

Office of Code Enforcement



RECEIVED
NOV 02 2012

BY:

INTEROFFICE MEMORANDUM

TO: Joseph Titone, Interim Town Manager
FROM: Paul J. Garand, Code Enforcement Officer
SUBJECT: Seabrook Long Term Beach Management Plan
PROPERTY ID#: 21/22/23
DATE: November 2, 2012

Handwritten signature of Paul J. Garand in blue ink.

The Seabrook Long Term Beach Management Plan was never formally adopted. The adoption of the Management Plan would allow the town to work along the waterfront dune area without making application to the Department of Environmental Services (DES). Current state regulations require a Dredge and fill permit for the said work any time work and/or maintenance is done in areas considered dune. This work/maintenance includes erecting snow fencing, reworking sand along the waterfront, repairing or replacing boardwalks, and also beach raking.

I forwarded a copy of the draft management plan to your office on October 03, 2012, asking that the plan be reviewed, public noticed and formally adopted by the Board of Selectmen. In late September town crews leveled and reworked dune areas without the required permits and currently the dredging project is commencing. The management plan would allow for these projects, and it is important that the plan be adopted as soon as possible.

I would like to meet with you to discuss the importance of adopting the Long Term Beach Management Plan.

Needs to be
Public noticed
and accepted.

Seabrook/Sun Valley Beach Long-Term Management Plan

Prepared For:
Beach Management Committee/
Seabrook Conservation Commission
Seabrook, New Hampshire

Prepared By:
Appledore Engineering, Inc.
Portsmouth, New Hampshire

"This project was funded under the Coastal Zone
Management Act by NOAA's Office of Ocean and
Coastal Resource Management in conjunction
with the New Hampshire Coastal Program."



June 30, 2004

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Purpose of the Plan

Almost all maintenance and capital projects at Seabrook Beach require a permit from the New Hampshire Department of Environmental Services (DES), Wetlands Bureau. In the past, the Town of Seabrook has applied for and received permits for specific activities. In 2001 the DES Wetlands Bureau issued a permit (#2000-00949) to allow for beach re-grading in the North Beach area as the initial step in a long-term beach management plan. In 2002 the Wetlands Bureau issued a permit (#2002-00130) to allow for 1500 linear feet of beach replenishment as the second step in the development of a long-term dune restoration and beach management plan. **See Appendix A for copies of these permits.**

The purpose of this Beach Management Plan is to provide the next step in the development of a “comprehensive long-term restoration and management plan for the entire town-owned area of Seabrook Beach” (as recommended by NH DES Permit #2000-00949) in coordination with the Wetlands Bureau. With the acceptance of this plan by the Towns of Seabrook and Hampton and the New Hampshire DES Wetlands Bureau, the towns will be able to manage the beach and dune environment in a responsible manner for the long-term with the approval of the DES Wetlands Bureau and associated regulatory agencies.

The Planning Process

Staff of Appledore Engineering, Inc. worked closely with an appointed Beach Management Committee to prepare the Long-Term Beach Management Plan, for purposes of this study the Committee decided to divide Seabrook Beach into two segments—North Beach and South Beach—because each has a distinctive set of characteristics each requiring specific management strategies. North Beach contains a beach area that has adjacent residential structures and only minimal isolated vegetated dunes. By contrast the South Beach not only has an extensive beach, it also has a significant vegetated dune system. Initially, an inventory and analysis of beach and dune conditions was conducted, that documented the natural, physical and economic resources of the overall beach area as well as beach and dune issues including encroachment of the dunes and dune grass on to private property and structures. The Committee then established a long-term vision for the beach including a set of goals for the whole beach as well as specific goals for the North and South Beaches. The Committee also considered a wide range of beach management techniques to address the issues raised in the inventory and the need to maintain a healthy and safe beach and dune environment. Based on the needs identified in the inventory and the goals that the Committee wished to achieve, an assessment of the most appropriate beach management techniques were prepared by the Committee. These techniques were then formulated into an action plan and implementation program for long-term beach management.

