DUNE VEGETATION MANAGEMENT PLAN

BOROUGH OF STONE HARBOR

CAPE MAY COUNTY, NEW JERSEY

June 2015

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TLCG FILE No.: 12-782

TABLE OF CONTENTS

Dune Vegetation Management Plan

SECTION **PAGE**

SECTION 1. INTRODUCTION 1

SECTION 2. BACKGROUND 2
2.1 Statement of Values of Dunes and Dune Vegetation 2
2.2 Statement of Issues from Establishment of Japanese black pine 2

SECTION 3. DUNE VEGETATION MANAGEMENT PLAN 4
3.1 Goals of the Plan 4
3.2 Objectives of the Plan 4
3.3 Roles and Responsibilities 4
3.4 Management Standards 7

SECTION 4. PLAN APPROVAL PROCESS 12
4.1 Review and Approval Process 12

SECTION 5. CONCLUSION 13

SECTION 6. SELECTED REFERENCES 14

APPENDICES

APPENDIX A.	**Borough of Stone Harbor Beach Ordinance Chapter 156, with special reference to Article III: Beach and Dune Protection, adopted as Section 12-7 of the 1982 Revised General Ordinance and Executive Policy -- Title: Beaches and Dunes, Number: B-002**
APPENDIX B.	**NJDEP Jurisdictional Determination**
APPENDIX C.	**Approved List of Dune Vegetation**
APPENDIX D.	**Standard for Creating and Restoring Sand Dunes**
APPENDIX E.	**Dune Vegetation Management Plan Base Map prepared by The Lomax Consulting Group, dated December 4, 2014.**

DUNE VEGETATION MANAGEMENT PLAN

SECTION 1. INTRODUCTION

The beach-dune system of the Borough of Stone Harbor is an extraordinary community asset. This dynamic coastal zone system is the major natural feature that has attracted residents and visitors to the Borough for generations. Not only is this dune ecosystem a foundation component of the tourism economy, it provides to Stone Harbor residents, businesses and their properties the following critical services.

(a) serves as a protective Atlantic Ocean buffer dissipating coastal storm energy
(b) contains a bank of sand to replenish the beach system
(c) supports a diversity of habitats for adapted coastal plants and wildlife
(d) creates the unique coastal ambiance appeal of the community to residents and visitors

The dune ecosystem, the subject of this Plan, is naturally occurring in the Borough; however, it has required management for many years to retain its integrity and to preserve its unique features for the environmental and economic benefits that it provides.

After the March 1962 storm that devastated the New Jersey coastal resorts, well-meaning protection efforts to stabilize the dune sand resulted in the introduction of species that had unintended consequences. One of these species, the Japanese black pine (*Pinus thunbergiana*), has since become a dominant vegetation feature in the back dune area and other coastal environs. Because of its invasive and dominating characteristics, it has displaced most of the native species beneath it as it has grown to heights exceeding 30 feet. While originally considered a favored,salt-tolerant conservation species, it has proven to out-compete native species. The Japanese black pine has become so well established in some of the dunes adjacent to residences that it has resulted in a monoculture. The pines produce large quantities of combustible cones and needles in this dry environment and, therefore, create a potential for wildfires in close proximity to residences. In addition, these stands have created a visual barrier impacting the value of the waterfront properties. Finally, the stands of Japanese black pine are displacing the dune-adapted, native species, thereby creating a high potential for ecological instability when they are lost. The Japanese black pine monocultures have created a risk because of their susceptibility to pests and pathogens. Dead and dying Japanese black pines are readily observable on the Seven Mile Barrier Island, as well as on the mainland. Recognizing the impending loss of these pines, it has become necessary to evaluate the extent

of this issue in the Borough and to establish a strategy to reduce or eliminate the adverse impact of this species and other damaging invasive species while protecting and restoring the integrity of the Borough's dune system. Other species include bamboo and such damaging vines as Japanese honeysuckle, English ivy, Virginia creeper, poison ivy and green briar.

During the summer of 2013, The Lomax Consulting Group conducted an evaluation of the distribution of the Japanese black pine and identified principal areas of risk to the Borough. The findings and recommendations were reported to the Natural Resources Committee along with a proposed plan approach and Dune Vegetation Management Plan (DVMP or Plan) concept outline for review and direction. Subsequently, pursuant to guidance from the Committee, a presentation was made to Borough Council, officials and the public on December 3, 2013. The planning process was approved and the development of the Plan was authorized. The Plan was drafted and submitted to the Natural Resources Committee for review and comment during 2014.

SECTION 2. BACKGROUND

2.1 Statement of Values of Dunes and Dune Vegetation

The Borough of Stone Harbor dune system is a critically important and integral natural resource of the community that provides: (a) a protective buffer dissipating coastal storm energy; (b) a bank of sand to replenish the beach system during coastal storm events; (c) an extensive and diverse habitat for plants and wildlife adapted to the dune ecosystems; and (d) a unique opportunity to foster a maritime vegetation community and associated coastal ecosystems. Accordingly, the stewardship of the Stone Harbor dunes is critical to the protection of the Borough. Further, the dunes, an integral part of the beach-dune complex, are a foundation component of the tourism economy of the Borough.

2.2 Statement of Issues Relating to the Establishment of Japanese black pine and other damaging invasive species

Invasive vegetation, especially the Japanese black pine, has demonstrated its ability to spread beyond the areas where it was originally planted to portions of the back dunes and other areas adjacent to residences at such a rate that it has: (a) resulted in hazardous conditions associated with the accumulation of a combustible tinder base subject to wildfire in close proximity to residences, beach paths and the dune system; (b) evolved into monocultures resulting in degraded and unsuitable habitat for native plants and wildlife adapted to the dune system; (c)

created a substantial risk to portions of the dune system to destabilization through the die back of this species; (d) created an unacceptable visual barrier impacting the value of the waterfront properties and (e) especially invasive damaging vines smother and weaken native dune trees and shrubs. Therefore, the Borough has examined the risks and established a strategy to reduce or eliminate the adverse impact of this species, while protecting and enhancing the integrity of the Borough's dune system.

SECTION 3. DUNE VEGETATION MANAGEMENT PLAN

3.1 Goals of the Plan

3.1.1 Maintain and restore a healthy, diverse dune system comprised primarily of adapted native species.

3.1.2 Establish a science-based approach to evaluating and managing/restoring dune vegetation, in a manner ensuring that the Borough receives the critical safety and ecological services that its dunes can provide.

3.2 Objectives of the Plan

3.2.1 Develop a Dune Vegetation Management Plan that addresses control of Japanese black pine and other damaging invasive plants, as appropriate, by its removal and replacement with native vegetation.

3.2.2 Provide management standards, techniques and recommended native plants that can be used for the vegetation restoration and enhancement component of the dune ecosystem.

3.3 Roles and Responsibilities

3.3.1 While the Borough maintains the overall health and integrity of the dune system; appropriate stewardship by the adjoining property owners and visitors is integral to the protection of this community asset. The Borough accomplishes this task by providing the public with an understanding of this ecosystem and its values, including educational signage that is pertinent to protection of dunes.

The Borough has established the framework for protecting its oceanfront assets by establishing and implementing Chapter 156, with special reference to Article III - Beach and Dune Protection Ordinance and the Executive Policy. **(APPENDIX A)** This Ordinance is enforced through the Regulations: unlawful activities (156-23) and Enforcement: violations and penalties (156-26). The Borough, as part of this Plan development, is obtaining a jurisdictional determination from the New Jersey Department of Environmental Protection (NJDEP) to make certain that management techniques set forth herein are in accordance with NJDEP regulations and policies. Please refer to **APPENDIX B** for a copy of the jurisdictional request and response documentation. In

addition, the Borough supports dune vegetation improvement programs through its Public Works Department and through volunteer beachgrass planting initiatives, in addition to education programs.

Once the Plan is approved, the Borough Administrator will develop a Schedule of Maintenance with the Department of Public Works. The Schedule will:

a. Establish priority locations for dune vegetation management, including a schedule for the removal of dead trees and hazardous vegetation that pose a risk to the public;
b. Obtain approval for dune vegetation maintenance, including pre-maintenance documentation (i.e., area description, issue of concern, proposed action, methodology, photographic evidence);
c. Conduct maintenance activities within the areas of responsibility, including post-maintenance documentation (i.e., summary of issue, action taken, results, future consideration/monitoring, photographic evidence) and reporting progress to the Borough Administrator for inclusion in the Dune Vegetation Management Plan Base Map.

3.3.2 Property owners, especially those living in close proximity to dunes, play an important role in maintaining a healthy dune system. They have the unique opportunity to participate voluntarily in the DVMP program and engage the Borough-designated program consultant to evaluate the affected dune area in the vicinity of their property. If the site conditions are consistent with the DVMP program eligibility, the Borough-designated consultant will design a project in coordination with the property owner in order to protect and to enhance the dune system on or adjacent to their property. Further, diligent property owners may aid the Borough to monitor activities that may damage the dunes. By participating in the DVMP through the removal of Japanese black pines and the re-planting of compatible native vegetation, the stewardship of this resource becomes a shared and common purpose. Should property owners choose to participate in the DVMP program, the proposed dune enhancement project must be designed, implemented and monitored consistent with the Plan guidelines, standing land use regulation and Borough Ordinances. Responsibility for the project rests with the property owner. Accordingly, various safeguards have been incorporated into the design of the DVMP to direct landscape contractors selected by the property owner to

implement an approved DVMP project. These safeguards provide an opportunity for addressing landowner interests and concerns while providing guidance and public notification through the Dune Vegetation Management planning and oversight of the implementation process.

3.3.3 Property owners and their landscape contractors, who intend to engage in and sponsor any vegetation management activities in the dune system, must coordinate with the Borough-designated program consultant and comply with the requirements of Chapter 156, Article III: Beach and Dune Protection adopted as Section 12-7 of the 1982 Revised General Ordinance prior to taking any action. During the application process the Borough's Natural Resources Committee will review and determine whether the proposed project actions are consistent with the DVMP. Then the Committee will report to the Zoning Officer of the Borough so that a zoning permit may be issued for an approved project. If the proposed action is approved, the landscape contractor will be required to provide notification to the Construction Official of their intention to carry out trimming, thinning or removal/enhancement of dune vegetation consistent with the approved project. They will also be required to coordinate with the Borough-designated program consultant in order to provide photo-documentation of the site conditions before and at the conclusion of the vegetation management process. Monitoring schedules shall be adhered to in order to ensure the success and survival of the plantings installed in the dunes. Proof of adequate training, certifications and insurance will also be a requirement for landscape contractors, as specified by the Borough, prior to the commencement of work.

