.

In the late 1870's, erosion threatened Chatham Light, and the entire station had to be moved across the street where it stands today. The new lighthouses were built of metal. Two towers were used at Chatham until 1923. At that time, the north tower was moved to Nauset Beach in North Eastham, the next stop on our tour.

### **Nauset Light**

The lights at Nauset Beach have had a long and complicated past. In 1838, three brick towers were built in a row 150 feet apart on the cliffs at Nauset. It was at this time that the lighthouses became known as the Three Sisters. When the original brick towers fell victim to erosion in 1892, they were replaced with three movable wooden towers.

## *Touring Cape Cod Lighthouses — continued*

Occasionally, remnants of a foundation are exposed by the action of the waves and can be seen at low tide.

In 1911, it was decided that it would be cheaper to have one light that flashed three times, and two of the Three Sisters were sold. They became part of a summer cottage. The one remaining light became known as “The Beacon.” All three of the Three Sisters are now owned by the National Park Service. They have been arranged in their original configuration and placed in the woods just off Cable Road on your way to Route 6 as you leave the current site of Nauset Light. Tours of the Three Sisters are given by Park Rangers.

The current Nauset Beach Lighthouse which sits in the general location of the original “Beacon” was moved from Chatham in 1923 when the twin lights of Chatham were discontinued. Nauset Beach Light has a handsome red band around the top of its tower. This is called a daymark, and helps mariners tell Nauset Light from other Cape Cod lights during the day.

Nauset Light was threatened by erosion and in 1996 the Nauset Light Preservation Society moved it 300 feet back from the edge. As you look at Nauset Light, notice also the round ball on the top of the tower. This ventilator ball allows air to enter and cool the lantern room where the lamp is located. The fourth-order Fresnel lens which was originally used in this tower is now located in the museum at the Salt Pond Visitor Center just off Route 6.

### **Cape Cod Light**

Rested and refreshed after your visit to the museum at the Salt Pond Visitor Center, you’re now ready to move on down the Cape to the oldest lighthouse of all, Cape Cod Light, established in 1798. It is also sometimes called Highland Light because it was built on the high lands of Truro. For sailors coming from Europe, Cape Cod Light is the first light seen on the transatlantic voyage from Europe to Boston. Captains knew that once they spotted Cape Cod Light, they would be home in Boston by the following day. For this reason, it has always been considered a very important light.

The present brick lighthouse and associated buildings attached to the lighthouse were built in 1857. The first-order Fresnel lens installed at that time made Highland Light the most powerful light on the New England mainland. When electrified, it measured an unimaginable four million candlepower. A piece of Fresnel lens and some old photographs of the lighthouse are on display in a small exhibit that can be viewed through the window of the radio room at the lighthouse. Sixty-six feet tall and located high on the clay cliffs of Truro, Cape Cod Light’s beacon shines 174 feet above the ocean and can be seen twenty miles out to sea. It flashes a white light every five seconds. The beam can be seen by motorists at night from Truro to Provincetown as they drive Route 6.

Like many Cape Cod lighthouses before it, Highland Light was in danger of falling into the ocean due to erosion of the cliffs; its plight hastened by harsh winter storms. In 1996, the National Seashore and Truro Historical Society joined forces to move Cape

## ***Touring Cape Cod Lighthouses — continued***

Cod Light. The historical society also operates a wonderful museum in an old hotel, called the Highland House, just down the road from the lighthouse.

### **Race Point Light**

Race Point Light is accessible, but only to those who want to take a long walk. Walk from Race Point Beach and head west along the beach about two miles. Bring water and a snack. You can see the lighthouse at a distance from several vantage points. One of the best is the Province Lands Visitor Center. Climb the steps to the observation deck and look west, to the left of the Old Coast Guard Station with the red roof. You can also see the lighthouse from Herring Cove Beach. Park in the parking lot on the right, walk down onto the beach and look to your right.

The lighthouse was first established at Race Point in 1816 to help ships navigate around the knuckles of the Cape on their way into Provincetown Harbor. Even with Race Point Light, this is still a dangerous and difficult area to navigate. Between 1816 and 1946, more than one hundred shipwrecks were recorded on the beach and dangerous shoals offshore. So treacherous is this area, that Race Point Light is equipped with a foghorn to warn ships in times of poor visibility.

The keeper's house and lighthouse currently on the site were built in 1876. The 40-foot tower is 41 feet above the ocean and its white light, flashing every 15 seconds, can be seen 16 miles out at sea.

### **Wood End Light and Long Point Light**

The best place to see Wood End and Long Point Lights, the final two lighthouses on our tour and on Cape, is from the breakwater by the rotary at the end of Commercial Street in Provincetown. You can avoid the center of town by leaving the Seashore on Province Lands Road. Turn right as you leave Herring Cove Beach and right again at the lights on Route 6. Park at the rotary which, incidentally, contains a plaque commemorating the first landing place of the Pilgrims. It takes about half an hour to walk across the breakwater to Wood End Light and another half hour to walk approximately a mile further to the tip of Cape Cod where Long Point Light marks the entrance to Provincetown Harbor. During the summer, a local company operates a shuttle service to Long Point.

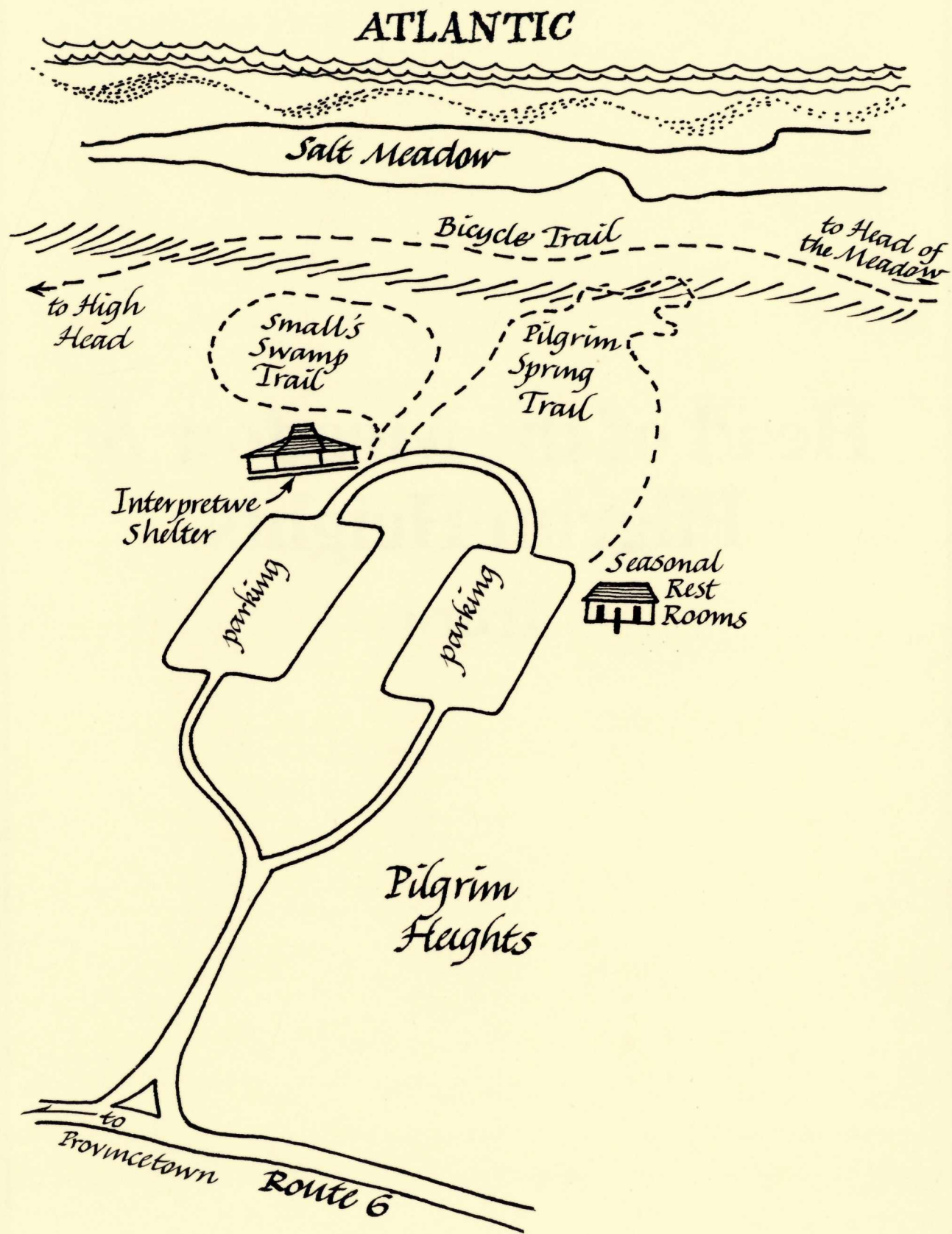
Wood End Light, visible slightly to the right of the far end of the breakwater, is the twin of Long Point Light. Unlike the other lighthouses we've seen on this tour, Wood End Light is a square white tower. Built in 1873, the light is now powered by solar power and flashes a red light every fifteen seconds.

Long Point Light, the last lighthouse on our tour, was established in 1827. Long Point's steady green light is also solar-powered. You can get a good view of Long Point Light without leaving your car from the West End parking lot, opposite the 1807 House at 54 Commercial Street. Now isolated and alone, Long Point Light was once the center of a thriving fishing community that existed on the tip of Cape Cod between 1818 and 1860.

# **Head of the Meadow & Pilgrim Heights**

**Truro**









## **Head of the Meadow and Pilgrim Heights**

- Directions:** Traveling north on Route 6, proceed  $\frac{1}{4}$  mile north from Cape Cod Light/Highland Road exit. Look for the brown and white Head of the Meadow Beach sign on the right. Turn right and proceed two miles to the beach and bike trail head. Other areas of interest nearby include Pilgrim Heights (one mile further north on Route 6) and High Head ( $\frac{1}{2}$  mile further north beyond Pilgrim Heights).
- Safety:** Use caution when turning on and off Route 6 onto side roads in these locations. Traffic is heavy in summer. There is no bus turnaround in summer at Head of the Meadow Beach. There is no bus turnaround at High Head—the road becomes narrow and unpaved and dead ends.
- Other:** Public restrooms and a picnic area are available at Pilgrim Heights (restrooms are closed in winter). Lifeguard protected beach is available at Head of the Meadow Beach in summer. Limited restroom facilities are available at Head of the Meadow Beach in summer only.
- Tips:** Start telling Head of the Meadow story upon exiting Highland Light area. Head of the Meadow bike trail is two miles one way on flat terrain. Each of the two self-guiding trails at Pilgrim Heights are approximately  $\frac{3}{4}$  mile loops, hilly terrain. Respect private property rights at High Head. Exploring the High Head area is best done on foot.
- Time Frame:** Ten-minute bus narration. Fifteen to thirty minutes or longer at Pilgrim Heights for picnicking, restrooms, walking trails.
- Notes for Educators:** Frequent Ranger-guided interpretive programs are offered in the area three seasons of the year. Inquire at visitor centers for schedule. Pilgrim Heights area contains two self-guiding trails, Small's Swamp Trail and Pilgrim Spring Trail. Both are approximately  $\frac{3}{4}$  mile in length.
- Highlights:** Head of the Meadow Beach  
Head of the Meadow Bicycle Trail  
Small's Swamp and Pilgrim Spring Trails  
High Head Overlook



## **Head of the Meadow and Pilgrim Heights**

- The Head of the Meadow area displays various habitat changes due to environmental changes over time. Bayside waters once reached into this marsh area, whereas today, the area is mostly dominated by a coastal dune setting.
- Pilgrim Lake was once connected with Provincetown harbor. The railroad and highway impounded the waters here, and blocked tidal ebb and flow. The waters have gradually become brackish over the years.

**Watch out for ticks and poison ivy.**





## **Head of the Meadow and Pilgrim Heights**

The Head of the Meadow area offers diversified terrain, activities and facilities, all within a short distance. In an afternoon, you could enjoy beachcombing at Head of the Meadow Beach, ride the bicycle trail, picnic at Pilgrim Heights, and hike through the parabolic dunes at High Head. Camping areas and small stores in the surrounding North Truro area offer limited services year round. The area is seven miles from Provincetown.

Three distinct geographical regions are highlighted here: the outer beach, an extended freshwater meadow, and the pine uplands of Pilgrim Heights that culminate with the bluffs of High Head overlooking Provincetown. At the “head” of the freshwater meadow are two public ocean beaches, one administered by the town and one by the National Park Service. There are fees to park at each beach in the summer. At low tide, the remains of the shipwreck *Frances* (1872), can be viewed from shore on the west end of the public beach. Her cargo of sugar and tin, as well as her crew, was rescued, although the German captain of the iron-hulled bark later died and is buried in North Truro.

The Head of the Meadow Bicycle Trail begins at the entrance to the beach. It follows a remnant of the Old King’s Highway for a two-mile, paved, flat stretch, ending at the dirt parking lot at High Head. The trail runs along the fringes of the meadow and is rich in birds and other wildlife, especially early and late in the day.

### **Pilgrim Heights**

Pilgrim Heights is a lightly-visited area that offers ample parking, a picnic area and restrooms, and two self-guided trails. Small’s Swamp trail explores a geologic kettle hole and traces the development and demise of the Small family farm, while the Pilgrim Spring trail tells the story of the Pilgrims of 1620 as they discovered their first fresh water in the New World near here. Both trails traverse rolling Pitch Pine forest and offer comfortable walking all seasons of the year. Overlooks from both trails highlight the meadow and ocean below. The meadow used to be a salt meadow, offering a rich harvest of salt hay used for livestock. Its outlet into Cape Cod Bay to the west was sealed in 1873, creating a freshwater habitat.

Continuing north from Pilgrim Heights, the road suddenly descends from the heights, and spectacular views of sand dunes and Provincetown unfold for a brief moment. You have descended from High Head and have crossed over 25,000 years of geologic history. Geologically, High Head represents the tip of “old Cape Cod.” The original landform deposited during the last Ice Age ended here, with cliffs towering above the sea. The dunes beyond are part of the growing sandspit which has developed beyond High Head during the last 6,000 years—very young indeed geologically. This “new” spit is nourished from materials eroded from other parts of Cape Cod and redeposited here.

## *Head of the Meadow and Pilgrim Heights — continued*

Look for the brown and white sign for High Head on the right. This road will fork, the left continuing as dirt road and ending at a small parking lot from which to explore the dunes and access the beach. The end of the bicycle trail is here as well. A right turn leads you back up High Head for a wonderful overlook of Provincetown, Pilgrim Lake, and the majestic sand dunes. There is no official parking at the top, and all vehicles except resident vehicles are discouraged. Therefore, access to High Head is limited, and walking up to the area is recommended. Please respect private property rights.



## **Small's Swamp Trail**

### **A Kettle Forms**

Even as they retreat, glaciers are shapers of the land. Their great loads of sand and gravel, boulders and rock powder are carried forth in muddy meltwater by the millions of tons, and piled layer upon layer. Thus it was that the forearm of Cape Cod from Orleans to North Truro was created, principally from the great ice lobe which lay a mile or two to the east about 18,000 years ago.

Here, as happened elsewhere on the Cape, a great block of ice was separated from the melting glacier, then it was gradually surrounded or covered with outwash deposits. Then, as the ice block melted, the debris settled into the cavity left by melting ice, and the kettle was given its final, symmetrical form.

Only in the past 2,000 years or so did the Cape's freshwater layer intersect this kettle. Water-loving plants were at last able to grow on the moist kettle floor—and leaf by leaf, season by season, several feet of peat slowly accumulated. Swamp azalea, highbush blueberry, and black cherry are abundant now, but should the water level drop, or the soil dry as it builds up, the balance will swing—and the “swamp” will quickly progress to a stand of red maple and tupelo—and ultimately become a beech forest.

### **Layers of History**

Like chapters in a book, the artifacts retrieved from Small's Swamp reveal a history of its Native American inhabitants that stretches 4,000 years or more into the past. The first settlers were hunters and fishers and gatherers of fruit and seed, but there evolved a woodland culture with finer tools and the skills to raise crops. These people learned it was time to plant when the leaves of the white oak were the size of a mouse's ear; how to till the soil; and how to fertilize plants with fish and seaweed. And so by about 500 A.D., the raising of corn, pumpkin, squash, and beans became a part of each summer's ritual.

While men continued to hunt and fish, women planted and hoed, wove baskets, clothing, and furnishings, and carried on their household tasks. Such were the privileges of the “sanops,” the common people, who possessed rights to tribal land.

These were migrant people. They cleared the land of forest with fire; they raised crops for several years in succession, then they moved on. And by this process, the soil was allowed to recover before it was used again. The evidence? In part, it lies within a seven-and one-half inch layer of swampy earth gathered during these years of settlement. The layers which possess corn pollen are separated by intervening layers of peat which hold no such record of nearby agriculture.

By A.D. 1600, life here was bountiful. Relatively peaceful and secure, the people were adjusted to this world, and had learned how to tap the resources of both the land and sea.

## *Small's Swamp Trail — continued*

They knew how to preserve grain, vegetables and meat for winter use. Government by the ruling “sachem” included the advice of his noble “sagamores,” and Kiehtan, the Great Spirit, guided all life and all things.

But with European contact, this world was quickly erased. A great plague struck many tribes from 1615 to 1619, and four of every five persons were killed. The old order fell apart. Traditions, skills, language, education—a whole heritage virtually disappeared. And while it did, the newly arriving, light-skinned people began putting their mark on the land.

### **Thomas Small's Farm**

*We shudder at the thought of living here ... Some of it is not worth writing a deed for.*

HENRY DAVID THOREAU

After two centuries of European settlement, the Truro plain had little resemblance to the forests which the Pilgrims found. Logging, farming, sheep raising, and the general needs of settlement were a greater drain than the soil could provide, and so by 1850, the area was barren. Still, agricultural use was expanding, and in the 1860's Thomas Small and his wife began their 200-acre farm.

An observant person does not build without considering winters that are long and harsh—and the Smalls were no exception. So, as the Native Americans did, they selected this kettle for its protection from wind, and here built their house and outbuildings.

The Smalls worked this earth for sixty years. Cows were raised, heavily supplemented by saltmarsh hay; and corn and asparagus were cropped. But the land's day of yielding a living was ending. Upon Warren Small's death in 1922, the farm was abandoned. Once a part of the Cape landscape, the structures were eventually burned.

Few remnants survive of the buildings which once stood here, yet there are more lasting marks. The dooryard favorites—grape, lilac, bouncing bet, plum, and apple—all of these were once a cultivated part of the farm. They are unkept and untamed now, blending with the returning woods, but they endure, reminders of how the land was used, and of a way of life that has passed from the Cape Cod scene.

**Reminder: Artifact hunting is prohibited within the National Seashore.  
These are held in trust for all of us.**





## **Historical Quotes About the Pilgrim Heights Area**

### **The New World**

There was a time, not long ago, when the New World was new. It was known to Europeans, because forty or more ships had plied these New England waters prior to 1620; but the reports were fleeting, and sometimes deceptively optimistic. In truth, it was a wild place, and it was unknown.

*The waters are most pure, proceeding from the entrails of the mountains.*

*The herbs and fruits are of many sorts and kinds ...*

*Oak is the chief wood, ... fir, pine, walnut, chestnut, burch, ash, elm, ... and many other sorts.*

*Whales, grampus, porpoises, turbot, sturgeon, cod, hake, haddock, ... crabs, lobsters, mussels, wilkes, oyster, and diverse others.*

*A DESCRIPTION OF NEW ENGLAND  
JOHN SMITH  
1616*

### **The Pilgrim Voyage**

Given chance winds and surf, the *Mayflower* was lucky to survive its Atlantic crossing. An altered course brought the ship to Milford Haven (Provincetown Harbor) in place of a Hudson River destination in the Northern Virginia territory, and so from this unplanned landing, the Pilgrims began to explore a new and unsettled land.

*... we espied land which we deemed to be Cape Cod, and so after was it proved.*

*GOVERNOR WILLIAM BRADFORD*

*... after longe beating at sea they fell with that land which is called Cape Cod; the which being made & certainly known to be it, they were not a little joyfull ...*

The Pilgrims had made their commitment, and now time was critical, for the delays resulted in a November landing. It was imperative to select a suitable place to survive the winter.

*... what could they see but a hidious & desolate wilderness, full of wild beasts & wild men? ...*

*HISTORY OF PLYMOUTH PLANTATION  
WILLIAM BRADFORD*

### **Exploring Unknown Territories**

Armed and armored, a small band of men ventured from the *Mayflower* to assess this land—the first of three “Discovery” expeditions on the lower Cape. Native Americans were sighted, followed, then lost, and soon the Pilgrims were lost, too. The men fought

## *Historical Quotes About the Pilgrim Heights Area — continued*

through thickets, they found refreshing water at this place that would bear their name, and after further exploring, they returned to the *Mayflower*, ... *lest they should be in fear of their saftie*.

*We ... sat us down and drank our first New England water with as much delight as we ever drunk drink in all our lives.*

MOURT'S RELATION  
1622

*As we wandered we came to a tree, where a young sapling was bowed down over a bow and some acorns strewn underneath. Stephen Hopkins said it had been to catch some deer. So as we were looking at it William Bradford being in the rear, when he came looked also on it, and as he went about, it gave a sudden jerk up and he was immediately caught by the leg. It was a very pretty device made with a rope of their own making and having a noose as artifiically made an any roper in England can make and as like ours as can be, which we brought away with us.*

MOURT'S RELATION  
1622

*We marched through boughs and bushes, and under hills and valleys which tore our very armor in pieces.*

MOURT'S RELATION  
1622

### **Settling Down**

Finally, Plymouth was selected for settlement, across the bay. It was a modest entry into the new world, but it was enough. It marked the beginning of a new way of life in New England that was to stay—and in a sense, it marked the end of the cultures which preceded them.

*... as one small candle may light a thousand, so the light here kindled hath shown to many, yea in some sort, to our whole nation.*

GOVERNOR WILLIAM BRADFORD



## **Shipwrecks**

### **An Ocean Graveyard**

So many ships have piled up on the hidden sand bars off the coast between Chatham and Provincetown that those forty miles of sea have been called an “ocean graveyard.” Indeed, between Truro and Wellfleet alone, there have been more than 1,000 wrecks.

When a storm struck the Cape in the early days, no one was surprised to hear the alarm: *Ship ashore! All hands perishing!* The townspeople would turn out on the beach, but usually the surf was too high for them to attempt a rescue. And by the time the storm was over, there was usually no one to rescue.

The first recorded wreck was the *Sparrowhawk* which ran aground at Orleans in 1626. The people aboard were able to get ashore safely, and the ship was repaired. But, before it could set sail, the ship was sunk by another storm and wasn’t seen for over two hundred years. In 1863, after storms had shifted the sands again, the skeleton of the *Sparrowhawk* reappeared briefly. So the ocean takes and gives back and takes again. (The ribs of the ship are now on display in Plymouth at Pilgrim Hall.)

But if the passengers and crew of these early ships couldn’t be saved, the cargo often was. After a wreck, townspeople would come out with their carts and horses and haul away the spoils: wine, coffee, nutmeg, cotton, tobacco, and whatever the ship had been carrying. Sometimes owners of the wreck paid the local people to salvage their cargo; often the local people simply went on the theory that finders were keepers. Certainly, this was their theory when the famous pirate, Samuel Bellamy, and his ship, the *Whydah*, went down off Wellfleet in the spring of 1717. Although officially all goods on such a ship belonged to the colony, plunder occurred.

From the Head of the Meadow Beach at North Truro, the wreck of the *Frances*, which was sunk in a December gale in 1872, may still be seen at low tide. United States Life Saving Service men dragged a whaleboat from the bay across the Cape to the outer beach and rescued all aboard. The captain, who died several days later from the effects of exposure, is buried in Truro.

### **Rescuing Sailors**

In the early 1800’s, there was an average of two wrecks every month during the winter. The loss of life seemed especially sad when a sailor managed to get ashore on a winter night only to freeze to death after he got there. In 1797, the Massachusetts Humane Society started putting up huts along the most dangerous sections of the Massachusetts coast in the hope that stranded sailors would find them and take shelter. It was not, however, until 1872, that a really efficient lifesaving service was put into operation by the United States government. Stations were erected every five miles on the beach. Six or seven surfmen and a keeper lived in each station and kept a continuous

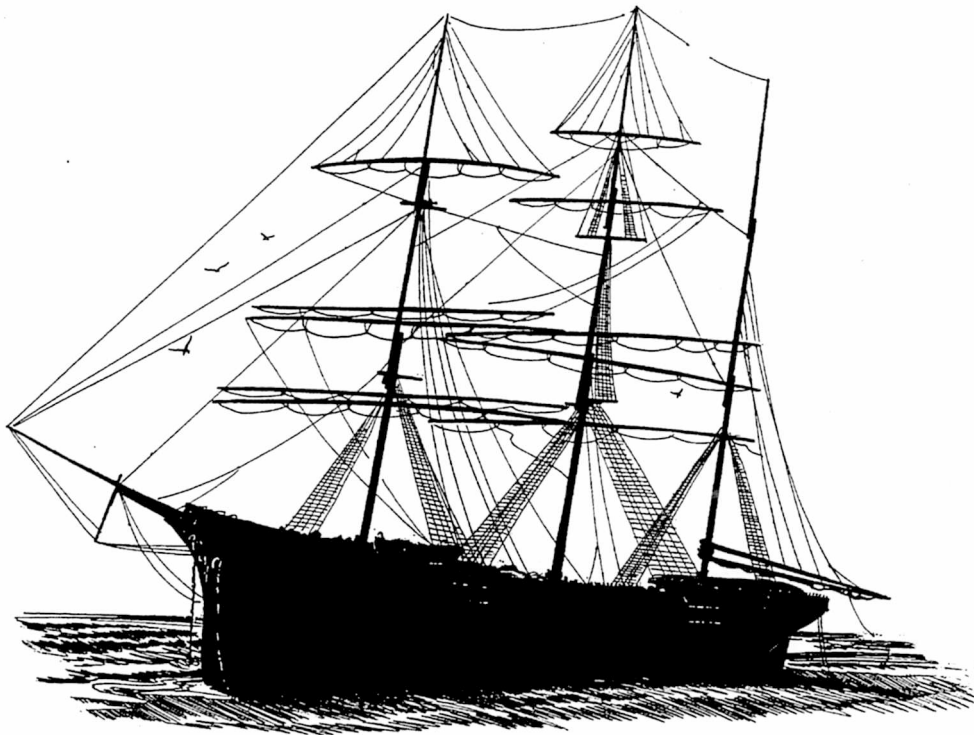
## *Shipwrecks — continued*

lookout. At night, two men from each station walked the beach on patrol, met at a small half-way shelter between stations, and then returned on their same route.

As soon as a ship in distress was sighted, a red signal was fired from ashore to let the crew at sea know they'd been seen. Then the lifesaving crew went into action. If the sea permitted, they launched their special surfboats—some equipped with air chambers (to help keep them afloat), cork fenders (to keep them from being smashed against the sinking ship), and righting lines (to use in case they capsized). If they could not get out by boat and if the shipwreck was near enough to shore, the lifesaving team stayed on the beach and pulled the sinking crew to shore, one by one, in a basket-like contraption called a breeches buoy attached to a rope that was strung high over the water. By the use of a Lyle gun (a small cannon), a double line with pulley was fired to the ship. While the sailors on the ship tied their end of the line to the mast, the lifesaving crew attached the other end to a structure anchored in the sand and then sent the breeches buoy over the rope to the ship. A sailor from the sinking ship would climb into the breeches buoy and be pulled to shore. Then back the breeches buoy would go for the next rescue.

A demonstration of a breeches buoy drill is given weekly during the summer months by National Seashore Rangers at Race Point in Provincetown.

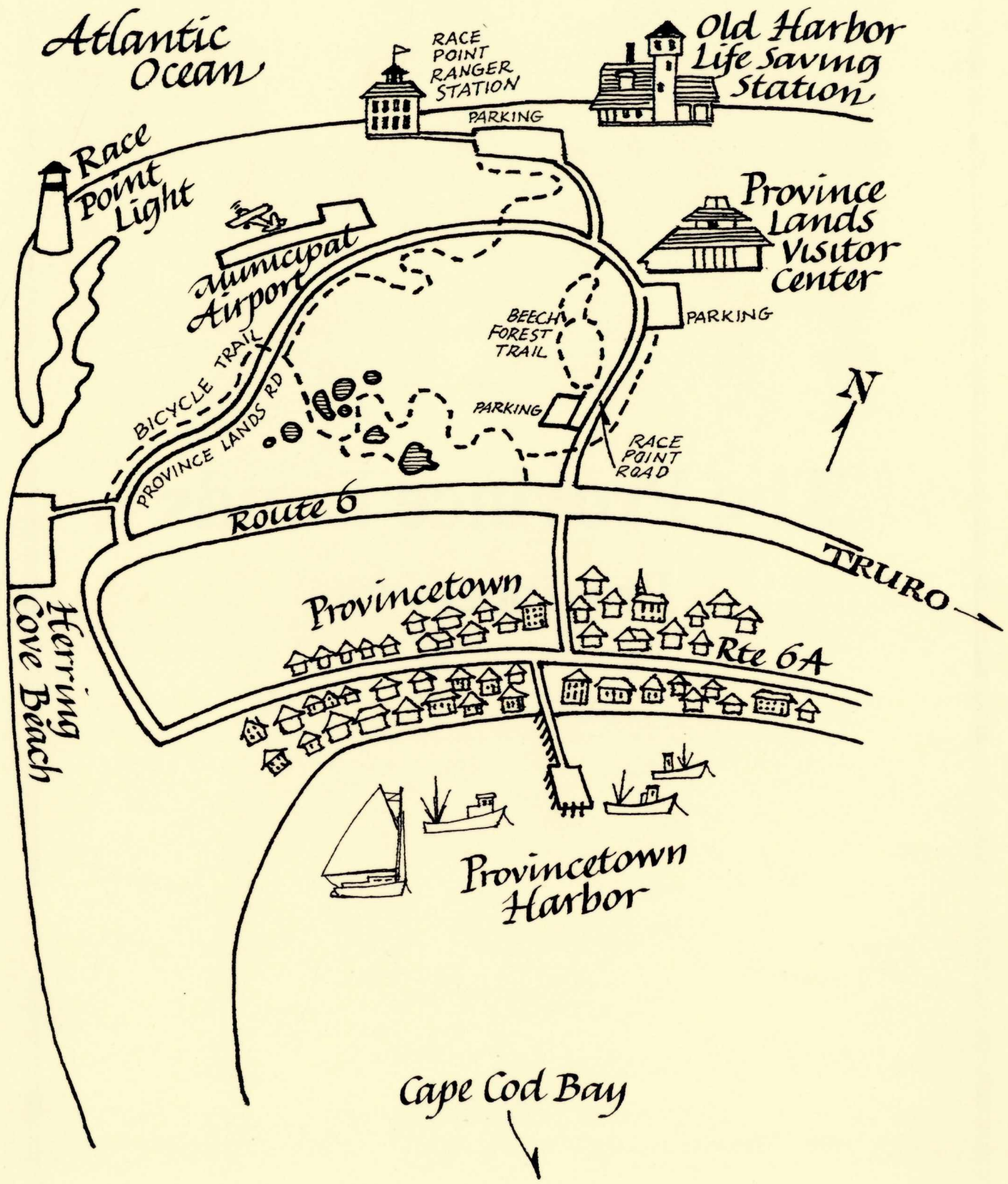
The Old Harbor Life Saving Station at the east end of Race Point is still standing. Currently, it is being restored to its original condition, complete with lifesaving equipment.