Inventory

Study Area Description

Seabrook Beach, the second largest contiguous beach in New Hampshire, forms part of the barrier beach system, which extends from Plum Island in northern Massachusetts to Great Boars Head in the Town of Hampton, New Hampshire. The barrier beach in New Hampshire is backed by an extensive salt marsh system, the Blackwater River and portions of Hampton/Seabrook Harbor. The barrier beach has been heavily developed with primarily residential development on the ocean side and commercial/residential development on the landward side along the Route 1A corridor. US Route 1-A runs along the length of the barrier beach in New Hampshire. **See Figure 1 – Site Location Plan.**

The study area extends from the Hampton Harbor inlet, south to the state line and includes both North and South Beaches. **See Photograph 1 - Overall of Seabrook Beach.** For the purpose of this study, the North Beach area will include the section of beach from the Hampton Harbor inlet south to Ashland Street, which is referred to locally as Sun Valley. The North Beach portion of Seabrook Beach extends approximately 2200 feet from the White Rock south to Hooksett Street. There it merges into South Beach, which extends approximately 5,150 feet south to the New Hampshire/ Massachusetts state line at the Town of Salisbury, in the vicinity of east-west running NH Route 286. **See Figure 2 - Existing Conditions Plan and Photo 1.** The beach and dune area of Seabrook is owned and maintained by the Town of Seabrook.

Residential development in the North Beach area occurs between 100 to 120 feet inshore of the High Tide Line as shown on **Figure 2 - Existing Conditions Plan.** No continuous dune system exists within this area, although several small dune areas and beach grass patches are evident, particularly in the vicinity of Hooksett and Suncook Streets.

By contrast, residential development in the South Beach area is set back approximately 250 to 500 feet from the high tide line with a significant continuous dune system between the beach and this development that extends to the state line. This system had been highly degraded by the middle 1980's through actions of individual owners, ocean storms and periodic high winds. This dune system was restored by the Town of Seabrook during the springs of 1993 and 1994 based on a restoration plan prepared by the town in cooperation with IEP, Inc. in 1988.

There are several physical landmarks that mark the study area. One is the exposed bedrock located near mean low water, between Concord and Franklin Streets. **See Figure 3, Photographic Inventory.** Both the US Geologic Survey (USGS) maps and National Oceanic and Atmospheric Administration (NOAA) charts for the area refer to this exposed rock as "Thomas Rock." Another is a rock outcropping a little further offshore from South Beach between Merrimac and Haverhill Streets known as "Round Rock". Finally, there is an Army Corps project at Hampton Harbor inlet that includes a dredged channel and stabilizing jetties on both the north and south shores. The south shore jetty extends eastward to a rock outcropping at the north end of North Beach known as White Rocks. The inlet provides boating access into and out of Hampton Harbor and is the primary inlet/outlet for tidal water exchange and local watershed discharge.

Existing Beach And Dune Conditions

The following section describes the existing conditions of the beach and dune environment of Seabrook Beach. The discussion is broken down into general conditions, and specific conditions for the North or South Beach, since each area has different characteristics that will affect the town's approach to long-term beach management.

General

The ocean conditions for the entire study area are quite similar, except for the area near the harbor entrance, which is influenced by the harbor tidal currents, the offshore rock shoals and a submerged sandbar extending a significant distance out from White Rocks. Since the Hampton Harbor inlet was stabilized with rock jetties (circa 1935 and 1963), the inlet location has remained at its present location and there have been no major changes to the Seabrook Beach shoreline, other than variations in beach width (see Northern Seabrook Beach Study, June 1995). Previous reports have indicated that there does not appear to be significant net long shore movement of beach sand and that such movement is primarily short term, based on the actual wind and wave direction relative to the beach.

The mean tidal range in the study area is just over 8 feet, with the 100 year storm still water level at about 14 feet above mean lower low water (MLLW) chart datum. This 100-year storm still water level (excluding water height and runoff) is approximately the water level experienced during the winter storm of 1978, based on nearby tide station readings. Sea level is rising relative to the land in this area of New England at an average rate of about 0.6 feet per century (based on the 1912 to 1999 tidal records) and this sea level rise will increase the potential for storm flood damage on Seabrook Beach buildings over time.

The primary stands of beach grass in this study area occur just north of Suncook/Hooksett Streets. In this area, the stands of beach grass covered dunes are approximately 10+ feet high (Elevation 25± feet). **See Photograph 3, Figure 3 - Photo H and Figure 2, Existing Conditions Plan.** The remainder of this study area contains several small areas where stands of beach grass have developed or have been planted such as in front of homes between Ashland and Tilton Streets. **See Photograph 4, and Figure 3 - Photo E.** The dunes under these stands of beach grass are typically less than 5 feet high and are located adjacent to the backside (eastside) of the homeowners' properties. In some cases, these vegetated dunes have buried existing shore protection structures. **See Photograph 5.** Further north in the Sun Valley area there are small outcroppings of beach grass that appear to be stabilizing the beach and potentially establishing initial stages of dune development. **See Figure 4, Existing Beach and Dune Plan.** The remaining North Beach study area is void of any beach grass or dune system. The Town of Seabrook installs seasonal snow fences to prevent sand migration from occurring during the winter storm season. **See Photograph 6 and Figure 3 - Photos F & G.** These are usually installed in late October and removed in April/May. Since the houses and other shorefront structures can act to trap wind blown sand, the town periodically re-grades this area in order to prevent development of a significant sand/dune system that would eventually encroach on the existing waterfront structures and recreational beach space.