3.3.4 While the Borough has assumed the role of facilitating the Dune Vegetation Management Planning process; financial responsibilities and obligations will be allocated in accordance with a Memorandum of Agreement (MOA) between private property owners and the Borough of Stone Harbor for the project design, vegetation removal and replacement and project monitoring.

3.4 Management Standards

3.4.1 The establishment of Priority Dune Vegetation Management Areas is essential to the overall success of the program. A prioritization system will allow the Borough to determine key areas where vegetation management is necessary on a priority basis to secure the integrity of the dune system and to ultimately protect the citizens of the Borough from damage associated with coastal storms or from the occurrence of injury or damage resulting from dead or dying trees on public property.

3.4.2 In areas where the implementation of the Plan includes both private and public property, an MOA will be executed by the affected parties (i.e., adjacent land owner(s) and the Borough). This MOA will lay out the proposed vegetation management and the allocation of resources. Prior to the commencement of work on private property within the dune system, approved site documents are necessary. They include, but are not limited to, an inventory of invasive vegetation to be removed, a re-planting plan, an approved and executed Memorandum of Agreement and evidence of escrowed funds, in addition to consultant/landscaper contracts.

3.4.3 Once the site boundary map on an aerial photograph has been established, the site investigations will be conducted. Site investigations must be consistent with the Dune Vegetation Management protocols to determine areas where the invasive tree management is necessary. Trees that require management will be located and identified by species, size (dbh) and condition (i.e., living or dead), in addition to whether each is a native or invasive species. This information will be plotted on a site plan. Trees that require management consistent with the Dune Vegetation Management Plan will be identified and physically marked in the field with flagging numbered to correspond to the Plan.

3.4.4 Management actions will be separated into the following three categories:

(a) The immediate removal of the aerial portion of dead trees. (Rationale: dead trees are not vegetation and must be removed in the interest of public safety – in the case that there is no imminent risk to the public, these trees or a portion of the trunk of the tree may be retained for cavity nesting birds);

(b) The removal of seedling and sapling Japanese black pine. (Rationale: pulling of seedlings or the clipping of the aerial portion of a sapling prevents the maturation and

production of seedlings while preventing crowding and displacement of native vegetation);

(c) The selective removal or trimming of trees in accordance with the Dune Vegetation Management Plan. Any trees approved for removal will be cut at ground level with a hand-managed saw. Heavy (motorized) equipment will not be used in the dunes to remove such trees. (Rationale: this vegetation management will result in opening areas at ground level to provide adequate space for the planting of replacement native species during the appropriate season).

3.4.5 The invasive Japanese black pine will be replaced with native species that are:

(a) Drought tolerant;

(b) Less susceptible to disease;

(c) Less prone to wildfire; and

(d) Provide better habitat for native wildlife.

Refer to the Approved List of Dune Vegetation provided in (**APPENDIX C**), which lists native replacement vegetation according to salt spray tolerance and location within the dune landscape.

3.4.6 The management process is initiated by installing a sand fence to secure the existing sand base, if required by the National Resource Committee, along the ocean side of the area to be managed. This installation shall be performed prior to the commencement of vegetation thinning, trimming or replacement in order to protect the dunes from wind erosion. Sand fence will not be required if the dune area under restoration is not subject to failure or the installation will damage existing dune vegetation that protects the site.

3.4.7 Invasive trees less than 6 feet in height will be hand sheered at ground level and the aerial portion of the seedlings / saplings will be removed.

3.4.8 An inventory of invasive trees will be conducted to determine which trees can be thinned, trimmed or removed to provide an area for their replacement by native vegetation. Invasive trees in a stand may be thinned as part of a phased dune vegetation management project. However, thinning is limited such that the maximum distance between the remaining trees is no greater than fifteen feet. Further, the stand must be landward of the protective sand fence, if required.

3.4.9 Replacement plantings are selected, acclimated, installed and maintained consistent with Standards for Creating and Restoring Sand Dunes (**APPENDIX D**). The installation holes shall be twice the size of the plant container for shrubs and three times the size of the tree container or root ball. The soil amendments of top soil and/or organic matter are used to backfill the hole to promote survivability of the plants. They are planted in a staggered row configuration.

3.4.10 If all invasive trees are not or cannot be removed at one time (in the phased approach), then the pruning of the lower branches of the invasive trees (that have been identified for eventual removal) shall be completed such that adequate open ground area is provided for the establishment of native plants and in order to minimize the efforts to remove the invasive trees later. This process allows for the thinned and trimmed trees to remain in the dune system for the interim to maintain the integrity of the dune structure until the replacement vegetation is established.

3.4.11 If a phased approach is taken, and the native plants have been established consistent with the Plan, the remaining invasive vegetation will be removed and replaced by native species in successive years.

3.4.12 The replacement vegetation will be inspected at the end of the growing season to ensure successful establishment. Plant replacement is required for plant losses of greater than the required 85% survival rate

3.4.13 Plants that are not invasive may be maintained and may be trimmed to promote their health consistent with the approved Plan.

The property owners will be responsible for ensuring that adequate watering of the newly planted vegetation occurs through the next growing season after planting has occurred. Fixed sprinkler-type irrigation system will not be used. Temporary above-ground (e.g., Hunter High Efficiency MP Rotator head) is required between the limit of irrigation as established in the Planting Plan. The irrigation system is supplied by temporary surface tubing and will comply with the Borough Ordinance regarding time and days of watering and will be carried out three days per week unless adequate precipitation occurs. It is

also recommended that temporary irrigation lines be "blown out" at the end of the season for maintenance purposes. Irrigation will be terminated and the systems removed, generally after one or two growing seasons, when it has been determined by the Borough-designated program consultant that the approved planting was successful.

3.4.14 Safeguards to assure that the overall dune system is protected, to the maximum extent practical, have been incorporated into the design of the DVMP. They include:

(a) Live native vegetation will be retained to the maximum extent practical;

(b) The entire root system of the trees to be removed will be preserved without disturbance of the soil. This root structure will help to stabilize the dune system as the replacement vegetation becomes established;

(c) Cutting and removal of the invasive trees will be accomplished by hand using trained professionals;

(d) The invasive Japanese black pine or other damaging invasive plants must be removed without the use of any vehicles in the dunes or dune path;

(e) The utmost care is required to preserve all existing native vegetation during the removal of the Japanese black pine or other damaging invasive plants;

(f) Prior to phased removal of the remaining stand of invasive trees, the replacement native plants must survive into the second growing season;

(g) The installation of a sand fence, if required, along the ocean side of any area proposed for management, when appropriate, ensures that the planted native species will be sheltered from harsh winds from the onset of the process.;

(h) The replacement native vegetation will not release weeds (non-native plants) that are not indigenous to the Stone Harbor dune system.

3.4.15 Inspections and monitoring are important elements of the DVMP by providing continued feedback concerning the successes and necessary revisions of the Program. It is proposed that a DVMP Base Map **(APPENDIX E)** be used to track priority restoration areas and facilitate monitoring success of the Dune Restoration Plan with annual updates.

3.4.16 Pre-inspections, including photo-documentation, of areas involved in dune management and restoration will be incorporated into the project proposal. Post-inspection reports of the success of replacement native plants will be submitted to the Borough for monitoring purposes. These reports will include an assessment of plant survival and coverage

annually, including photo-documentation, until the plants are established, generally three (3) years.

SECTION 4. DUNE VEGETATION MANAGEMENT PLAN APPROVAL PROCESS

4.1 Review and Approval Process

The Dune Vegetation Management Plan (DVMP) promotes the use of management standards, techniques and an approved list of native replacement plants that maintain a healthy, diverse dune system.

4.1.1 The Draft Plan will be reviewed by the Borough Natural Resources Committee for comment and recommendations.

4.1.2 The Plan will be refined by The Lomax Consulting Group based on input provided by the Committee.

4.1.3 The Plan will be presented to Borough Council for its review, comments and recommendations.

4.1.4 The Plan will be submitted to NJDEP as part of the Jurisdictional Determination request.

4.1.5 The proposed changes to Borough Dune Ordinances to incorporate the DVMP program will be submitted to the Borough Natural Resource Committee for review and comment.

4.1.6 The draft changes to the Borough Dune Ordinances incorporating the DVMP program will be submitted to Borough Council for consideration and approval.

4.1.7 After review and approval by Borough Council (incorporating their changes), the Plan elements will be integrated into the Borough Beach and Dune Protection Ordinance (Chapter 156, Article III).

4.1.8 The Borough will inform the interested public and landscapers of the purpose and provisions of the DVMP through a news release and meetings, as appropriate.

SECTION 5. CONCLUSION

The benefits of a well-planned and maintained dune system that provides a protective barrier from coastal storms has become most evident since Superstorm Sandy. This Dune Vegetation Management Plan creates a framework for the community to return the dune vegetation to its natural and most resilient state. It fosters a public-private partnership where property owners within the community and the Borough implement the management standards that safeguard the integrity of the dunes, while allowing vegetation management and dune restoration. The Dune Vegetation Management Plan outlines conservation practices and safeguards to clarify roles and responsibilities and effective management of the dunes. Further, the Plan lays out the approval process to ensure that the goal of a healthy and diverse ecosystem is achieved and connected to the Borough's public policy process. Accordingly, the Dune Vegetation Management Plan is an integral part of the Community Forestry Management Plan and relevant Borough Ordinances.

In conclusion, the Dune Vegetation Management Plan recognizes that the dune system is a critical asset of the community and requires continued management to ensure that a healthy dune system is sustained to protect the Borough, its inhabitants and property, the natural ecology of the dunes and the Borough's tourism economy.

SECTION 6. SELECTED REFERENCES

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APPENDIX A:

Borough of Stone Harbor Beach Ordinance Chapter 156 with special reference to Article III: Beach and Dune Protection adopted as Section 12-7 of the 1982 Revised General Ordinance

and

Executive Policy

Title: Beaches and Dunes

Number: B-002

Chapter 156. BEACHES

Article III. Beach and Dune Protection

§ 156-20. Preamble.