# **The Province Lands**

## **Provincetown**









## **The Province Lands**

- Directions:** From Head of the Meadow, travel Route 6 north toward Provincetown for six miles. Turn right onto Race Point Road at first traffic light. Look for brown and white signs marking the Beech Forest area and Province Lands Visitor Center. Race Point Road ends at Race Point Beach. To get to Herring Cove Beach, go to the end of Route 6. The beach is on the right. (To reach the center of Provincetown, which is outside the National Seashore, turn left at the set of lights on Route 6. The center of town is marked by the Pilgrim Monument, the prominent stone tower. Provincetown has a variety of restaurants, shops, whale watch boats, art galleries, and other services available. Contact the Provincetown Chamber of Commerce for more information.)
- Safety:** Roads are heavily traveled in summer. Secondary roads are narrow and winding. Stay on paved surfaces to avoid getting stuck in sand. Lifeguard protected beaches are available at the two public beaches in summer.
- Other:** Buses wishing to park at a beach during peak summer hours must park at Head of the Meadow Beach in North Truro. Restrooms are available in season at the two public beaches, Beech Forest and the Province Lands Visitor Center. No restrooms are available in winter. The visitor center is open mid April through November.
- Tips:** Start telling the Province Lands story upon exiting the Head of the Meadow Area. This is one of the most scenic drives on the Cape. Spectacular sand dunes and views of Cape Cod Bay and the Atlantic ocean are highlights. Province Lands Bike Trail is a hilly, six-mile loop through dunes and forest, with spurs to both public beaches. Beech Forest Trail is a one-mile loop trail through forest and ponds, and includes a picnic area.
- Time Frame:** Ten-minute bus narration; twenty minutes for Beech Forest Trail; thirty to forty minutes at Province Lands Visitor Center; twenty minutes at Old Harbor Museum
- Notes for Educators:** Frequent Ranger-guided interpretive programs are offered in the area and at the Visitor Center. Visitor Center has orientation movies, exhibits, bookstore and observation deck.
- Highlights:** Province Lands Visitor Center  
Old Harbor Museum  
Beech Forest Area  
Race Point and Herring Cove Beaches  
Parabolic Dunes  
Town of Provincetown



## **The Province Lands**

- **The Outer Beach.** This portion of the Cape is accreting (building) as a result of “along shore” transport of sand from the glacial scarps to the south. The shoreline here drops off dramatically, allowing whales (and vessels) to come close inshore.
- **The Beech Forest Trail** is a 1½ mile loop that skirts the Beech Forest Pond and travels through a forest dominated by beech trees, which once were much more numerous on Outer Cape Cod. The area is gradually being inundated by migrating sand. It is a rewarding area for bird watching, especially for sighting warblers in the spring and fall.
- **Dunes.** The spectacular dune landscape of the Province Lands has a complex history. It is primarily the result of deposition of sand that has washed from the eroded glacial scarp, subsequently built into dunes by wind action, and stabilized by beach grass. The Province Lands Visitor Center is a prime location to observe the dunes.
- **Beach grass revegetation** efforts can be seen throughout the Province Lands. The dunes were forested once, but land use practices of European settlers denuded the dunes and caused widespread migration of sand. Efforts were initiated in the early 1800’s to stabilize the dunes (which in Pilgrim times were covered by a foot of soil and forested) with vegetation. The National Park Service has continued to stabilize dunes with native beach grass planting, a program which was started shortly after the establishment of Cape Cod National Seashore in 1961.

**Use caution on bicycle trails. Watch out for ticks and poison ivy.  
Use caution when walking; do not damage beach grass.**



## **The Province Lands**

The Province Lands Area has long been a source of inspiration for writers, poets and artists. The stark colors of sand and sea, windswept dunes and the isolation of the Cape's tip still inspire the arts in Provincetown today. The numerous galleries and art schools in town and the primitive dune shacks and beach retreats foster creativity and keep the tradition alive and well.

The drive down Route 6 towards Provincetown reveals this splendid, barren landscape. Cottages line Beach Point to your left, with Cape Cod Bay as a backdrop. To your right, Pilgrim Lake and the large parabolic dunes on the opposite shore provide breathtaking contrast. The lake was once known as "East Harbor," and served as Provincetown's inner harbor. Ships weathered storms by anchoring here. Concern over sand being flushed out into Provincetown Harbor, and the arrival of the railroad, led to the filling in of the entrance to East Harbor by 1873. With an average depth of three feet, today's Pilgrim Lake is a brackish lake ruled by white perch and huge carp.

### **A Highway of Sand**

The parabolic dunes are sculpted by powerful northwest winds that continue to drive the dunes into Pilgrim Lake. Seen from the air, their horseshoe shape, similar to a parabola in geometry, are a unique landform in the east. Just past the Provincetown line, some of the dunes are spilling onto the highway. Beach grass planting, a technique used since the early 1800's to slow the march of the dunes, has stemmed the bulk of the erosion here. In the past, the state struggled to keep this stretch of highway open by removing tons of sand every winter. In addition, some of the sand was mined for commercial purposes.

Why so much sand? The Province Lands was formed a mere 5,000 years ago from eroded materials from cliffs facing the Atlantic Ocean to the south. This loose sand and gravel was transported by along-shore currents and deposited inland by the wind. Although a mature forest developed over much of the Province Lands, grazing and clearcutting for firewood, and for house and saltworks construction, depleted the vegetation. The blowing sand threatened Provincetown with burial for a time.

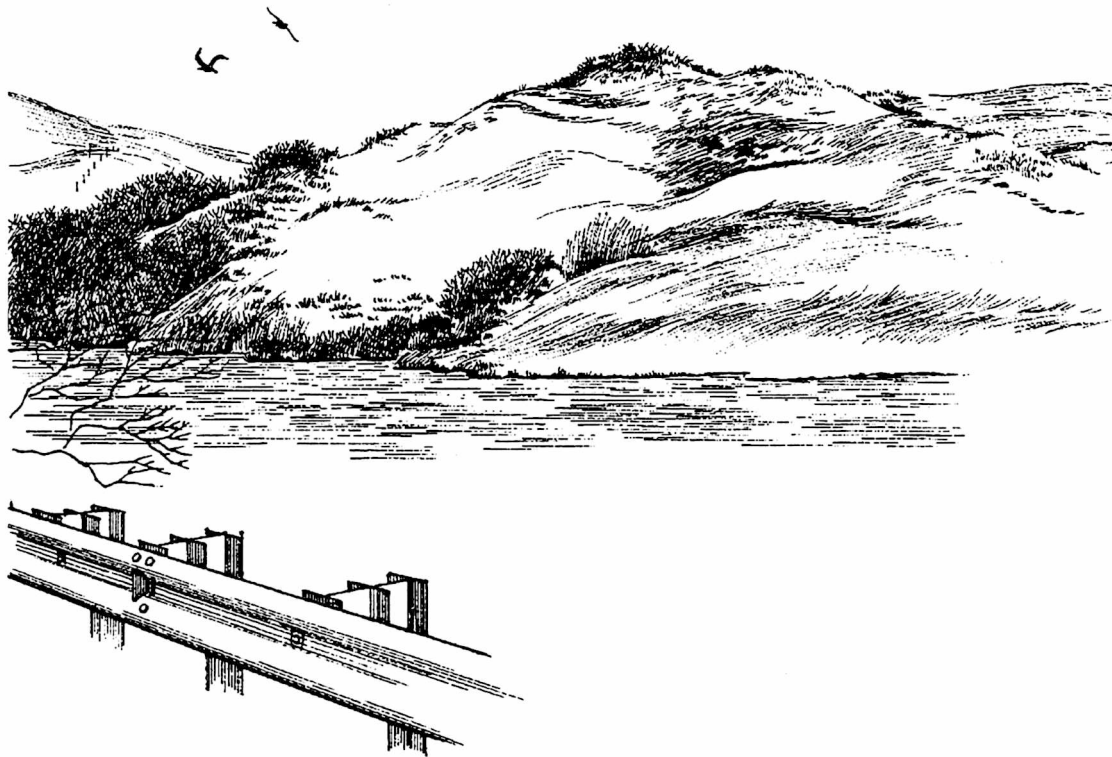
Grazing and cutting controls, extensive plantings of beach grass, pine and scotch broom, stabilized 1,200 acres by the 1930's. Today, the land is still recovering from the onslaught. As recently as 1988, the National Park Service planted beach grass in critical areas, especially around Pilgrim Lake.

One of the few reminders of our hardwood forests is the Beech Forest area. A self-guided trail explores the ponds and groves of beech and oak trees that represent the "climax," or final stage in forest succession. Dense leaf patterns dominate the forest canopy, shading out the competition. The ponds in the area may provide a clue to the original formation of the Province Lands sand spit.

## *The Province Lands — continued*

The Province Lands Visitor Center is an excellent source for more information on the history and present-day flora and fauna of the Province Lands. The center offers orientation movies, exhibits, a bookstore and observation deck. Numerous Ranger-guided walks from the center explore the dunes and wet hollows where wild cranberries flourish.

Inquire about hours for the Old Harbor Museum, which can be spotted from the observation deck. The museum is a former U.S. Life Saving Station located at Race Point Beach that displays shipwreck rescue equipment from the turn of the century. On Thursday mornings in the summer, an historical reenactment of the Breeches Buoy Rescue is conducted at the station. (Note: Beach parking fee is collected in summer at Race Point Beach.)





## **The Province Lands Dunes**

A dune is a hill of sand piled up by the wind.

The sand of the Province Lands is very uniform in size, with the coarseness representing the energy of the winds in that area. These sand grains are composed mostly of quartz, and are the end product of the breaking down of the rocks of the ancient Appalachian mountains and neighboring volcanoes. Sand dunes are found in many areas of the Cape and Islands, mostly in coastal zones, but occasionally inland.

The most extensive example of dunes on the Cape is found on the area known geologically as the Provincetown Spit. The height of the dunes varies from a few dozen feet to over one hundred feet in several locations, such as near the Province Lands Visitor Center on Race Point Road.

### **Linear and Parabolic**

Dunes are of two types—linear and parabolic. Linear dunes, known as foredunes, are located just behind the beach, and are formed by onshore winds carrying beach sand inland to where it is caught by beach grass. Some interior dunes are also linear and probably mark older locations of the beach when the sandy hook was still forming. Foredunes act as barrier dunes to protect the inland freshwater community from the ocean. Their importance is such that the Seashore has rules limiting traffic across them and asks people not to climb on them from the beach.

The larger interior dunes are parabolic, or horseshoe shaped, and are geologic structures that are (for this part of the world) unique to the Cape area. The U-shapes of these dunes develop as the centers become blowouts, with the prevailing winter winds from the west and northwest lifting the sand up the inside of the U and dropping it over the steep downwind side of the migrating sand wave. When looked at from an airplane, or on an aerial photo, the parabolas line up, and point downwind in a southeasterly direction.

Henry David Thoreau, in his book, *Cape Cod*, described the Cape as an upraised arm with *the sandy fist at Provincetown*. The fist has been added onto the glacially deposited sands and gravels of the arm during post-glacial time. Once the vast glaciers had melted enough, about 6,000 years ago (to raise sea level by almost 350 feet), an erosion process began on the ocean side of the Outer Cape that has reduced the forearm to a width that is less than half its former size.

The beach that develops at the base of the wave cut cliffs is actually a “river of sand” that migrates along the edge of the Cape in the predominate northward direction of wave attack. It is also the first step in the sorting action that reduces the numerous grain sizes of the glacially deposited sands and gravels to the very uniform size found on the beach. This material is further sorted when the wind picks some of it up and blows it off the beach and into the dune area.

The general appearance of the dunes has changed considerably over time. The Pilgrims, in 1620, reported in *Mourt's Relation* (author unknown) that they found the

## *The Province Lands Dunes — continued*

Province Lands as follows: ... *on this side where we lay* (Provincetown harbor) *is the bay, and further side the sea; the ground or earth, sand hills much like the downs in Holland, but much better; the crust of the earth (soil) a spit's (spade's) depth; ... the wood for the most part open and without underwood, fit either to go or ride in* (a climax forest). In short, the original forests were essentially like the present ones, but with more hardwood deciduous and less pine, more openness in the understory, larger trees, richer soil, and a greater diversity of species. About 97 percent of the Cape upland area was vegetated with only the beaches, some dunes, and salt marshes exposed.

In 1800, Timothy Dwight, a traveler, described crossing *a sandy waste of 1,000 acres in Eastham*, the high ground of Truro was *bleak, barren, and desolate*, and the land of Provincetown could *scarcely be said to contribute at all to the sustenance of man*. Thoreau, in 1850, comparing his scene with the Pilgrims, commented on the *barrenness and desolation of the land*, described it as a *desert*, and reported that he did not *see enough black earth in Provincetown to fill a flower pot*. He saw *scarcely anything high enough to be called a tree*. *The greater part of the land was a perfect desert of yellow sand, rippled like waves by the wind, in which only a little Beachgrass grew here and there*.

### **What had happened to the lushness of the original Cape?**

In short, the Cape was stripped of its vegetation by the early settlers. By the early 1700's, hardly a tree could be found. Wood was needed for building and fuel, and the land needed to be cleared for farming. In the Provincetown area, this abuse led to the uncovering of the sand beneath the soil and created a hardship for the inhabitants. Sand dunes drifted like snow, at a rate of several hundred feet per year, according to early descriptions, and tended to bury buildings if not shoveled away.

The present state of vegetation is somewhere between the lushness of the Pilgrims and the barrenness of the 1700-1800's. This improvement is due to a change in attitude toward the land, moving away from the need to use the land for sustenance toward a desire to live with it, helped by a better understanding of what we need to do to protect and ensure our continued existence in this dynamic but fragile area.

Reclamation and replanting efforts started by the State in the late 1800's have been continued into the present by the federal government, now in stewardship of these sand plains. Beach grass is the anchor that holds and builds the dune structures. It was always planted first to stabilize the dune, to be followed by a diverse variety of hardy bushes and trees. The Seashore is still using this method in areas that have been abused by more modern use, such as heavy pedestrian traffic, off road vehicles, roads that are now closed, or where construction of buildings, roads, or trails has taken place.

Most of the dunes are now fairly well stabilized, with the most active moving only about ten feet per year. The future is the renewal of the forests of long ago over a time span that, although difficult to predict, will happen rapidly enough that we can observe changes within our lifetimes.





## **The Pilgrims Arrive on Cape Cod**

The Pilgrims were a small group of people who made a great impact on world history. Their story begins in England, sometime after King Henry VIII started the independent Church of England, also known as the Anglican or Episcopal Church. Most of the countries surrounding England did not agree with the King's decision. Many people in England did not agree either. Some wanted the Anglican Church to be more like the old Catholic church. Others wanted it to be even more simple and to rely more on Bible teachings than ceremony.

### **Puritans and Separatists**

Near the end of the 1500's, a number of groups began to form in England with renewed interest in trying to establish different church practices. One of these groups was called "Puritans" because they wanted to make the existing Anglican church more "pure" and simple. Others were called "Separatist" because they wanted to become completely separate from the official Church of England. The Pilgrims were "Separatists," and they were often punished severely for this. (One of their beliefs was that they should be allowed to select their own church leaders and ministers.)

As different Kings and Queens took over ruling England throughout this period they had different ideas about religious practices. When King James came along, the Pilgrims thought they might finally be able to ask for permission to set up their own church. But the King denied the request, and the Pilgrims decided to leave England and move to Holland, where freedom of religion was accepted.

After several years of living in Holland, the Pilgrims became restless and unhappy. Their children wanted to speak Dutch instead of English and they missed other things about English life as well. Their leaders, William Bradford, Reverend John Robinson and several others worked out a plan to move the entire Pilgrim church group to America. That way they could still be English. But it was too difficult and too expensive to move everyone at once.

### **History in the Making**

The trip was difficult to organize. In addition to the Pilgrims, it was necessary to include around fifty other English people to pay for the ship and supplies. (The original Pilgrim church members called themselves "Saints" and the others "Strangers.") Finally, after many setbacks, the *Mayflower* left for America on September 6, 1620. The trip across the ocean was rough and uncomfortable for the 101 passengers. But they sensed that what they were doing was an important piece of history.

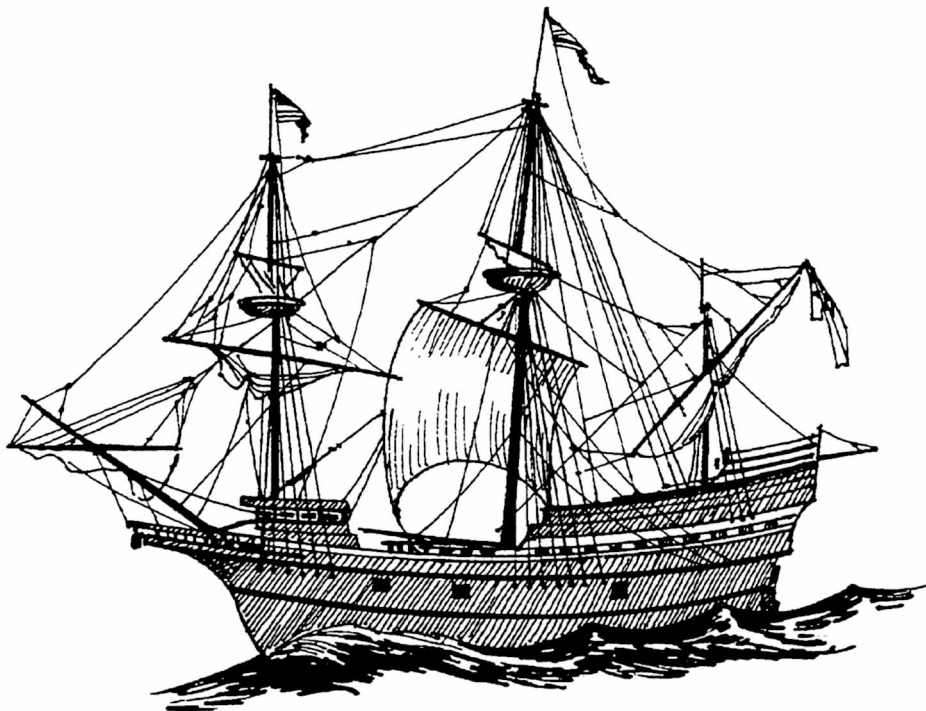
On November 11, 1620, the Pilgrims got their first look at the New World when they saw Cape Cod. The Pilgrim group had permission to settle in the northern part of

## *The Pilgrims Arrive on Cape Cod — continued*

Virginia (which in those days reached to present day New York). When the *Mayflower* turned south, however, it ran into rough, shallow waters and became in danger of tipping over and sinking. It was quickly decided to head back to the deeper, safer waters off the tip of Cape Cod. But now a decision had to be made. Was this where they should stay?

The next thing that happened was very important indeed. Since Cape Cod was outside the area they were supposed to settle in, the group agreed to write a “compact” or “self-governing” agreement. This agreement became known as the Mayflower Compact. It called for the election of a governor from amongst the members of their group (something they were already comfortable with from their church practices). This was the first act of self-government in the New World.

After signing the Mayflower Compact, the Pilgrims decided to look over Cape Cod as a place to settle. They sent out three separate “discovery” expeditions to see what the area had to offer. During these “discoveries” they found their first fresh water, took some Indian corn, and almost had a battle (called the First Encounter) with some Native Americans. Cape Cod had many good features, but after a month of searching, it was decided to finally settle in Plymouth.





## **The Mayflower Compact**

In the Name of God, Amen. We whose names are underwritten, the loyal subjects of our dread sovereign Lord, King James, by the grace of God, of Great Britain, France and Ireland, King, Defender of the faith, etc.

Having undertaken, for the glory of God, and advancement of the Christian Faith and honor of our King and Country, a voyage to plant the first colony in the northern parts of Virginia, do by these presents solemnly and mutually in the presence of God, and one of another, covenant and combine ourselves together into a civil body politic, for our better ordering and preservation and furtherance of the ends aforesaid: and by virtue hereof to enact, constitute and frame such just and equal laws, ordinances, acts, constitutions and offices, from time to time, as shall be thought most meet and convenient for the general good of the colony: unto which we promise all due submission and obedience.

In witness where we have hereunder subscribed our names at Cape Cod the 11th of November\*, in the year of the reign of our sovereign Lord, King James of England, France and Ireland the eighteenth, and of Scotland the fifty-fourth, Ano. Dom. 1620

|                    |                 |                 |                     |
|--------------------|-----------------|-----------------|---------------------|
| John Carver        | Richard Warren  | John Turner     | Edmon Margeson      |
| William Bradford   | John Howland    | Francis Eaton   | Peter Brown         |
| Edward Winslow     | Stephen Hopkins | James Chilton   | Richard Britteridge |
| William Brewster   | Edward Tilly    | John Crackston  | George Soule        |
| Isaac Allerton     | John Tilly      | John Billington | Richard Clarke      |
| Myles Standish     | Francis Cooke   | Moses Fletcher  | Richard Gardiner    |
| John Alden         | Thomas Rogers   | John Goodman    | John Allerton       |
| Samuel Fuller      | Thomas Tinker   | Degory Priest   | Thomas English      |
| Christopher Martin | John Rigdale    | Thomas Williams | Edward Doty         |
| William Mullins    | Edward Fuller   | Gilbert Winslow | Edward Leister      |
| William White      |                 |                 |                     |

\*Old Calendar



## **The Pilgrims in Truro and Provincetown**

### **“Land Ho!”**

The cry went up on the morning of November 9, 1620. The land was Cape Cod, and for the 100 passengers who for 65 days had shared cramped quarters on the *Mayflower*, the cry came like an end to a nightmare. Beaten about by storms, confined below deck, sickly, coughing, and dirty, the passengers crowded onto the deck and squinted over the water.

Yes, it was land, all right. Low, brown, weather-beaten, wild—but it was land. Of course, it was not where they were supposed to be. Their contract with the Virginia Company entitled them to land in the Hudson River area which was still several days away, but when they found how dangerous the waters were along the eastern shore of the Cape, they decided that, contract or not, they would settle nearby.

Back to the end of the Cape (off Provincetown) they sailed; but, before dropping anchor, the leaders drew up a compact for all male members to sign, committing them to cooperate in the new government which would be established.

Now they were free to go ashore, a few at a time. First, just to feel land underfoot, then to wash clothes that hadn't been washed since they'd left Europe, to cut wood so they could have a fire and a hot meal for a change, and to run—which is what the children did.

### **Three Discoveries and One Encounter**

The *Mayflower* stayed in the bay for a month while three separate parties searched the Cape for a place to settle. In single file, dressed in armor, carrying muskets, the men marched up the coast and through the woods and looked for a river, a good harbor, and a suitable area for planting crops.

What the explorers discovered first were five Native Americans, who ran away too fast to be questioned. Next, they found a spring of fresh water—their “first New England water” which tasted better, they said, than anything they'd drunk in their lives.

The following day, they found on the beach a large metal kettle (made in Europe) and a mound of dirt which seemed freshly-packed. With thirteen men standing around the mound, muskets ready, the other three men dug up what turned out to be a treasure—corn (placed there by the local natives for storage), several baskets, which held three to four bushels each. Since this was too much to carry back, they hung one basket on a pole for two men to carry between them. They filled the kettle with loose corn and stuffed what they could in their pockets and clothes. On their second trip, they came back for more (a total of ten bushels) and found also a bag of beans and a bottle of oil.

Corn Hill Beach in Truro is the site of the Pilgrim's find. (They later compensated the local natives for this act.) This Cape corn which the Pilgrims planted the following spring saved many Pilgrim lives.

## *The Pilgrims in Truro and Provincetown — continued*

Not everything turned out as well for the Pilgrims while they were on the Cape. The exploring party was lost once for a whole day; William Bradford fell into an Indian deer trap and had to be rescued. Fourteen-year-old Francis Billington, playing with a musket near an open barrel of gunpowder, pulled the trigger and set off sparks which might easily (but luckily did not) have blown up the *Mayflower*. There were days of grieving. Three passengers died here. But there was also a day of rejoicing when Peregrine White was born, the first white child to be born in New England.

The chief worry, however, was the worsening winter weather. And still no place had been found for a settlement. Although some argued for settling then and there on Corn Hill, it was finally agreed that one more discovery trip would be made. Robert Coppin, the *Mayflower* pilot who had been in the area the year before, said there was a good river and harbor across the bay.

So on December 6, nineteen men set out in their shallop, an open boat, for the third discovery. Because of the extreme cold, they followed the coastline and camped that night on the beach near the present site of Eastham. The next morning, they were surprised by a wild cry and arrows flying around them. At the edge of the woods stood a band of Native Americans. They didn't stay long. When they saw the Pilgrim men running toward them in their coats of mail, muskets firing, they ran away. What they said, according to the explorers, sounded like "Woach, woach, ha hoch, woach." The Pilgrims called this their first encounter and were thankful that no one was hurt.

After their encounter, the explorers continued on their way, and at the end of a stormy week, they returned to the *Mayflower* with the report that they had indeed found a good area for a settlement. On December 15th, the *Mayflower* left the Cape and sailed for the place that would soon be called Plymouth.



## **Beech Forest Trail Guide**

### **Birth of a Sandy Hook at the End of Cape Cod**

When glaciers retreated northward from this land some 150 centuries ago, they left a landscape far different from the world of beaches and sand dunes we see today.

At first, the sea was as much as four hundred feet below its present level, and the land that would become Cape Cod was distinguishable only as the high area of a great mound of earthen debris. Even the fishing shoals of Georges Bank, about one hundred miles to the east, were exposed by this lowered sea level. Cape Cod was thereby protected from the erosive power of easterly storms for a while. But meltwaters from the great glaciers poured into the oceans as warmer climates returned, and the sea slowly submerged the banks. Storms then assaulted the eastern shore of this highest land.

Water chewed into the soft debris, waves cut away the earth, and the debris was sorted by size in the surf and carried along the coast according to the direction of the waves. Bars of sand formed from these sediments, wherever irregularities existed in the coastline, and extended from several to tens of feet each year. A mile, perhaps two miles, of the eastern coastline of Cape Cod was removed by this erosion. And all the while, the rising sea flooded the coastline.

Although many Cape ponds were formed in depressions left by melting blocks of glacial ice, the dune ponds are different. In some instances, shallow ponds formed when sand was blown from low-lying areas. Other ponds lie in swales between small, former spits. All these areas became water-filled when the ground water was lifted by the saltwater beneath it.

So, the Province Lands "fist" is a relatively recent addition to Cape Cod. It began to form about 5,000 years ago. And, with the addition of sand, the great peninsula continues to slowly expand westward as glacial sediments are transported from the south. The sand and gravel of Truro's outer cliffs will nourish these famous beaches for a while, but inevitably, the nourishing landforms will be eroded away by the relentless action of the sea. The growth of the Province Lands will end and its erosion will begin.

### **From Beach to Beech**

No land is without life for long. And so it was with the Province Lands. Beach grass was one of the early colonizers of this land, then a forest of black oak, white oak and pitch pine gradually covered the stabilized dunes. By the time the Pilgrims landed, most of the land was forested.

With life comes soil. And soil moderates the extreme conditions to which life is exposed. So, what was once hot, arid, sterile sand became shaded, moist and nutrient-rich.



## ***Beech Forest Trail Guide — continued***

Plants flourished in the excellent black earth. They included plants present along the trail today: mayflower, spotted wintergreen, starflower, red maple and, of course, beech.

The beech forest, then, is the product of centuries of development. It represents the last stage in the sequence of changing plants on Cape Cod. Given the climate and the nature of the local “earth,” it is the ultimate cover of life. No other forms will replace it. Without such catastrophes as fire, it will perpetuate itself.

### **Life on the Pond**

Water is the essence of life. Where it is abundant, life is in profusion. Where it is scarce, plants and animals adapt to economize the limited supply, or fail to survive. This range of conditions is conspicuous by the dune’s ponds.

Uphill from water, only pines are growing well. Their roots extend deep and wide in the earth to obtain the little water that sand holds. But, close to the pond, there is a noticeable change. Other plants are able to reach this life-sustaining liquid and survive. They include tupelo, red maple, inkberry, swamp azalea and sheep laurel. Even if no water is visible, these plants are indicators of water-saturated earth within a few feet of the ground surface. The pond itself is an exposed portion of this same water table.