Photo 3: Vicinity of Suncook/Hooksett Streets, Looking Northwest



Photo 4: Vicinity of Tilton Street, Looking South



Photo 5: Vicinity of Ashland Street, Looking South



Photo 6: Vicinity of Suncook/Hooksett, Streets, Looking North

Immediately south of this area, residential development is set back approximately 250 to 500 feet from the approximate Mean High Water, allowing a relatively stable dune system to be retained between the beach and the nearest development. **See Figure 4.** The width of this dune system significantly reduces the accumulation of drifting sand in the residential area. This beach and dune area is owned by the Town of Seabrook.

Prior to 1990, much of this dune area was highly degraded from man-made intrusions, ocean storms and wind action. During the spring seasons of 1993 and 1994, the Town of Seabrook restored much of the system. Consequently, there are vegetated stands of beach grass that cover much of the dune system in the South Beach area.

There appears to be only one area of the South Beach dune system that has become eroded recently. There is a washout area of the dune near Atlantic Avenue at New Hampshire Street. This erosion may be due to a combination of pedestrian traffic, wave overtopping and wind due to the degradation of the dune. **See Figure 3 - Photos Q & R.**

The Town of Seabrook has installed and maintains eleven (11) public boardwalks in the South Beach area extending from each street end to the beach area except at Merrimac Street and New Hampshire Street. A public boardwalk is due to be built at Merrimac Street as part of the Merrimac Street subdivision plan.

Beach Natural Resources

The South Beach dune and beach system provides valuable natural resources that are typical of the New England Coastal Dune Community. The predominant vegetative species is beach grass (*Ammophila breviligulata*). In recent years there has been significant die-off in various areas of the back dune between Haverhill Street and Hudson Street and transitional vegetation is emerging. In some locations, particularly between Tyngsboro Street and Hudson Street the beach grass has been replaced with Sand-Golden Heather (*Hairy hudsonia*), a state threatened species according to the New Hampshire Natural Heritage Inventory¹. **See Figure 5, Rare Species and Exemplary Natural Communities.** Other threatened species that have been observed include:

- Tall wormwood (*Artemisia campestris*)
- Sea Beach Needlegrass (*Aristida tuberculosa*)

There has also been a minor invasion of a non-native plant, *Yucca filamentosa*.

¹ The New Hampshire Natural Heritage Bureau prepared an inventory of natural communities and rare, threatened and endangered species for the Seabrook Harbor area (including Seabrook beach and dunes) as part of the Major Impact Wetland Application for the dredging of Seabrook Harbor in August of 2003. A full description of the beach and dune resources is included in that document.



Photo 10: Vicinity of Manchester Street,
Looking South



Photo 11: Vicinity of Nashua Street,
Looking East



Photo 12: Vicinity of Haverhill Street,
Looking Northeast



Photo 13: Vicinity of Haverhill Street,
Looking Northwest

The total width of the beach and dune system of the South Beach is generally wider than North Beach. At high tide there is limited recreational beach due to the extensively vegetated dune system. The increased setback distance of the shorefront property owners has allowed wind blown sand to accumulate and disperse over a larger area, resulting in dunes lower in elevation and minimizing the obstruction of ocean views. The height and width of this existing dune helps prevent significant storm damage or flooding from occurring.

The location of the vegetated dunes with respect to the high tide line provides relatively less usable recreational beach width near the intersection of Suncook/Hooksett Streets and Manchester Street. A significant dune system, which has been created by the houses and other shorefront structures in this area, has trapped wind blown sand. These dunes have reached elevations over 30 feet. Since windblown sand in this area is prevented from dispersing due to the proximity of the shorefront structures, the dune system continues to grow in height, rather than width, threatening to engulf the houses while obstructing ocean views. **See Figure 3 – Photo 1 and Figure 2.**

Economic Assessment Of Beach Area

The economic value of the Seabrook/Sun Valley Beach area can be directly attributed to the beach environment.

The Seabrook and Sun Valley Beach area consists largely of private single family and duplex homes. There are also a number of businesses located on Route 286, Route 1A and River Street, which are considered to be part of the beach area.