The beach berm and dunes offer the first line of defense against the sea during a storm. Dune areas are vulnerable to erosion and damage by wind, water, indiscriminate trespass, construction, acts which damage their protective vegetation, and the absence of good husbandry. Therefore, the Borough has a vital interest in establishing and maintaining a protection program for the beach and dune areas.

§ 156-21. Policy.

A. It is the policy of this Borough to encourage the development of sand dunes, and to take whatever steps are required to maintain and protect these dunes. The specifics for such steps are set forth in Executive Policy 98-B-001, as amended from time to time.

B. All the provisions of this article are deemed necessary, material and substantial, and are therefore not subject to waiver or variance.

§ 156-22. Definitions.

As used in this article, the following terms shall have the meanings indicated:

BEACH AREA

The area between the mean low-water line of the ocean and the seaward edge of the dune as hereinafter defined.

DUNE AREA

The area between the seaward edge of the dune and the landward edge of the dune.

DUNE VEGETATION

All plant species found on beaches and dunes of northeastern US, either native or introduced, which can build and stabilize sand dunes.

LANDWARD EDGE OF THE DUNE

The intersection line of the backslope of the dune and the sea wall.

MEAN HIGH WATER (MHW)

A tidal datum that is the arithmetic mean of the high-water heights observed over a specific nineteen-year Metonic Cycle (the National Tidal Datum Epoch). For the New Jersey coast, the two high waters of each tidal day are included in the mean. This datum is available from the DEP, Bureau of Tidelands Management.

MEAN HIGH-WATER LINE (MHWL)

The intersection of the land with the water surface at elevation of mean high water. The elevation of mean high water varies along the oceanfront and the tidal bays and streams in the

coastal zone. (Note: For practical purposes, the mean high-water line is often referred to as the "ordinary" high-water line, which is typically identified as the limit of wet sand or debris line on a beach, or by a stain line on a bulkhead or piling.)

MEAN LOW WATER (MLW)

A tidal datum that is the arithmetic mean of the low water heights observed over a specific nineteen-year Metonic Cycle (the National Tidal Datum Epoch). For the New Jersey coast, the two low waters of each tidal day are included in the mean. This datum is available from the DEP, Bureau of Tidelands Management.

MEAN LOW-WATER LINE (MLWL)

The intersection of the land with the water surface at the elevation of mean low water. The elevation of mean low water varies along the oceanfront and the tidal bays and streams in the coastal zone.

MECHANICAL RELOCATION

Broadly defined to include the transport of sand by any mechanical means to or into the dune area, as well as the placement of sand obtained from off-site locations.

PATHWAY

An improved, protective accessway across the dune.

SAND FENCE

A wind-barricade-type of fence established in a line or a pattern to accumulate sand and aid in the formation of a dune, such as a picket-type consisting of light wooden slats held together by wire and affixed to wooden posts.

SEAWARD EDGE OF THE DUNE

The intersection line of the foreslope of the dune and the gradient of the beach area, or vegetation line, or the upper driftline, whichever is most easterly.

UPPER DRIFTLINE

The line produced by the winter spring tides (highest tides of the year) which contains oceanic debris (flotsam such as seaweed, etc.) and the seeds, rhizomes, or detached plants which can germinate and/or grow to produce a zone of new dune vegetation.

VEGETATION LINE

The line connecting the most seaward naturally occurring perennial plants with other such plants.

WALKWAY

A constructed means of crossing the dune area and usually consists of steps, ramps and elevated wooden walkways.

§ 156-23. Regulations; unlawful activities.

Except with the expressed approval of the Mayor and Council of the Borough of Stone Harbor, or in connection with the Borough's construction or placement of dune fencing, elevated walkways over the dunes, pathways and planting of dune vegetation, the following activities are unlawful:

A. To construct or attempt to construct any structure within the dune area.

B. To remove or cart away, by any means, any sand, sand fencing or dune vegetation from the dunes or from the area around the dunes.

C. To willfully or intentionally relocate or damage any sand fencing or any other type of dune protection device, or to hang any objects thereon.

D. To cut, burn or destroy any dune vegetation.

E. For any person, either on foot or on some form of conveyance, to:

(1) Disturb or destroy dune vegetation;

(2) Trespass within any area enclosed by sand fencing, or enclosed by sand fencing and the bulkhead along the beaches;
(3) Enter into those areas of the Public Use District and the Conservation Management District south of 122nd Street in all locations where dunes, dune grasses, or other forms of vegetation planted for the development of dunes exist;
(4) Enter into any other areas as may from time to time be specifically posted by order of the governing body.

F. To cross over the dunes by means other than using the pathways and elevated walkways constructed for that purpose.
G. To use and/or operate motor vehicles on the beach other than in accordance with Article **II**, Vehicles on Beaches, of this chapter.
H. To harvest beach sand or scrape beach sand or dunes without written approval by the Borough.

§ 156-24. Replenishment of sand and sand dunes.

A. Dune replenishment activity shall take place during periods prescribed by specific regulations, except in the case of emergency circumstances which constitute an immediate threat to the public health, safety and welfare as declared by appropriate Borough officials.
B. Replenished dunes shall be protected by planting appropriate vegetative cover in accordance with specifications set forth in Executive Policy 98-B-001.
C. Replenished dunes shall be immediately protected by the erection of sand fences in accordance with specifications set forth in Executive Policy 98-B-001.
D. In the event that the replenishment sand, or a portion thereof, is obtained from an off-site location, the added sand shall be of such grain size, shape, color and other characteristics as will be compatible with the existing on-site sand.

§ 156-25. Plans and records.

A. The Borough shall maintain a current plan to define the specific location and dimensions for the planting of dune vegetation, the erection of sand fencing, or the placement of temporary walkway protection in compliance with the standards set forth in Executive Policy 98-B-001.
B. The Borough shall conduct periodic inspections of beaches and prepare both written and photographic reports of findings in a format suitable for presentation as official evidence.
C. The Borough shall initiate and maintain beach profiles and engineering activities as part of a monitoring program, and maintain appropriate records.

§ 156-26. Enforcement; violations and penalties.

A. The Borough's Police Department shall enforce the various requirements defined and set forth in this article.
B. All persons or associations of persons shall, upon conviction of a violation of this article, be subject to the penalties set forth in Chapter **1**, Article **III**, Penalty, of the Borough of Stone Harbor Code. *Editor's Note: Amended at time of adoption of Code (see Ch. 1, General Provisions, Art. I).*

§ 156-27. Exceptions.

Anything to the contrary herein notwithstanding, it shall be lawful for persons to traverse the area of the dunes upon duly designated pathways and walkways. It shall also be lawful for officials

of the Borough of Stone Harbor, the State of New Jersey and the United States of America, their agents, representatives and contractors to traverse upon the dunes where necessary in connection with the erection of sand fencing, planting and fertilizing dune vegetation, erection of shore protection devices and other similar activities.

Borough of Stone Harbor, NJ
Wednesday, October 1, 2014

Chapter 156. BEACHES

[HISTORY: Adopted by the Borough Council of the Borough of Stone Harbor as indicated in article histories. Amendments noted where applicable.]

GENERAL REFERENCES

Beach supervision — See Ch. **18**.
Public performances — See Ch. **121**.
Alcoholic beverages — See Ch. **134**.
Amusements; arcades — See Ch. **141**.
Animals — See Ch. **147**.
Bicycles, skateboards, roller skates and Segways — See Ch. **162**.
Boating — See Ch. **170**.
Bulkhead and dock construction — See Ch. **199**.
Special events — See Ch. **275**.
Flood damage prevention — See Ch. **300**.
Loitering — See Ch. **363**.
Noise — See Ch. **374**.
Parks and recreation areas — See Ch. **400**.
Peace and good order — See Ch. **405**.

Article I. Paid Beaches

[Adopted as Sec. 12-4 of the 1982 Revised General Ordinances]

§ 156-1. Paid beaches established.

A. Paid places of resort, bathing and recreation, known as "paid beaches," are hereby established in the Borough of Stone Harbor for the public health, recreation and entertainment.

B. Such paid beaches shall include the oceanfront upon all lands in the Borough of Stone Harbor fronting on the Atlantic Ocean between 80th Street and Hereford Inlet, and upon all of the lands fronting on Hereford Inlet commonly known as "the beach."

§ 156-2. Fees and charges.

[Amended 3-7-2006 by Ord. No. 1251]

In order to provide the necessary funds and to improve, maintain and police the beaches, various fees shall be charged for such facilities and collected by the Beach Tag Sales Supervisor. The Borough Council shall have the right to change these fees from time to time by resolution of the Borough Council.

§ 156-3. Badges required; fee exemptions.

[Amended 10-18-2011 by Ord. No. 1392]

A. Persons 12 or older. No person of the age of 12 years or older shall bathe at or otherwise use the paid beaches without having first acquired and then having in his or her possession a proper and effective badge permitting him or her to use said beaches.

B. Persons in active military service. Though such persons are required to display a badge, no fees shall be charged to or collected from persons in active military service in any of the Armed Forces of the United States or to their spouse or dependent children over the age of 12 years.

C. Persons who are active members of the New Jersey National Guard. Though such persons are required to display a badge, no fees shall be charged to or collected from persons who are active members of the New Jersey National Guard who have completed initial active duty training and to their spouse or dependent children over the age of 12 years. As used in this subsection, "initial active duty training" means basic military training, for members of the New Jersey Air National Guard, and basic combat training and advanced individual training, for members of the New Jersey Army National Guard.

D. Persons who have served in any of the Armed Forces of the United States and who were discharged or released therefrom under conditions other than dishonorable and who either have served at least 90 days in active duty or have been discharged or released from active duty by reason of a service-incurred injury or disability (veterans). Though such veterans are required to display a badge, no fees shall be charged to or collected from such veterans. In order to obtain a badge with no fee, such veterans shall present to the Beach Supervisor documentation, consistent with law and the rules and regulations promulgated by The Adjutant General of the New Jersey Department of Military and Veterans Affairs, sufficient to establish entitlement to a badge with no fee.