Within the dune’s ponds, life is in profusion. Nutrients are abundant and there are few stresses—other than space—that limit growth. Arrowhead, pickerel weed, golden club and floating heart grow with abandon.

But, even here, life is controlled by changes in the water level. The water level rises and falls from one to two feet each year, according to seasonal rainfall and evaporation, and at times, shallow portions of the ponds are exposed. Only yellow water lilies grow near the pond edge. These plants can survive periods of exposure. Conversely, white water lilies grow in deeper water; their roots cannot tolerate the high concentration of oxygen in the air.

Too much of something, then, can be as much of a limiting factor to growth as too little.

### **Settlement and Change**

Early Pilgrim writings describe Cape Cod as a forest of luxuriant woods, ... *juniper, birch, holly, vines, some ash, and walnut; wood for the most part open and without underwood* ... But the practice was to hold this land for the common use of everyone. This was its downfall, for its use became a matter of first come, first served. Those who exploited it reaped its benefits. Before long, the wealth of the forest found its way into all aspects of colonial life.

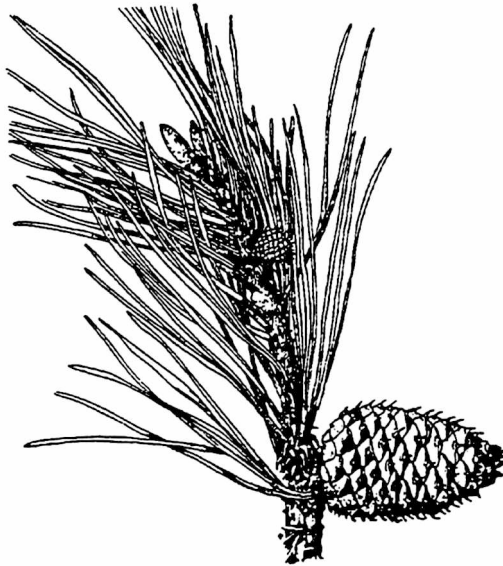
The Province Lands’ forests provided tar, turpentine and potash. Wood was used for homes, ship repairs and fuel. Land was cleared for farming and the raising of cattle and sheep that grazed without restriction. Inevitably, the forests dwindled as early settlers took more from the land than it could produce. With few controls upon its use, the cover of life was destroyed and the soil deteriorated. By 1800, most Outer Cape forests had vanished.

## *Beech Forest Trail Guide — continued*

Without tree cover, the land was unprotected. And, the fierce Province Lands winds began to tear away the soil. Sand movement was so pronounced by 1714 that Provincetown and its harbor were in danger of being obliterated. Houses were even built on pilings so the sand could pass beneath, unopposed.

In an effort to halt the abusive uses, colonial and federal laws were repeatedly enacted. Most were ignored. In desperation, beach grass was planted on 1,400 acres of sand in the early 1800's in an effort to save the town. Finally, in 1893, the Commonwealth of Massachusetts began a major program to plant woody trees and shrubs. The result of that project is the ring of green that now surrounds Provincetown.

Yet today, the sand dunes are still moving and portions of the beech forest are still being buried. So, the effort to stabilize the land goes on. With time—and care—more of the Province Lands may once again look like this rich island of green. And the diversity of life the Pilgrims found may return.





## **The Lifesavers of Cape Cod**

### **Between Storms and Shoals**

The lifesaver's motto was, *You have to go, but you don't have to come back*. Likewise, their work earned them the title, "Guardians of the Ocean Graveyard" while they were stationed on Cape Cod between 1872 and 1915.

The lonely form of Cape Cod stretches its fist-clenched forearm 25 miles into the ocean. Thoreau described it as ... *boxing with northeast storms ... and heaving up her Atlantic adversary from the lap of the earth*.

To the mariner, the Cape represents both a hazard and a haven, as all shipping between Boston and New York must either pass into its sheltered bay, or ground on its treacherous shoals. Combined with the forces of countless "nor'easters" and its precarious location, the Cape has been the site of more than 3,000 shipwrecks in 300 years of recorded history.

It is the shallow sand bars several hundred yards off the beach that present the greatest danger. Here is where storm driven ships ground, break into pieces under the pressure of tons of raging water, and spill their fragile contents and occupants into the bone chilling surf.

### **The Early Humanitarians**

From the onset, Native Americans and succeeding generations of Cape Codders offered aid to shipwreck victims. In 1785, the Massachusetts Humane Society initiated the world's first organized lifesaving service. Starting in Boston Harbor with shelters and food for shipwreck survivors, the Society eventually established outposts on Cape Cod in the early 1800's. Whereas their methods and equipment were well intended, the Humane Society members were unpaid volunteers and could not provide continuous or adequate services.

In 1845, Congress took the first step toward meeting the nationwide sea rescue problem by funding private organizations like the Humane Society. Finally, in 1872, the first federally constructed and staffed lifesaving stations emerged as part of the Department of Treasury. They became the U. S. Life Saving Service.

In the 1870's, nine stations were built on Cape Cod: Race Point, Highlands, Peaked Hill Bars, Pamet, Cahoon's Hollow, Nauset, Orleans, Chatham, and Monomoy Point.

### **Men, Equipment and Muscle**

Life at these stations was a mixture of danger, glory, excitement and boredom. Usually manned by a crew of six surfmen and a keeper (or captain), the rank and responsibility of each man was carefully structured.

Endless hours of patrol were critical, especially at night and during storms when wrecks were most likely to occur. They were sometimes monotonous, but during foul

## *The Life Savers of Cape Cod — continued*

weather the patrols were exhausting; surfmen often had to hold a wooden shingle in front of their faces to keep the sand out of their eyes as they patrolled. Patrols would meet at small halfway houses between stations and exchange metal tags, or punch time clocks to verify completion. In the summer months, the surfmen were released, leaving only the keeper on duty.

At the station, a strict schedule was followed, requiring different drills on specific days. However, when a wreck was sighted, the surfman on patrol would ignite a coston's flare to signal the stranded ship and alert the station crew. "Ship Ashore!" was the verbal alarm.

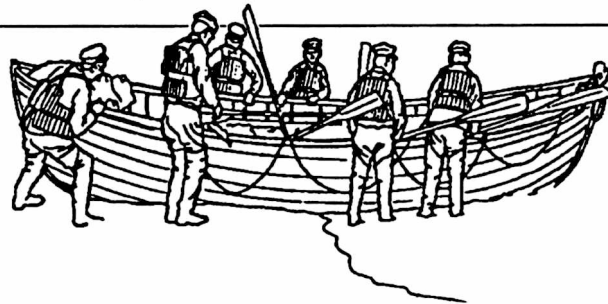
After laboriously carrying rescue equipment by hand or horsecart to the beach, the keeper would determine where and when to launch the specially designed surfboats. Given the names "Race Point" and "Monomoy" types, these buoyant, sturdy, and relatively lightweight boats carried five oarsmen and the keeper at the helm. Only five victims could be safely rescued at a time, thus often many perilous return trips had to be made. Whereas hundreds of victims were rescued in this manner, only on two tragic occasions did Cape Cod lifesaving crews lose their own lives.

### **The Breeches Buoy**

When weather and surf were too violent to launch the surf boat, the alternate method of rescue was the breeches buoy. The buoy consisted of a pair of canvas breeches fastened inside a life ring and suspended from a life line and pulley system between the stranded ship and shore. The Lyle gun (a small cannon) was used to shoot a lightweight line to the ship, which in turn was pulled on board by the ship's crew. Along with it came an instruction paddle, block and pulley, the heavier hawser line, and continuous whip lines. Simultaneously, the surfmen erected a twelve-foot wooden crotch to suspend the hawser line and breeches buoy above the surf and buried an anchor in the sand. In practice, the whole operation had to be done within five minutes. Only after all this was accomplished could one victim at a time be rescued as the breeches buoy was tediously pulled back and forth from shore. Time and effort made this less popular than using the surf boat.

### **End of an Era**

Eventually, there was change. During the early 20th century, sturdier self-propelled steel ships began replacing sail-powered wooden vessels. Likewise, telegraphy, radio, and improved weather forecasting dramatically reduced the number of shipwrecks on Cape Cod. However, it was the opening of the Cape Cod Canal in 1914 that reduced navigation dangers and ended the colorful era of the lifesavers on Cape Cod.





## **Saltmaking on Outer Cape Cod**

Saltmaking flourished on the Outer Cape in the early nineteenth century.

Salt was made on the Cape before the invention of "saltworks." The earliest method used was boiling down salt water in huge vats, a process that required huge amounts of firewood. This contributed to the destruction of forests.

A firewood-saving innovation in saltmaking aided the expansion of this industry. In 1776, John Sears of Dennis changed the saltmaking system by using solar evaporation of salt water in shallow vats. A form of solar evaporation had been used in Europe by the 18th century, but this was done in clay-lined beds unavailable on the Cape. Therefore, Sears used wooded structures in his process.

In 1793, Reuben Sears of Harwich, improved Sears' work when he built covers that could be opened on sunny days and closed in inclement weather. The process was again improved when Nathaniel Freeman of Harwich used small windmills to run pumps that brought water into the vats; "miniature windmills whirled above the low roofs of the saltwork sheds." Hattil Kelly refined the roof system when he developed a system to cover or uncover two vats at a time. Blocks, pumps, and rollers for saltworks were made by Joseph Young of Chatham after 1828, and the manufacture of saltmaking apparatus was mechanized in 1847. A set of drawings of Enoch Harding's saltworks in Chatham in 1830 was made for the Historic American Buildings Survey (HABS). Each vat is depicted as being nearly fifteen feet square.

Different salts were produced by this process. One of them, Glauber salt, was used in tanning to prevent hides from drying stiff, as well as for medicinal purposes. The final product, sodium chloride, was used principally for the preservation of fish. It was stored in bushel baskets if consumed locally, or put in barrels if shipped.

The favored locations for saltworks were shoreline coves, particularly on the bay side or near Nauset Harbor and Town Cove. In these places, seawater could be pumped by means of windmills into the evaporation vats.

Saltworks grew rapidly, and in 1802 there were 136 operations on the Cape which produced more than 40,000 bushels of salt and 182,000 bushels of Glauber or epsom salts each year. The War of 1812 caused a "fillip to prices," as in the Revolution, and more saltworks were established. *Every man living near the salt water had his patch of saltworks, if it took his last patch of cornfield or potato yard.* Considering that these literally were backyard operations, some of the reported data on salt production may not include small-scale saltworks that provided salt for consumption by local fishermen who wanted to preserve their catch. Consequently, official statistics are probably on the low side.

Besides employing mechanics who constructed the saltworks, making salt gave employment to elderly men and boys.



## **Windmills and Salt Vats**

### **Windmills for Energy**

Up and down the shores of Cape Cod, windmills were rigged with sails in the old days. The long arms of the mills turned and the sails billowed in the wind as if, given the notion, the Cape itself might take off to sea. It is not surprising that Cape Codders, who learned to be as much at home at sea as on land, should find a way to put sails to work when they were ashore.

Of course, as soon as the Outer Cape towns were settled in 1639 and the early 1640's, mills were needed. Cape farmers soon tired of the long three-and-a-half-day wagon trip to Plymouth to have their corn ground; so, they began building water mills along the streams of Sandwich, Barnstable, Yarmouth, and down the Cape. But, in 1683, Thomas Paine, a millwright, decided that, with streams being in short supply, he'd call on the wind for power. The first windmill he built was in Eastham, but hardly had he finished when the people of Eastham decided they wanted another. So up went a second windmill. Then nothing else would do. Barnstable must have one of Mr. Paine's windmills. Then Yarmouth. Then Truro.

Obviously, the way windmills were catching on, Thomas Paine couldn't supply the whole Cape, and he didn't need to. Thomas Baxter and his two sons of West Yarmouth went into the business. Their windmills were said to be the quietest on the Cape. During a strong wind, a windmill is a creaking, groaning, clickety-clacking affair. In any case, Cape people like to joke about the Baxters:

*The Baxter boys they built a mill;  
Sometimes it went; sometimes stood still;  
And when it went, it made no noise  
Because it was built by the Baxter boys.*

Not even a Baxter mill was easy to operate. In order to shorten or unfurl the sails (depending on the strength of the wind), a miller had to climb out on each of the four arms of the windmill, just as if he were climbing the mast of a ship. And before he went up, he had to remember to fasten the heavy iron chain that held the arms still. Seventy-year-old Henry Hall of Dennis forgot once and was halfway out on an arm when the wind caught the wheel and began turning it. If Mr. Hall had not been a sailor at one time and used to climbing in a wind, he might not have made it back to the shaft.

The only workable sail-rigged windmill on the Cape today is a gristmill built in Plymouth in 1783 and brought on a raft to Truro. A few years later (probably 1797), it was moved to its present site on Route 6 in Eastham, the home of Thomas Paine's first windmill.



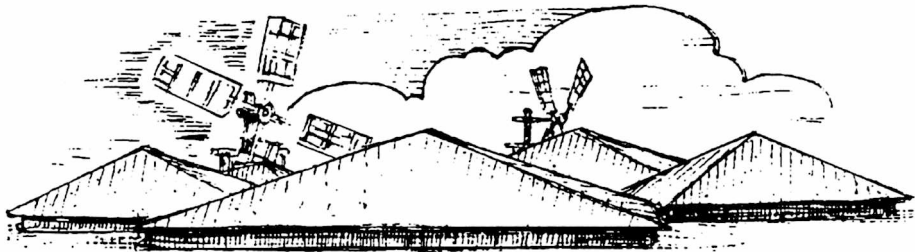
## *Windmills and Salt Vats — continued*

### **Getting Salt Out of the Sea**

As proud as every town was of its windmills, it was not until they were given a new job that they reached the height of their popularity. Windmills, it was discovered, could help get salt out of the sea. Of course, Cape Codders had always made salt which they needed not only to flavor their food but to preserve it. In the early days, they had simply boiled seawater in huge iron kettles. When the water had boiled away, they scooped up the salt that remained. But this slow work used up a great deal of firewood and produced only a little salt.

Then Captain John Sears of Dennis had an idea: instead of boiling the water away from the salt, why not let the sun evaporate it? He built long, shallow wooden vats which he filled with seawater and exposed to the sun. It did not work any better. The first year Captain Sears produced eight bushels of salt, but he almost wore himself and his family out with carrying buckets of water and emptying them into those vats. He tried hand pumps, but even this was hard. Ten years later (about 1786), Major Nathaniel Freeman of Harwich thought of windmills to pump the seawater up hill into man-made salt ponds or wooden reservoirs from which the water could be released into the vats as needed.

Cape Codders were in the salt business. More windmills went up. The shores were lined with rows of windmills, always far enough away from the road so they wouldn't frighten passing horses. Vats were improved to obtain the finest possible quality of salt. By the 1830's there were 442 saltworks on Cape Cod producing more than a million bushels of salt each year. Saltworks dotted the shoreline of Cape Cod Bay, especially in Truro and Provincetown. This prosperity, however, lasted only about ten years when salt mines opened in New York State, and the price of salt went down. Gradually, Cape Codders turned their vats and windmills to other uses.



## ***Section II***

### **Prominent Cape Cod Personalities and Natural Resources:**

*Prominent Cape Cod Personalities*

*Common Plants and Animals*

*Coastal Processes and Their Effects*

# **Prominent Cape Cod Personalities**



## **Samoset, Squanto and Massasoit**

### **Samoset**

On March 16, 1621, residents of Plymouth were startled by the sudden arrival of the first Native American to visit them. This was Samoset, a sagamore of a tribe living in Maine. He knew English fishermen in that area, and had learned the language. He shook hands with the Pilgrims, greeted them warmly, and gave them information about the tribes in the area. Samoset dined with the Pilgrims and spent the night at the home of Giles and Constance Hopkins' father, Stephen. He found his hosts friendly, but well supplied with cannons and muskets.

Subsequently, Samoset led several members of the nearby Wampanoag tribe into Plymouth for a visit, and most providentially, Squanto stayed with the Pilgrims for the rest of his life. Samoset's memory is preserved in an important east-west road in Eastham as well as in other towns in the former Plymouth Colony.

### **Squanto**

Squanto, also known as Tisquantum, from the Patuxet tribe which had occupied the general area around Plymouth until a few years before the Pilgrims' arrival, had made a strange odyssey. It is believed that he was kidnapped by a villainous English shipmaster who intended to sell him and about nineteen others into slavery in Spain. Squanto escaped and stowed away on an England-bound vessel and was taken in by a kindly London merchant. It is believed that he had learned English on a previous trip to that land. At his request, the merchant sent him to Newfoundland where he persuaded the master of a Maine-bound vessel to take him as an interpreter. Eventually, he reached the Plymouth area to discover that all his family and friends had been wiped out by a pestilence, thought to have occurred four years before the *Mayflower's* arrival.

Squanto chose to remain with the Pilgrims and made himself indispensable as interpreter, guide and teacher. He knew the coast from Penobscot Bay, Maine, to Point Judith, Rhode Island. He taught them when and where to fish, how to tread eels from the mud, where to find herbs in the forest. Best of all, he taught the Pilgrims how to plant and fertilize Indian corn or maize, an unknown crop to Englishmen, to whom "corn" meant a grain such as wheat.

### **Massasoit**

In this same month of March 1621, Squanto brought to Plymouth the Wampanoag sachem, Massasoit, his brother, Quadequina, and sixty Native Americans. After an exchange of friendly remarks, feasting and drinking, a peace treaty was concluded by Massasoit and Plymouth Governor, John Carver, in the presence of Edward Winslow, Myles Standish and other Pilgrim leaders. Samoset was also present.

## *Samoset, Squanto and Massasoit — continued*

The peace treaty with Massasoit, was of enormous importance to the Plymouth Colony in guaranteeing peace for over fifty years. For Massasoit and the Wampanoags, English support in the face of the powerful Narragansetts was essential.

A death threat against Squanto resulted in a strong stand by the Pilgrims to the Native Americans of Southern New England of the necessity for mutual respect. Squanto and Hobomok, a Wampanoag who also chose to live with the Pilgrims, went with a message to Massasoit. Corbitant, a Wampanoag sagamore, encountered them and decided to kill them. Myles Standish and fourteen Pilgrims scuffled with Corbitant and drove him off.

### **Trifles for Furs**

In the summer of 1621, leaders of the Plymouth Colony decided to make a diplomatic visit to “the Massachusetts,” a tribe inhabiting the Blue Hill area south of Boston. Squanto, Hobomok, Myles Standish and the new governor, William Bradford, traveled part way by shallop and landed at a section of present-day Quincy known ever since as “Squantum.” By offering glass beads and trifles in exchange for beaver furs, the Pilgrims started a beneficial trading relationship with “the Massachusetts,” and thus provided furs to their London financial backers. Fur shipments to England became the Pilgrims’ economic salvation, and the ins-and-outs of the fur trade were taught to the Pilgrims by Squanto. Furs were trapped and the pelts cured by the Native Americans, who valued them more for trade than to wear. They bartered them for English products such as, hardware, wool coats and blankets.

Squanto’s insights were important to the Pilgrims and would be missed later. Canonicus, a Narragansett sachem, threw down a fighting challenge to the Pilgrims by sending a messenger with an arrow bundle in rattlesnake skin. Squanto told Bradford its significance. Canonicus was silenced when the snakeskin was returned filled with powder.

During the Plymouth Colony’s second winter, 1621-22, Squanto inexplicably started a rumor that Massasoit was about to attack. Possibly, he went beyond his genuine capabilities in order to increase his importance. Massasoit demanded Bradford give up Squanto for beheading. William Bradford’s dilemma—Squanto was invaluable to the Colony, but Massasoit’s good will was essential. Fortunately for Bradford, and especially for Squanto, Massasoit cooled off and changed his mind.

The corn harvest was short in Plymouth during the second autumn, 1622, so Governor Bradford set out in the ship, *Swan*, piloted by Squanto, to barter on Cape Cod. At Pleasant Bay, Squanto reassured the Monomoyick Indians and persuaded them to offer corn and beans to Bradford in trade. A fatal illness overcame Squanto at Pleasant Bay, and *desiring the Governor to pray for him that he might go to the Englishmen’s God in Heaven*, he was probably buried on a hill just west of Ryder’s Cove and Route 28 in Chatham, where an Indian burial ground has long existed.

Governor Bradford said Squanto had stayed with the Pilgrims *because he was a special instrument of God for their good beyond their expectation.*



## **The Penniman Family**

Scammell Penniman was the first member of the Penniman family to purchase property in Eastham in 1829. He was a sixth-generation descendant of James Penniman, who came to America in 1631. His early training was as a carpenter, and he later became a merchant dealing with dry goods and real estate.

Upon his death in 1836, the Eastham property passed to Scammell's second wife, Hannah. In June 1838, Hannah transferred the property to Scammell's children—Fanny, Daniel, and Maria. The two sisters never married. Records indicate that Fanny and Maria never lived in Eastham, even though they owned property there. Daniel appears to have been living in Eastham from at least as early as 1829. He continued to live there until he sold his property to his son in 1867. The 1860 agricultural census lists Daniel Penniman as owning eight acres of land in Eastham, Massachusetts, as well as one horse, two milk cows, and two pigs. He raised rye, corn, and potatoes.

### **Whaling Captain**

Captain Edward Penniman, who purchased the property from his father, was responsible for the construction of the existing structures on the site, and is the renowned member of the Penniman family with whom the site is associated. He was born in Eastham on August 16, 1831. At age eleven, he began his career at sea as a cook on a schooner bound for the Grand Banks. This expedition ended in a wreck in which only the crew and cargo were saved. Possibly tempered by this experience, he spent his adolescent years fishing in the Eastham area. In 1852, at 21 years old, he went to New Bedford, and embarked on his first whaling expedition to the Pacific aboard the *Isabella*. This expedition began Edward Penniman's long and highly successful career as a whaling captain. He made seven whaling voyages, several of which were around the world.

A tally of the whale oil and bone acquired by Captain Penniman on his voyages, listed in the History of Barnstable County, Massachusetts, reveals how successful these expeditions were:

*On various voyages, he [Captain Penniman] took 4,237 bbls. of sperm oil, 12,096 bbls. of whale oil and 166,871 pounds of whale bone.*

Captain Penniman's whaling voyages were also adventuresome. On his fourth voyage, as captain of the *Minerva*, he narrowly escaped capture by the *Shenandoah*, a privateer ship attempting to burn whaling vessels. Other adventures are recorded by his daughter in her "Remarks," written in 1943. Between whaling voyages, Captain Penniman would return to Eastham, and it was here that he retired at the end of his whaling career in 1884. He occupied his time with small-scale farming. He owned a house and barn, a cow, a horse, and a flock of chickens. He had a large vegetable garden and a greenhouse where he raised chrysanthemums. Penniman also was active in community affairs, most notably the Eastham Universalist Church. His obituary reads:

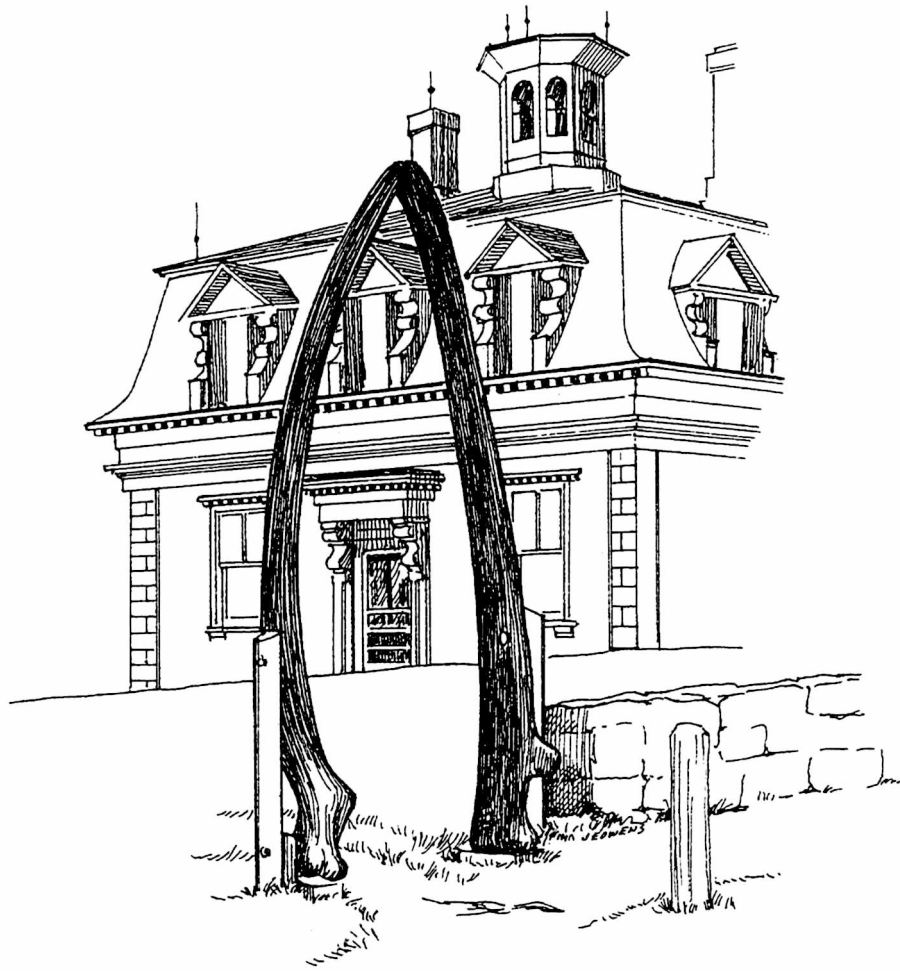


## *The Penniman Family — continued*

*He was the stalwart pillar of the Eastham Universalist Church, and to that his loss will be a staggering blow...*

Captain Penniman died at his home on October 16, 1913. Ownership of the Fort Hill property passed to his wife, Betsey Augusta Knowles Penniman. She was a remarkable woman. She accompanied Captain Penniman on three of his seven whaling voyages, each time taking one of the children along. She was an active participant in the expeditions, as demonstrated on her second voyage when Captain Penniman and most of the crew were ashore and the ship was blown out to sea by a gale. Under her direction, the ship weathered the storm at sea and returned, two days later.

Upon Betsey Augusta Knowles Penniman's death, ownership of the Eastham property passed to her daughter, Betsey Augusta Penniman. Betsey had never married and was living in the house at the time of her mother's death. Both of her brothers, Eugene and Edward, had moved to Dorchester, where they started a hardware business. She died in 1957, passing the house to her niece, Irma Penniman Broun Kahn. Irma and her first husband, Maurice Broun, sold the house to the National Park Service in 1963.





## **Eugene O'Neill**

Eugene O'Neill, recipient of four Pulitzer Prizes and the Nobel Prize for Literature, has the reputation of being America's greatest playwright. He revolutionized the style of drama written and produced in this country. He wrote 45 plays—all tragedies—dealing with what he called the "sickness of today." O'Neill felt that science was the culprit in robbing people of faith and leaving them with no faith to satisfy desire for meaning in life and to comfort their fear of death.

O'Neill was born in 1888 in a New York hotel to James O'Neill and Ellen Quinlan O'Neill. His father came to this country from Ireland in 1856. He was a talented actor and performed Shakespearean roles, but he achieved permanent fame in Dumas's *The Count of Monte Christo*. He was so successful in the role that he was typecast and continued to perform in this play for 25 years.

James was difficult to live with. He bullied his family, was a trickster and a miser. His wife, from a prosperous Cleveland family of Irish extraction, early on began storing up resentments over a shifty life with her actor husband. At some point, suffering from pains, she received a morphine prescription, and soon became addicted, retreating into a dream world, playing on the emotions of her husband and sons.

Eugene had a brother, Jamie, ten years his senior, who was a corrupting influence on him. Lonely and depressed, Jamie was an alcoholic by age twenty.

### **Road of Tragedies**

The only sense of "roots" young Eugene ever had was Monte Christo Cottage in New London, Connecticut, which his parents built in the 1880's and used as a summer home for many years.

Much of the time, young Eugene traveled on the road with his parents and nanny. He had no friends. Shy like his mother, he was troubled, brooded, and buried himself in books. He was sent to a Catholic boarding school in New York, away from theatrical touring and the sight of his mother's drug habit. Subsequently he lived with Ellen in New York. He went through a brief period of intense religious feelings. His secondary schooling was at Betts Academy in Stamford, Connecticut. Princeton followed for a short time in 1906, but Eugene rebelled against the social life of clubs, was bored, ultimately suspended, and flunked out.

In 1909, O'Neill married Kathleen Jenkins, who bore him a son, Eugene, Jr., in 1910. It was the first of three marriages. He had no real interest in wife or baby, and soon deserted them. Within the next few years, he roamed from gold prospecting in Honduras to sailor on a square rigger. He came down with tuberculosis, drank heavily, and attempted suicide.

## *Eugene O'Neill — continued*

### **The Provincetown Players**

Eugene's forays into New York City brought him into contact with Greenwich Village writers and playwrights, some of whom summered in Provincetown, calling themselves the Provincetown Players. A member of this avant-garde set, Mary Heaton Vorse, a writer on socialist subjects, acquired the Lewis Wharf in Provincetown. This became the Wharf Theater.

In 1916, Eugene, summering in the wreck of a ship in Truro, offered the Players for presentation in their humble Provincetown surroundings a one-act play, *Bound East for Cardiff*. It was a sensation, a momentous occasion for American drama and for O'Neill's standing as a playwright.

Modern American drama was born with the Provincetown Players, and O'Neill's genius paralleled the success of this group. The Wharf Theater, which burned down, projected out from shore opposite the end of Gosnold Street in Provincetown.

In 1918, O'Neill married Agnes Boulton, and shortly thereafter began spending summers at the former Coast Guard Station at Peaked Hill Bars in Provincetown. This place was given to Eugene and Agnes by his father.

Eugene did his writing here on a desk built by his friends, the Coast Guardsmen. He loved returning to Peaked Hill Bars each year. *It's wonderful—same old sea and all*, he said. Eugene swam, kayaked, chatted with Portuguese fishermen and Coast Guardsmen. In 1931, the old Coast Guard Station was swept away in a storm.