When considering the economic value attributed to the beach environment, it is necessary to include the fact that the beaches along the Atlantic Ocean and Seabrook Harbor are attractive to year-round residents, seasonal residents and tourists throughout the year. The aesthetics and high quality of the water, beach, sand dunes and natural environment of the Seabrook area provide an attractive draw for public recreational use.

Seabrook Beach is the southern entrance to the Scenic Coastal By Ways established by the State of New Hampshire for the benefit of tourism. Recreational attractions in the area include: swimming, sunbathing, beach walking, bird watching, biking, boating, kayaking, fishing, whale watching, and day and evening party boat cruises. Businesses in the area that draw public interest include: several restaurants, convenient grocery stores, real estate offices, party boat fishing and whale watching, fish and bait markets, the Yankee Co-operative fishing industry, and a kayak sales and rental store.

Value of Business and Residential Properties

Business

There are 16 businesses in the Seabrook Beach area with total assessed values of \$7,070,200. The business owners are mainly dependent upon the tourist trade to derive their income and contribution to the community. Maintaining an attractive safe beach environment provides an attraction for tourists and residents alike. As an indicator of the market strength in this beach community, the NH State Liquor Commission is planning to open a retail store in June 2004 at Preston Plaza on Route 1A.

The economic impact from these businesses can be further analyzed with the values of the room and meal taxes submitted to the state. The state does not make mean figures available on a town-by-town basis. However, an informal survey of business owners resulted in the fact that most businesses in the beach area are earning from a half a million to several million dollars in revenue, which contributes largely to the economic impact of the area, both directly and indirectly.

Beach User Counts

In order to better assess the demand for use of the Seabrook/Sun Valley Beach, members of the Seabrook Beach Civic Association conducted a census of beach users during two (2) days in August of 2003, through the use of a mobile photographic unit. Below is a table that summarizes the results of this census by date, time of day, beach location and the number of individuals at each of these locations.

On Friday August 22nd, there were a total of 747 beach goers during the late morning and 649 during the mid-afternoon. Based on the break down of the counts during the late morning, it would appear that there was greater concentration of beach goers between Concord and Nashua Street than elsewhere on the beach. **See Figure 2 for the location of these areas.** This concentration may be due to the available access at Hooksett Street. Unfortunately, the same location categories were not used for the afternoon counts, but it is clear that there were fewer beach goers and there does not appear to be as clear a concentration of beach goers. There may also be a similar concentration on either side of the Hooksett Street access. There were no counts below Haverhill Street to the state line as there were in the Saturday counts.

Date	Time	Location	Head Count
08-22-03	11AM to noon	Harbor	23
		Sun Valley to Ashland Street	112
		Ashland to Concord	197
		Concord to Hooksett	214
		Hooksett to Nashua	126
		Nashua to Haverhill	98
		Total ocean front beach	747
	2PM – 3PM	Sun Valley to Ashland Street	190
		Ashland to Hooksett	175
		Hooksett to Haverhill	284
		Total ocean front beach	649
08-23-03	11:30 AM	Hampton River mouth to Haverhill Street	436
		Haverhill south to State line	245
		Total ocean front beach	681
	3:30 PM	Hampton River mouth to Haverhill	550
		Haverhill south to State line	350
		Total ocean front beach	900

The counts in the previous section were obtained from a filming done on a mobile unit. The film was then slowed down and stopped to take a count of people. The difference in counting technique could account for variations in the data, since it would appear that the volunteers recorded more beach goers than the photographic census on Friday the 22nd.

Beach User Survey

In March 2002, the Beach Management Committee prepared and distributed a survey to all households in Seabrook to determine the nature of beach use on Seabrook Beach. The final results are tabulated in a report that is attached to this beach management plan in **Appendix B**. There was a 17% return rate. The results of the survey are summarized below.

Most of the survey respondents (48% or 84 individuals) indicated that they use South Beach for the most part with 31% preferring North Beach. A similar number (46%) indicated that they frequent the beach mostly in the summer with 21% preferring the spring and another 21% preferring the fall and most respondents use the beach at least once per week (90%). The most frequent activities for the beach users included walking (31%), sunbathing (27%) and swimming (22%). Other activities included sightseeing, bird watching and fishing.

The Committee was also interested in citizen reaction to dune management and protection. By an overwhelming majority (82%) the respondents felt that the dunes enhanced the beach environment. Although some respondents were concerned that the dunes were too large, most agreed that they were satisfactory as is or that they were not large enough. A majority (56%) indicated that there should be a designated wildlife resource area in the dunes.