[Added 3-4-2014 by Ord. No. 1438[1]]

[1]: *Editor's Note: Pursuant to this ordinance, former Subsection D was redesignated as Subsection E.*

E. Records and verification. As required by law, the Beach Tag Supervisor shall maintain a list of all individuals to whom beach tags are issued pursuant to Subsections **B**, **C**

and **D** above, including the names of all individuals and, as applicable hereunder, their family members who qualify for the beach fee exemption. The Beach Tag Supervisor shall also establish procedures for verifying that individuals and, as applicable hereunder, their family members qualify for the beach fee exemption by presentation by those claiming the exemption of appropriate credentials demonstrating active duty or veteran status.
[Amended 3-4-2014 by Ord. No. 1438]

§ 156-4. Hours.

The paid beaches shall be kept open during the usual bathing season, which shall be established on an annual basis by resolution of Borough Council. The beaches shall be opened during the hours from 10:00 a.m. to 5:00 p.m. prevailing time, except during inclement weather.

§ 156-5. Borough control.

The Mayor and Council are hereby authorized and empowered to:

A. Adopt by resolution, in addition to the rules and regulations herein enumerated, such other rules and regulations as may be necessary for the proper control and regulation of the beachfront and the waters adjacent thereto.

B. Designate by resolution the protected bathing beaches where boats and lifeguards are to be provided by the Borough and from which beaches persons may bathe and swim, and to change or abolish the precise location of any one or more of such protected bathing beaches from time to time, as safety and attending circumstances shall require.

C. Employ inspectors, lifeguards, and such other employees as may be necessary to carry out and enforce the provisions of this section and all rules and regulations established herein or subsequently adopted by resolution.

D. Purchase badges, checks or other insignia and such other supplies, materials and equipment as may be necessary.

E. Designate by resolution of the Borough Council from time to time, upon written application therefor, that the requirements of having a beach badge be lifted on certain beaches for the duration of certain functions found by Borough Council to be in the best interests of the Borough of Stone Harbor. Examples of such functions would be the conduct of a hobie cat race, a sailing race, a surfing tournament, a surf fishing tournament, or some other similar event. It is the intention of Borough Council that such events be kept to a reasonable number so as not to unduly interfere with the public's use of our beaches.

§ 156-6. Rules and regulations.

A. It shall be unlawful to violate any of the following rules and regulations, or those subsequently adopted by resolutions, during the bathing season or at other times if specifically provided for. No person shall:

(1) Bathe or swim from the paid beaches except from the protected bathing beaches where boats and lifeguards are provided, and at such times as the lifeguards are on duty; nor bathe or swim beyond a safe depth in the ocean as from time to time indicated or regulated by the lifeguards.

(2) Use a surfboard, boat or raft of any kind or description except at locations designated by the lifeguards.

(3) Engage in surf fishing in the bathing areas during bathing hours, except that surf fishing shall be permitted within 20 yards of either side of a jetty, subject to modification on a daily basis by the lifeguards on duty, depending upon water and wind conditions.

(4) Use the public beaches for picnicking. The word "picnicking" as used herein means the carrying of or otherwise transporting any box, basket, bag or tub or other receptacle in which there is contained food or beverage, or both, and the consumption of such food or beverages, or both.

(5) Consume alcoholic beverages on the public beaches.

(6) Change clothes, dress, undress or otherwise disrobe, except outer wraps.

(7) Sleep on the public beaches during any time between sunset and sunrise.

(8) Act in a loud, indecent, obscene or offensive manner.

(9) Revel, disport, or behave in a noisy and boisterous manner, emitting loud cries and other noises, so as to inconvenience others, or otherwise disrupt and disturb the public peace and dignity within the beach areas defined.

(10) Climb upon, stand on, tamper with or handle the lifeguard boats or other equipment used by the lifeguards.

(11) Throw, bat or catch a baseball, football, basketball, softball, metal horseshoes, beach darts, or engage in the playing of any game, which endangers the health and safety of others. This subsection shall not apply to the playing of beach tennis or playing "catch" with a soft rubber or beach ball, unless the health and safety of others is endangered.

(12)

Throw, place, deposit or leave any bottles, glass, crockery, sharp or pointed articles or things, paper, refuse or debris of any kind on the beaches.

(13) Conduct any commercial activity or business on the public beaches, unless specifically authorized to do so by Borough Council, or unless licensed to do so by the Borough of Stone Harbor. In addition, no person shall offer as a gift or free sample any article, goods, wares, merchandise, or any materials advertising any article, goods, wares or merchandise for sale, to any person on the public beaches of the Borough of Stone Harbor.

(14) Park vehicles, loiter, assemble, band or crowd together, so as to interfere, or be likely to interfere, with the ingress and egress of others at the street ends approaching the beaches.

(15) Drive or move any vehicle on the beach at anytime during the entire year without a permit issued in accordance with Article **II**, Vehicles on Beaches, of this chapter.

(16) Fly a kite of any size, shape or description or attempt to do so, or propel or cause the movement of any object through the air, whether manually, mechanically or electrically during the hours that the beach is made available for bathing.

(17) Start or maintain a fire on the beach at any time during the entire year without permit in writing issued by the Mayor.

(18) Permit or allow any dogs or other animals on the beachfront or the waters adjacent thereto, or upon any public walk contained on the beachfront, except as otherwise set forth in § **147-7H** of the Code of the Borough of Stone Harbor.

(19) Fail to immediately obey all orders, directions, whistles or other signals used by the lifeguards, the beach inspectors, the beach tag checkers and/or the Borough police officers.

(20) Operate a power-driven boat, jet ski, or other power-driven watercraft:

(a) Within 300 feet of any person swimming in the ocean off said beaches;

(b) Within an area circumscribed by a line drawn from the seaward end of any two of the Borough's stone revetments, the stone revetments themselves and the beach; or

(c) Within 300 feet of the seaward side of the line drawn from the seaward end of any two stone revetments.

(21) Use a surfboard, without a leash attached thereto, in the water off the beach; use a kayak, in the waters off the beach, without wearing a life jacket.

B. This section shall be applicable between the 15th day of May and the 25th day of September during the hours of 8:00 a.m. and 6:00 p.m., inclusive.

§ 156-7. Revocation of beach privileges.

The Borough reserves the right to revoke any beach privileges granted under this article for any violations of its provisions, or other rules and regulations, and to retake and impound any beach identification badge or permit which has been improperly used or obtained. Such revocation shall not preclude the imposition of any other penalties provided for such violation.

§ 156-8. Violations and penalties.

[Amended 3-7-2006 by Ord. No. 1251]
Anyone violating any provision of this article shall, upon conviction thereof, be subject to a minimum fine of $30 and the maximum penalties set forth in Chapter **1**, Article **III**, Penalty, of the Borough of Stone Harbor Code.

Article II. Vehicles on Beaches

[Adopted as Sec. 12-5 of the 1982 Revised General Ordinances]

§ 156-9. Placement or operation of vehicles regulated.

Except as hereinafter provided, it shall be unlawful to place or to operate an automobile, truck, motorcycle, minibike, or other vehicle on the beach within the Borough.

§ 156-10. Application for permit.

[Amended 8-16-2011 by Ord. No. 1385]

A. Any person desiring to operate a permitted vehicle on the beaches shall make application to the Borough Clerk of the Borough of Stone Harbor to do so between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday. The applicant shall furnish his/her name, address, valid driver's license, registration and insurance card, make, model and year of vehicle and license plate number.

B. The applicant shall sign a completed application and by signing the application agrees to have the required equipment maintained in the vehicle, tow rope, jack with board, inflated spare tire, shovel, fire extinguisher, first aid kit and flashlight. By signing the application, the applicant agrees to allow spot inspections of his/her vehicle for this equipment by the Stone Harbor Police Department while operating on the beach in

Stone Harbor. Failure to maintain the equipment while in operation on the beach in Stone Harbor will result in a fine.

§ 156-11. Permitted vehicles; insurance.

Permits shall only be issued for vehicles which have passed inspection by the Division of Motor Vehicles of the State of New Jersey for the current year or by the equivalent department or agency of the state in which the vehicle is registered. Such vehicles must also be insured for liability, etc., in an amount which is at least the amount required by the State of New Jersey.

§ 156-12. Permit fee and application.

[Amended 3-7-2006 by Ord. No. 1251; 8-16-2011 by Ord. No. 1385]
The fee for a permit shall be established by the Borough Council by resolution for the season, or any portion thereof, for which the application is made. Applications shall be accepted by the Borough Clerk between September 1 and March 15 of the following year. Payment in full shall accompany the applications.

§ 156-13. Display of permit.

Upon issuance of a permit, the permittee shall receive a descriptive decal which shall be prominently displayed upon the vehicle. The permit shall be carried on the vehicle at all times and made available for inspection to any member of the Police Department when the vehicle is on the beach, or when the vehicle is about to enter or has just exited from the beach. A copy of this article shall be carried in the vehicle during operations on the beach.

§ 156-14. Expiration date; renewal.

[Amended 8-2-2005 by Ord. No. 1240; 8-16-2011 by Ord. No. 1385]
Permits shall be issued for the season, which will run from October 1 through March 15, inclusive, for the beachfront from 122nd Street North and from the day after Labor Day to March 15 for the beach front and Point Area from 122nd Street South. Application for renewal shall be made in the same manner as an original application.

§ 156-15. Rules and regulations.

[Amended 8-2-2005 by Ord. No. 1240; 8-16-2011 by Ord. No. 1385]

A. No vehicles with sleeping or eating accommodations shall be issued a permit or operated on the beaches at any time.

B. No vehicles shall be operated on the beaches of the Borough at a speed in excess of 15 miles per hour.

C. Vehicles are prohibited from operation on the beaches between 111th and 114th Streets, inclusive.

D. Permitted vehicles may enter the beach areas only for the purposes of fishing, and when the fishing is completed, they shall promptly be removed from the beach.

E. No permit issued hereunder shall be construed to authorize the right to operate a vehicle over private property without the permission of the owner of such property.

F. Permitted vehicles shall only operate upon the hard sand and shall not be operated more than 25 feet above the mean high water line of the Atlantic Ocean, except when entering or exiting the beach. Said vehicles shall not be operated over or upon the dunes or meadowland. Permitted vehicles may only be operated by the person to whom the permit has been issued, and the hours of operation shall be as follows:

(1) On the beaches south of 122nd Street: at any time from the day after Labor Day until March 15, inclusive.