O'Neill was restless. During a period of approximately 35 years, he lived seasonally in Provincetown; Ridgefield, CT; a chateau in France; Sea Island, GA; Danville, CA; Marblehead, MA; and Boston. Tao House in Danville, where he lived with his third wife, Carlotta Monterey, is now the Eugene O'Neill National Historic Site.

At Peaked Hill Bars, O'Neill wrote *Beyond the Horizon*, *The Emperor Jones*, *Anna Christie*, *The Hairy Ape*, and *Marco Millions*. By the 1930's most of his plays had been written, including the aforementioned, plus *Desire Under the Elms*, *Strange Interlude*, *Mourning Becomes Electra*, *Ah, Wilderness*, and *The Iceman Cometh*. These were followed by *A Moon for the Misbegotten*, about brother Jamie.

Eugene O'Neill suffered from Parkinson's Disease starting in 1944, resulting in a loss of ability to create. He died in 1953 in a hotel in Boston. Three years later, his most autobiographical play about his parents and brother, *Long Day's Journey Into Night*, was produced.

A knowledge of O'Neill's family is fundamental to the understanding of his plays. He portrayed his family in his plays to allay old ghosts.

# **Common Plants & Animals**



## Endangered Species

What does it mean to be endangered? By definition, it means to be in danger of extinction. As biologist Michael Soule said, *The end of life is one thing, the end of birth is something else.* Extinction is an essential, and natural, part of the adaptation and evolution of life and its environment. Based on information gained from the fossil record, it is estimated that 99.9 percent of all species that have existed on Earth are extinct.

A threatened species is in danger of becoming endangered.

Scientists have identified 1.4 million different species. As we explore the tropical rainforests and our backyards, this number may reach as high as twenty to thirty million! Due to habitat loss, however, we are losing at least one species a day, many before we have had a chance to learn how they interact with the rest of the world. The effect of species extinction is difficult to assess. The loss of one species of plant will have a direct effect on at least thirty additional species. Most people know the importance of plants in oxygen production, but what of the northeastern beach tiger beetle? Though a beetle may seem insignificant to us personally, its role in the food web cannot be overlooked.

Chief Seattle, in 1852, reportedly said, *...All things are connected like the blood which unites us all. Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself.* We are now trying to figure out what we have done and what we can do. Since extinction is a natural process, what do we save? Right now, extinction rates are rapidly increasing due to human competition for resources. Taking the role of "Stewards of the Earth," the Endangered Species Act set up guidelines for the protection of species in danger of extinction. As studies are completed by scientists, recovery plans are outlined for each listed species. These include such ideas as captive breeding programs, reintroduction of populations into historic sites, and the securing of critical habitat which may help the species survive. Since the establishment of the Act, 428 species have been listed, with another 4,000 identified as candidates. Of those listed, 257 have approved recovery plans. Within the Seashore, the Piping Plover recovery plan has been implemented, and a plan for the NE beach tiger beetle is being developed.

Currently, within the Cape Cod National Seashore, thirteen vertebrates and one invertebrate subspecies are identified as endangered or threatened. They include:

### Birds

|    |                  |                                     |
|----|------------------|-------------------------------------|
| FE | Peregrine Falcon | ( <i>Falco peregrinus</i> )         |
| FE | Bald Eagle       | ( <i>Haliaeetus leucocephalus</i> ) |
| FE | Roseate Tern     | ( <i>Sterna dougallii</i> )         |
| FE | Eskimo Curlew    | ( <i>Numenius borealis</i> )        |
| FT | Piping Plover    | ( <i>Charadrius melodus</i> )       |

## *Endangered Species — continued*

### **Mammals**

|    |                |                                   |
|----|----------------|-----------------------------------|
| FE | Right Whale    | ( <i>Balaena glacialis</i> )      |
| FE | Sei Whale      | ( <i>Balaenoptera borealis</i> )  |
| FE | Finback whale  | ( <i>Balaenoptera physalis</i> )  |
| FE | Humpback Whale | ( <i>Megaptera novaeangliae</i> ) |

### **Reptiles**

|    |                      |                                   |
|----|----------------------|-----------------------------------|
| FE | Atlantic Hawksbill   | ( <i>Eretmochelys imbricata</i> ) |
| FE | Atlantic Ridley      | ( <i>Lepidochelys kempi</i> )     |
| FE | Atlantic Leatherback | ( <i>Dermochelys coriacea</i> )   |

### **Insects**

|    |                       |                               |
|----|-----------------------|-------------------------------|
| FT | NE Beach Tiger Beetle | ( <i>Cicindela dorsalis</i> ) |
|----|-----------------------|-------------------------------|

FE-Federal Endangered species

FT-Federal Threatened species

Some states have enacted their own Endangered Species Legislation to help protect existing populations of species that occur within their boundaries. Within the Seashore, there are an additional fourteen threatened and endangered vertebrates, two invertebrates, and twelve plant species that are recognized by Massachusetts.

## **VERTEBRATES**

### **Birds**

|    |                       |                                  |
|----|-----------------------|----------------------------------|
| SE | Northern Harrier      | ( <i>Circus cyaneus</i> )        |
| SE | Henslow's Sparrow     | ( <i>Ammodramus henslowii</i> )  |
| SE | Golden-winged Warbler | ( <i>Vermivora chrysoptera</i> ) |
| SE | Leach's Storm Petrel  | ( <i>Oceanodroma leucorhoa</i> ) |
| SE | Loggerhead Shrike     | ( <i>Lanius ludovicianus</i> )   |
| SE | Upland Sandpiper      | ( <i>Bartramia longicauda</i> )  |
| SE | Sedge Wren            | ( <i>Cistothorus platensis</i> ) |
| SE | Short-eared Owl       | ( <i>Asio flammeus</i> )         |
| ST | Least Bittern         | ( <i>Ixobrychus exilis</i> )     |
| ST | Northern Parula       | ( <i>Parula americana</i> )      |
| ST | Pied-billed Grebe     | ( <i>Podilymbus podiceps</i> )   |
| ST | King Rail             | ( <i>Rallus elegans</i> )        |



## ***Endangered Species — continued***

### **Reptiles**

ST            Diamondbacked Terrapin    (*Malaclemys terrapin*)

### **Amphibians**

ST            Spade Foot Toad                    (*Scaphiopus holbrookii*)

## **INVERTEBRATES**

### **Insects**

ST            Barren bluet Damselfly    (*Enallagma recurvatum*)

ST            Decodon stem borer Moth   (*Papaipema sulphurata*)

## **PLANTS**

SE            Oysterleaf                            (*Mertensia maritima*)

SE            Walter's Sedge                    (*Carex striata*)

SE            Ovate Spike-rush                (*Eleocharis obtusa* v. *obtusa*)

SE            Sea Lyme-grass                  (*Elymus mollis*)

SE            Northern Alkali-grass        (*Puccinellia langeana* v. *alaskana*)

SE            Weak Rush                         (*Juncus debilis*)

SE            Fibrous Bladderwort        (*Utricularia fibrosa*)

ST            Golden Club                        (*Orontium aquaticum*)

ST            Few-flowered Sedge        (*Carex oligosperma*)

ST            Purple Needlegrass        (*Aristida purpurascens*)

ST            Swamp Oats                        (*Sphenopholis pensylvanica*)

ST            Adder's-tongue fern        (*Ophioglossum vulgatum* v. *pseudopodium*)

SE-Listed by the Commonwealth of Massachusetts  
as endangered species within the state

ST-State Threatened



## Common Trailside Plants of Cape Cod National Seashore

The following list includes identification numbers posted along nature trails within the National Seashore:

### Impoverished Sandy Soil, Dunes Heathlands

Plant Code No.



- |    |                      |                                                  |
|----|----------------------|--------------------------------------------------|
| 1  | American Beach Grass | ( <i>Ammophila breviligulata</i> )               |
| 2  | Dusty Miller         | ( <i>Artemisia stellariana</i> )                 |
| 3  | Broom Crowberry      | ( <i>Corema conradii</i> )                       |
| 4  | Golden Heather       | ( <i>Hudsonia ericoides</i> )                    |
| 5  | Poverty Grass        | ( <i>Hudsonia tomentosa</i> )                    |
| 6  | Seaside Goldenrod    | ( <i>Solidago sempervirens</i> )                 |
| 7  | Sweet Fern           | ( <i>Comptonia pergrina</i> )                    |
| 8  | Beach Pea            | ( <i>Lathyrus japonicus</i> var. <i>glaber</i> ) |
| 9  | Lichen               | ( <i>Cladonia</i> spp.)                          |
| 10 | Bear Oak             | ( <i>Quercus ilicifolia</i> )                    |

### Upland Forests, Dry and Open Woods

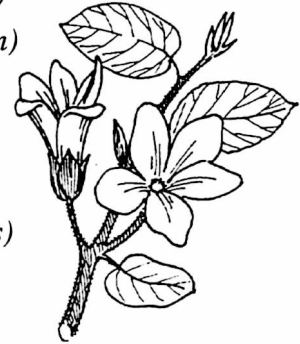
- |    |                     |                                    |
|----|---------------------|------------------------------------|
| 11 | Pitch Pine          | ( <i>Pinus rigida</i> )            |
| 12 | White Oak           | ( <i>Quercus alba</i> )            |
| 13 | Black Oak           | ( <i>Quercus velutina</i> )        |
| 14 | Black Cherry        | ( <i>Prunus serotina</i> )         |
| 15 | Sassafras           | ( <i>Sassafras albidum</i> )       |
| 16 | Black Huckleberry   | ( <i>Gaylussacia baccata</i> )     |
| 17 | Bearberry           | ( <i>Arctostaphylos uva-ursi</i> ) |
| 18 | Checkerberry        | ( <i>Gaultheria procumbens</i> )   |
| 19 | Starflower          | ( <i>Trientalis borealis</i> )     |
| 20 | Spotted Wintergreen | ( <i>Chimaphila maculata</i> )     |



## Common Trailside Plants — continued

### Moist Lowland Woods, Developed Forests

|    |                    |                                    |
|----|--------------------|------------------------------------|
| 21 | American Beech     | ( <i>Fagus grandifolia</i> )       |
| 22 | Tupelo             | ( <i>Nyssa sylvatica</i> )         |
| 23 | Wild Sarsaparilla  | ( <i>Aralia nudicaulis</i> )       |
| 24 | Highbush Blueberry | ( <i>Vaccinium corymbosum</i> )    |
| 25 | Lowbush Blueberry  | ( <i>Vaccinium angustifolium</i> ) |
| 26 | Sweet Pepperbush   | ( <i>Clethra alnifolia</i> )       |
| 27 | Mayflower          | ( <i>Epigaea repens</i> )          |
| 28 | Winterberry        | ( <i>Ilex verticillata</i> )       |
| 29 | Shadbush           | ( <i>Amelanchier canadensis</i> )  |
| 30 | Southern Arrowwood | ( <i>Viburnum dentatum</i> )       |
| 31 | Inkberry           | ( <i>Ilex glabra</i> )             |
| 32 | Sheep Laurel       | ( <i>Kalmia angustifolia</i> )     |
| 33 | Swamp Azalea       | ( <i>Rhododendron viscosum</i> )   |



### Freshwater Ponds, Streams

|    |                   |                               |
|----|-------------------|-------------------------------|
| 34 | Slender Arrowhead | ( <i>Sagittaria teres</i> )   |
| 35 | Golden Club       | ( <i>Orontium aquaticum</i> ) |
| 36 | Pickeralweed      | ( <i>Pontederia cordata</i> ) |
| 37 | White Water Lily  | ( <i>Nymphaea odorata</i> )   |
| 38 | Meadowsweet       | ( <i>Spiraea latifolia</i> )  |

### Freshwater Swamps, Receding Ponds, Shallow Bogs

|    |                      |                                      |
|----|----------------------|--------------------------------------|
| 39 | Atlantic White Cedar | ( <i>Chamaecyparis thyoides</i> )    |
| 40 | Red Maple            | ( <i>Acer rubrum</i> )               |
| 41 | Buttonbush           | ( <i>Cephalanthus occidentalis</i> ) |
| 42 | American Cranberry   | ( <i>Vaccinium macrocarpon</i> )     |



## *Common Trailside Plants — continued*

### **Back Dunes, Transitional Fields**

|    |                   |                                 |
|----|-------------------|---------------------------------|
| 43 | Beach Plum        | ( <i>Prunus maritima</i> )      |
| 44 | Salt Spray Rose   | ( <i>Rosa rugosa</i> )          |
| 45 | Virginia Rose     | ( <i>Rosa virginiana</i> )      |
| 46 | Common Blackberry | ( <i>Rubus alleghiniensis</i> ) |
| 47 | Poison Ivy        | ( <i>Rhus radicans</i> )        |
| 48 | Bullbriar         | ( <i>Smilax rotundifolia</i> )  |
| 49 | Bayberry          | ( <i>Myrica pennsylvanica</i> ) |

### **Open Fields, Forest Margins**

|    |                   |                                        |
|----|-------------------|----------------------------------------|
| 50 | Eastern Red Cedar | ( <i>Juniperus virginiana</i> )        |
| 51 | Virginia Creeper  | ( <i>Parthenocissus quinquefolia</i> ) |
| 52 | Honeysuckle       | ( <i>Lonicera japonica</i> )           |
| 53 | Wild Asparagus    | ( <i>Asparagus officinalis</i> )       |
| 54 | Fox Grape         | ( <i>Vitis labrusca</i> )              |
| 55 | Bouncing Bet      | ( <i>Saponaria officinalis</i> )       |



### **Altered, Previously Cultivated Habitats**

|    |                 |                                 |
|----|-----------------|---------------------------------|
| 56 | Domestic Apple  | ( <i>Pyrus malus</i> )          |
| 57 | Black Locust    | ( <i>Robinia pseudoacacia</i> ) |
| 58 | Tree of Heaven  | ( <i>Ailanthus altissima</i> )  |
| 59 | Multiflora Rose | ( <i>Rosa multiflora</i> )      |

### **Saltwater Marshes**

|    |                      |                                  |
|----|----------------------|----------------------------------|
| 60 | Salt Marsh Cordgrass | ( <i>Spartina alterniflora</i> ) |
| 61 | Salt Meadow Grass    | ( <i>Spartina patens</i> )       |
| 62 | Seaside Lavender     | ( <i>Limonium carolinianum</i> ) |
| 63 | Glasswort            | ( <i>Salicornia spp.</i> )       |
| 64 | Sea Rocket           | ( <i>Cakile edentula</i> )       |
| 65 | Eelgrass             | ( <i>Zostera marina</i> )        |
| 66 | Knotted Wrack        | ( <i>Ascophyllum nosodum</i> )   |
| 67 | Rockweed             | ( <i>Fucus vesiculosus</i> )     |



## **Common Cape Cod Trees**

The forested areas of Outer Cape Cod combine a mixture of changing and relatively stable scenes. Oak, cedar, and locust trees commonly line the roadways of the Eastham area, while pitch pines dominate the horizon in South Wellfleet. Maples, mixed with other hardwoods, offer picturesque interruptions of reds and yellows in the fall along river drainages in the Truro area. Stunted pitch pines again claim the scene in the Highlands area, while the Beech Forest area along Race Point Road provides yet an additional community not previously encountered. In time, these scenes will change further.

The forest of Outer Cape Cod today is different from what it once was. When European explorers viewed Cape Cod prior to the arrival of the Pilgrims, they noted great expanses of wooded land, which in spots, stretched to the very “brink of the sea.” This forest consisted of oak, pine, juniper and sassafras, with prominent assemblies of beech and other hardwoods.

When the Pilgrims took up permanent residence on Outer Cape Cod in the 1640’s, they cleared the forests for fields, and to harvest timber. Their efficiency proved detrimental, as the landscape failed to recover from deforestation, and plunged into a hundred years of barren, impoverished plains. When Thoreau visited the Outer Cape in the 1850’s, he remarked that there was often not even a single tree to break the horizon for as far as the eye could see.

The recovery of the Outer Cape’s forest began with the planting of trees in the mid 1800’s to stabilize shifting sand and old farmland. After World War II and the Cape’s shift to a residential and tourist-based economy, the Outer Cape’s forest reemerged in earnest, but with a mixture of species that will be in transition for years to come. In time, the abundance of red cedars, which thrive in abandoned fields, will give way to oaks and other hardwoods.

Following is a description of some of the more common trees that are readily visible on the Outer Cape:

### **Pitch Pine**

Pitch Pine is an abundant evergreen which thrives in the poor but well drained glacial soils of Cape Cod. Existing here for several thousand years in varying densities, Pitch Pine’s success can be partially attributed to its resiliency. It is capable of surviving the cold of northern latitudes and the warmth of postglacial summers.

In colonial days, Pitch Pine was used, as its name implies, as a source for rendering pitch into turpentine spirits or other resinous products. Because of its frequently gnarled posture and sappy wood, it was used only sparingly for lumber. Pitch Pine was especially popular as a fuel for boiling seawater into salt before the advent of solar evaporation “salt works” on the Cape in the late 18th Century.

## ***Common Cape Cod Trees — continued***

Exposure of pines to the effects of salt spray can retard needle growth and cause discoloration. Severe insect infestations (i.e., pine tip borer) adversely affect pine trees and can cause noticeable changes in their appearance, even eventual death. This is a natural cyclic condition.

### **Bear Oak, Scrub Oak**

Bear Oak, or Scrub Oak, is a member of the Black Oak group. This stunted, shrubby tree can survive in the harsh, windblown, back-dune environment of the Outer Cape, and in upland areas with poorer soils. Because of its small size and often twisted and gnarled posture, Bear Oaks were not sought after by early Cape Codders for lumber.

### **White Oak**

After being almost entirely eliminated from the Outer Cape between the 1700's and the mid 1800's, oaks have made a strong comeback. In colonial days the wood from this straight, smooth-grained hardwood was harvested for making furniture, flooring, tools, boats, posts and beams for houses, and many other items.

### **Black Oak**

Black Oaks were utilized in much the same way as White Oaks. Early settlers used them for constructing post and beam houses, furniture, boats, and other items.

### **Black Cherry**

Black Cherry trees are found in wooded areas in association with more dominant species, as well as within transitional areas, such as alongside trails in heavily forested areas. Black Cherry is distinguished by its narrow two- to six-inch long leaf, which is 1 to 1½ inches wide and trimmed with fine teeth along its margins. These trees can grow to heights of fifty feet or more. Outside of protected areas, Black Cherry is still an important commercial species.

### **American Beech**

This attractive tree was once abundant and occasionally dominant in certain areas during pre-colonial days, but due to deforestation and other human activities, its frequency declined. On Cape Cod, the smooth gray-barked American Beech can now be found only in limited numbers. One location where pockets of this species still survive in quantity is within the moist, well developed hollows (between dunes) of the Province Lands. Another prevalent location on the Outer Cape is in Wellfleet, along the upper portions of the Herring River.

### **Atlantic White Cedar**

Atlantic White Cedar inhabits several swampy kettle holes on the Cape. This formerly abundant evergreen migrated north, after the Ice Age gave way to warmer temperatures. Several thousand years ago, when the climate of Cape Cod was as warm as that of



## ***Common Cape Cod Trees — continued***

present day Virginia, Atlantic White Cedar thrived. But as the climate cooled, this tree's range receded southward. Today, Cape Cod is within the northern portion of its range (Maine is the northern limit).

Atlantic White Cedar has long been used by humans. Native Americans reputedly used hollowed out White Cedars as ocean-going canoes. Colonists took advantage of the White Cedar's resistance to weathering and decay, and its ease in splitting to make shingles used extensively for roofs and sidings on Cape Cod houses. In the 19th century, White Cedar gained nationwide popularity in the pencil industry. At home, Cape Codders used White Cedar in constructing solar evaporation salt works—especially for making wooden pipes that were used to carry sea water to and from the various vats.

### **Red Maple**

Red Maples often compete for habitat with Atlantic White Cedars, occasionally fringing the deeper water in which the cedars thrive. Maples wait for debris and sediment to reduce the water level so that their seedlings may invade. They also colonize abandoned cranberry bogs. In colonial times maples were sought for their fine-grained, hard, durable wood, which was especially well suited for furniture making. During the fall, Red Maples make their presence known along the low-lying drainages of the Outer Cape, such as the Pamet River Valley, and amid various kettle depressions in Eastham and Wellfleet, with brilliant displays of colorful foliage.

### **Eastern Red Cedar**

These common sun-loving trees are known for their rapid invasion of old fields. Red Cedars often inhabit areas where some form of past human activity has occurred, such as farming, mowing, or raising livestock. Birds help to spread the Red Cedar's seeds, which pass undamaged through their digestive tracts. The Eastern Red Cedar is actually a juniper and only a distant relative to the true Cedars. However, its wood has qualities and properties similar to that of other types of "cedars" and has been used since early colonial days for making shingles and other such products. The richly aromatic foliage, berries (cones), wood and often conical "Christmas Tree" shape are distinctive features of this prominent evergreen.

### **Black Locust**

The Black Locust, a native of more southern regions of the United States, was introduced to Cape Cod to help restore worn out soil, to provide ground cover and to develop windbreaks. Black Locust is a legume, and like all others in the pea family, has a nitrogen-fixing bacteria associated with its root nodules which aids in enriching poor soils. This feature, plus the fact that locust wood makes excellent fence rails and can be burned green as firewood, made it an attractive tree for replanting the barren landscape of the Outer Cape in the early part of this century.



## **Birding**

Cape Cod is a nationally recognized destination for migratory birds. The National Seashore's bird inventory lists 368 species that have been sighted within the Seashore, many of them on an annual basis. Spring migration can run hot or cold, depending on the weather patterns for that given year, but fall is the time when the greatest variety and numbers of birds can be found beginning with the adult shorebirds that arrive on the first of July and continuing through the fall with juvenile shorebirds in August, warblers in September, and hawks and waterfowl in October and November. Hurricanes and northeast storms may also occasionally blow huge numbers of seabirds into Cape Cod Bay, where the visitor lucky enough to be on the bayside beaches during the nastiest of weather may see thousands of jaegers, phalaropes or alcids.

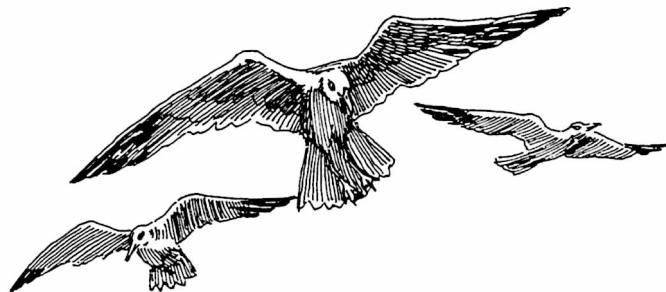
Nesting birds in the summer include least sandpiper, common, roseate and Arctic terns, and a variety of upland birds in the pitch pine woodlands. There is an active management program for the piping plover. Whale watches out of Provincetown frequently encounter pelagic birds such as storm-petrels, shearwaters and gannets in addition to humpback and finback whales.

Both the Cape Cod and Stellwagen Bank Christmas Bird Counts include portions of the Seashore, and a breeding bird survey is conducted annually in cooperation with the U.S. Fish & Wildlife Service.

A checklist of Cape Cod birds is published by the Cape Cod Bird Club and is available for sale at Park Visitor Centers and area bookstores.

Both the Salt Pond Visitor Center in Eastham and Province Lands Visitor Center in Provincetown have some displays on Cape Cod birds. Additional exhibits may be seen at the Cape Cod Museum of Natural History in Brewster or the Massachusetts Audubon Society Wellfleet Bay Wildlife Sanctuary off Route 6 in South Wellfleet, and the Center for Coastal Studies, Provincetown.

Prime birding areas are: Beech Forest Trail (spring warblers); Fort Hill Overlook (marsh and upland species); Outer Beaches (terns and plovers, spring and summer); Bayside areas for pelagic birds (after storms).





## **Common Birds of Cape Cod National Seashore**

- |                              |                               |
|------------------------------|-------------------------------|
| ___ Common Loon              | ___ American Kestrel          |
| ___ Double-crested Cormorant | ___ Great Horned Owl          |
| ___ Mute Swan                | ___ Screech Owl               |
| ___ Common Eider             | ___ Mourning Dove             |
| ___ White-Winged Scoter      | ___ Rock Dove                 |
| ___ Surf Scoter              | ___ Ruby-throated Hummingbird |
| ___ Black Scoter             | ___ Belted Kingfisher         |
| ___ Common Merganser         | ___ Common Flicker            |
| ___ Red-breasted Merganser   | ___ Downy Woodpecker          |
| ___ Mallard Duck             | ___ Hairy Woodpecker          |
| ___ Black Duck               | ___ Eastern Kingbird          |
| ___ American Widgeon         | ___ Eastern Peewee            |
| ___ Canada Goose             | ___ Horned Lark               |
| ___ Herring Gull             | ___ Barn Swallow              |
| ___ Great Black-backed Gull  | ___ Tree Swallow              |
| ___ Ring-billed Gull         | ___ Bank Swallow              |
| ___ Laughing Gull            | ___ Chimney Swift             |
| ___ Little Tern              | ___ American Crow             |
| ___ Common Tern              | ___ Blue Jay                  |
| ___ Black Skimmer            | ___ Black-capped Chickadee    |
| ___ Great Blue Heron         | ___ Tufted Titmouse           |
| ___ Green Heron              | ___ White-breasted Nuthatch   |
| ___ Snowy Egret              | ___ Brown Creeper             |
| ___ Great Egret              | ___ Carolina Wren             |
| ___ Glossy Ibis              | ___ Brown Thrasher            |
| ___ American Oystercatcher   | ___ Gray Catbird              |
| ___ Black-bellied Plover     | ___ Northern Mockingbird      |
| ___ Ruddy Turnstone          | ___ American Robin            |
| ___ Semipalmated Plover      | ___ Wood Thrush               |
| ___ Piping Plover            | ___ Cedar Waxwing             |
| ___ Short-billed Dowitcher   | ___ Red-eyed Vireo            |

## *Common Birds of Cape Cod National Seashore — continued*

|                                                 |                                                 |
|-------------------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> Red Knot               | <input type="checkbox"/> Pine Warbler           |
| <input type="checkbox"/> Whimbrel               | <input type="checkbox"/> Prairie Warbler        |
| <input type="checkbox"/> Willet                 | <input type="checkbox"/> Yellow Warbler         |
| <input type="checkbox"/> Greater Yellowlegs     | <input type="checkbox"/> Common Yellowthroat    |
| <input type="checkbox"/> Lesser Yellowlegs      | <input type="checkbox"/> Red-winged Blackbird   |
| <input type="checkbox"/> Sanderling             | <input type="checkbox"/> Brown-headed Cowbird   |
| <input type="checkbox"/> Dunlin                 | <input type="checkbox"/> Common Grackle         |
| <input type="checkbox"/> Spotted Sandpiper      | <input type="checkbox"/> Starling               |
| <input type="checkbox"/> Least Sandpiper        | <input type="checkbox"/> Northern Oriole        |
| <input type="checkbox"/> Semipalmated Sandpiper | <input type="checkbox"/> Northern Junco         |
| <input type="checkbox"/> Western Sandpiper      | <input type="checkbox"/> Northern Cardinal      |
| <input type="checkbox"/> White-rumped Sandpiper | <input type="checkbox"/> House Finch            |
| <input type="checkbox"/> Common Bobwhite        | <input type="checkbox"/> American Goldfinch     |
| <input type="checkbox"/> Northern Harrier       | <input type="checkbox"/> Rufous-sided Towhee    |
| <input type="checkbox"/> Red-tailed Hawk        | <input type="checkbox"/> Chipping Sparrow       |
| <input type="checkbox"/> Osprey                 | <input type="checkbox"/> White-throated Sparrow |
| <input type="checkbox"/> Turkey Vulture         | <input type="checkbox"/> Song Sparrow           |



## Checklist of Mammals

### Shrews and Moles

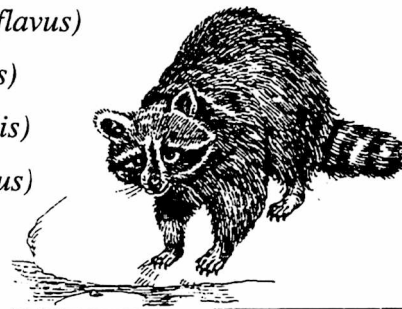
|                    |                               |
|--------------------|-------------------------------|
| Masked Shrew       | ( <i>Sorex cinereus</i> )     |
| Short-tailed Shrew | ( <i>Blarina brevicauda</i> ) |
| Eastern Mole       | ( <i>Scalopus aquaticus</i> ) |
| Hairy-tailed Mole  | ( <i>Parascalops brewer</i> ) |
| Star-nosed Mole    | ( <i>Condylura cristata</i> ) |

### Bats

|                     |                                      |
|---------------------|--------------------------------------|
| Little Brown Myotis | ( <i>Myotis lucifugus</i> )          |
| Keen Myotis         | ( <i>Myotis Keeni</i> )              |
| Indiana Myotis      | ( <i>Myotis sodalis</i> )            |
| Silver-haired Bat   | ( <i>Lasionycteris noctivagans</i> ) |
| Eastern Pipistrel   | ( <i>Pipistrellus subflavus</i> )    |
| Big Brown Bat       | ( <i>Eptesicus fuscus</i> )          |
| Red Bat             | ( <i>Lasiurus borealis</i> )         |
| Hoary Bat           | ( <i>Lasiurus cinereus</i> )         |

### Carnivores

|                     |                              |
|---------------------|------------------------------|
| Raccoon             | ( <i>Procyon lotor</i> )     |
| Short-tailed Weasel | ( <i>Mustela erminea</i> )   |
| Long-tailed Weasel  | ( <i>Mustela frenata</i> )   |
| Mink                | ( <i>Mustela vison</i> )     |
| River Otter         | ( <i>Lutra canadensis</i> )  |
| Striped Skunk       | ( <i>Mephitis mephitis</i> ) |
| Red Fox             | ( <i>Vulpes fulva</i> )      |
| Coyote              | ( <i>Canus latrans</i> )     |



### Sea Lions and Seals

|             |                           |
|-------------|---------------------------|
| Harbor Seal | ( <i>Phoca vitulina</i> ) |
|-------------|---------------------------|

## *Checklist of Mammals — continued*

### **Rodents**

|                          |                                    |
|--------------------------|------------------------------------|
| Woodchuck                | ( <i>Marmota monax</i> )           |
| Eastern Chipmunk         | ( <i>Tamias striatus</i> )         |
| Eastern Gray Squirrel    | ( <i>Sciurus carolinensis</i> )    |
| Red Squirrel             | ( <i>Tamiasciurus hudsonicus</i> ) |
| Southern Flying Squirrel | ( <i>Glaucomys volans</i> )        |
| White-footed Mouse       | ( <i>Peromyscus leucopus</i> )     |
| Southern Bog Lemming     | ( <i>Synaptomys cooperi</i> )      |
| Meadow Vole              | ( <i>Microtus pennsylvanicus</i> ) |
| Pine Vole                | ( <i>Pitymys pinetorum</i> )       |
| Muskrat                  | ( <i>Ondatra zibethica</i> )       |
| Norway Rat               | ( <i>Rattus norvegicus</i> )       |
| House Mouse              | ( <i>Mus musculus</i> )            |
| Meadow Jumping Mouse     | ( <i>Zapus hudsonius</i> )         |



### **Hares and Rabbits**

|                        |                                      |
|------------------------|--------------------------------------|
| Snowshoe Hare          | ( <i>Lepus americanus</i> )          |
| New England Cottontail | ( <i>Sylvilagus transitionalis</i> ) |

### **Deer**

|                   |                                   |
|-------------------|-----------------------------------|
| White-tailed Deer | ( <i>Odocoileus virginianus</i> ) |
|-------------------|-----------------------------------|

### **Whales, Dolphins and Porpoises**

Several species occur in offshore waters of the Atlantic Ocean and in Cape Cod Bay, and are occasionally grounded on beaches.