Finally, the Committee wanted to determine the level of use at the town access areas (public boardwalks) to the beach and the level of support for beach maintenance by the town. Although all the access areas were used, the most frequently used were Hooksett Street (19%) and Haverhill Street (23%). And while most people do not tend to use the existing observation platforms (65% of the respondents did not), a similar number do use the benches that are located throughout the beach area. Almost all respondents were in favor of town financial support for annual beach maintenance with over 69% supporting an expenditure of \$15,000 or more annually.

The survey also asked for written comments. For the most part respondents were interested in maintaining and protecting the beach dune environment as a pleasant area for low impact recreation. There were a number of comments with regard to banning personal watercraft in the ocean area near the beach for noise and safety reasons.

Fish and Wildlife Service

The US Fish and Wildlife Service is responsible for implementing the Endangered Species Act, Section 9 and its implementing regulations 50 CFR Part 17. All of Seabrook/Sun Valley Beach area is an identified breeding area for the Piping Plover. The service has prepared a guidance document for protection and management of this habitat in cooperation with the Army Corps of Engineers, FEMA and the New Hampshire Fish & Game Department. This document is entitled, *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act*, April 15, 1994. Active management and protection of this habitat area typically occurs between April and August of each year. **See Appendix C for a copy of these guidelines.**

State of New Hampshire

New Hampshire Department of Environmental Services--Wetlands Bureau

The state of New Hampshire regulates activities in wetlands through the Wetlands bureau of NH DES under RSA 482- A. Wetlands are defined to include sand dunes under RSA 482-A:2 and A:4, which regulates dredge and fill in wetlands. The regulations define sand dunes as a hill or ridge of sand piled up by wind.

Under RSA 482-A:3 (Fill and Dredge in Wetlands), VII a:

Permit required to alter or remove any sand or vegetation from any sand dune in the state; except "any person may remove sand which blows or drifts onto any lawn, driveway, walkway, parking or storage area, or boat ramp, or which blows or drifts in, on, or around buildings or other structures owned by the person".

Under Section VIII no person shall operate or ride any mechanized or off highway recreational vehicle on any sand dune in the State of New Hampshire. However, under Section IX there may be exemptions for driving vehicles on dunes; including maintenance vehicles, emergency vehicles and commercial fishermen.

As part of the Wetlands Bureau's regulatory jurisdiction, it has issued a set of administrative rules to clarify the requirements for an application to disturb sand dunes and stabilize shorelines. These include the following:

Wt 101.32 Lists dune vegetation in the definition section as species commonly found associated with sand dunes, e.g. American Beach Grass.

- Protection of public use of waters, including recreation.

Under this act the state has jurisdiction for managing certain activities within 250' from highest observable tide line (excluding storm events). Within this area the state has established standards for uses, vegetative cutting, building and septic system setbacks. In reality, since the state has only one shoreland regulator for the whole state, it relies on local regulators to inform the state of any violations or to implement this program informally through its local regulatory process.

New Hampshire Department of Environmental Services—Land Resources Management (Site Specific) Program

Under RSA 485-A:17 (Water Pollution and Waste Disposal) the state regulates disturbance of land for all activities if the disturbance of land is 100,000 sf or greater through the terrain alteration or site specific permit process. However, in the shoreland zone this threshold is reduced to 50,000 sf.

New Hampshire Fish & Game Department

This agency, in cooperation with the U.S. Fish and Wildlife Survey, is responsible for implementing the Endangered Species Act. This responsibility includes protection and management of the Piping Plover breeding habitat.

Towns of Seabrook and Hampton

Zoning Ordinance

The Towns of Seabrook and Hampton control the types of uses and activities within each community's jurisdiction through the designation of use districts as defined in the Zoning Ordinance. The Seabrook Beach area is within the 2R Residential Zone in Seabrook, which is primarily a zone that allows for single family residential units and accessory uses. The Seabrook Beach Village District administers the ordinance for individual lots and establishes dimensional requirements for lot dimensions, setbacks, height and open space. Any activity that includes more than one lot or is a commercial activity is regulated by the town Planning Board.

The Town of Hampton has designated the Sun Valley area as the RA or Residence A Zone which, like Seabrook, is primarily a zone for single-family residential units and accessory structures. The building inspector is responsible for implementing the requirements of the ordinance for single lots.