(2) Upon the beaches north of 122nd Street: during the period one hour prior to sunrise until one hour past sunset only.

G. All permitted vehicles shall only be usable for beach fishing and shall have four-wheel drive or shall otherwise be suitable for operation in the sand. The Police Department, in making the determination as to whether or not the vehicle is suitable for operation in the sand, shall consider the following factors: whether or not the vehicle has a truck-type chassis, the type of drive, i.e., front or rear, whether or not it has special tires, its power; and avoid permitting vehicles which are likely to become stuck in the sand from being operated on the beach.

H. Access to the beaches shall be limited to the following locations:

(1) The ramps at 85th Street, 96th Street, 102nd Street, 118th Street, 122nd Street, the ramp at the 123rd Street parking lot and the beach and the ramp in the southwesterly corner of the parking and turning-around area adjacent to the 127th Street groin.

I. Access to the beach from the ramp in the parking and turning area adjacent to the 127th Street groin shall be along the new access road running from the 123rd Street parking lot, west of the bulkhead. The old access road, having its entrance at 122nd Street and Second Avenue and proceeding west for approximately 150 feet before turning and heading to the beach, shall be closed to vehicular traffic with the exception of emergency vehicles and Borough vehicles on Borough business.

J. The Mayor, or in his or her absence the Acting Mayor, shall have the right to close beaches to all but emergency vehicles, when the conditions on the beach are determined by said Mayor or Acting Mayor, in his or her sole discretion, to be dangerous for motor vehicles or if the conditions are such that the motor vehicles may cause damage to the beach or the dunes or, if after consultation with state and/or federal regulators, such closure is determined by the Natural Resources Committee to be necessary for the protection of wildlife.

§ 156-16. Adoption of additional rules and regulations.

[Amended 3-7-2006 by Ord. No. 1251]
The Borough Council is authorized and empowered to adopt by resolution such other rules, regulations, and requirements as it may deem necessary for the proper control, operation, and removal of automobiles and other vehicles on the beaches, including a requirement that such vehicles shall contain equipment for the purpose as shall be specified in the resolution. Also, the power and authority to change by resolution the hours when authorized vehicles shall be permitted on the beach, and the place or places of entry to and exit from the beach. Permittees shall comply with all the rules, regulations, and requirements herein set forth and as shall subsequently be amended or adopted.

§ 156-17. Revocation of permit.

The Borough reserves the right to revoke any beach privileges granted under this article for any violations of its provisions, or of other rules and regulations, and to retake and impound any permit which has been improperly used or obtained. Such revocation shall not preclude the imposition of any other penalties provided for such violation.

§ 156-18. Exceptions.

[Amended 5-5-2009 by Ord. No. 1337]
The provisions of this article shall not apply to Borough employees who may be required to enter upon the beaches in the performance of their municipal duties or functions, nor to any governmental agency, its employees, agents, contractors and subcontractors, who may be engaged in beach restorations or protection work, nor to any Borough contractor or permitee where the terms of such contract or permit allow for the operation of vehicles.

§ 156-19. Violations and penalties; suspension or revocation of permit.

[Amended 3-7-2006 by Ord. No. 1251; 8-16-2011 by Ord. No. 1385]

Anyone violating a provision of this article shall, upon conviction thereof, be subject to a minimum fine of $250 and the maximum penalties set forth in Chapter 1, Article III, Penalty, of the Borough of Stone Harbor Code, and revocation of the permit.

Article III. Beach and Dune Protection

[Adopted as Sec. 12-7 of the 1982 Revised General Ordinances]

§ 156-20. Preamble.

The beach berm and dunes offer the first line of defense against the sea during a storm. Dune areas are vulnerable to erosion and damage by wind, water, indiscriminate trespass, construction, acts which damage their protective vegetation, and the absence of good husbandry. Therefore, the Borough has a vital interest in establishing and maintaining a protection program for the beach and dune areas.

§ 156-21. Policy.

A. It is the policy of this Borough to encourage the development of sand dunes, and to take whatever steps are required to maintain and protect these dunes. The specifics for such steps are set forth in Executive Policy 98-B-001, as amended from time to time.

B. All the provisions of this article are deemed necessary, material and substantial, and are therefore not subject to waiver or variance.

§ 156-22. Definitions.

As used in this article, the following terms shall have the meanings indicated:

BEACH AREA

The area between the mean low-water line of the ocean and the seaward edge of the dune as hereinafter defined.

DUNE AREA

The area between the seaward edge of the dune and the landward edge of the dune.

DUNE VEGETATION

All plant species found on beaches and dunes of northeastern US, either native or introduced, which can build and stabilize sand dunes.

LANDWARD EDGE OF THE DUNE

The intersection line of the backslope of the dune and the sea wall.

MEAN HIGH WATER (MHW)

A tidal datum that is the arithmetic mean of the high-water heights observed over a specific nineteen-year Metonic Cycle (the National Tidal Datum Epoch). For the New Jersey coast, the two high waters of each tidal day are included in the mean. This datum is available from the DEP, Bureau of Tidelands Management.

MEAN HIGH-WATER LINE (MHWL)

The intersection of the land with the water surface at elevation of mean high water. The elevation of mean high water varies along the oceanfront and the tidal bays and streams in the coastal zone. (Note: For practical purposes, the mean high-water line is often referred to as the "ordinary" high-water line, which is typically identified as the limit of wet sand or debris line on a beach, or by a stain line on a bulkhead or piling.)

MEAN LOW WATER (MLW)

A tidal datum that is the arithmetic mean of the low water heights observed over a specific nineteen-year Metonic Cycle (the National Tidal Datum Epoch). For the New Jersey coast, the two low waters of each tidal day are included in the mean. This datum is available from the DEP, Bureau of Tidelands Management.

MEAN LOW-WATER LINE (MLWL)

The intersection of the land with the water surface at the elevation of mean low water. The elevation of mean low water varies along the oceanfront and the tidal bays and streams in the coastal zone.

MECHANICAL RELOCATION

Broadly defined to include the transport of sand by any mechanical means to or into the dune area, as well as the placement of sand obtained from off-site locations.

PATHWAY

An improved, protective accessway across the dune.

SAND FENCE

A wind-barricade-type of fence established in a line or a pattern to accumulate sand and aid in the formation of a dune, such as a picket-type consisting of light wooden slats held together by wire and affixed to wooden posts.

SEAWARD EDGE OF THE DUNE

The intersection line of the foreslope of the dune and the gradient of the beach area, or vegetation line, or the upper driftline, whichever is most easterly.

UPPER DRIFTLINE

The line produced by the winter spring tides (highest tides of the year) which contains oceanic debris (flotsam such as seaweed, etc.) and the seeds, rhizomes, or

detached plants which can germinate and/or grow to produce a zone of new dune vegetation.

VEGETATION LINE

The line connecting the most seaward naturally occurring perennial plants with other such plants.

WALKWAY

A constructed means of crossing the dune area and usually consists of steps, ramps and elevated wooden walkways.

§ 156-23. Regulations; unlawful activities.

Except with the expressed approval of the Mayor and Council of the Borough of Stone Harbor, or in connection with the Borough's construction or placement of dune fencing, elevated walkways over the dunes, pathways and planting of dune vegetation, the following activities are unlawful:

A. To construct or attempt to construct any structure within the dune area.

B. To remove or cart away, by any means, any sand, sand fencing or dune vegetation from the dunes or from the area around the dunes.

C. To willfully or intentionally relocate or damage any sand fencing or any other type of dune protection device, or to hang any objects thereon.

D. To cut, burn or destroy any dune vegetation.

E. For any person, either on foot or on some form of conveyance, to:

(1) Disturb or destroy dune vegetation;

(2) Trespass within any area enclosed by sand fencing, or enclosed by sand fencing and the bulkhead along the beaches;

(3) Enter into those areas of the Public Use District and the Conservation Management District south of 122nd Street in all locations where dunes, dune grasses, or other forms of vegetation planted for the development of dunes exist;

(4) Enter into any other areas as may from time to time be specifically posted by order of the governing body.

F. To cross over the dunes by means other than using the pathways and elevated walkways constructed for that purpose.

G.

To use and/or operate motor vehicles on the beach other than in accordance with Article II, Vehicles on Beaches, of this chapter.

H. To harvest beach sand or scrape beach sand or dunes without written approval by the Borough.

§ 156-24. Replenishment of sand and sand dunes.

A. Dune replenishment activity shall take place during periods prescribed by specific regulations, except in the case of emergency circumstances which constitute an immediate threat to the public health, safety and welfare as declared by appropriate Borough officials.

B. Replenished dunes shall be protected by planting appropriate vegetative cover in accordance with specifications set forth in Executive Policy 98-B-001.

C. Replenished dunes shall be immediately protected by the erection of sand fences in accordance with specifications set forth in Executive Policy 98-B-001.

D. In the event that the replenishment sand, or a portion thereof, is obtained from an off-site location, the added sand shall be of such grain size, shape, color and other characteristics as will be compatible with the existing on-site sand.

§ 156-25. Plans and records.

A. The Borough shall maintain a current plan to define the specific location and dimensions for the planting of dune vegetation, the erection of sand fencing, or the placement of temporary walkway protection in compliance with the standards set forth in Executive Policy 98-B-001.

B. The Borough shall conduct periodic inspections of beaches and prepare both written and photographic reports of findings in a format suitable for presentation as official evidence.

C. The Borough shall initiate and maintain beach profiles and engineering activities as part of a monitoring program, and maintain appropriate records.

§ 156-26. Enforcement; violations and penalties.

A. The Borough's Police Department shall enforce the various requirements defined and set forth in this article.

B.

All persons or associations of persons shall, upon conviction of a violation of this article, be subject to the penalties set forth in Chapter **1**, Article **III**, Penalty, of the Borough of Stone Harbor Code.[1]

[1]: *Editor's Note: Amended at time of adoption of Code (see Ch. 1, General Provisions, Art. I).*

§ 156-27. Exceptions.

Anything to the contrary herein notwithstanding, it shall be lawful for persons to traverse the area of the dunes upon duly designated pathways and walkways. It shall also be lawful for officials of the Borough of Stone Harbor, the State of New Jersey and the United States of America, their agents, representatives and contractors to traverse upon the dunes where necessary in connection with the erection of sand fencing, planting and fertilizing dune vegetation, erection of shore protection devices and other similar activities.