(See Fact Sheet on Whales of Cape Cod Waters)

Taxonomy based upon *A Field Guide to the Mammals* by W. H. Burt and R. P. Grossenheider, Houghton Mifflin Co., Boston, 1964.







## **The Eastern Coyote in Massachusetts**

The following question has become popular: “We understand that coyotes have been seen in the Cape Cod National Seashore area. When and how did they get here?”

There are coyotes in the Seashore area—not many at this point, but their population is growing. Coyotes came to Cape Cod in the late 1970’s the same way most everyone else has—across the Bourne and Sagamore bridges.

Although sometimes called “coydogs or brush wolves,” these animals are true coyotes. Today, they exist statewide from the Berkshires to Cape Cod. In Massachusetts, coyotes are about the size of a medium-sized German shepherd dog, but with longer, thicker fur. They have a long, bushy, black-tipped tail that is usually carried pointed down. Their snout is long and slender, and their ears are pointed and erect. The pelts range from grayish-black to the less common blonds, light tan, dark tan, or even all black.

Coyotes usually are shy and elusive animals. Male and female coyotes pair up, establish a territory, and breed in February or March; four to eight pups are born in April or May. Coyote activity is variable; they can be active night or day, and sightings at dawn or dusk are common. They remain active all year-round and do not hibernate. Coyotes often are seen individually, in pairs, or in small groups—usually a family unit consists of an adult male and female with their current offspring. The area a coyote uses may vary from four to thirty square miles.

Coyotes have good senses of sight and smell and use these senses to find food. They are opportunistic feeders and will eat many types of foods. Because they are predators, their primary foods include small rodents, rabbits, deer, birds, snakes, frogs and insects. Coyotes will also eat fruits, berries, vegetables, garbage and pet food left outdoors. In some areas, they will prey upon unprotected pets, including house cats, and have been known to attack domestic dogs.

Coyotes are an important, renewable natural resource. In Massachusetts, they are classified as a furbearer species, for which an established harvest season and management program exists.

Source: Commonwealth of Massachusetts  
Department of Natural Resources



## Whales of Cape Cod Waters

Provincetown was once a port to whaling vessels, with crews eager to harvest whales for the oil that came from their blubber and the corset stays that came from their baleen. Today, Provincetown is home port to boats of a different kind—still searching for whales, but now filled with people hoping to understand and protect the whales.

The fertile waters off Cape Cod are home to several different species of whales, many of which are seasonally resident here, using the area as a feeding ground and a safe place in which to raise their young. Provincetown is the closest port to Stellwagen Bank, an underwater deposit of sand and gravel located just a few miles north of Provincetown. The shallower waters of Stellwagen result in high levels of productivity, supporting huge quantities of plankton (tiny plants and animals, including algae, small crustaceans, and fish larvae); large numbers of fish; and the humpbacks, fin whales, and other marine animals that feed on those fish. **Stellwagen Bank has been designated a National Marine Sanctuary because of the valuable role it plays for the marine life in this area.**

### Baleen Whales

Whales are divided into two groups, the toothed whales and the baleen whales. The **Minke Whale** is a typical baleen whale. Baleen whales are generally solitary animals. They use their baleen plates (called “whalebone” by early whalers) to filter small fish and plankton from the water.

### Toothed Whales

The **Atlantic White-Sided Dolphin** is similar to many of the other dolphin species, all of which are toothed whales. These toothed whales are highly social animals, often traveling in large “pods” which may number as many as 400-500 animals. Toothed whales feed on fish and squid.

Some species of whales can be individually identified by differences in the natural markings found on their bodies. Thanks to the access provided by the Dolphin Fleet, scientists from the Center for Coastal Studies have been able to follow many of these whales throughout their lives. We know that many of these individuals return here every year to feed and raise their young, how often they bear calves, how long they take to reach sexual maturity—information essential to protecting them.

### Humpback

The **Humpback Whale** (*Megaptera novaeangliae*) spends its spring, summer and fall months in northern waters, where it feeds on the small schooling fish which occur here. Late in the year, humpbacks migrate to the waters of the West Indies where they mate and

## *Whales of Cape Cod Waters — continued*

bear their calves. Humpbacks are easy to tell apart using natural field marks—the black and white pattern on their tail flukes. One famous female humpback is named Cat's Paw for the white paw-like mark on her nearly all black tail. There are about 550 humpback whales in the Gulf of Maine, many of which frequent Cape Cod waters. The humpback is a large whale, often reaching lengths of 40-50 feet. It is distinguished by its long white flippers and the fact that it often raises its tail high into the air when it dives.

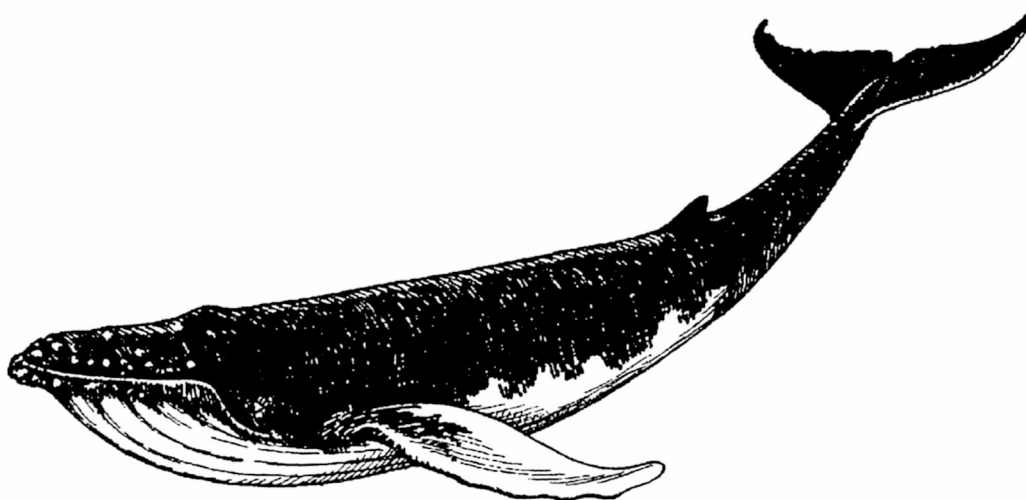
### **Fin Whale**

The **Fin Whale**, or **Finback**, (*Balaenoptera physalus*) is somewhat larger than the humpback, reaching lengths of 50-75 feet. It is also a more streamlined animal, moving quickly through the water. Fin whales can be individually identified by using a combination of body characteristics: dorsal fin shape, scars, and—the most telling characteristic but also the most difficult to photograph—the subtle shadings and swirls on the right side of the whale called the blaze and chevron. Fin whales are unique in that they are asymmetrically colored; the whale's lower right jaw is white and its lower left jaw is dark gray or black.

### **Right Whale**

The **North Atlantic Right Whale** (*Eubalaena glacialis*) is the most endangered of all the world's great whales. Once found in Cape Cod Bay in huge numbers, there are fewer than 350 North Atlantic right whales remaining in the world today. The right whale's long baleen plates, covered in a thick mat of fine hairs, help this 45-50 foot animal to strain tiny plankton from the water for food. Right whales can be identified by the differences in "callosity" patterns on their heads and lips; these callosities are actually bumps covered with tiny whale "lice." Right whales are found in the Massachusetts area in the late winter and early spring months. They use these waters as a feeding ground and nursery for mothers with young calves.

Source: Courtesy of the Dolphin Fleet and the Center for Coastal Studies





## **Stranded or Beached Marine Animals**

Whales, dolphins and other marine animals have been recorded stranding on Cape Cod since it was first settled by Europeans in the 1600's. It seems to be a naturally caused phenomenon, possibly due to the Cape's geologic configuration. Some scientists speculate that it is the Cape's curving bayside shoreline that confuses whales and dolphins, which orient themselves by "echolocation" (determining the location of an object by emitting sound waves which bounce back to the whales as echoes). It is also evident that shallow, fast-emptying tidal creeks often trap unsuspecting marine animals during tide changes.

Other stranding causes are potentially related to ill-health of pod leaders, who instinctively seek shallows and unwittingly strand fellow pod members. Once in the shallows, marine mammals can experience stresses that can lead to life-threatening conditions. Overheating, drying out, and body weight stress on lungs and other vital organs can cause irreversible damage.

Sea turtles also strand on Cape Cod shores. Sometimes this is due to animals getting swept out of their normal range by ocean currents. Some of these species are threatened and endangered, and will be assisted by the Cape's Stranded and Beached Animal Network.

Source: National Marine Fisheries



## Checklist of Amphibians and Reptiles

### AMPHIBIANS

#### Salamanders

1. Spotted Salamander (*Ambystoma maculatum*). North to Pamet River.
2. Red-Backed salamander (Woodland salamander, lead-backed salamander) (*Plethodon cinereus*). Most abundant Cape Cod amphibian, found Capewide.
3. Four-toed salamander (*Hemidactylium scutatum*). Cedar swamps are an ideal habitat.

#### Frogs and Toads

1. Spadefoot toad (*Scaphiopus holbrooki*). A burrowing toad, rarely seen.
2. Fowler's toad (*Bufo fowleri*). Widespread on the Cape.
3. Spring peeper (*Hylo crucifer*). Widespread.
4. Grey tree frog (*Hyla versicolor*). Uncommon. Great salt tolerance.
5. Pickerel frog (*Rana palustris*). Locally abundant, north to Pamet River.
6. Green frog (*Rana clamitans*). Most common species.
7. Bullfrog (*Rana catesbiana*). Likely introduced to Wellfleet area from its upper Cape range.

### REPTILES

#### Turtles

1. Snapping turtle (*Chelydra serpentina*). Active predator, but an opportunist, too. Capewide.
2. Spotted turtle (*Clemmys guttata*). Requires a marsh habitat or pond. Omnivorous, but cranberries are a favored food.
3. Diamondback terrapin (*Malaclemys terrapin*). Wellfleet marshes and bays are its northern boundary.
4. Painted turtle (*Chrysemys picta*). Kettle ponds a favorite habitat. Capewide distribution.
5. Box turtle (*Terrapene carolina*). Original range unknown; population decimated by collectors.

#### Sea Turtles

Migratory summer residents. All nest in southern waters.

1. Green turtle (*Chelonia mydas*). Of turtle soup fame.

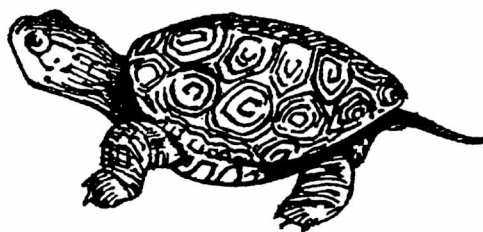
## *Checklist of Amphibians and Reptiles — continued*

2. Loggerhead turtle (*Caretta caretta*). Carnivorous. Largest and most common species.
3. Ridley turtle (*Lepidochelys kempi*). Most belligerent of the local species.
4. Leatherback turtle (*Dermochelys coriacea*). Largest living reptile (by weight). Warm blooded; jellyfish diet.

### **Snakes**

1. Water snake (*Natrix sipedon*). Capewide northward to Pilgrim Heights. Not common.
2. Garter snake (*Thamnophis sirtalis*). Especially abundant in Province Lands.
3. Ribbon snake (*Thamnophis sauritus*). Capewide, but especially abundant in Province Lands. Boldly striped.
4. Ringneck snake (*Diadophis punctatus*). Diets on salamanders.
5. Hognose snake (*Heterodon platyrhinos*). Capewide distribution.
6. Black racer (*Coluber constrictor*). Common Capewide.

Status based on *Reptiles and Amphibians in Massachusetts* and *This Broken Archipelago* (1976) by James D. Lazell, Jr.







## **Red Tide**

### **Red Tide**

Red tide, though it has an ominous sounding name, really bears no resemblance to anything red in Cape waters. The algae which cause the phenomenon is known scientifically as *Gonyaulax tamarensis*. It is naturally occurring and not the result of pollution or tampering with nature by humans. Outbreaks of the red tide have been documented as early as Samuel Champlain's time, although modern-day research has focused attention on it more clearly. In tropical areas of the world, red tides do, in fact, color the water red.

This local species thrives in a very narrow temperature range, and will bloom only if salinity, nutrients, and sunlight conditions are correct. If conditions are perfect, the algae may change from a dormant state (called cysts) and can bloom in a matter of several days. Areas such as Salt Pond appear to be ideal for the survival of these cysts, thus blooms appear to begin in these regions and spread by tidal action to other areas. Filter feeders, such as shellfish, consume the organism, breaking down the cells and releasing a toxic substance—and are themselves unaffected. However, warm-blooded animals which consume such shellfish can be affected by the toxins. This is termed Paralytic Shellfish Poisoning, and results in a disruption of breathing and other central nervous system functions. Other organisms such as lobsters, crabs, finfish and birds are unaffected.

Regular testing of shellfish beds safeguards the public throughout the year, and shellfish harvested from other areas or available through fish markets or restaurants can be considered safe.

Source: Eastham Natural Resources Department



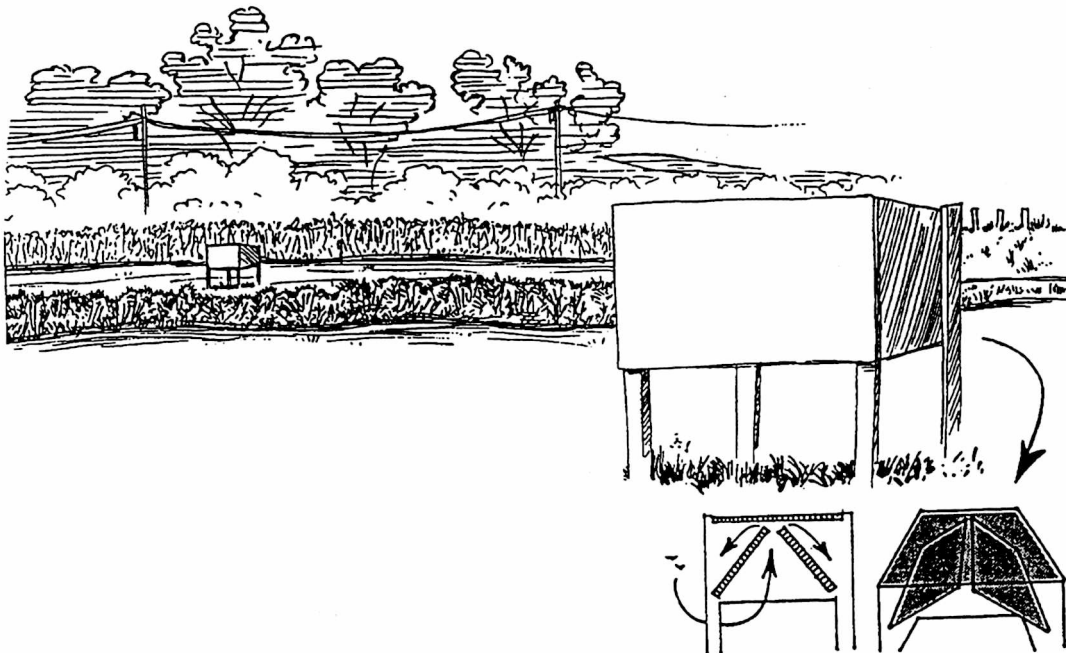
## **Greenhead Fly Traps**

### **What and Why are Those Boxes on the Marsh?**

As you explore Cape Cod, you probably wonder why there are boxes of different colors in the marsh. They are not bird nests, hunting blinds or somebody's hideaway. They are greenhead fly traps. If you have visited the Cape during the summer, you probably already know what a greenhead fly is. It is one of the most unwelcome creatures on the marsh and beach, so far as personal comfort is concerned. There are lots of these biting insects around then. Sometimes when it is flat calm, there are so many on the beach, you either have to stay in the water or else go home. Its name fits the fly, since it has a green head.

The female fly lays its eggs on grass stems in midsummer. These females seek blood of warm blooded animals to develop their eggs. The eggs hatch into inch-long maggots, which winter in the mud at the base of the plants, feeding on insects, worms, snails and other greenhead larvae. Usually, the following summer they emerge as the dreaded fly. They in turn provide a bumper meal in late July for the swallows and other birds.

The boxes on the marsh are there to catch greenhead flies. Why the flies go into the box is a mystery, but once inside, they can't find their way out again. These boxes help keep down the number of these biting insects without having to use chemicals. In fact, they catch so many flies that the boxes need to be cleaned out every couple of weeks. The people studying the greenhead fly use a measuring cup to scoop them out—one cup equals three hundred flies! In some areas, it is felt they catch seventy percent of the flies.



# **Coastal Processes and Their Effects**



## **Outer Cape Salt Marshes**

A salt marsh, such as the Nauset Marsh, is a vast expanse of land and dominant swaths of hearty grasses criss-crossed by meandering streams and tidal creeks of seawater which flows in and out with twice daily flooding and draining by tides. The Nauset Marsh is among the most productive in the world.

Cape Cod salt marshes began developing extensively when rising sea level caused the creation of barrier beaches and spits and shallow, protected embayments. Salt marsh grasses thrive in such habitats, and build proportionately along with elevating sea levels. Thus, new marsh layers build upon the base provided by former generations.

The two main salt marsh grasses on Cape Cod belong to the genus *spartina*. *Spartina alterniflora*, known locally as salt marsh cord grass, is the taller of the two species. Cord grass grows in the deeper portions of the salt marsh margins and in the center of tidal flats. It can survive having its roots and base submerged by salt water twice daily, and the entire plant can withstand being completely inundated for several days at a time during extremely high course tides and storms. The plant has a means for exuding excess salt from its system, which is also why it can survive in an otherwise hostile environment with only limited competition. *Spartina patens*, or salt marsh hay, has similar qualities, but is finer and softer to the touch than its robust cousin, and can withstand only the twice monthly emersions of salt water which it routinely receives.

Hence, salt marsh hay is found on the higher edges of the salt marsh community directly adjacent to the upland transition known as the “wrack line.”

Surprisingly, extensive salt marsh communities on the Outer Cape are relatively new. Most of the conditions favoring their formation, in geologic time, have only recently come into being. One evidence of this is the chart of Nauset Marsh drawn up by Samuel De Champlain in 1604, which shows relatively little salt marsh and much open water. We know that Champlain could not have been mistaken about this matter because his company’s ship actually sailed into the open bay that existed then.

Gradually rising sea levels force the salt marsh community to grow ever upward, but the pace is matched by new plant life growing upon the remains of older growth. The mixture of organic plant materials, along with silt and mud, creates an extensive and durable base of peat upon which the salt marsh not only grows but thrives. Decomposing materials within this layer provide additional food for crustaceans, mollusks, and fish. Smaller creatures, in turn, become food sources for larger ones, including a multitude of wading birds, such as yellowlegs and herons.

The daily inward and outward tidal flow also helps the salt marsh to thrive. New nutrients are brought in, and wastes are flushed out. But the inward and outward flow also connects the salt marsh to the greater ocean ecosystem in a significant way. Many species of fish and shellfish use the salt marsh environment as a nursery. It has been

## *Outer Cape Salt Marshes — continued*

found that one of the key developmental stages of the American lobster often takes place in the salt marsh environment.

The salt marsh uplands have an equally rich significance. In the early days of settlement on Cape Cod, residents harvested salt marsh hay extensively. While shellfish resources were used appropriately by Native American people as a key supplement to their diet, shell midden remains have shown that they also did so on a year-round basis at certain points in time. Pilgrim settlers were particularly impressed with the quality of Cape Cod oysters, especially in the vicinity of Wellfleet bay. But, surprisingly, mid 19th century Cape Cod mariners sought out Cape Cod clams not for eating, but for baiting their cod fish hand lines. Today, the rich visual qualities of Outer Cape salt marshes, with brilliant greens in spring and margins crowned by subtitle violet sea side lavender in the fall, serve as inspiration to all who view it.





## **The Sandy Shore and Dunes Environment**

A sandy beach, at first glance, may seem to be barren of animal life. *Herring gulls* stand quietly at the water's edge until someone walks nearby. *Terns* swoop back and forth and suddenly plunge down to catch a gleaming *silverside minnow*. *Sandpipers*, large and small, run across the wet sand, stopping to probe with their long bills, always staying just ahead of the waves.

The remaining animals adapted to these open beach conditions are harder to find. Some are sand-colored, blending beautifully with their background; many dig into the sand; still others are so small that they can live in between sand grains.

Along the tideline, shells and other dried sealife give clues to animals and plants living in the sandy bottom. Most of these animals are burrowers to keep from being carried away by waves and currents.

### **A Desert Environment**

In the dune area, high above the tideline, live an amazing number of plants and animals adapting to surviving in what amounts to a desert environment. The sandy soil does not hold rainwater for long, and the air is often full of salt spray, drawing out the fresh water already in the plants. Plants that have thick, waxy leaves, much like desert cacti; those equipped with long tap roots (up to thirty feet) which descend into the water table; and beach grass whose roots spread over a great surface area, are adapted to the dry conditions.

Another necessary adaptation living things make is to the tremendous heat, which can reach 120 degrees F (48 degrees C). During the hot daylight hours, many animals dig into the sand. If you do the same, you can feel that it is many degrees cooler just under the surface. No animal can stay more than a few seconds on the hot sand. Leaves of many plants droop or curl, which reduces evaporation.

Because there is little natural cover for animals to hide from predators, color adaptation is necessary. Examples are the common large *dune grasshopper* and *wolf spider*. Both of these animals have dull gray speckled bodies, hard to see against sand. The young *sanderlings* are pictures of protective coloration. When potential danger approaches, they freeze in place and seem to vanish from sight.

### **Beach Grass**

The creator and guardian of our sandy beaches and dunes is the *beach grass*. This is a perennial, tough, native grass that can withstand some flooding, salt spray, drought, strong winds and building (accreting) sand. It is the first plant to be seen growing on a forming sand dune. Bits of broken rhizome from the beach grass root system will start growing with little moisture. This is why beach grass grows back so quickly after a storm has torn it to



## *The Sandy Shore and Dunes Environment — continued*

pieces or buried it completely. When a healthy stand of grass develops, the stems break the force of winds and blowing sand. Grains of sand come to rest at the base of the stem and a good stand of grass can accumulate up to four feet of sand in a year's time.

This natural system is better than artificial methods for dune building and rebuilding. If you find an eroded bank with the root system of the grass exposed, you will see clearly that the clumps of grass are connected to each other by underground horizontal stems, the rhizomes. These horizontal rhizomes have enlargements from which grow tough wiry roots that spread out into the sand. As the grass is buried and grows up, decaying parts of the grass create humus so other beach plants can take hold and grow.

You and others in your group can help dunes and beaches by not walking on the grass with shoes and by not sliding down or climbing up a dune face. Wherever beach grass is destroyed, the dune begins to disintegrate and blow away.



## **Tides**

A hundred years ago, lives of the people of Cape Cod were inseparably connected to the sea. They relied on the ocean-going vessels for their food, travel and trade, making an understanding of the tides essential for their survival. In an age of mass transportation, our link to the ocean and our knowledge of its cycles has weakened with time.

Visiting a bayside beach during a low tide may cause some inconvenience to a summer vacationer. All in all, most people have little cause to think about the ebb and flow of the ocean's tide. Playing a small part in modern life, the tides are the driving force behind life on the coast.

### **Gravitational Pull**

Newton provided the first detailed explanation of tidal action when he introduced the theory of gravitation in 1687. He proposed that objects exert a force upon each other which pulls them towards each other. This force, known as gravity, keeps the speeding planets in orbit around the sun and the moon spinning around the earth. Larger objects, such as planets, produce a stronger pull on each other compared to smaller objects. In addition, the force of gravity between objects will decrease as the distance between them increases.

As the earth and moon spin around a central axis, the moon's gravitational force pulls up on the earth's surface. The force isn't strong enough to change the shape of the inflexible land masses. However, as the moon passes over the earth's oceans, a mound of water is created. As the earth spins, the bulge of water travels across the planet's surface. This mound causes an increase in the water level, thus creating the tide. The whole ocean undergoes the regular tidal changes, though they are easier to perceive near shore.

### **Centrifugal Effect**

Newton described a second effect which is necessary for the explanation of why we have two tides per day, even though we have only one moon. Centrifugal effects tend to throw objects away from spinning bodies. On the side of the earth away from the moon, this action counteracts the gravitational pull, and creates a second, smaller mound of water on the earth's surface. We experience the second tide as the earth turns beneath it.

Cape Cod, like most places on the coast, experiences semidiurnal tides, meaning two high and two low tides occur daily. Each tide, controlled by lunar movement, takes place fifty minutes later than the previous day. The moon completes a full circle around the earth every 24 hours and fifty minutes, causing the variation of tidal timing from day to day.

### **Spring and Neap Tides**

The sun's gravitational pull on the earth, though 81 times weaker than the moon's pull because of its immense distance from us, still affects the tides. During each lunar month,

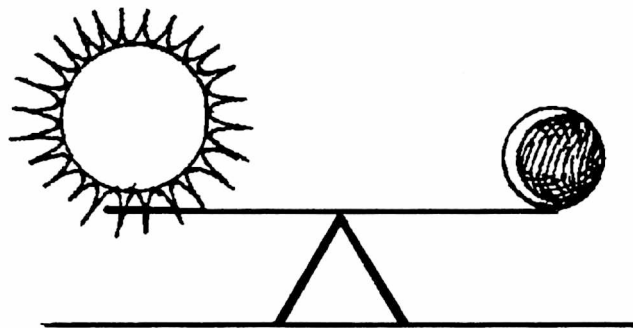
## *Tides — continued*

two higher than normal tides and two lower than normal tides occur. Corresponding to the full and new moon when the sun, earth, and moon align with each other, this phenomenon is called a spring tide. The name originated from an old Saxon word meaning rising or rolling of water and has nothing to do with the spring season. The sun's gravitational force is added to the moon's pull. This extra pull creates an extra large mound of water, resulting in extreme high and low tides.

The sun's pull creates another interesting tidal variation called "neap tide." Occurring on the first and third quarters of the moon cycle, the moon, earth and sun are positioned in a 90-degree angle. The force of the sun and moon work against each other, counter-acting their effects on the ocean. A smaller mound of water is formed, producing a less significant change in the water level between high and low tide.

Local factors, such as coastal geography, add an interesting twist to the already complicated story of the tides. Most areas have semidiurnal tides (two high and two low). However, the Gulf of Mexico experiences diurnal tides, having only one high and one low tide a day. Tidal height is another factor which is produced by local differences. For example, New York City normally has a five-foot difference between the high and low tide marks; whereas, Rockport, Maine sees a change of ten feet between tides, and the Bay of Fundy has an incredible thirty-foot change in water level.

The tides are an essential life regulating force in and around the ocean. Bays, estuaries and marshes rely on the huge amount of water which is forced into these areas churning and distributing organic matter in its wake. Nutrients produced in the estuaries are then flushed into deeper water as the tides recede, fueling the food chains of the open ocean. The tides set the rhythm of life for the plants and animals of the ocean's edge. Horseshoe crabs and small fish called grunion are stimulated to mate by the change in tides.





## **The Changing Cape Cod Coast**

If one were to draw a map of North America as it looked, or probably looked, 70,000 years ago, Cape Cod would not be visible. The area was part of the mainland with low hills and flat stretches that reached far out into the Atlantic Ocean. But if you were to drill five hundred feet down into the ground of the Upper Cape today, you would find the same bedrock of granite that underlies the rest of New England.

### **How Cape Cod Became a Cape**

The geography of New England was changed by ice. The weather in the north became so cold that snow didn't melt in summer, but instead, piled deeper and deeper and formed sheets of ice or glaciers that were thousands of feet thick. Gradually dragging along everything they met in their path, these huge sheets of ice spread south.