Recent Beach Management Activities

The Town of Seabrook Department of Public Works has been performing maintenance activities within the guidelines of the New Hampshire Department of Environmental Services. The activities include:

- Periodic machine raking of debris on the areas of the beach used by the public. This has been done without disturbing areas where there is presence of dune grass.
- Erecting storm fencing in the fall on North Beach areas in front of private residences and in front of public access walks on South Beach in an effort to contain wind blown sand. The storm fencing is removed in the spring.
- In 1996 a permit allowed the town to re-grade the North Beach by pushing the windblown sand away from beach walls toward the ocean. This procedure was repeated in 2001 in order to maintain a level of protection to private properties.
- Maintenance of the public access boardwalks. At times the boardwalks need to be raised and re-graded due to shifting sand. The walks are then reset in order to maintain safe walking conditions.
- Beach nourishment has been done either by transporting the harbor dredge material by pipes to the beach or most recently, transporting by truck and distributing the sand with earthmoving equipment. Beach nourishment was most recently completed in March of 2004 with a limited amount of sand from harbor maintenance dredging that was trucked onto the beach and placed as a berm above the high water line in a few isolated areas. **See Photo 14.**

Other organizations or private individuals have also contributed to beach management activities, and include the activities described below:

- Beach Management Committee members conducted a visual count of persons using the beach during the last weekend in August 2003 to aid in the assessment of public use analysis. Also, a policeman riding on the ATV filmed the beach on the same weekend for a population study.
- The local schools perform an annual Coastal Cleanup in the fall to collect and document man-made debris.
- The NH Fish & Game Department conducts a program annually to protect the nesting population of Piping Plovers in the South Beach Area from approximately April through July or August.
- The Seabrook Conservation Commission posted signs regarding the regulation of feral cats and their impact on protection of the Piping Plovers.

Beach Management Methods

Beaches in the local New Hampshire/Massachusetts barrier island system use a mixture of beach stabilization methods to attempt to retain sand or armor the shoreline from storm damage. The traditional methods include shoreline armoring with seawalls or rubble stone structures, such as the Hampton Beach seawall, the perched beach rock sill at Half Tide Jetty, or the stone groins on Plum Island. More recent "softer" methods involving dune creation have been used at Hampton Beach State Park, Seabrook South Beach and at Salisbury Beach. These methods are typical along the east coast and have had mixed success. The "hard" structures typically last longer than the "soft" structures/methods, however the "hard" structures, particularly when used without concurrent beach fills or nourishment, are typically thought to cause adverse changes to the dynamic beach/dune system from wave reflection and increased scour. The "soft" methods can be quite successful if there is sufficient beach width to allow the construction of dunes with proper setback from wave action so that they will be less prone to frequent storm damage. The Town of Salisbury has reported success with dune creation using snow fencing and some of these dunes have been planted with dune grass (based on discussion with the Salisbury Public Works Director in April 2004).

There are other methods and numerous variations on these methods that have been tried in this country and overseas, some of which might be categorized more as science experiments, rather than practical long-term cost effective methods for beach management. An expanded discussion and analysis of these methods is found in **Appendix E**. The following list summarizes possible beach management methods:

Sand Grading

The moving of sand on the beach or dunes with mechanical earth moving equipment.

Beach Raking

Raking of the beach with tractor mounted rake to remove seaweed and trash.

Sand/Snow Fence

Trapping of wind blown sand with simple barriers, including sand or snow fencing.



Sand filled geotube berm (Photo courtesy of Bradley Industrial Textiles, Inc.)

Planted Dune Construction

A vegetated sand berm, constructed farther inshore to lengthen life expectancy and a structure typically expected to survive most storm events due to the higher cost associated with developing a vegetation cover. Since the construction of vegetated dunes does remove sand from the beach system for all but the most severe storm events, the construction of vegetated dunes may require imported sand to minimize the adverse impacts on down-drift beaches. Wind blown sand will tend to accumulate on vegetated dunes, causing growth in dune height, which can affect wind patterns and block ocean views.



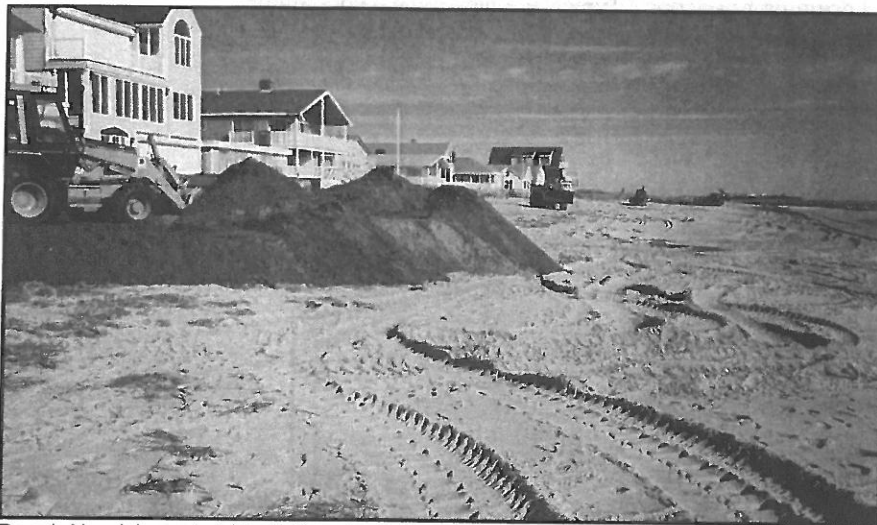
Planted Dune (Photo courtesy of the US Army Corps of Engineers)