Article IV. Public Beachfront Recreational Area

[Adopted as Sec. 12-8 of the 1982 Revised General Ordinances]

§ 156-28. Public beachfront recreational area created.

A public beachfront recreational area is hereby created east of the oceanfront bulkhead, which presently runs from 80th to 127th Street, and also eastwardly of that line, if extended, to the southerly tip of the island, with the exception only of the parcel of beachfront between the jetties at 111th and 114th Streets in the Borough of Stone Harbor.

§ 156-29. Public beachfront nondiscriminatory.

The public beachfront recreational area shall be opened to the general public on a nondiscriminatory basis for recreational purposes, subject to appropriate fee regulation in connection with public bathing purposes and subject to other appropriate regulations by the Borough, if and when required, for the proper operation and maintenance thereof.

§ 156-30. Privately owned beachfront.

In the event the Catholic Church should cease to be the owner of Lots 1 through 8, Block 112.1, then that portion of such parcel of land east of the bulkhead shall be acquired by the Borough of Stone Harbor, and the beachfront east of the bulkhead between the jetties at 111th and 114th Street shall be included as part of the public beachfront recreational area and shall be subject to the terms of this article.

§ 156-31. Acknowledging public beachfront recreational area.

This article further acknowledges that the entire southern portion of the island south of 127th Street and a portion of the island as far north as 122nd Street is governed by an easement of record by which the Borough of Stone Harbor is to preserve and protect such property as a wildlife habitat, and a recreational educational nature area for such activities as nature walking, bird watching, and fishing as permitted and regulated. This area is subject to the Coastal Area Facility Review Act (CAFRA) Permit No. CA 75-7-125, and the Order of Dismissal from the Office of Administrative Law, Docket No. ESA 1412-80. The Permit and Order contain conditions that the area south of 127th Street is to be conserved to protect natural resources and provides that the use and parking of motor vehicles shall be regulated such that dunes, endangered and threatened wildlife habitat, critical wildlife habitat, wetlands and other natural resources are protected.

EXECUTIVE POLICY

Borough of Stone Harbor

Title: Beaches and Dunes

Number: B-002

POLICY:

It is the policy of this Borough to encourage the development of beaches and sand dunes, and to take whatever steps are required to build, maintain and protect such beaches and dunes.

In the performance of these duties, the Borough shall follow the procedures and guidelines set forth in this policy.

PROCEDURE:

DUNE PLANTING:

Planting may take place at any time based upon weather and ground conditions. Spring planting should be accomplished by frequent watering, where practical. Initial and subsequent fertilization is recommended at the rate of about 2 pounds of slow-release 10-10-10 per 1000 square feet.

For initial planting, or replanting sparse areas, Cape American beach grass (Ammophila brevillgula) should be used. The entire Dune Area behind the foreslope shall be planted. The vegetation will voluntarily grow down the foreslope.

Only fresh planting stock cut back to 16-18 inches long shall be utilized. Spacing shall be no greater than 18 inches, two stems to a hole, at least 7 inches deep. If not planted with a water flooding method, the sand shall be compacted to eliminate air pockets.

Sand placed by earth moving equipment shall be allowed to become compacted by rains before planting is commenced.

After beach grass has been established, other appropriate vegetation may be added.

Adopted by Resolution 2001-S-67 on May 1, 2001

EXECUTIVE POLICY

Borough of Stone Harbor

Title: Beaches and Dunes

Number: B-002

SAND FENCING:

Fencing shall be standard 4-foot wood sand (snow) fence in good condition, secured to wooden posts of a minimum cross-section of 4 square inches and a minimum length of 6 ½ feet, with a maximum span between posts of 12 feet. Alternate fencing, as approved by the Borough, may be used.

Where practical, there shall be at least two parallel lines of fencing the length of each section of the dune area, a minimum of 10 feet apart. At least one line of fencing should be in a zig-zag pattern with alternate posts offset by at least 5 feet.

Half-height fencing may be used on the back dune.

ELEVATED WALKWAYS:

Walkways shall be constructed at an elevation and design in accordance with Borough and other appropriate government or regulatory codes and building standards.

Whenever the dune builds to the point that any part of the surface of an existing walkway is at or below the sand surface elevation within five feet to either side, that walkway shall be raised.

PATHWAYS:

If an elevated walkway is not used to access the ocean, a clearly defined pathway may be established. Such pathway shall be protected by placing suitable material on the sand surface.

Adopted by Resolution 2001-S-67 on May 1, 2001

APPENDIX B:

NJDEP Jurisdictional Determination

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Land Use Regulation
Mail Code 501-02A, P. O. Box 420
Trenton, New Jersey 08625-0420
www.state.nj.us/dep/landuse

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

Stone Harbor Borough
9508 Second Ave.
Stone Harbor, NJ 08247

SEP 18 2015

Re: **COASTAL JURISDICTIONAL DETERMINATION**
LUR File No.: 0510-15-0006.1
Activity Number: APD150001
Applicant: STONE HARBOR BORO
Block(s) and Lot(s): [N/A, N/A]
Stone Harbor Borough, Cape May County

Dear Madam and/or Sir:

This letter is in response to your request for a jurisdictional determination for the proposed dune re-vegetation on the above referenced site within the CAFRA regulatory area in a non-qualifying municipality. Potentially applicable statutes include Waterfront Development Act (N.J.S.A. 12:5-3 et . seq.), Wetlands Act of 1970 (N.J.S.A. 13:9A-1 et. seq.) and the Coastal Area Facility Review Act, CAFRA, (N.J.S.A. 13:9-1 et. seq.).

Based on a review of the information and a review of information as maintained on the Department's Geographic Information System the following determination is made:

Based on a review of the Coastal Permit Program Rules, the following determination is made:

(x) **A Waterfront Development permit is not required**, as no portion of the proposed dune re-vegetation will be conducted at or below the elevation of Mean High Water.

Based on a review of the Coastal Permit Program Rules, the following determination is made:

(x) **A CAFRA permit is not required**, as dune re-vegetation (with native, non-invasive species) is encouraged but not regulated.

Based on a review of the Coastal Wetlands Maps, the following determination is made:

(x) **Coastal Wetlands permit is not required**. Coastal Wetlands are mapped on this site. However, no activity is proposed at or below the Upper Wetlands Boundary.

This letter does not constitute a jurisdictional determination for the Freshwater Wetlands Protection Act Rules at N.J.A.C. 7:7A and the Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-1.1 et seq. For assistance with the applicability of these statutes you are advised to contact the Division's Technical Support Center at (609)777-0454.

This letter does not relieve the applicant of the responsibility of obtaining any other required State, Federal or local permits or approvals as required by law and is based on the information submitted in accordance with existing regulation. This determination shall be considered null and void if the submitted information is incorrect, site conditions or regulations change.

Please contact Jeffrey Alpert of our staff by e-mail at Jeff.Alpert@dep.nj.gov or (609) 777-0454 should you have any questions regarding this letter. Be sure to indicate the Department's file number in all communication.

Sincerely,

William J. Kresnosky, Supervisor
Division of Land Use Regulation

DATE: 9/18/15

Cc: Bureau of Coastal and Land Use Compliance and Enforcement, Toms River
Stone Harbor Borough Construction Official
Agent

APPENDIX C:

Approved List of Dune Vegetation

the LOMAX Consulting group

P. O. Box 9 (mailing)
1435 Route 9 North (delivery)
Cape May Court House, NJ 08210, USA

609-465-9857 (p)
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LIST OF DUNE VEGETATION

This List of Dune Vegetation was developed for the purpose of restoring/enhancing dune ecosystems utilizing native vegetation. The List was developed from review of literature, direct dune observations in natural areas of coastal barrier island communities and preserved maritime forests, including Island Beach State Park, in addition to personal experience and communications with other qualified professionals in the field. It is acknowledged that the Dune Vegetation List presented below was prepared originally for the Borough of Avalon and approved by their Environmental Commission. This List has been tested and refined over several years.

Adapted vegetation is an integral part of the overall dune system that is vital to the protection to the Borough from coastal storms. This vegetation not only aids sand deposition and accumulation, but also serves to retain the sand in the dune system. Accordingly, the selection of plants that will survive and flourish in the harsh environment of the dune system is critical. The Borough's dune system is a diverse ecosystem exposed to wind and salt spray. The dune soils are sandy, and as such, are droughty. In recognition of these conditions, the following vegetation list has been divided into two main categories regarding exposure and soil moisture conditions: (A) Salt Spray Tolerant Vegetation; and (B) Sheltered Upland Dune Vegetation based on the species tolerance of conditions and location in the dune system. The criteria for selection of the following native plants for dune re-vegetation include: (1) adaptation to survival in the dune environment; (2) resistance to disease and pests; (3) drought hardiness after they are established; (4) ability to be pruned to control shape and height, if trimming is begun early in the tree/shrub development; and (5) availability from nurseries.

One asterisk (*) indicates that this species is used by wildlife for food (including pollinators) and cover. Two asterisks (**) indicate that the plant has high wildlife value. (E) indicates that the plant is evergreen.