In the course of millions of years, there were a series of Ice Ages. It was during the last one about 20,000 years ago that Cape Cod was formed. Covering what is now Cape Cod, Martha's Vineyard, and Nantucket, the ice sheet (or glacier) sometimes up to two miles high, crept south. And then it stopped. For a long time it stayed there; then as the weather warmed, it receded to form a new line that ran along the north side of Cape Cod. Again it stopped until the weather warmed up about 18,000 years ago. This time the weather stayed warm enough for the ice finally to melt altogether in what is now the New England area. Eventually so much ice melted that the ocean level rose four hundred feet. Miles of land, that had been at the edge of the continent, were now underwater. Only the highest parts were above water.

The hills along the northern coast of the Cape (beside the mid Cape highway east of the Canal) are made up of the debris which the glacier gathered in its long journey from the north and dumped here.

The ice didn't melt evenly. When the ice sheet retreated, it left behind great blocks of ice. When these blocks finally melted, they left great hollows in the ground. Some were simply depressions in the ground; some later became cranberry bogs; some filled up with fresh water and have become freshwater ponds; some are connected by channels with the sea and have become salt ponds.

There are hundreds of these ice-block lakes (or kettles) on Cape Cod. Round Pond, north of Wellfleet, is an example of a deep freshwater kettle. The first Visitor Center at the National Seashore has been named for the salt pond (or kettle) beside it.

Other reminders of the Ice Age can be seen on Cape Cod. Every large boulder originally came from some place farther north. It was picked up by the glacier, dragged down to the Cape, and left here.

## *The Changing Cape Cod Coast — continued*

Doane Rock, off the road that leads from the Salt Pond Visitor Center to Coast Guard Beach, is the largest glacial boulder known on the Outer Cape.

Many pebbles, stones, and rocks have scratch marks on their surfaces. These were made as the glacier, rolling and scraping the rocks against each other, moved south.

### **The Changing Cape**

Not only ice has shaped the Cape, but wind and waves are constantly taking land away from one place and adding it to another. Thousands of years ago, the southern and eastern shores of the Cape were not only rough and ragged, they also extended several miles farther into the ocean. Gradually, however, waves and winter storms have smoothed out the coastline and have dragged sand away from the cliffs of the Outer Cape. An average of three feet of Atlantic shoreline disappears every year. But not all the sand has left the shore forever. Much of it is returned farther north in an ever-lengthening beach. First the sand forms a sandbar underwater, and as more sand is added, the sandbar is exposed and becomes what is known as a sandspit, new land that is a continuation of the old.

All of the Province Lands is new land. Glacial deposits end at High Head in Truro. From there the sand has been built up in ridges or dunes that may be seen from the observation platform at Province Lands Visitor Center on Race Point Road.

North Beach in Chatham and Nauset Spit in Eastham are also prime examples of sandspits.

On the Cape Cod Bay shore in Wellfleet and South Truro, there were once four islands. Now there is one long beach known as Great Island. Sand has filled in between the islands, and linked the islands, including Great Island (which stood alone as recently as 1831), to the mainland.

On the other hand, Billingsgate Island, which once was the home of many families, has eroded to the point where only a sandbar is seen at low tide.

Cape Cod loses more land than it gains. While the ocean side of the Lower Cape loses five acres a year, it gains only two new acres. In other words, the Cape loses three feet of shoreline a year. The planting of beach grass on bare dunes has helped to make the sand more capable of resisting storms and waves than it was before. If people respect these fragile areas, the beach will have a better chance to survive, although the Cape will continue to be re-formed by wind and water, as it always has.



## **Erosion on Outer Cape Cod**

Erosion is a natural thing on Cape Cod. In fact, much of what we enjoy about the Cape is a result of this natural process. The wide sandy beaches we walk on are made from sand that falls down from the glacial cliffs, or scarps, behind the beach. Waves, currents and wind then move much of this sand to other parts of Cape Cod. All of the Province Lands area, as well as Nauset Spit, and much of Great Island were created by the movement and relocation of sand. If erosion of the outer beach cliffs were somehow stopped, these formations would eventually disappear.

Human construction such as buildings and parking lots, however, often suffer severely from coastal erosion. The Highland and Nauset Lighthouses are in danger of falling over the cliff as a result of shoreline retreat. In 1977, the Old Harbor Life Saving Station had to be moved from North Beach in Chatham to Race Point Beach in Provincetown in order to save it. In the following year, a 300-car parking lot located at Coast Guard Beach in Eastham was completely demolished by the Great Storm of 1978. More recently, private home sites in Chatham have fallen into the ocean as a result of coastal erosion. We have now learned that it is better to build further away from the shoreline, and to plan for regular replacement of buildings and features that need to be located close to the water's edge.

### **Nature Prevails**

We have also found that natural "systems" are often better at slowing and controlling erosion than human "solutions" (such as building sea walls, jetties, or placing boulders along the beach). Scientists have found that the natural movement and placement of sand (both up and down the coast, as well as on and off the shoreline) slows the erosion effect of waves. You can test this on your own. Try running on a sandy beach for a certain distance. Time yourself. Then try running for the same distance on a parking lot. Time yourself again. The sand on the beach will have slowed you down considerably. Likewise, the soft sandy beach slows down the power of storm waves much better than solid concrete barriers can.

Beach grass planting in the Province Lands dunes is another way in which natural restoration activities can help correct unnatural erosion rates. Beach grass traps the sand blown by the wind, and is actually responsible for forming all of the dunes that you see on Outer Cape Cod. When people or animals trample beach grass and kill it, the dunes in turn begin to fall apart. Before the Pilgrims arrived on Cape Cod, the beach grass in the Province Lands did such a good job of holding the dunes together that once a complete forest grew on top of them. Sometimes you can still see the remains of old trees poking through the sand!

The average natural erosion rate on the ocean side of Cape Cod has been calculated by scientists at three feet a year. This means that there may be no erosion for several



## *Erosion on Outer Cape Cod — continued*

years, and more than three feet other years. Thus, the Cape is gradually narrowing. Its natural life span still gives the Cape several thousand more years.

Human activities that increase erosion can upset the natural “give and take.” While natural processes narrow the Cape, they also build it up in other areas. All of the Province Lands was created by sand being transferred from other parts of the Cape. The same is true of Nauset Spit, Monomoy, and Sandy Neck. These sandy stretches can also grow upwards, due to windblown sand deposits forming into dunes, which in turn are stabilized further by native vegetation. Cuts in these features by trails created by humans can cause accelerated, unnatural rates of erosion. This is why it is important for people to learn not to take shortcuts through the dunes to get to the beaches. Beach grass can withstand the most powerful winds, but can die if stepped on more than twice. Erosion is a natural process that has shaped much of Cape Cod as we see it today. It is important that this process be kept natural and not be upset by human interference.





## **Dune Stabilization**

Erosion and dune stabilization along the eastern shore of Cape Cod have been a concern for many years, with winds and waves damaging beaches and dunes the entire length of the Seashore.

Erosion is the primary factor altering this unique area, yet the processes of erosion consist of various agents acting, at times, independently of each other to create and shape a changing land form. Erosion of the coastline continually results in a vertical removal of shoreline sediments, principally by marine agents. Visitors to the Seashore, seeking to understand the geologic features of a changing coast, encounter a marine scarp, beaches, migrating sand spits and inlets, all vital components of a dynamic, moving coastline. Generally, erosion problems involving these elements occur as a combination of natural forces and to a lesser extent human-induced activities. The major problems related to shoreline erosion are associated with erosion of the scarp, recession of the shoreline, and landward migration of the barrier beaches. Stabilization efforts directed to these areas are futile; sea erosion along the Great Beach occurs at an average of three feet per year. Coastal retreat is inevitable, a natural, on-going process of shoreline recession. The changing shoreline is a result of severe storms, winds and waves, a rising sea level and the careless habits of man.

### **A Story of Change**

The history of the Outer Cape is a story of change. It is a story of how nature formed the land and how man has since changed it. Several hundred years ago the Province Lands was completely forested. European settlement changed the face of this area and damaged the forest ecosystem. Cutting of timber, creation of open grazing land, and sporadic wildfires broke the vegetative cover and caused massive blowouts which finally released the dunes. Early settlers attempted to control sand movement by planting vegetation; their efforts achieved only limited success. Despite measures to still the sand over a period of years, human impacts have caused dune migration to persist.

The Province Lands is an area with a variety of attractions that entice many people and their vehicles. Continued human activities have allowed these spectacular resources to deteriorate. Uncontrolled pedestrian traffic and indiscriminate off-road vehicle use eroded the natural and scenic quality of prime seashore resources. Each winter prevailing winds drive the massive dunes across the landscape. Some of the sand dunes move fifteen to twenty feet per year. Today, these spectacular dunes are eroding and losing height while threatening other unique resources with burial. In the past, erosion of the dunes was man-induced. For the moment, it is man's activities in conjunction with natural forces that adversely impact eight square miles of dunes within the National Seashore.

The National Seashore was set aside as an area for public use to be preserved and used by present and future generations. As such, the National Park Service has an overriding

## ***Dune Stabilization — continued***

responsibility to protect significant Park resources. This mandate prompted the Service to implement restrictive types and levels of use with respect to deteriorating resources. It studied the feasibility of stabilizing the migrating dunes. Scientific research now furnishes the data that is used to direct the course of action the Seashore is pursuing to preserve the high dunes in the Province Lands.

### **Lessons in the Sand**

We are slowly learning that it is a mistake to stabilize a sandy shoreline; as long as the sea level continues to rise the coastline will erode. But the problem of erosion in the dunes is not the same problem as coastal erosion. While the sea is responsible for rearranging the coastal scene, the wind and the handiwork of man are the primary forces that alter the unique land forms in the Province Lands. Research shows that planting the bare areas of sand can stabilize and give life back to the high dunes. Following recommendations from scientific studies, the Park has acted to revegetate portions of active dune fields in anticipation of stabilizing critical areas. Since 1985 beach grass planting activities have been completed by private contract, Park volunteers and Seashore personnel who together have helped stabilize nearly 153 acres of barren sand.

In order to continue to provide for visitor use as well as resource protection, the Seashore has set guidelines for more discriminate use and dune access by both people and oversand vehicles. The long term goal of the National Park Service is to restore a portion of the dune vegetation and thereby restore the stability of dunes which today continue to encroach upon significant and critical resources within the National Seashore. The Service will continue to regulate human activities, to minimize man-made erosion problems, and protect this unique area without damaging its infinite beauty.

# ***Section III***

## **Procedures, Policies and Support Services**

*Emergency Information*

*Accessibility Information*

*Visitor Center Services*

*Self-Guiding Nature Trails*

*Park Regulations and Background*

*Additional Resource Options*

*Update Procedures*

# **Emergency Information**



## **Emergency Information**

### **Local Police**

|              |       |
|--------------|-------|
| Chatham      | 9-1-1 |
| Orleans      | 9-1-1 |
| Eastham      | 9-1-1 |
| Wellfleet    | 9-1-1 |
| Truro        | 9-1-1 |
| Provincetown | 9-1-1 |

### **Local Fire and Ambulance**

|              |       |
|--------------|-------|
| Chatham      | 9-1-1 |
| Orleans      | 9-1-1 |
| Eastham      | 9-1-1 |
| Wellfleet    | 9-1-1 |
| Truro        | 9-1-1 |
| Provincetown | 9-1-1 |

### **Medical**

|                                          |                |
|------------------------------------------|----------------|
| Ambulance                                | 1-800-352-7141 |
| Cape Cod Hospital                        | 1-508-771-1800 |
| Orleans Medical Center Walk-In           | 1-508-255-9577 |
| Outer Cape Health Services, Provincetown | 1-508-487-9395 |
| Wellfleet                                | 1-508-349-3131 |
| Poison Information Center                | 1-800-682-9211 |
| AA                                       | 1-800-637-6237 |

### **Cape Cod National Seashore**

|                                             |                      |
|---------------------------------------------|----------------------|
| Salt Pond Visitor Center, Eastham           | 1-508-255-3421       |
| Park Headquarters, Wellfleet                | 1-508-349-3785, X200 |
| Province Lands Visitor Center, Provincetown | 1-508-487-1256       |

## **OTHER TELEPHONE LOCATIONS AND NUMBERS**

### **Public Telephones**

|                                          |                               |
|------------------------------------------|-------------------------------|
| Salt Pond Visitor Center                 | Head of the Meadow Beach      |
| Coast Guard Beach                        | Province Lands Visitor Center |
| Nauset Light Beach                       | Race Point Beach              |
| Marconi Beach (not at site headquarters) | Herring Cove Beach            |



## ***Emergency Information — continued***

### **Transportation**

Bus Terminal, Hyannis .....1-508-775-5524  
Ferry Lines: Hy-Lines .....1-508-778-2600  
Steamship Authority .....1-508-477-8600

### **State Police**

Bourne .....1-508-759-4488  
South Yarmouth .....1-508-398-2323

### **U.S. Coast Guard Search/Rescue**

Cape Cod Canal .....1-508-888-0335  
Chatham .....1-508-945-0164  
Provincetown .....1-508-487-0070  
Woods Hole .....1-508-548-5151

**Weather Phone - Outer Cape** .....1-508-255-8500

### **Marine Animal Rescue**

C-MARC .....1-508-896-3328

**Beware of poison ivy, especially along trail sides—“Leaves of three, let them be.”**

**Be aware of deer ticks (see tick fact sheet).**

**Do not walk on top of or beneath faces of cliff.**





## Lyme Disease

### What is Lyme Disease?

Lyme Disease is an infectious disease syndrome caused by a bacterium that is transmitted to humans by the bite of an infected tick (*Ixodes dammini*).

### Where is Lyme Disease Found?

Lyme Disease occurs over wide areas of the United States, but particularly along the east coast. It was first recognized in the U.S. in 1975 as the result of an investigation of a group of children with arthritis in Lyme, Connecticut. The disease is most likely to be transmitted between late May and early autumn, the peak activity period for ticks.

### How is Lyme Disease Transmitted?

The bacteria that cause Lyme Disease are acquired by juvenile ticks (larvae) through feeding on an infected animal, usually a mouse. At a subsequent stage in development (nymph), the ticks cling to vegetation in brushy, wooded, or grassy areas and transfer by direct contact to the skin of passing animals or humans. The bite of the infected tick can then transmit the bacteria to the new host. This transmission of the infectious organism appears to require that the tick be attached for at least 24 hours.

The Lyme tick is very small, no larger than the period at the end of this sentence. During its complex two-year life cycle, it can infect a variety of hosts including white-footed mice, deer, and possibly other animals as well as humans.

**It is important to note that not all ticks carry Lyme Disease,** and even a Lyme tick bite does not necessarily mean that the disease will follow. Prompt removal of a tick will lessen chances of disease transmission.

### What Are the Symptoms of Lyme Disease?

**Early:** The first symptom of Lyme Disease is usually—but not always—a skin rash called *erythema chronicum migrans*. While the tick may go undetected, the rash occurs at the site of the bite. It begins as a small red area three to 32 days after the bite, then gradually enlarges, often with partial clearing in the center so it resembles a donut. There may be multiple secondary lesions, occasionally described as burning or itching.

Other skin signs include hives, redness of the cheeks and under the eyes (malar rash), and/or swelling of the eyelids with reddening of the whites of the eyes. Skin signs may be accompanied by flu-like symptoms such as fever, headache, stiff neck, sore and aching muscles and joints, fatigue, sore throat, and swollen glands.

These symptoms may disappear on their own over a period of weeks. However, the rash may recur in about 50 percent of untreated people, and more serious problems may

## *Lyme Disease — continued*

develop later. Treatment with appropriate antibiotics clears up the rash within days and may prevent complications.

**Late:** Three major organ systems—the joints, nervous system, and heart—can be affected weeks to months after the initial tick bite, although symptoms usually appear within four to six weeks. A small number of people with Lyme Disease may develop symptoms during later stages without having had the early skin rash.

Arthritis in the large joints, primarily the knee, elbow, and wrist, occurs in as many as 60 percent of untreated persons. The arthritis can move from joint to joint and can become chronic.

Neurological complications occur in 10 percent to 20 percent of infected persons. The most common symptoms include severe headache and stiff neck (aseptic meningitis), facial paralysis or other cranial nerve palsies, and weakness and/or pain in the extremities or chest (radiculoneuritis). These symptoms can persist for weeks, often fluctuate in severity, and may respond to intravenous antibiotics.

Heart symptoms occur in 6 percent to 10 percent of infected persons. Electrical conduction in the heart may be affected and the heart muscle may become inflamed (myocarditis).

### **How is Lyme Disease Diagnosed?**

Diagnosis is based primarily on recognition of the typical symptoms of Lyme Disease, such as the characteristic skin rash, in a person who lives in or has visited a high-risk area. Atypical cases, or cases with only later stage complications, are difficult to diagnose and may require a blood test for antibodies to the causative bacteria. DPH (Massachusetts Department of Public Health) offers free antibody testing when requested by physicians for diagnosis of such cases. It should be noted that during early stages, this blood test can be negative even though the disease is present; only in later stages does the test become reliable.

### **What is the Treatment for Lyme Disease?**

Oral antibiotic treatment is beneficial early in the illness, and tetracycline appears to be the most effective drug. Penicillin is the drug of choice for children under seven years, however, because tetracycline can stain the enamel of developing teeth. For penicillin-allergic persons, erythromycin can be substituted although it may be less effective. **Prompt treatment of early symptoms may prevent later and more serious problems.**

### **How Can Lyme Disease Be Prevented?**

The only known way to get Lyme Disease is from a bite from an infected tick. Knowing where these ticks are found, avoiding such areas, and (if bitten) promptly removing the tick are the primary preventive measures.

Source: Massachusetts Department of Public Health

# **Accessibility Information**



## **Accessibility Information**

Many Park facilities and services are accessible to disabled visitors. The following information on accessibility will help you to plan a visit.

For answers to specific accessibility questions, stop in at either Visitor Center or at Park Headquarters. All three have accessible parking and restrooms; all are ramped. For pre-visit information, call one of the numbers listed below or write to Cape Cod National Seashore, Marconi Site Road, Wellfleet, MA 02667.

### **Salt Pond Visitor Center**

|                |                                |
|----------------|--------------------------------|
| U.S. Highway 6 | Open daily, 9 a.m. - 4:30 p.m. |
| Eastham        | (extended hours in summer)     |
| 1-508-255-3421 |                                |

### **Province Lands Visitor Center**

|                 |                                                       |
|-----------------|-------------------------------------------------------|
| Race Point Road | Open daily April through November, 9 a.m. - 4:30 p.m. |
| Provincetown    | (extended hours in summer)                            |
| 1-508-487-1256  |                                                       |

### **Park Headquarters (Administrative Offices)**

|                 |                                                |
|-----------------|------------------------------------------------|
| Marconi Area    | Open Monday through Friday, 8 a.m. - 4:30 p.m. |
| South Wellfleet | all year                                       |
| 1-508-349-3785  |                                                |

## **FACILITIES AND PROGRAMS**

### **FOR VISION IMPAIRMENTS**

Please request the free large print version of the official Park folder. It provides general information on Park features, visitor facilities and safety. Ask about Ranger talks, guided walks and other accessible programs that may be available at the time of your visit. A touch-and-feel box with shells and other objects is located at each Visitor Center.

### **Trails**

The Buttonbush Trail, adjacent to Salt Pond Visitor Center in Eastham, is designed for the visually impaired. This one-quarter mile trail has a guide rope and features trailside labels in Braille and large type. The Park's free folder about self-guiding trails is in large print.

## ***Accessibility Information — continued***

### **FOR HEARING IMPAIRMENTS**

A variety of publications may be obtained at Visitor Centers and at Park Headquarters. Audio programs about Park features are available at both Visitor Centers and at Park Headquarters.

#### **Films**

Park orientation films with open captioning can be seen on request on TV monitors located at Salt Pond and Province Lands Visitor Centers.

#### **Programs**

Ask about Ranger-guided activities which may be available during your visit. Many of these programs (such as trail walks and historic house tours) have written materials to which you can refer during the presentation.

#### **Trails and Exhibits**

Wayside exhibits with illustrations and text on natural and historical features are situated throughout the Park. Text folders or in-place panels accompany each of the Park's self-guiding nature trails. Labeled exhibits on natural and historical topics are located at both Visitor Centers and at Park Headquarters.

### **FOR MOBILITY IMPAIRMENTS**

You can obtain information regarding accessibility to specific Park features or programs at either Visitor Center, or at Park Headquarters. Ask about accessible programs and alternatives that may be available during your visit.

#### **Beaches**

Herring Cove Beach in Provincetown provides the best access for you. This facility offers accessible parking that fronts on the beach. In July and August, this beach offers accessible restrooms and changing facilities. Its specially-designed showers can accommodate wheelchairs. Coast Guard Beach in Eastham provides accessible restrooms May through September and a ramp from the parking area to the beach (check with Salt Pond Visitor Center or Park Headquarters for details). At Nauset Beach, the Town of Orleans provides level boardwalk access and accessible parking and restrooms in summer. Several town-managed beaches on Cape Cod Bay offer relatively level access. Check with town recreation departments for details.

#### **Overlooks and Vista Points**

Many accessible parking areas provide spectacular views or other vistas. These include: Fort Hill, Nauset Light Beach, Great Island, Highland Light, and Pilgrim Heights.



## ***Accessibility Information — continued***

### **Trails**

Park trails in several locations have been surfaced to accommodate wheelchairs. These include the Red Maple Swamp Trail (through the heart of a red maple swamp); the Doane Rock Area (a half-mile loop trail with accessible restroom and picnic sites); the Marconi Station Site (exhibits and ocean vista); the historic Old Harbor Life Saving Station at Race Point Beach (featuring a one-quarter mile accessible boardwalk through the dunes).

### **Water Access**

Because the shoreline constantly changes, there are no permanent ramps descending into the ocean at Cape Cod National Seashore facilities. In summer, the Park provides limited temporary surface treatments (such as portable ramps or mats) at beaches such as Herring Cove in the Province Lands and Coast Guard Beach in Eastham. Because of surf conditions, these temporary surfaces must stop short of the water. Town-managed piers and boat launching ramps may provide saltwater fishing access (check with town Harbormasters for details).

### **Food and Lodging**

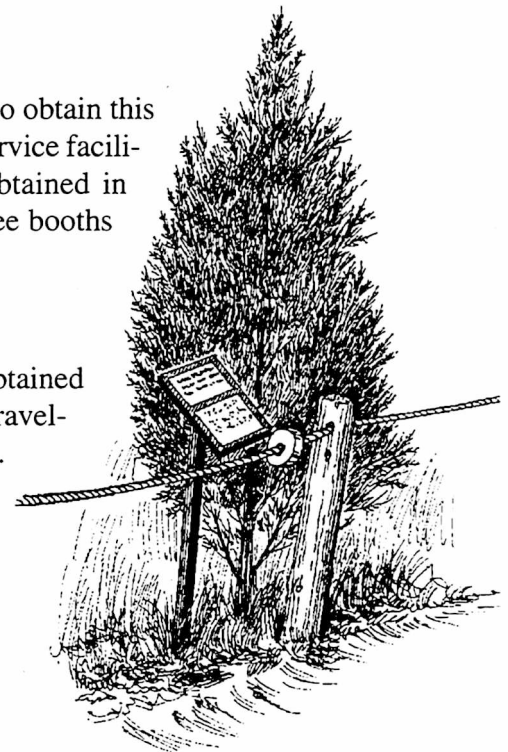
The Cape Cod Chamber of Commerce publication, *Where to Stay, Where to Dine and What to See*, lists hotels and restaurants on Cape Cod that provide facilities or services for disabled persons. To obtain it, call 1-508-362-3225 or write to the Cape Cod Chamber of Commerce, Hyannis, MA 02601.

### **Golden Access Pass**

Individuals with permanent disabilities are eligible to obtain this free pass, which permits them to enter National Park Service facilities without charge nationwide. This pass may be obtained in person at one of the Park's Visitor Centers, at beach fee booths in summer, or at Park Headquarters.

### **Parking**

Temporary permits for accessible parking may be obtained at either Visitor Center by physically disabled visitors traveling in vehicles without specially marked license plates.



# **Visitor Center Services**



## **Visitor Center Guidelines for Group Tours**

Things you and your tour group should know at Salt Pond Visitor Center in Eastham or at Province Lands Visitor Center in Provincetown

**Safety** of your group is our greatest concern. Please watch for steps, curbs, and moving cars. Tour leaders should know where emergency exits are located and have control over their group at all times.

At Salt Pond Visitor Center, **buses** may discharge and pick up passengers only at the designated "bus loading zone," not at the curb in front of the main entrance. Parking areas for buses also are designated. These regulations exist for safety reasons, and will be enforced by Park Rangers.

**Information Desks** at the Visitor Centers are staffed to answer questions for individual visitors. When the building is congested, tour-group participants should ask their questions of their tour leader, not the Park Ranger at the information desk.

**Maps of Cape Cod National Seashore** are not available free in quantity to groups. Maps may be purchased at Visitor Center bookstores for 25 cents per copy. Maps may also be ordered in advance, in bulk quantities at a reduced rate.

**A Twelve-Minute Orientation Movie** is shown at each Visitor Center. At Salt Pond Visitor Center the film is shown every thirty minutes on the hour and half-hour. Historical films are also shown at 1:30 p.m., 2:30 p.m. and 3:30 p.m. at SPVC daily.

At Province Lands Visitor Center a film is shown every hour on the hour. Either the orientation film or a historical film may be shown.

**Smoking, Food and Beverages** are prohibited within any portion of either Visitor Center. Please leave food and beverages on the bus. Smoking is allowed outside the building. Please do not let passengers dispose of their smoking materials on the ground. Use appropriate disposal bins.

**Golden Age Passports** are available at a cost of \$10.00 each. Since no fees are required to use any Cape Cod National Seashore facilities, except beach parking in summer, these passes are only needed for individuals who plan to visit other National Park Service areas on their own. **Golden Access** passes are available free to individuals with permanent disabilities.

**Other Rules, Regulations and Guidelines:** Please remind your group that picking flowers and feeding wildlife are prohibited. Please do not drop litter or other refuse on the ground or out of bus windows.

## *Visitor Center Guidelines for Group Tours — continued*

### SALT POND VISITOR CENTER

U.S. HIGHWAY 6

EASTHAM, MA

1-508-255-3421

#### Time to Allow

**Restroom** facilities are limited. When several buses arrive at once, there may be long waiting lines—especially for the women's restroom. Please forewarn your group.

Up to 30 minutes

An **Orientation Film** is shown every thirty minutes between 9:30 a.m. and noon, and at 1, 2, 3, and 4 p.m.

12 minutes

**Museum Exhibits** featuring the history and natural history of Cape Cod occupy their own wing of the building.

30 minutes or more

The **Bookstore** features an extensive variety of Park-related literature and thematic material. The nonprofit Eastern National Park & Monument Association operates the bookstore.

15 minutes

The **Buttonbush Trail** starts near the parking lot. It provides special features for the visually impaired (guide rope and Braille/large-lettered plaques).

30 minutes

The **Nauset Marsh Trail** starts near the Visitor Center terrace. It provides varied views as it traverses Salt Pond, Nauset Marsh and surrounding woods.

60 minutes

### PROVINCE LANDS VISITOR CENTER

RACE POINT ROAD

PROVINCETOWN, MA

1-508-487-1256

**Restrooms** are located at the side of the parking area. Tour groups are encouraged to use this facility as well as the restrooms in the Visitor Center to save time.

15 minutes

A **Film** is shown on the hour. Inquire for subject.

12 minutes

The **Lobby** contains exhibits and a bookstore operated by the nonprofit Eastern National Park & Monument Association.

30 minutes

The **Observation Deck** provides a panoramic view of spectacular sand dunes, the Atlantic Ocean, Cape Cod Bay, and the tip of Cape Cod. It is located on the second floor (twenty steps) at the Visitor Center.

10 minutes

# **Self-Guiding Nature Trails**



## **Cape Cod National Seashore Self-Guiding Nature Trails**

There are eleven self-guiding trails at Cape Cod National Seashore open year-round. Additional trail information leaflets are available at several trailheads. Plant identification numbers located along trails refer to a guidebook available at Visitor Center bookstores.

- Flat soled shoes are recommended. In hot weather, it is advisable to wear a hat and use insect repellent.
- Watch out for **poison ivy** and **ticks**. Stay in the center of trails. There are no poisonous snakes on Cape Cod.
- Wildflowers may not be picked. (Only fruit may be picked in the National Seashore.) Please, do not litter.
- Natural archeological features must remain undisturbed.
- Pets and bicycles are prohibited from all self-guiding trails year-round.

### **EASTHAM**

#### **Fort Hill Trail**

- Length: One and one-half miles. Allow at least one hour for the entire walk.
- Location: Turn off Route 6 at the brown Fort Hill sign on Governor Prentice Road in Eastham.
- Features: This trail crosses open fields, connects with the Red Maple Swamp trail, and offers spectacular vistas of Nauset Marsh and Nauset Spit as it loops back to its starting point.
- Conditions: Moderate walking difficulty; solid surface. Some log steps on slopes.

#### **Red Maple Swamp Trail**

- Length: One-half mile. Allow a minimum of one-half hour.
- Location: Entrances to this trail feed from the Fort Hill trail. (See Fort Hill Trail summary.)
- Features: Boardwalk sections of this trail loop through the heart of the Red Maple Swamp (which is wheelchair accessible from the Hemenway entrance). This setting is most colorful in the fall.
- Conditions: **Caution: Tree roots on footpath sections protrude above ground.**



## ***Self-Guiding Nature Trails — continued***

### **Buttonbush Trail**

- Length: One-fourth mile. Allow one-half hour (longer if blindfolds are used).
- Location: Adjacent to Salt Pond Visitor Center amphitheater; off Route 6 in Eastham; marked by brown signs.
- Features: This trail involves all the senses as it winds through forest, crosses over the Buttonbush Pond on a boardwalk bridge, and traverses formerly cultivated areas, while looping back to the starting point.
- Special  
Features: Guide rope, texts in Braille, and large print.
- Conditions: Easy; some log steps on second half of trail; moderate grade.