Sand Adhesive

This is a non-toxic water based adhesive typically spray applied to the sand to help prevent wind blown sand drifting. Foot traffic reportedly breaks up the crust formed and at least some formulations may adversely impact plant growth. Only very limited use on beach and coastal dunes to date based on document research.

Beach Fill or Nourishment

The method involves the placement of sand onto the beach from an inland borrow area (beach fill) or from a dredging project (beach nourishment). This procedure does require that the imported sand grain size and shape be similar to the existing sand on the beach to minimize potential beach changes. There may be adverse environmental impacts at the submerged dredging site or at the terrestrial borrow area.



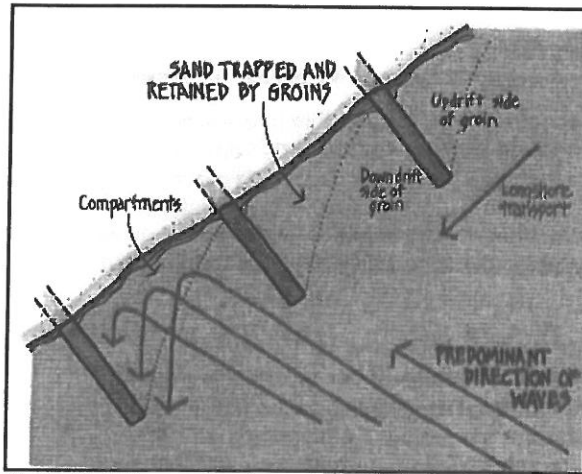
Beach Nourishment at North Beach

Sand By-Passing System

A hydraulic dredging system, where sand accumulating on one side of a barrier or inlet due to long-shore drift, is pumped beyond the barrier or inlet to nourish the down-drift area. Requires high capital and operating costs, and the system may be shut-down for significant portions of each year for beach use and environmental reasons.

Beach Dewatering

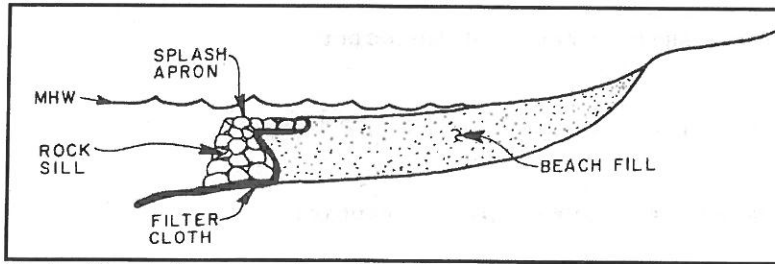
This is a mechanically pumped drainage system intended to reduce seaward sand particle movement in the wave runup zone by draining the face of the beach and absorbing wave backwash. Complex system prone to storm damage, which can be classed as more of a science experiment, rather than a practical beach management method.



Groin Field (Image courtesy of the US Army Corps of Engineers)

Perched Beach Sill

This technique involves an underwater retaining wall structure installed at the toe of a beach used to retain a larger volume of sand on the intertidal beach at a reduced slope, or with an increased crest width. The retaining wall structure may be comprised of traditional construction materials, or may be formed with sand filled geotubes. A potential hazard for bathers.



Perched Beach (Image courtesy of the US Army Corps of Engineers)

Artificial Seaweed

A manufactured product using synthetic fabric materials to simulate the function of seaweed to reduce water motion and encourage sand accretion. Trial installations in surf zones have indicated relatively short life expectancies, a possible beach debris source if storm damaged. A potential for adverse impacts to swimmers.

North Beach (Including Sun Valley)

- Maintain a beach profile best suited to minimize the potential for property damage during storm events.
- Minimize the impact of wind blown sand along the front of all private properties and public access ways.

South Beach

- Discourage private boardwalks in the vegetated dunes.
- Maintain the beach seaward of the existing dune vegetation for public use.
- Minimize the impact of wind blown sand along the front of all public access ways.
- Protect and manage the natural habitats and vegetation of the beach/dune environment.