A. Salt Spray Tolerant Vegetation

1. Trees:

Common Name	Scientific Name
Eastern red cedar *(E)	*Juniperus virginiana*
Black cherry **	*Prunus serotina*
Winged sumac **	*Rhus copallinum*
Smooth sumac **	*R. glabra*

2. Shrubs:

Common Name	Scientific Name
Northern bayberry **(E)	*Morella pensylvanica*

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A. Salt Spray Tolerant Vegetation (continued)

Wax myrtle *	*M. cerifera*
Beach plum *	*Prunus maritima*
Groundsel *	*Baccharis halimifolia*
Bearberry (E)	*Arctostaphylos uva-ursi*
Beach-heather (E)	*Hudsonia tomentosa*

3. Vines:

Common Name	Scientific Name
Virginia creeper **	*Parthenocissus quinquefolia*

4. Herbaceous:

Common Name	Scientific Name
American beachgrass	*Ammophila breviligulata*
Sea rocket	*Cakile edentula*
Seaside spurge	*Euphorbia polygonifolia*
Coastal panicgrass *	*Panicum amarum var. amarulum*
Seaside goldenrod **	*Solidago sempervirens*
Beach pea *	*Lathyrus japonicus*
Dusty miller	*Artemisia stelleriana*
Rough cocklebur	*Xanthium strumarium*
Prickly pear (cactus)*(E)	*Opuntia humifusa*

B. Sheltered Upland Dune Vegetation

1. Trees:

Common Name	Scientific Name
Pitch pine **(E)	*Pinus rigida*
Eastern red cedar *(E)	*Juniperus virginiana*
Sassafras **	*Sassafras albidum*
Hackberry **	*Celtis occidentalis*
American holly *(E)	*Ilex opaca*
Scarlet oak **	*Quercus coccinea*
Black oak **	*Q. valutina*
Blackjack oak **	*Q. marilandica*
Scrub oak **	*Q. ilicifolia*
Pignut hickory *	*Carya glabra*
Mockernut hickory *	*C. tomentosa*
Hop-hornbeam *	*Ostrya virginiana*
Winged sumac **	*Rhus copallinum*
Smooth sumac **	*R. glabra*
Persimmon **	*Diospyros virginiana*

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2. Shrubs:

Common Name	Scientific Name
Northern bayberry **(E)	*Morella pensylvanica*
Wax myrtle *	*M. cerifera*
Beach plum *	*Prunus maritime*
Groundsel *	*Baccharis halimifolia*
Inkberry holly **(E)	*Ilex glabra*
Low rose **	*Rosa carolina*
Sweet fern *	*Comptonia peregrina*

3. Vines:

Common Name	Scientific Name
Climbing bittersweet *	*Celastrus scandens*
Trumpet vine *	*Campsis radicans*

4. Herbaceous:

Common Name	Scientific Name
Bitter panicgrass *	*Panicum amarum*
Coastal panicgrass *	*Panicum amarum var. amarulum*
Saltmeadow cordgrass	*Spartina patens*
Switchgrass **	*Panicum virgatum*
Bluestem	*Schizachyrium scoparium*
Seaside goldenrod **	*Solidago sempervirens*
Beach pea *	*Lathyrus japonicus*
Partridge pea *	*Chamaecrista fasciculata*
Rough cocklebur	*Xanthium strumarium*
Dusty miller	*Artemisia stelleriana*
Prickly pear (cactus) * (E)	*Opuntia humifusa*
Spanish bayonet * (E)	*Yucca filamentosa*
Yarrow *	*Achillea millefolium*
Butterfly Milkweed **	*Asclepias tuberosa*

Over 35 years of environmental excellence

APPENDIX D.

Standard for Creating and Restoring Sand Dunes

STANDARD
for
CREATING and RESTORING SAND DUNES
From Massachusetts to North Carolina

Written by: Mike Fournier, Former PMC Manager

Edited by:
Christopher Miller, Regional Plant Specialist, USDA-NRCS
William Skaradek, Manager, Cape May Plant Materials Center

DEFFINITION: Effective establishment and maintenance of physical (living or inert) barriers which manage the surface movement of shifting coastal beach sands.

PURPOSE: To develop a system of coastal sand dunes to protect human lives, personal property, and community infrastructures. A secondary benefit of such developments is the creation and protection of critical habitat of threatened and endangered bird species.

WHERE APPLICABLE: Along ocean and bay shorelines; where blowing sands and storm waters may cause damage to human and wildlife resources.

METHODS and MATERIALS: Sand dunes naturally form on barrier islands, shorelines exposed directly to the ocean, and inland sand deposits. The source of this wind born sand is the ocean or its bays. These parallel ridges of sand form perpendicular to prevailing winds and grow toward its source of sand. Periodic storm events and human activity continually alter their development and original configuration. Once developed the sand dunes provide adequate protection from moderate storms and tides. The existence and maintenance of vegetation on dunes provides a network of root and foliage which holds unconsolidated sand in place. American beachgrass is the dominant, naturally occurring, vegetation of the frontal dunes of the northern Mid-Atlantic and New England coasts. From Vriginia beach southward through the Carolinas, sea oats becomes the dominant foredune plant. When beachgrass or sea oats are established with structural resources and other dune species, a formidable well-anchored storm barrier is established, capable of saving major public and private assets. Establishing curvilinear foot paths or wooden crosswalks through or over the sand dunes, bordered by sand fencing, is necessary where foot or vehicular traffic is expected.

1.VEGETATION

A. **Plant Materials**: The foliage of most sand dune species filters sand from the wind. The reduction of wind velocity near the dune's surface by vegetation allows sand to be deposited. The root mass of these plant species adapted to the sand dune environment are typically deep and extensive, anchoring the dunes to their foundation. When possible only certified cultivars, which have been tested on similar sites, should be utilized for protecting valuable coastal resources.

1).Cultivar Releases recommended for stabilizing sand dunes; all cultivars listed were released by the USDA- Natural Resources Conservation Service's Plant Materials Program:

a.) **'Cape'** american beachgrass (*Ammophila breviligulata*)
b.) **'Atlantic'** coastal panicgrass (*Panicum amarum var. amarulum*)
c.) **'Northpa'** bitter panicgrass (*Panicum amarum*)
d.) **'Avalon'** saltmeadow cordgrass (*Spartina patens*)
e.) **'Monarch'** seaside goldenrod (*Solidago sempervirens*)
f.) **'Wildwood'** bayberry (*Myrica pensylvanica*)
g.) **'Ocean View'** beach plum (*Prunus maritima*)
h.) **'Sandy'** rugosa rose (*Rosa rugosa*)
i.) **'Emerald Sea'** shore juniper (*Juniperus conferta*)

2.) Non-Cultivar Releases suitable for adding plant diversity on sand dunes:

a.) seashore little bluestem (*Schizachyrium scoparium* var. *littoralis*)
b.) sea oats (*Uniola paniculata*)
c.) switchgrass (*Panicum virgatum*)
d.) partridge pea (*Chamaecrista fasiculata*)
e.) beach pea (*Lathyrus maritimus*)
f.) eastern red cedar (*Juniperus virginiana*)
g.) groundsel tree (*Baccharis halimifolia*)

NOTE: The cultivars listed were developed specifically for sand dune stabilization and should be specified and used when available. By using cultivars developed for such a harsh environment, the risk of plant failure is reduced.

In addition, when developing a planting plan for a dune system, it is imperative to plant species in their zone of adaptation.
The species best adapted to the frontal dune face are american beachgrass, bitter panicgrass, and sea oats (Delmarva Penninsula and south). As you move onto the back of the frontal dune or into the secondary dune system, the additional species listed above may be incorporated into the planting as available. By broading the plant diversity, the risk of plant failure is further minimized. See (Diagram 1) for plant zonation guidelines.

B. Plant Establishment

1.) **(Cape) american beachgrass** (*Ammophila breveligulata*)- Beachgrass is successionally classified as a pioneering type species; it is about the only species capable of surviving the harsh environmental conditions of the frontal dunes. For initially stabilizing a dune system, this species is the most reliable and commercially available option. Once established it rapidly spreads by a rhizomatous root system, developing a soil binding network of inter-woven roots.

Date = November 1 to April 1; under non-frozen soil conditions
Planting Unit = a minimum of two stems (culms) per hole
Method = hand placement, or use of a vegetable or tree planter
Size = 16 to 18 inch long stems, ≥ ¼ inch in diameter
Depth = culms placed approximately 8-10 inches deep
Spacing: severe sites = 12" X 12"
normal sites = 18" X 18"
stable sites = 24" X 24"

Notes:

- Plant ≥ 100 feet of horizontal distance from the mean high tide water line to ensure success
- Plant a minimum of 10 parallel rows; stagger (off-set) rows to maximize protection
- Firm soil around plants to eliminate air pockets
- If utilizing dredged fill allow salts to leach out before planting and rains to compact sands

2.) **(Northpa) bitter panicgrass** (*Panicum amarum*)– This perennial, warm-season grass with a prostrate growth habit spreads slowly from short, strong rhizomes initially forming open clumps. Over time these clumps can fuse to form a dense mat of vegetation. Since this grass produces little viable seed it must be planted vegetatively.

Date: potted plants = April 1 to May 1
bare root = November 1 to April 15
stem cuttings = April 1 to May 15
Planting Unit = single bare-root or containerized seedling or stem division; 12 - 18 inches tall
Depth: potted/bareroot = 2 inches deeper than the nursery depth
Stem cuttings= place on a 45 degree angle in a 8-10 inch hole or slit leaving the top 6-10" of stem exposed.
Method: plants = hand placed, or using a vegetable transplanter
Spacing: Potted/bareroot = 2 feet apart in 2-3 foot staggered rows.
Stem cuttings= minimum of three stems/hole, spaced 2 feet apart in staggered 2-3 foot rows

3.) **(Atlantic) coastal panicgrass** (*Panicum amarum var.amarulum*)- This warm season bunch-like grass is a post stabilization species thriving from the crest of the frontal dune to inland sites. It is the only dune stabilization species which has been directly seeded on to the sand dunes successfully. Potted plants and stem divisions can also be successfully established on these severe sites. The annual foliage emerges from a deep fibrous perennial root system with short lateral rhizomes. This species can be successfully planted with or over seeded into stands of American beachgrass. The closely related switchgrass is not as well adapted to sand dune conditions due to its lower seedling vigor. However, it is a good alternative, especially north of Long Island where coastal panicgrass is not native.

Date: Seeding: over seeding = April 1 to May 1
Dormant seeding = November 1 to April 15
Planting = April 1 to May 15
Planting Unit = single bare-root or containerized seedling or division; 12 - 18 inches tall
Seeding rate = 8 to 12 Lbs. of Pure Live Seed (PLS) per acre
Depth: plants = 2 inches deeper than the nursery depth
seed = drilled 1½ to 2½ inches deep
Method: seed = hand broadcast/incorporated, garden seeder (single row, push) or mechanically operated drill or drop seeder

plants = hand placed, or use a vegetable or tree transplanter

Spacing: plants = place 2-4 feet apart within a row with rows spaced 6-8 feet apart

seed = 3' to 10' row spacing

4.) **Sea oats** (*Uniola paniculata*)- **Adapted only south of the Delaware Bay (Delmarva Pennisula & south).** Within it's range, sea oats is the most important plant in the pioneer (frontal dune) zone. Like beachgrass, it flourishes best where sand is drifting and accumulating. However, unlike beachgrass, it persists as a perennial cover after the sand has been stilled but dies back to the ground over the winter. For initial stabilization of a sand dune, it is best to interplant both species.