### **Nauset Marsh Trail**

- Length: One mile. Allow one hour to walk this trail leisurely.
- Location: Adjacent to the Salt Pond Visitor Center amphitheater, off Route 6 in Eastham.
- Features: This trail winds along the edge of Salt Pond and Nauset Marsh, crosses fields, and returns to the Visitor Center through a recovering forest. There are several spectacular vistas along the way.
- Conditions: Easy; some log steps; moderate grade. Use caution when crossing bicycle trail.

### **Doane Loop Trail**

- Length: One-half mile. Allow 45 minutes to complete this trail.
- Location: One mile east from Salt Pond Visitor Center in Eastham via Doane and Nauset Roads (leading to Coast Guard Beach), at the picnic area marked by brown signs.
- Features: This trail winds through an emerging pine and oak forest, and offers vistas of Nauset Marsh.
- Special  
Features: Paved wheelchair accessible loop trail.
- Conditions: Easy; wheelchair accessible grade. (Also good for strollers.)

## **WELLFLEET**

### **Atlantic White Cedar Swamp Trail**

- Length: One and one-fourth miles. Allow one hour to walk this trail.

## *Self-Guiding Nature Trails — continued*

- Location:** Turn east off Route 6 in South Wellfleet, at stop light, to Marconi Station Area. Follow brown signs to the Marconi Site and White Cedar Swamp.
- Features:** This award winning trail descends through a stunted oak and pine forest into a mature woodland, and then leads to a boardwalk that loops through the picturesque Atlantic White Cedar Swamp. The trail returns via historic “Wireless Road” (a sand road) to the starting location.
- Conditions:** Moderate difficulty; some steep stairs; return route is a half-mile in soft sand. The swamp portion of this trail is boardwalk.

### **Great Island Trail**

- Length:** Three miles, one way, to Jeremy Point overlook (eight miles round trip via tavern site route). Allow three to five hours to explore Great Island.
- Location:** From Route 6, follow green signs to Wellfleet center; turn left onto East Commercial Street (follow signs to town marina); continue along the shoreline from town pier via Chequesset Neck Road to the Great Island parking lot. Driving hint: Keep water view on your left after leaving Route 6.
- Features:** This is the National Seashore’s most difficult trail. It rambles along sandy stretches between the elevated heights of Great Island and Great Beach Hill. The higher elevations are punctuated with spectacular vistas which peek out from an emerging, even aged, pitch pine forest. Portions of the trail lead to a colonial era tavern site (no remains visible), while other sections skirt salt marsh embayments.
- Conditions:** The National Seashore’s most difficult trail; mostly soft sand. Some log steps. Portions are submerged at high tide. Head covering, sturdy footwear and drinking water are advisable. **Caution: Optional routes can be confusing. Do not attempt to walk to Jeremy Point if the tide is rising. Please, do not disturb natural or archeological features.**

## **TRURO**

### **Cranberry Bog Trail**

- Length:** One-half mile.
- Location:** Turn right (east) on North Pamet Road, Truro. Proceed a mile and a half. Trail begins at the parking lot below the Environmental Education Center (a Youth Hostel in the summer).
- Features:** This area was once an active cranberry operation, but was abandoned in the 1950’s. The area still retains many key characteristics for culti-

## *Self-Guiding Nature Trails — continued*

vating cranberries which can be seen along the pathway that leads through several former bogs.

Conditions: Easy; some log steps; moderate grade. Part of this trail is boardwalk.

### **Small's Swamp Trail**

Length: Three-fourths mile.

Location: Turn right (east at the Pilgrim Heights area sign). Walk begins at interpretive shelter.

Features: Farmers from Pilgrim times sought to make a living on the fragile Cape Cod landscape. Gradually the soil gave out, but eventually, the abandoned landscape began to recover. Here, the forest hides most, but not all, of the former land uses in this area.

Conditions: Easy; many log steps; steep grade.

### **Pilgrim Spring Trail**

Length: Three-fourths mile.

Location: Interpretive shelter, Pilgrim Heights area. Path leads to site of spring where Pilgrims may have drunk their first water in New England.

Features: This short loop trail winds through the recovering pine and oak forest, and passes a representative site which commemorates the Pilgrims' initial exploration of this area.

Conditions: Easy; some log steps; moderate grade.

## **PROVINCETOWN**

### **Beech Forest Trail**

Length: One mile.

Location: Turn right (north) at traffic light on Race Point Road. Proceed about 1/2 mile to the Beech Forest parking lot on the left side of the road.

Features: This trail provides walkers an in-depth journey into the heart of a picturesque beech forest. The trail skirts the shallow Beech Forest Pond, and hugs dunes that are gradually engulfing part of the forest.

Conditions: More difficult; steep log steps; mostly soft sand.

# **Park Regulations and Background**



## **General Information: Cape Cod National Seashore**

Cape Cod National Seashore, a unit of the National Park system of the Department of the Interior, was authorized by Act of Congress, Public Law 87-126, approved August 7, 1961, by President John Kennedy. Comprised of some 44,600 acres, 27,700 acres of which are in land area, the area stretches for forty miles along the shoreline of the "Great Beach" of Cape Cod from Chatham to the tip of the Cape at Provincetown. Extending across the Cape in the towns of Wellfleet and Truro, it covers fourteen miles of the most interesting shoreline on Cape Cod Bay.

A movement for the establishment of the Cape Cod National Seashore began in 1939 following a survey of the Atlantic coast by the National Park Service. Massachusetts agencies joined the National Park Service in recommending that the great outer beach of Cape Cod be established as a public seashore, but lacking sufficient support, the movement failed. Again in 1953, the National Park Service made another survey of the Atlantic and Gulf coasts, and in 1955, issued the report, "Our Vanishing Shoreline." This report described the rapid wave of development spreading along the seacoasts. It also pointed out that the Outer Cape was the *most outstanding undeveloped shoreline along the Atlantic Coast*. Farsighted people in the state and throughout New England, who loved the Cape, joined in the movement to protect this area from the wave of development that had swept other similar areas.

During the six years after 1955, the National Seashore proposal was a matter of great controversy in the six towns adjacent to the area. County, state and federal officials joined the towns in lengthy discussions, and leading New England newspapers became interested in the project. *The Cape Codder*, published in Orleans, continued to support the proposal until it was authorized by Congress. From 1955 to 1961 Arthur T. Lyman, Francis W. Sargent, and Charles H. W. Foster, as Commissioners of the Massachusetts Department of Natural Resources, represented the Commonwealth in strong support of the Seashore. Francis Sargent continued this support as executive director of the Outdoor Recreation Resources Review Commission.

### **Highlights of Public Law 87-126**

The Act authorizing the Cape Cod National Seashore also authorized the sum of \$16,000,000 to purchase the privately-owned lands within the area. In addition, a bill was passed during the closing days of the 1962 Massachusetts Legislature to convey state-owned lands within the boundaries of the National Seashore to the National Park Service. So, the original core of the park consisted of the Province Lands, Pilgrim Springs State Park and Camp Wellfleet, a former Army Reserve Training Camp. There also existed 2,240 acres of town-owned land within the park boundaries. This land was exempt from condemnation, but could be donated to the National Seashore, or

## *General Information — continued*

exchanged for other land. Since 1962, an additional \$17,500,000 has been appropriated by Congress for land acquisition, or a total of \$33,500,000. All has been used.

Because of the complexity of the project, the land acquisition program started slowly, and has not yet ended. Cape Cod was a most complicated area in which to set aside a public reservation of the magnitude recommended because of the settlement which had preceded its creation. Today, there are still approximately 550 residential and ten commercial properties within the boundaries, encompassing some 1,560 acres.

Congress intended that those structures built after September 1, 1959 would be acquired. However, the Act made provisions for the continued private ownership of dwellings built before September 1, 1959. Such property may be retained indefinitely, provided the affected towns adopt zoning bylaws conforming to standards recommended by the secretary of the Department of Interior to preserve the area. All Seashore towns have now done so; therefore, those homeowners may keep their homes, sell them, or pass them on to their descendants. All other lands over and above the minimal acreage retained with dwellings are considered unimproved lands and are subject to acquisition for inclusion in the National Seashore.

Future land acquisition has as its priority the remaining undeveloped land and improved properties that do not comply with the zoning standards. Improved properties will not be acquired unless they are *essential* to complete Park development that provides for visitor use. Otherwise, any Park development must be done in such manner that...*will not diminish for its owners or occupants the value or enjoyment of any improved property located within the Seashore.*

Land acquisition is handled through negotiations between the Park Service Land Acquisition Office and the landowners. All property is appraised at its fair market value by contract appraisers.

Also guided by the enabling legislation, the secretary of the Department of Interior established a ten-member advisory commission composed of representatives from the six Seashore towns and the county, state and federal government who provide advice on major policy matters and all major development plans. The commission meets about six times annually at Seashore headquarters.

Cape Cod was the Pilgrims' first landfall in the New World, and in later years, it harbored many of New England's famed fishing and whaling fleets. The primary purpose of Cape Cod National Seashore is to preserve henceforth for public enjoyment the scenic, scientific and historic features and the landscape of settlement that existed here. To the people of Cape Cod, whose livelihood depends upon an economy springing from the Cape's natural recreation resources, this means insurance for the future. And to the people of the nation, this means that a source of peace and inspiration, fast disappearing elsewhere, will always be available here, becoming more meaningful to each succeeding generation.





## **Park Regulations and Background**

### **Camping**

There are no government-operated campgrounds at Cape Cod National Seashore. Camping is not permitted within the Seashore except at the designated privately-operated campgrounds listed below:

|                                          |                                                                              |
|------------------------------------------|------------------------------------------------------------------------------|
| <u>Atlantic Oaks RV Park</u>             | Route 6, Eastham, MA 02642<br>Phone: 1-800-332-2267                          |
| <u>Coastal Acres Camping Court, Inc.</u> | West Vine St. Ext., Provincetown, MA 02657<br>Phone: 1-508-487-1700          |
| <u>Dunes' Edge Campground</u>            | Route 6, Provincetown, MA 02657<br>Phone: 1-508-487-9815                     |
| <u>Horton's Camping Resort</u>           | 71 South Highland Rd., North Truro, MA 02652<br>Phone: 1-508-487-1220        |
| <u>Maurice's Campground</u>              | Route 6, South Wellfleet, MA 02663<br>Phone: 1-508-349-2029                  |
| <u>North of Highland Camping Area</u>    | Head of the Meadow Rd., Box 297, N. Truro, MA 02652<br>Phone: 1-508-487-1847 |
| <u>North Truro Camping Area</u>          | Box 365, North Truro, MA 02652<br>Phone: 1-508-487-1847                      |
| <u>Paine's Campground</u>                | Old County Rd., So. Wellfleet, MA 02663<br>Phone: 1-508-349-3007             |

A large, state-owned campground is located in nearby Brewster, MA, at Nickerson State Forest Park. Phone: 1-508-896-3491. Reservations are accepted at this campground.

In addition to the above camping areas, there are others in towns adjacent to the Seashore. Information, including addresses and information on the varied camping facilities available on Cape Cod, may be obtained from the Cape Cod Chamber of Commerce, Hyannis, MA 02601. Reservations should be made well in advance for July and August dates.

### **Fishing**

Fishing at Cape Cod National Seashore is in accordance with federal, state and local laws.

#### Freshwater Fishing

Rainbow and brook trout and warm water sport fish live in a number of freshwater ponds within the Seashore area.

## ***Park Regulations and Background — continued***

### Saltwater Fishing

Surf casting for saltwater fish is a popular sport on Cape Cod. Fishing seasons run generally May through October for the below listed species:

Striped Bass    Bluefish    Mackerel    Cod    Flounder    Fluke

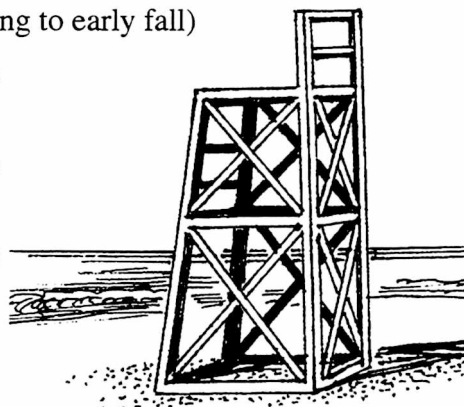
Massachusetts licenses are required for freshwater fishing and lobstering. Saltwater fishing licenses are required only if the fish are sold commercially. Town permits are required for the taking of shellfish. Overnight parking permits for night fishing at beach parking areas are required and may be obtained from Rangers at the respective areas. Information on shellfishing may be obtained at the Town Hall in the respective town concerned.

More detailed information on fishing is available from the Cape Cod Chamber of Commerce, Hyannis, MA 02601. Phone: 1-508-362-3225

### **Swimming**

Lifeguard services are provided at the below-listed beaches from 9:00 a.m. to 5:00 p.m. seven days a week from late June through Labor Day.

| <u>Beach</u>                            | <u>Facilities Available</u> (spring to early fall) |
|-----------------------------------------|----------------------------------------------------|
| Coast Guard Beach<br>Eastham            | Restrooms & Bathhouse                              |
| Nauset Light Beach<br>Eastham           | Restrooms & Bathhouse                              |
| Marconi Beach<br>South Wellfleet        | Restrooms & Bathhouse                              |
| Head of the Meadow Beach<br>North Truro | Restrooms                                          |
| Herring Cove Beach<br>Provincetown      | Restrooms, Bathhouse and Concession Stand          |
| Race Point Beach<br>Provincetown        | Restrooms & Bathhouse                              |



### **Water and Air Temperatures**

The outer beach of Cape Cod is bathed by the chilling Labrador current with cool water temperatures prevailing at most times. Comparative data taken at various swimming beaches is listed below:

## ***Park Regulations and Background — continued***

| <u>Beaches</u> | <u>Nauset</u> |          | <u>Coast</u> |          | <u>Marconi</u> |          | <u>Race</u>  |          | <u>Head of</u> |          | <u>Herring</u> |          |
|----------------|---------------|----------|--------------|----------|----------------|----------|--------------|----------|----------------|----------|----------------|----------|
|                | <u>Light</u>  |          | <u>Guard</u> |          |                |          | <u>Point</u> |          | <u>Meadow</u>  |          | <u>Cove</u>    |          |
|                | <u>W</u>      | <u>A</u> | <u>W</u>     | <u>A</u> | <u>W</u>       | <u>A</u> | <u>W</u>     | <u>A</u> | <u>W</u>       | <u>A</u> | <u>W</u>       | <u>A</u> |
| <u>July</u>    |               |          |              |          |                |          |              |          |                |          |                |          |
| Avg. Temp.     | 56            | 73       | 60           | 77       | 59             | 72       | 64           | 71       | 58             | 71       | 61             | 71       |
| Max. Temp.     | 61            | 81       | 62           | 82       | 66             | 75       | 66           | 80       | 63             | 82       | 68             | 81       |
| Min. Temp.     | 53            | 65       | 54           | 66       | 47             | 66       | 57           | 64       | 56             | 65       | 54             | 65       |
| <u>August</u>  |               |          |              |          |                |          |              |          |                |          |                |          |
| Avg. Temp.     | 57            | 72       | 54           | 72       | 56             | 73       | 60           | 73       | 59             | 72       | 63             | 74       |
| Max. Temp.     | 69            | 75       | 60           | 78       | 63             | 82       | 68           | 79       | 63             | 77       | 67             | 79       |
| Min. Temp.     | 51            | 56       | 51           | 68       | 53             | 67       | 56           | 64       | 59             | 61       | 50             | 64       |

A water temperature of 45 degrees is very cold water. Fifty-five to 60 degrees is reasonably comfortable for hardy bathers. Water temperatures at the above areas can change 5 to 10 degrees in a matter of an hour or two. Water temperatures at Herring Cove beach run a few degrees warmer as it is on the bayside of the Cape. Usually there is no surf at this beach.

### **Surfing**

Special surfing areas are located at Marconi Beach in South Wellfleet and Head of the Meadow in Truro, with a lifeguard in attendance from 9:00 a.m. to 5:00 p.m. daily (late June through Labor Day). Surfing is also allowed off the protected beaches in other areas of the Seashore.

### **Fires**

Open fires are prohibited except for cooking purposes. Campfire permits must be secured. Permits are not required for stoves or grills using gas or other manufactured fuel or for charcoal grills when these are used in designated picnic areas or on sandy or rocky beaches bordering tidewater. Fires are not permitted on protected bathing beaches.

### **Hunting**

Hunting is permitted at Cape Cod National Seashore in accordance with state regulations. A Massachusetts hunting license is required and a Federal waterfowl stamp if hunting for migratory waterfowl.

Certain areas in the vicinity of nature trails and public use facilities are closed to hunting for safety reasons. These areas are posted on the grounds and shown on maps available upon request.

## ***Park Regulations and Background — continued***

### **Weather**

|                | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Avg. day temp. | 24         | 30         | 42         | 48         | 58         | 63         | 69         | 73         | 62         | 55         | 48         | 36         |
| Max. temp.     | 51         | 47         | 56         | 80         | 82         | 83         | 98         | 89         | 86         | 73         | 75         | 43         |
| Min. temp.     | 14         | 11         | 24         | 44         | 37         | 43         | 54         | 51         | 40         | 31         | 25         | 27         |

### **Horseback Riding**

Marked bridle paths are located in the Province Lands area near Provincetown. Mounts may be secured at nearby rental stables. A map of the bridle paths is available on request.

### **Fee Collections**

Fees are collected from late June through Labor Day from 9:00 a.m. to 5:00 p.m. at protected beaches (free to holders of Golden Eagle, Golden Age, and Golden Access passes):

Herring Cove, Provincetown

Head of the Meadow, North Truro

Nauset Light, Eastham

Race Point, Provincetown

Marconi Beach, South Wellfleet

Coast Guard Beach, Eastham

### **Oversand Vehicles**

Sand routes are located in the Truro-Provincetown area. Annual registration permit stickers must be obtained at the Race Point Ranger Station, Race Point Beach, Provincetown.

Vehicles are subject to inspection and a permit must be obtained before entering the oversand routes. Further information on equipment required, etc. is available on request.

Additional information on services, accommodations, and facilities available in or near Cape Cod National Seashore may be obtained from the Cape Cod Chamber of Commerce, Hyannis, MA 02601. Phone: 1-508-362-3225.



## **Five Million Visits a Year**

*There is something about the sea that has captured the imagination of man, and those who are drawn to its shores inevitably seek to understand the bizarre life forms encountered there. Few places on earth have more abundant life than coasts and few are more varied than America's North Atlantic coast, which extends from Cape Cod north to Newfoundland.*

MICHAEL AND DEBORAH BERRILL

About one-fourth of its visitors respond to Cape Cod National Seashore as Professor and Mrs. Berrill have.

Situated 100 miles from Boston and 290 miles from New York City, Cape Cod National Seashore hosts five million visits per year. About half of these occur between mid June and Labor Day. These midsummer masses come mainly to enjoy Cape Cod's relatively warm, pollution-free waters and its vast expanses of sandy beaches—which are rare further north. For many people, a Cape Cod vacation is an annual or even a more frequent event, often built around a favorite beach activity—sunning, surfing or fishing.

Those who utilize interpretive services, though a minority, are nonetheless numerous. From April to November each year, more than three-quarters of a million people visit the Seashore's two Visitor Centers. They constitute an important group since many are first-time visitors to Cape Cod. Each year, up to one and a quarter million people walk the Seashore's ten self-guiding interpretive trails and view its four dozen wayside exhibits. Each summer, more than 100,000 people attend conducted walks or evening programs.

Five interpretive themes identify the Cape Cod National Seashore:

- **Cape Cod's natural systems and processes:** Glacial origins and landforms; seasonal change; Cape Cod ecosystems—forest, marsh and coastal sea; and the natural history of Cape Cod plants and animals.
- **The sea's effect on the land:** Erosion of Cape Cod; waves and beach processes.
- **Human's effect on the land:** Wampanoag Indian alteration of the land; colonial settlement; transportation and utilities on pre-petroleum Cape Cod; pre-industrial agriculture—cranberries; sheep raising; and resource management by the seashore.
- **The sea's effect on humans:** Pilgrim voyages; whaling; historic and modern commercial fishing; salt production; shipwrecks; lighthouses, and sea resources; transatlantic communications (cable and wireless); and ocean recreation—swimming, surfing, boating and fishing.
- **Responses to Cape Cod through the arts and humanities:** Colonial music, Cape Cod architecture, painters and writers.

All coastal parks share these five themes or have equivalents of them. The distinctive Cape Cod manifestations of these themes are all cultural: the Pilgrims' first landfall

## *Five Million Visits a Year — continued*

(November 15, 1620—a month before landing at Plymouth Rock), Marconi's wireless, the architectural style called the Cape Cod house, and the Cape Cod books authored by Henry Beston and Henry David Thoreau.

Cape Cod shares its natural features and phenomena with many other coastal localities. The dramatic shoreline retreat of up to three feet a year stems from rising sea level and prevails in some degree the entire length of the Atlantic seaboard. Interpreting the erosion of the shores of outer Cape Cod helps visitors comprehend the futility of efforts to stop this inevitable consequence of rising sea level. The Seashore itself experienced this process with the destruction of a bathhouse and parking lot in a February 1978 storm.

Dune stabilization and tern management typify park management concerns that depend on coordinating interpretation with law enforcement, resource management, and maintenance efforts to achieve a Park goal.

### **A Land Levelled**

When the Pilgrims first explored Cape Cod in 1620, the land was 97 percent forested, even though the Wampanoag Indians had lived here for thousands of years. European settlement, with its woodcutting and stock grazing, soon denuded much of the Cape. In the Province Lands, eight square miles of dunes (one-sixth the total land area of the National Seashore) were laid bare and began to move before the wind. The long-term goal of the National Park Service is to restore part of the vegetation and hence to restore the stability of dunes which today continue to encroach upon adjoining forests and at times to cover adjacent roads.

Loss of tern nesting sites and mortality of young due to foot traffic, vehicle traffic and other human disturbances have been a growing concern along the entire seaboard for more than ten years.

Tern protection and dune stabilization share similar techniques. In both cases, the sites involved must be closed to vehicles and foot traffic. Signs, and at some locations fencing, mark off the perimeter of each site. Through publications and talks featuring the programs, and through informal, on-site visitor contact, interpreters act as advocates for the programs. Their objective is to foster visitor acceptance built on an understanding of the purpose of these actions.

Preserving Cape Cod's terns, restoring its dunes, and awakening visitors to the inevitability of shoreline retreat all strongly warrant advocacy positions by Park interpreters. These are among the most important of the many elements of Cape Cod National Seashore's interpretive program.





## **Land Ownership within Cape Cod National Seashore**

Cape Cod National Seashore was authorized by Congress on August 7, 1961 (Public Law 87-126) providing an area of more than 43,000 acres to be set aside for conservation and preservation purposes. An act to provide for the establishment of Cape Cod National Seashore provides that no development for the convenience of visitors shall be undertaken that would be incompatible with the unique flora and fauna. However, Congress also provided for the retention of private residences within the authorized boundary. Also, the right of the individual towns comprising the Seashore to retain town-owned land was protected by Congress. Each of the towns—Provincetown, Truro, Wellfleet, Eastham, Orleans and Chatham—continues to own undeveloped land, roads, parking areas, beaches and other facilities within the Seashore boundary.

### **Ownerships Within the National Seashore as of December 1993**

|                                     |                     |
|-------------------------------------|---------------------|
| Seashore, Fee title                 | 27,052 acres        |
| Scenic easement held by Seashore    | 346 acres           |
| Private land                        | 1,610 acres         |
| Public (state, town, other federal) | <u>14,561 acres</u> |
|                                     | 43,569 acres        |

Private land improved with a one-family dwelling prior to September 1, 1959, may continue in private ownership. There are approximately 600 developed parcels of private property scattered throughout the Seashore, primarily within the towns of Eastham, Wellfleet and Truro. The Act providing for the establishment of the Seashore exempted "improved property" for acquisition by condemnation. The term "improved property" means a detached, one-family dwelling the construction of which was begun before September 1, 1959, together with...the land on which the dwelling is situated...(Public Law 87-126). The authority to acquire developed property was suspended in accordance with the Act when each of the towns within the Seashore adopted a zoning bylaw that met standards approved by the Secretary of Interior. All six towns have accomplished this requirement. Commercial uses of private land are prohibited and existing commercial uses continue only with the issuance of a Certificate of Suspension of Condemnation of Commercial and Industrial Property issued to the property owner for a specific use and time period (usually five years). Ten certificates for commercial uses have been issued to commercial uses that preceded the establishment of the Seashore. Examples of the latter are Head of the Meadow Service Station, Outer Reach Resort Motor Lodge, Surf Side Colony, and The Beachcomber of Wellfleet.

### **Guidelines for Private Property**

Following considerable discussion between the Cape Cod National Seashore Advisory Commission (established by the Act), local town administrators, private property owners and government offices, use guidelines for private property were adopted on

## ***Land Ownership within Cape Cod National Seashore — continued***

August 8, 1985 as part of the Land Protection Plan for Cape Cod National Seashore. These guidelines provide examples of compatible and incompatible activities.

Examples of compatible activities include normal maintenance and upkeep with similar building materials, repairs and construction to comply with safety, building or sanitation codes, minor modifications to existing structures and outbuildings, replacement of roofing and siding, shoring up structures threatened by subsidence of soil, repair or replacement of utility lines, expansion of the existing dwelling not resulting in an increase of more than 50 percent of the previously enclosed livable area, and construction of accessory structures not exceeding 50 percent of the enclosed livable floor area of the single family residence.

### **Examples of incompatible activities:**

1. Subdivision, including splits in ownership or sell off of portions of the land, timbering, initiation of new uses affecting park resources, or intensification of current uses which may be detrimental to the Seashore purposes.
2. Alterations to existing structures or new construction having one or more of these characteristics: New, separate residences or new residences physically linked to the existing structure. Replacement of a major structure with one that is larger than its predecessor by more than 50 percent. Impairment of historical integrity of an identified historic structure.
3. Expansion of existing uses to a point where they cause damage to the scenic, cultural or natural resources of the area.
4. Conversion of noncommercial property to commercial uses.
5. Damage to natural, scientific, or cultural resources including topographic changes or disruptions of natural drainage patterns, or disturbance of natural vegetation or wildlife.
6. Creation of hazards that endanger the safety of Park visitors.
7. Major increase in commercial use or traffic at access or crossing points on interior Park roads which could result in hazardous conditions that may endanger the safety of Park visitors.

### **Questions Frequently Asked**

- Q Will the National Park Service (NPS) eventually take over ownership of all the land within the authorized boundary?
- A No. It was not the intent of Congress when establishing Cape Cod National Seashore to acquire all private and public land within the authorized boundaries. Also, Congress has not specifically provided funds to acquire improved property. The Seashore's purpose is adequately protected through the adoption of zoning bylaws by each of the towns within the Seashore that meet the standards for zoning approved by the Secretary of the Interior.

## *Land Ownership within Cape Cod National Seashore — continued*

Other land held in public ownership will probably remain in that category for the foreseeable future. Approximately 11,930 acres of submerged land are under the jurisdiction of the Commonwealth of Massachusetts and are managed in a manner consistent with Seashore objectives. Approximately 2600 acres are under the jurisdiction of local towns (Provincetown, Truro, Wellfleet, Eastham, Orleans and Chatham) and are currently managed in a manner consistent with Seashore objectives. The Truro Air Force Base is in the process of being transferred to National Park Service ownership.

Q How much time are private owners allowed to live in their houses after they have been purchased by the government?

A Structures that were built after September 1, 1959, do not qualify for “improved property” status as provided by Public Law 87-126. As the structures were acquired, provision to retain a “use and occupancy” for a term of years was offered by the National Park Service to reduce the cost of purchase. Terms of life tenancy or 25 years (whichever was determined to be the maximum) were negotiated at the time of purchase. The majority of these “use and occupancy” agreements expire prior to the year 2000.

Q What percentage of the houses within the Seashore was involuntarily taken over by the government through condemnation?

A One structure constructed after September 1, 1950, was acquired through the eminent domain process. All other improvements constructed after September 1, 1959, were acquired through the willing buyer/seller concept. The acquisition of developed property constructed before September 1, 1959, was negotiated through the willing buyer/seller concept.

Q What is the status of the Dune Cottages?

A Prior to the establishment of Cape Cod National Seashore, a number of dune cottages provided summer housing for people who desired to escape “civilization” for a period of time to pursue their work or relax in solitude. Approximately 25 cottages existed when Cape Cod National Seashore was established. The federal government received title to the Province Lands and Pilgrim State Park by donation from the Commonwealth without any incumbrances. Other private land was acquired by eminent domain in an attempt to resolve the dune cottage issue. Today, fifteen cottages remain occupied under agreement with the United States; one has “improved property” status and three have been leased under the National Park Service Historic Leasing Program. Access routes to cottages were designated as a part of the Off-Road Vehicle Management Plan. The Peaked Hill Trust, a private, non-profit enterprise, manages four cottages that are subject to use and occupancy agreements with the National Park Service. On May 12, 1989, the Keeper of the National Register determined that the “Dune Shacks of Peaked Hill Bars Historic District” are eligible for the National Register.

## *Land Ownership within Cape Cod National Seashore — continued*

Q Can new homes be constructed within the Seashore?

A Public Law 87-126 did not restrict the construction of new private residences within the Seashore boundary. However, it was not the intent of Congress to permit additional construction on undeveloped land. The federal government would initiate acquisition proceedings if new construction was undertaken on undeveloped parcels of land to prevent destruction to the environment. Approximately 73 structures built between 1959 and 1961 (prior to the establishment of Cape Cod National Seashore) have been acquired.

Q Can existing dwellings be enlarged?