- Maintain all of Seabrook Beach for public recreational use, including raking to remove trash, removing washed-up fishing gear, and minimizing significant build up of seaweed.
- Develop beneficial uses for the material raked up in beach cleanup (primarily seaweed). Preference should be given to those uses, which benefit the beach environment and shoreline protection.
- Implement a seasonal sand fencing procedure to ensure the containment of wind blown sand along the front of all properties and public access ways on the North Beach and along the front of all public access ways on the South Beach.
- Establish/maintain public boardwalks at street ends that allow beach access. In the dune area, these boardwalks are intended to minimize pedestrian and vehicle disturbance of dune vegetation. Consider use of elevated non-vegetated sand berms to minimize wave overtopping, wash-through and flooding during storm events in the boardwalk locations.
- Accept clean sand on the beach from clean up of wind/wave deposited sand on private properties directly adjacent to the beach.
- Work with adjacent property owners during town-sponsored sand re-location projects to grade the beach/dune areas along adjacent property lines in a manner that is compatible with the abutting land contours and waterfront structures. This grading can be accomplished through the following:
 1. Nourishing the beach when sand is available from dredging at Hampton/Seabrook Harbor. Work cooperatively with appropriate state agencies, such as the Division of Ports and Harbors, to effect this program.
 2. Establishing and maintaining an appropriate dune profile of dune/beach grass areas close to private homes that are immediately adjacent to the beach/dune system to avoid damage to buildings. Such areas include properties at the head of Manchester and Hooksett Streets and properties just south of Ashland Street. This specific project would have an order of magnitude cost of approximately \$18,000 - \$23,000 including revegetation. The excess sand can either be used to re-grade the North Beach or used to restore the dune at New Hampshire Street.
 3. Re-grading North Beach as described in the North Beach Recommendation below.
- Develop an educational program for beach and community residents for residents (seasonal and year-round) highlighting beach management strategies and public land use restrictions. Such a program could include:

Recommendations - South Beach

At the South Beach the following additional beach management actions are feasible and should also be used:

- Restore dune and create public access boardwalk at New Hampshire Street in the existing washout area. It is recommended that the new boardwalk be on-grade, similar to the existing boardwalk designs, to allow future reconfiguration to match changes in dune height. The restored dune should have a similar profile and contours as the existing dune, but also provide for sufficient public access to, and use of, the beach. The dune restoration shall take place outside the Piping Plover breeding season. Sand could be imported for this restoration from the Manchester/Hooksett Street dune project. The order of magnitude cost to complete both projects would be approximately \$18,000 - \$23,000.
- Undertake a fencing program in cooperation with the New Hampshire Wetlands Bureau to provide preferable nesting habitat for Piping Plovers.
- Consider establishing a parallel boardwalk along the back dunes, in front of private properties between Haverhill Street and Nashua Street to allow residents easier access to the public beach boardwalks. Such a project could only be undertaken as funds allow.
- Maintain to the greatest extent practicable the natural, indigenous plant and animal community at the South Beach dune system. Maintenance of these communities can be accomplished through:
 1. Removal of invasive plant species and
 2. Continuing to implement the Piping Plover protection program in consultation with US Fish & Wildlife Service, NH Fish & Game and the NH Audubon Society. As part of the proposed educational program recommended previously, the Towns of Seabrook and Hampton could highlight the necessary cooperation with these agencies to protect Piping Plover habitat. Continuation of appropriate signage about the feral cat problem is an example.

Implementation Program

The following is the preferred implementation schedule for the recommended beach management strategies. Each action item is prioritized into one of the following categories:

Short Term

Action	Responsibility
1. Complete beach and dune property line and topographic survey.	Town Manager
2. Construct New Hampshire Street public access boardwalk and restore washout area.	Town Manager/Beach Management Committee
3. Establish 30-foot wide firebreak.	Town Manager/Beach Management Committee
4. Develop an educational program for beach and community residents.	Conservation Commission

Medium Term

Action	Responsibility
1. Consider establishing a parallel boardwalk along back dunes (Haverhill to Nashua Streets) if and when are funds available.	Town Manager/Beach Management Committee
2. Establish fire break between dune grass and adjacent homes.	DPW

Long Term

Action	Responsibility
1. Evaluate this Long-Term Beach Management Plan.	Beach Management Committee

APPENDIX B

March 2002 Beach User Survey

March 2002 Beach User Survey
Appendix B
Beach User Survey

APPENDIX D

Local Beach Regulations

Microsoft Word 2010

APPENDIX F

Guidelines for Beach Management Activities

Appendix F