A Any expansion to existing structures must meet the requirements of local and/or state zoning and building codes. Also, any construction within areas under the jurisdiction of the Massachusetts Wetland Conservation Act or Massachusetts Coastal Zone Management must be in compliance with those regulations. In addition, all towns comprising the Seashore have adopted zoning that meets standards approved by the Secretary of the Interior as required by Section 5 of Public Law 87-126. Finally, Use Guidelines for private property (appendix B) were adopted as a part of the Land Protection Plan for Cape Cod National Seashore on August 8, 1985. These guidelines provide for enlargement of the existing residence by approximately 50 percent in addition to that which existed on September 1, 1959. Accessory structures such as a garage, barn, or studio may also be constructed provided they do not exceed 50 percent of the total livable floor area of the single family residence.

Q Is there any undeveloped land that is not federally owned within the Seashore boundary?

A The Land Protection Plan identified 25 parcels containing approximately 82 acres of undeveloped land varying in size from 0.10 acre to 30 acres. These parcels have been identified as the third priority for acquisition.



## **Facts and Figures: Cape Cod National Seashore**

**Date Established:** August 7, 1961

**Acreage:**

|              |              |
|--------------|--------------|
| NPS          | 27,386       |
| Other public | 14,560       |
| Private      | <u>1,611</u> |
|              | 43,569       |

**Annual Visitation:** (average 1992-1996) 5,100,000

**Workforce:**

|                               |     |
|-------------------------------|-----|
| Permanent (authorized) (1996) | 72  |
| Other (1996)                  | 119 |

**Development/Facilities:**

- 25 hiking trails (25 miles)
- 3 bicycle trails (11 miles)
- 39 roads (23 miles)
- 23 parking areas
- 35 miles of fire roads
- 1 bridge
- 6 developed beaches
- 12 comfort stations and bath houses
- 2 visitor centers
- 3 picnic areas
- 47 administration and maintenance buildings
- 94 employee housing units
- 14 buildings maintained by concessionaires
- 13 historic structures listed on the National Register
- 24 septic systems
- 16 electrical power distribution systems
- 20 water systems

**Private Interests:**

|                                |     |
|--------------------------------|-----|
| Improved properties            | 616 |
| Use and occupancy reservations | 73  |
| Commercial certificates        | 10  |

Revised 1996

# **Additional Resource Options**

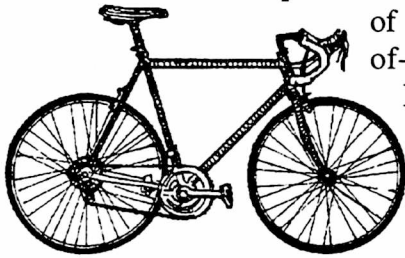




## **Outer Cape Cod Bicycle Trails**

There are four major paved bicycle trails located within the boundaries of Cape Cod National Seashore.

### **The Cape Cod Rail Trail**



The Cape Cod Rail Trail, managed since 1979 by the Massachusetts Department of Environmental Management, follows a former railroad right-of-way for nearly thirty miles through the towns of Dennis, Harwich, Brewster, Orleans, Eastham, and Wellfleet. The Rail Trail begins at Route 134 in South Dennis and ends at LeCount Hollow Road in South Wellfleet. With its smoothly paved surface, few hills, and well-marked automobile crossings, it is ideal for horseback riding, cyclists, walkers, and runners of all abilities and ages.

The Cape Cod Rail Trail passes through a wide variety of terrain—pine woods, salt marshes, cranberry bogs, and freshwater ponds. The ponds, which are common all over Cape Cod, are called “kettle ponds,” and provide potable water, wildlife habitat and recreation. Hinkley’s Pond, Long Pond and Seymour pond are just a few of the kettle ponds you will pass along the Rail Trail.

The trail takes you through many of the most common plant communities found on the Cape. These include white oak, black oak, pitch pine, black locust, bearberry, black cherry, bayberry, salt marsh grasses, wild roses and beach grasses.

Across Route 6A, the nature of the trail changes. You will leave behind the taller oaks and pines and enter a community dominated by salty air and coastal plants. As the trail heads north into Eastham and on into Wellfleet, it continues past several salt marshes, freshwater marshes, and freshwater ponds.

Cape Cod National Seashore operates *three* bicycle trails. A summary of features of each trail follows:

### **The Nauset Marsh Trail**

The length of the Nauset Marsh Trail is 1.6 miles, and may be accessed in Eastham at the Salt Pond Visitor Center parking area or the Doane Rock picnic area.

What a scene this was when the Nauset tribe lived upon the land! A bay rich with fish and shellfish was ringed with dome-shaped huts, and scattered through the forest were fields of corn and squash. Fragments of shells and hand-hewn rock still remain, the reminders of a past way of living.

## ***Outer Cape Cod Bicycle Trails — continued***

About 18,000 years ago, melting glaciers created this rolling hill and dale landscape. Rock, sand and fine sediment were washed here, and blocks of ice were buried—only to leave depressions as they melted. Forests then covered most of the land.

A century ago, this land was treeless from the excesses of settlement. Today, the fields near Salt Pond are dotted with eastern red cedar (a juniper) which are slowly covering traces of a golf course that operated until 1933. Yet these meadows will soon disappear as the oak-pine forest recovers.

The Nauset Marsh Trail is near Doane Memorial. Deacon John Doane settled here in 1644 as one of the seven original settlers of Nauset (Eastham).

### **The Head of the Meadow Trail**

The length of the Head of the Meadow Trail is two miles, and may be accessed in Truro at High Head Road and Head of the Meadow Beach parking areas.

In 1850, this was the overland route to Provincetown. The “Old Kings Highway” it was called, a name that in reality was not used until long after the Revolutionary War.

The trail lies along former headlands of Truro, which were once exposed to the open sea. These headlands were sheltered from wave action as the Provincetown spit began to extend northwestward, and a salt marsh and salt meadow gradually grew between the two land masses. Brackish water from the salt meadow now drains slowly into Pilgrim Lake, a lake that once opened to the sea on its northwest side. That opening was filled in 1869 to bring the railroad to Provincetown.

Close to the trail is Pilgrim Spring. In this vicinity in 1620, a small band of Pilgrims drank their first fresh water in the New World while exploring Cape Cod. Today, the trail skirts the former salt meadow, and offers glimpses of a variety of birds and other wildlife.

### **The Province Lands Trail**

The length of the Province Lands Trail loop is 5¼ miles. There are three spurs: Herring Cove Beach spur, 1 mile; Race Point Beach spur, ½ mile; and Bennett Pond spur, ¼ mile. All access points are in Provincetown: Beech Forest Parking Area, Province Lands Visitor Center, Race Point Beach Parking Area, and Herring Cove Beach Parking Area.

If 5,000 years ago a cyclist attempted to travel the Province Lands trail, it would have been a difficult task. This area was ocean! Since then, the land has slowly grown as waves gouged Truro’s coastline and carried sand northwestward. The spit is still lengthening at the rate of two-to four feet each year.

This is not a single extension of land. It is a succession of sand spits, each one built north of its predecessor. And so the land was enlarged into the fist of Cape Cod. Three of these former spits are crossed by the loop trail. The areas between these spit lines are now swales. The largest low area, where the airport lies, extends several miles northeast-

## *Outer Cape Cod Bicycle Trails — continued*

ward behind Hatches Harbor. These are ideal places for wild cranberries, a rich earth where fresh water is just below the surface and where plants are repeatedly covered with wind-driven sand (which favors cranberry productivity).

In a land of fierce winds the sand is blown and moved, piled high or abraded, unless it is stabilized with plant cover. Such is the history of this region. Thus, moving dunes partly obscured the original surface, and depressions were scoured in the ground. Later, these low areas held the shallow ponds of the Province Lands as the water table rose and intersected these dents in the earth.

Plant life is abundant near ponds, but the exposed dunes and wind-gnarled trees tell a story of more recent years of colonial settlement. Only with intensive planting has some of the forest returned. This ring of greenery, between the dunes and Provincetown, is a successful product of that effort early in this century to halt the advance of dunes before sand buried the fishing village. In time, and with more effort, more of the Province Lands may again be restored.

The Province Lands Trail is the most difficult of the Park bicycle trails. It is hilly, winding and has sharp curves.

### **Safety**

To insure the safety of all trail users, cyclists should observe the following guidelines:

**Keep to the right.**

**Ride in a straight line, single file.**

**Alert other riders if you are going to pass.**

**Wear bright, highly visible clothing, especially at dusk.**

**Wear protective head gear.**

**Stop and dismount at all stop signs.**

**Be sure young children are properly seated and fitted with helmets.**

**If you have an unfamiliar bike, check your brakes, gears and steering before entering a trail. There are steep grades, sharp turns and possibly obstacles.**

**Be alert for the unexpected (hikers, wet leaves, sand).**

**Don't speed!**



## Outer Cape Area Museums and Natural History Centers

A number of natural and historical support services and museum facilities are also available to groups touring Cape Cod National Seashore.

Educational groups visiting Cape Cod National Seashore may wish to arrange for additional outside services or activities. Most of these require a modest fee. A partial list follows:

Group visit to the **Massachusetts Audubon Refuge Wellfleet Bay Sanctuary** in South Wellfleet. Naturalist services both outside and within the Seashore boundary also available for a moderate fee. Special aquatic/boat programs. For further information call 1-508-349-2615. Admission fee.

Group visit to the **Cape Cod Museum of Natural History** in Brewster. Naturalist services both outside and within the Seashore boundary also available for a moderate fee. Special programs on marsh systems and marine mammals. For further information call 1-800-479-3867. Admission fee.

Contract naturalist services are available through the **Center for Coastal Studies**, Provincetown 1-508-487-3622.

A number of historical societies and museums also serve groups visiting the Outer Cape. These include:

The **Transatlantic Cable Museum**, operated by the French Cable Co. (now FTCC) from 1879 to 1959. See original equipment in operating condition here. This station was an important communications link between Washington and the American Expeditionary Force in France during World War I. It carried news of the Lindbergh landing in 1927. See also samples of new transatlantic fiber-optic cables TAT-9 and 10 which carry 80,000 simultaneous telephone calls each. Located at 41 Route 28, Orleans (corner of Cove Road and Route 28). Open seasonally 2-4 p.m. except Sunday and Monday. Museum phone: 1-508-240-1735. For off-hours appointment, phone: 1-508-255-1926. Admission is free.

The **Eastham Schoolhouse Museum**, directly across from the National Seashore Visitor Center, was built in 1869 as an elementary school and served that purpose until 1936 when its last pupils moved to a newer building. The museum displays objects from various facets of the town's history including farming, shipwrecks, the Life Saving Service, the school and daily life in the town. It is open during July and August, Monday through Friday from 1-4 p.m. Admission is free.

The **Swift-Daley House** is located on Route 6 next to the Eastham Post Office. Built in 1741, its bowed roof is typical of early houses built by ship's carpenters. The wide floor boards, paneling, deep fireplaces, and narrow stairways are other features of 18th century houses. The house is completely furnished, and its collections include examples

## *Outer Cape Area Museums and Natural History Centers — continued*

of period clothing, china, Native artifacts, quilts and household equipment. It is open during July and August, Monday through Friday from 1-4 p.m. Admission is free.

The **Tool Museum** is located behind the Swift-Daley House. It displays hundreds of tools, many unusual and unique to this part of the country. Open during July and August, Monday through Friday from 1-4 p.m. Admission is free.

The **Eastham Windmill** is located on the town green opposite the town hall on Route 6. It was built in the early 1680's, probably in Plymouth. In the 1770's, it was moved to Truro, and in 1793, to Eastham. The mill was moved to its present site about 1808, and is the only Cape Cod windmill still on a working site. The windmill is open 10 a.m. - 5 p.m. in the summer. Admission is free.

The **Wellfleet Historical Society Museum** on Main Street is open Tuesday through Saturday from late June to early September. Telephone number is 1-508-349-9157. The Wellfleet Historical Society was organized in 1951 to foster an interest in the town and its history. The public is invited to visit the museum, children under 12 are admitted free if accompanied by an adult. The society's collection includes old photographs, maps, documents, marine artifacts, Native American artifacts, period clothing, household, agricultural and commerce-related items. Special theme exhibits are planned for summer months. Admission fee.

**Truro Historical Society's Museum**, located in one of North Truro's best known landmarks, the old Highland House, contains an exciting collection of historic artifacts as well as a special room devoted to an important exhibit of work by the Society's founder and first president, the late Courtney Allen, nationally-famed artist and model maker. A visit to the museum affords fascinating insight into the everyday life of the past, from the time of the Pilgrims to the early days of this century, when electricity and paved highways were unknown to Truro. You may view seventeenth century firearms, shipwreck mementos, early fishing and whaling gear, household tools, farming implements, furniture, Sandwich glass, ship models and wonderful early toys. A pirate's chest, dresses brought home by the captain of a clipper ship, a cobbler's bench used by Cape Cod fathers to make their children's shoes—all may be seen along with documents from the War of Independence and a host of early photos of Truro scenes and people. The museum is located at the corner of Highland Road in North Truro near the Cape Cod Light, and is open seven days 10:00 a.m. to 5:00 p.m. during the summer months, with limited hours in the fall. Telephone number is 1-508-487-3397. Admission fee.

The **Pilgrim Monument** is an important historic landmark which was erected as a tribute to the Pilgrims' landing in Provincetown. President Theodore Roosevelt laid the cornerstone in 1907, and President Howard Taft dedicated the finished monument in 1910.

Today, the Pilgrim Monument is the tallest all-granite structure in the United States. It is 252 feet, 7½ inches tall and offers a beautiful vantage point from which to view the Cape. Enjoy a leisurely walk to the top on a ramp and step walkway and watch the view of Cape Cod expand as you near the top. At the top, you can see the entire "arm" of Cape Cod and,

## *Outer Cape Area Museums and Natural History Centers — continued*

on a clear day, the Boston skyline. Open daily in July and August, 9:00 a.m. to 7:00 p.m.; April, May, June, September and October, 9:00 a.m. to 5:00 p.m. Call 1-508-487-1310 for winter hours.

At the base of the Pilgrim Monument is the **Provincetown Museum**. The museum is an uncrowded way to learn about Cape Cod and Pilgrim history. Exhibits in the Pilgrim Wing recount the life and death events that marked the Mayflower's first landing and the Pilgrims' tentative explorations in this new land. The Provincetown Museum also has exhibits on seafaring history, the early days of Provincetown, the Provincetown Playhouse and Eugene O'Neill, and arctic explorer Donald MacMillan. One admission fee for both Pilgrim Monument and Provincetown Museum.

The **Provincetown Heritage Museum** was established in 1976 by the Town of Provincetown. It is located in the town's former Methodist church which was built in 1860, and is now a Registered National Landmark. It houses a growing legacy of the town's treasures: antique fire equipment, marine gear, artifacts of Provincetown, a 19th Century fishing village, and artwork that reflects the illustrious lineage of American artists.

On display is the half-scale model of the famous fishing schooner, *Rose Dorothea*, which won the Lipton Cup in 1907. This fore-and-aft rigged topsail fishing schooner was built under the supervision of master boat builder Francis "Flyer" Santos. At 64 feet long, this is the largest indoor boat model in the world. Also on display is the *Charlotte*, one of the last, once numerous trap fishing boats. Open daily in the summer, 10:00 a.m. to 6:00 p.m. Telephone number is 1-508-487-0666. Admission fee.

A bas-relief of the signing of the **Mayflower Compact** is located on Bradford Street in Provincetown, directly behind Town Hall. It depicts the signing of the "first American Act in our History." It was the beginning of democratic government and a first step toward the Declaration of Independence, signed 156 years later.







## **Monomoy National Wildlife Refuge**

Monomoy National Wildlife Refuge is located on the “elbow” of Cape Cod. The Refuge headquarters is located on Morris Island in Chatham. Most of the 2,750 acre Refuge is accessible by boat only, but a forty-acre Refuge containing one foot trail is located on the mainland. The Refuge is comprised of barrier beach islands of sand dunes, freshwater ponds and marshes, and saltwater marshes. Monomoy National Wildlife Refuge, along with seven other Refuges in Massachusetts and New Hampshire, is under the administration of the Great Meadows National Wildlife Refuge Complex.

### **Wildlife Events**

**Spring:** Wintering seaducks leave the Refuge for northern breeding grounds. Piping plovers arrive in April to establish nesting territories. Shorebirds, dressed in bright breeding plumage, use North Monomoy island during their northern migration. Terns and gulls form colonies and begin nesting.

**Summer:** Common terns defend their colonies fiercely. Hundreds of snowy egrets, and black-crowned night herons raise their young. Shorebirds’ southward migration is in full swing by August. Thousands of common and endangered roseate terns congregate to prepare for migration. The whimbrel, a large shorebird with a down-curving bill, can be easily observed in Refuge salt marshes.

**Fall:** Waterfowl return in large numbers. Hundreds of green-winged and blue-winged teal can be seen on Refuge ponds. Diving ducks such as ring-necked ducks, scaup, and canvasbacks can be seen in October and November. Thousands of common eiders, red-breasted mergansers, white-winged scoters, and brant arrive on the Refuge for the Winter months.

**Winter:** Seaducks remain abundant. Black ducks use saltwater and freshwater marshes heavily. Hundreds of harbor seals sun themselves on Refuge beaches and sandbars.

A complete list of the birds found on Monomoy National Wildlife Refuge is available.

### **Recreation**

Wildlife observation and photography, hiking, beach combing, shell and surf fishing, swimming, and picnicking are permitted on the Refuge. Most of the Refuge is a National Wilderness Area. **Please help us maintain the wilderness quality of the refuge.**

### **Closures**

Certain areas of the Refuge are closed to the public to protect wildlife from disturbance. The piping plover is federally listed as threatened and receives special management emphasis. Nesting and feeding areas are closed and nests are protected by fences.



## ***Monomoy National Wildlife Refuge — continued***

**Please respect these areas.** Each closed area is clearly posted. Endangered species need all of our cooperation.

### **Refuge Regulations**

- All local, state and federal laws apply while on the Refuge.
- No entry is permitted into areas posted as closed.
- No motorized vehicles of any variety.
- No pets, except on Morris Island from October 1 to March 30 and then on a short, hand-held leash.
- No fires, except those contained in small barbecue grills on the open beach.
- Refuge open from dawn to dusk, except twenty-four hour fishing on Morris Island only.

Before visiting Monomoy National Wildlife Refuge, contact the Refuge Manager for an update on seasonal closures, rules and regulations.

Monomoy NWR  
Morris Island  
Chatham, MA 02633  
Phone 1-508-945-0594

Great Meadows NWR  
Complex Headquarters  
Weir Hill Road  
Sudbury, MA 01776  
Phone 1-508-443-4661

Source: U.S. Fish & Wildlife Service



## **Stellwagen Bank**

Just a short distance north of Cape Cod exists a wonderland teeming with exotic creatures. Fish as flat as pancakes, shellfish with a hundred eyes, and whales that sing. Each year, thousands of people visit this place in order to glimpse the incredible life which is nurtured by this area. Like most fairy tale lands, this place is hidden. A traveler might pass right through its boundaries without realizing it. Beneath the blue surface of the Atlantic lays this wonderful place otherwise known as Stellwagen Bank.

### **The Bountiful Bank**

The twelfth National Sanctuary, Stellwagen Bank is located three miles north by northwest of Cape Cod. The sea water is only one hundred feet deep off this unusual rise in the ocean floor. Stellwagen Bank is situated in the mouth of Massachusetts Bay and largely influences the ocean currents, distribution of nutrients, and ecology of the Bay. Being one of the most biologically productive regions in the northeast, Stellwagen Bank supports a diverse population of fish, marine mammals, and invertebrates, in addition to many migratory species.

The National Oceanic and Atmospheric Administration manages the 842 square miles which make up Stellwagen Bank National Marine Sanctuary. Striking the correct balance between protection, research and commercial use is the primary function of the NOAA's management of this invaluable resource.

Stellwagen Bank was created between nineteen and fifteen thousand years ago, about the same time the last Ice Age or Wisconsin Ice Age was reshaping the area around Cape Cod. The eastern-most section of glacier, a sheet of ice and snow, reached the area which is now Martha's Vineyard, Nantucket and George's Bank. Material such as rock and soil was displaced by the glacier from northern New England and deposited at its eastern edge. As the climate increased, the glacier retreated northward, leaving behind newly formed Cape Cod, the Islands and Stellwagen Bank. The Bank was made up of the lighter material left by the glacier, such as sand, silt and gravel. Through the passage of time and the action of water currents, the finer sediment was redeposited in the deeper basins of the ocean. Today, the Bank is composed of coarse gravel and sand, with occasional rocky outcroppings.

### **Food Chain**

What makes Stellwagen Bank such an important resource is the vast amount of life which it supports. The Bank has two periods of peak productivity each year, when deeper water from Massachusetts Bay mixes with the shallower water over the Bank. These nutrients stimulate the growth of simple plant life called phytoplankton. These organisms, in turn, are eaten by microscopic animals or zooplankton. Small fish and invertebrates such as shellfish and worms are supported by this population and are thus

## *Stellwagen Bank — continued*

eaten by larger animals. Each creature, both dependent and depended upon, plays a significant role in the complex food web of Stellwagen Bank.

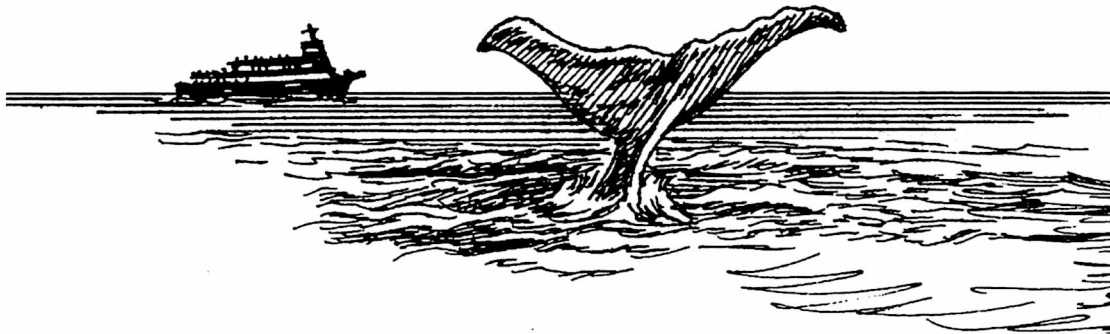
Historically, the prosperity of Cape Cod depends on the harvest of fish and other animals from its waters. Even its name reflects the importance of commercial fishing. The huge populations of fish on Stellwagen Bank made it a significant force in the growth of Cape Cod. Even today, fish are harvested from the Bank. Species important commercially are the bottom dwellers which include haddock, silver hake, pollock, ocean pout, summer, winter, witch, and yellowtail flounder. Lobster, sea scallops, ocean quahogs and squid are also abundant on Stellwagen Bank. Commercial fishermen aren't the only people fishing the Bank. It is popular among recreational fishermen seeking blue fin tuna and striped bass.

### **Whale Watching**

An entirely new industry has been created around a group of migratory visitors to Stellwagen Bank. Whale watching companies are flourishing on Cape Cod because these fantastic marine mammals travel to Stellwagen Bank to feed in its shallow waters. The most interesting species include the endangered northern right whale, the humpback whale and the fin whale. Many nonendangered marine mammals also frequent this area such as minke, pilot and orca whales. Harbor porpoise and assorted dolphins are additional attractions.

Whale watching may be the primary concern of most who travel to Stellwagen Bank, but there are many other creatures which add to the excitement of the trip. Harbor and gray seals travel through this area. Bird watchers won't be disappointed because they are likely to see any number of oceanic and migratory birds, including storm petrels, loons, gannets, phalaropes, terns and shearwaters. Endangered migrating species such as roseate terns and piping plovers are often sighted over Stellwagen Bank. A visitor may be extraordinarily lucky and spot a sea turtle. Endangered leather back, green, Kemp's ridley turtles, plus the threatened loggerhead turtle, provide an unforgettable experience when spotted.

Though it possesses qualities of a land straight out of a fairy tale, this place is available for the enjoyment of anyone willing to travel a few short miles. Either to be awed by the spectacular sight of endangered whales or to enjoy the sport of catching dinner, Stellwagen Bank is one place that should be on everyone's "must see" list during a trip to Cape Cod.



# Appendix



## **Some Confusing Cape Cod Words**

|                                   |                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Outer Cape</b>                 | The northeastern (forearm) of Cape Cod (synonymous with Lower Cape).                                                                                                                                                                                                                                                                                                                     |
| <b>Down Cape</b>                  | Going to the Outer Cape towards Provincetown. (From old sailing days—to go downwind, which tracked predominantly northward.                                                                                                                                                                                                                                                              |
| <b>Lower Cape</b>                 | The northeastern (forearm) of Cape Cod (synonymous with Outer Cape).                                                                                                                                                                                                                                                                                                                     |
| <b>Upper Cape</b>                 | The portion of Cape Cod closest to the Cape Cod Canal.                                                                                                                                                                                                                                                                                                                                   |
| <b>Mid Cape</b>                   | The center portion of Cape Cod.                                                                                                                                                                                                                                                                                                                                                          |
| <b>North &amp; South Highways</b> | Highways are divided into north or south, or east or west lanes. These refer to final destination points, not necessarily immediate compass direction. Route 6 is an east and west U.S. roadway. It terminates in the west in California and in the east at Provincetown. Route 28 is a north and south roadway. Its southern end terminates in Orleans.                                 |
| <b>Northeaster (No'theaster)</b>  | Storm or gale winds that blow onshore from a northeast direction. The storm itself, however, generally originates in the south and tracks northward along the eastern seaboard. Because such storms are of a cyclonic nature, the spinning pattern of wind associated with them hits shoreline destinations in a northeast trajectory. At times, these storms last for up to three days. |
| <b>Spring Tide</b>                | The monthly full and new moon high tides.                                                                                                                                                                                                                                                                                                                                                |
| <b>Marine Scarp</b>               | The glacial-origin cliff behind Outer Cape ocean beaches (not a dune). Also called a marine scarp because it is cut into by the ocean.                                                                                                                                                                                                                                                   |
| <b>Dune</b>                       | Sand deposits in large mounds, caused by wind action, generally held in place by beach grass. Dunes are different from glacial cliffs (or scarps).                                                                                                                                                                                                                                       |
| <b>Kettle Pond</b>                | Large, deep, generally round freshwater ponds. (Salt ponds are kettles which have been intersected by seawater.)                                                                                                                                                                                                                                                                         |
| <b>Cape Cod Cottage</b>           | A style of architecture noteworthy on the Cape with a central chimney and steep pitched roof.                                                                                                                                                                                                                                                                                            |



## Writers and Contributors

There are many others, not listed among the writers and contributors below, who helped in putting this manuscript together and who deserve the sincere thanks of the staff of *The Guide's Guide to Cape Cod National Seashore*.

|               |                                                             |                                                              |
|---------------|-------------------------------------------------------------|--------------------------------------------------------------|
| Guide-1.WP5   | Edison P. Lohr                                              | <i>Fact Sheet: Fort Hill/Skiff Hill</i>                      |
| Guide-126.WP5 | Michael E. Whatley                                          | <i>Fact Sheet: The Pilgrims in Eastham</i>                   |
| Guide-48.WP5  | Russell Moore                                               | <i>Fact Sheet: The Penniman House and Family</i>             |
| Guide-42.WP5  | Andrea Gilmore                                              | <i>Fact Sheet: Background of Penniman House</i>              |
| Guide-8.WP5   | Edison P. Lohr;<br>revised by Betsie Lind                   | <i>Fact Sheet: Fort Hill Trail</i>                           |
| Guide-117.WP5 | Michael E. Whatley                                          | <i>Fact Sheet: The Buttonbush Trail</i>                      |
| Guide-7.WP5   | Michael E. Whatley                                          | <i>Fact Sheet: The Nauset Marsh Trail Guide</i>              |
| Guide-46.WP5  | Edison P. Lohr;<br>revised by Michael E. Whatley            | <i>Fact Sheet: Deacon John Doane</i>                         |
| Guide-84.WP5  | Richard Cunningham                                          | <i>Fact Sheet: Why A National Seashore?</i>                  |
| Guide-11.WP5  | Eve Smith                                                   | <i>Fact Sheet: Cape Cod National Seashore Land Ownership</i> |
| Guide-2.WP5   | Edison Lohr,<br>Glen Kaye;<br>revised by Michael E. Whatley | <i>Fact Sheet: Coast Guard Beach</i>                         |
| Guide-28.WP5  | G. Franklin Ackerman                                        | <i>Fact Sheet: Archeology at Coast Guard Beach</i>           |
| Guide-14.WP5  | Eve Smith, 1988;<br>Revised 3/93                            | <i>Fact Sheet: Beaches and Breaches</i>                      |
| Guide-13.WP5  | Patricia Rotman                                             | <i>Fact Sheet: Henry Beston</i>                              |
| Guide-119.WP5 | Janet Cote, Suzanne Haley                                   | <i>Fact Sheet: Seals</i>                                     |
| Guide-41.WP5  | Berle Clemensen                                             | <i>Fact Sheet: The Three Sisters of Nauset Lighthouses</i>   |
| Guide-37.WP5  | Berle Clemensen                                             | <i>Fact Sheet: The French Transatlantic Cable</i>            |
| Guide-127.WP5 | David Gorrill                                               | <i>Fact Sheet: Piping Plovers</i>                            |
| Guide-39.WP5  | Edison Lohr,<br>Russell Moore,<br>Michael E. Whatley        | <i>Fact Sheet: Marconi Station Area, South Wellfleet</i>     |



## *Writers and Contributors — continued*

|               |                                            |                                                                     |
|---------------|--------------------------------------------|---------------------------------------------------------------------|
| Guide-15.WP5  | Glen Kaye                                  | <i>Fact Sheet: Marconi</i>                                          |
| Guide-38.WP5  | Edison Lohr                                | <i>Fact Sheet: The Marconi Station</i>                              |
| Guide-16.WP5  | Glen Kaye                                  | <i>Fact Sheet: Atlantic White Cedar Swamp Trail</i>                 |
| Guide-85.WP5  | Jean Fritz                                 | <i>Fact Sheet: Cape Cod's Whaling Era</i>                           |
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