Date = March 1 to April 15
Planting Unit = one bare-root or potted plant
Depth = 2 inches below the nursery grown depth
Method = hand placed, or vegetable planter
Size = ≥ 24-36 inch stem
Spacing = 18 to 36 inch row spacing with plants placed 18 inches apart within a row. May be interplanted with american beachgrass by alternating rows of each species.

5.) **(Avalon) saltmeadow cordgrass** (*Spartina patens*)- Although typically associated with tidal salt marshes, saltmeadow cordgrass also naturally occurs in the secondary and back dune areas. Predominantly inhabiting inter-dune troughs and low blow-out areas. It is dominate in these micro-sites since most other sand dune species can not tolerate wet to saturated soil conditions. The trailing rhizomes of saltmeadow cordgrass are slender, but form dense mats near the surface. It is vegetatively established on normal sites using freshly harvested stems (culms) or containerized plants on severe locations.

Date = May 1 to June 15
Planting Unit = 3 to 5 live stems placed bare-root or containerized
Depth = 2 inches below the nursery grown depth
Method = hand placed, or vegetable planter
Size = ≥ 12 inches
Spacing = 18 to 36 inches depending on the severity of the planting site
Notes: Utilize this species in low elevation sites of sand dunes which are frequently moist or inundated.

6.) **Switchgrass** (*Panicum virgatum*)– This warm-season, bunchgrass commonly grows in back dune swales and upper margins of tidal marshes. Seedling vigor is lower than in the closely related coastal panicgrass and therefore is not as well adapted for seeding on actively shifting sand dunes. However, switchgrass is a good alternative to coastal panicgrass north of Long Island, which is beyond the native range of coastal panicgrass.

Date: Seeding: over seeding = April 1 to May 1
dormant seeding = November 1 to April 15
planting = April 1 to May 15
Planting Unit = single bare-root or containerized seedling or division; 12 - 18 inches tall
Seeding rate = 8 to 12 Lbs. of Pure Live Seed (PLS) per acre
Depth: plants = 2 inches deeper than the nursery depth
seed = drilled 1½ to 2½ inches deep
Method: seed = hand broadcast/incorporated, single row garden seeder, or mechanically operated drill or drop seeder
plants = hand placed, or use a vegetable or tree planter
Spacing: plants = 4' X 4'
seed = 3' to 10' row spacing

7.) **Seacoast bluestem** (*Schizachyrium littorale*)– This native, warm-season grass is a coastal variation of the inland little bluestem. It differs visually with a more prostrate growth habit. Found in scattered open clumps in the back dunes, it rarely forms a solid stand, but is found mixed with other species such as beach heather, seaside goldenrod, beachgrass, bayberry, beach plum.

Date = March 1 to April 15
Planting Unit = one bare-root or potted plant
Depth = 2 inches below the nursery grown depth
Method = hand placed or vegetable planter
Size = ≥ 12-24 inch stem
Spacing = 24 to 36 inch row spacing with plants placed 24 inches apart within a row. Plant in the backdunes where sand is stable. May be interplanted with switchgrass, coastal panicgrass, saltmeadow cordgrass, seaside goldenrod, and beach or partridge pea.

8.) **(Monarch germplasm) seaside goldenrod** (*Solidago sempervirens*) – This perennial forb adds color and variety to a dune planting. It is a major food source on the fall migration of the Monarch butterfly. From it's inconspicuous green basal leaves in winter into early summer arises a brilliant yellow flower cluster in early fall. Although often blamed for causing allergies, it is actually an insect pollinated plant. (Ragweed is the real culprit).

Date = March 1 to May 15
Planting Unit = one bare-root or potted plant
Depth = 2 inches below the nursery grown depth
Method = hand placed or vegetable planter
Size = ≥ 12-18 inch stem
Spacing = 24 to 36 inch row spacing with plants placed 24 inches apart within a row. Plant in the backdunes where sand is stable. May be interplanted with switchgrass, coastal panicgrass, saltmeadow cordgrass, and beach or partridge pea.

9.) **Beach pea and partridge pea** (*Lathyrus maritimus/Chamaecrista fasciculata*) Beach pea is adapted from New Jersey- north and partridge pea, an annual reseeding legume, from Massachusetts to the Carolinas. These native legumes have good wildlife value as edible seed for both upland game and shore birds.

Partridge pea (seed only)
Date: Seeding: over seeding = April 1 to May 15
dormant seeding = November 1 to April 15

Seeding rate = 2-4 pounds of Pure Live Seed (PLS) per acre.

Depth: = seed drilled 1½ to 2½ inches deep in stilled sand

Method: seed = hand broadcast/incorporated, single row garden seeder, or mechanically operated drill or drop seeder

Beach pea (plants only)
Planting Unit = single bare-root or containerized seedling or division; 12 - 18 inches tall
planting = April 1 to May 15

Depth: plants = 2 inches deeper than the nursery depth
Method: plants = hand placed, or use a vegetable or tree planter
Spacing: plants = 4' X 4'
seed = 3' to 10' row spacing

10.) Shrubs and Trees (bayberry, beachplum, rugosa rose, groundsel)- Medium sized shrubs and small trees naturally dominate the back dune zone of New Jersey's barrier islands. The shrubs begin to co-inhabit the mid secondary dunes. Once extensive stands of bayberry, beach plum, pitch pine and other woody species covered these islands where houses now stand. The shrub species which are well adapted to the dune ecosystem are capable of either layering or root suckering. The trees and shrubs of the sand dunes have deep tap root systems for supplying adequate moisture and nutrients. Each species utilized for back dune stabilization has its own unique attributes Beach plum has a colorful bloom in spring which yields a tasty succulent cherry like fruit. Bayberry roots have nodules which enable it to fix atmospheric nitrogen similar to legumes; it also produces aromatic fruit and leaves. The thorny stems of rugosa rose are useful in directing pedestrian traffic along established access trails. This rose species also blooms from late spring to early fall, then gives rise to a bright red fruit. The pines and junipers which are adapted to sand dunes provide the visual appeal of evergreens in the back dunes. The major function of tree and shrub vegetation on sand dunes is still the permanent solid structural stabilization. All of trees and shrubs of the sand dunes produce viable seed, but intentional establishment occurs using bare-rooted or potted seedlings.

Date = March 15 to April 15; unless soil is frozen
Planting Unit = 1/0 or 2/0 bare-root seedlings or containerized transplants
Depth = 2 inches below the nursery grown depth
Method = hand placement or using a tree planter
Size = $\geq$ 12 inches tall
Spacing = 4 to 6 feet apart; off-set (stagger) rows for maximum protection
Notes: to ensure establishment (first 2 years) all competing vegetation must be removed from within 2 feet of each plant; it

is important not fertilize the surrounding vegetation which will potentially out-compete the tree or shrub

C. **Maintenance**

1) Fertilizer

Date = May through July; no sooner than 30 days after planting

Rate = $\leq$ 50 lbs. of nitrogen (N) per acre, $\leq$ 25 lbs. of phosphorus (P) and potassium (K) per acre

Frequency :

- Apply N for the first two years after planting, then as needed to maintain stem density and plant health.
- Single or split applications are acceptable if not applied before May 1 or after July 30. Split applications must be at least 30 days apart.
- It is only necessary to apply P and K bi-annually

Recommended Formulations:

- 10-10-10, 20-10-10, 15-10-10, etc. are acceptable as long as the maximum rates per nutrient are not exceeded
- Time release fertilizers are encouraged that will provide the target amounts of the primary nutrients per acre.

Notes:

- Only apply fertilizer to within the drip line of shrubs and trees. Not following this rule will result in excessive herbaceous growth, which will out compete newly established trees and shrubs.
- Apply using broadcasting machinery

2.) Replant:

- Like a chain, a dune system is no stronger than its weakest link. Uniform, unbroken dune lines are essential to the protection a system can provide.
- Uncontrollable events (i.e. storms, construction, etc.) may damage sand dunes. If such damage occurs between October and April replant within a month. If the damage is experienced from May to September, utilize the outlined sand fencing or excavation procedures listed below, then plant during the recommended establishment period .

2. **SAND FENCING**: A quick and effective way to build temporary sand dunes is with the use of sand fencing (standard snow fence). Utilizing lines of

fencing and wooden posts, orientated parallel to the beach. A source of sand is necessary for this technique to be effective, but it is not limited by time of establishment.

A. **Materials**

1) Fencing:
   - Standard 4 ft. slatted wood snow fencing; wood must be decay free
   - Four wire ties (≥ 12 ga.) must be used to secure fencing to each post.
2) Posts:
   - Wooden posts must be ≥ 6½ ft. long, with a minimum diameter of 3 inches; typical length ranges from 7 to 8 ft.
   - The posts should be made from black locust, eastern red cedar, Atlantic white cedar, or other species of similar durability and strength.
   - Space posts 10 ft. apart, and set them ≥ 3 feet deep

B. **Technique**

1) Position - orientate fence lines parallel to waterline of the beach, at least 140 feet from mean high tide (see figure 2)
2) Height - with adequate sand sources, dune elevations can be increased annually by at least four foot increments. (approximately the maximum height of the fencing, this can be increased with vegetation); The maximum dune height which is attainable will range from 12 to 15 feet, but is greatly influenced by prevailing wind velocities and sand grain size
3) Installation - weave fencing in front of and behind alternating posts to attain maximum strength
4) Number of Rows - 2 parallel rows spaced 30 to 40 feet apart, are ideal; but single rows with 30 ft. perpendicular spurs, spaced 40 ft. apart are also acceptable if space is a major limiting factor
5) Replacement - sand will typically fill fencing to ¾ of its total height at a maximum; upon reaching maximum fence capacity, additional lines of fence can be added until maximum planned dune height is reached; replace damaged fencing and posts within one month of storm damage to maintain a contiguous dune line

C. **Comments**

- This method is more expensive per linear foot than building dunes with vegetation alone, but less expensive than using earth moving machinery to construct dunes.
- Although dune height can be increased faster, it is limited by the fence height and ability to continually add more lines of fencing.
- Planting parallel rows of vegetation on either side of fences is usually more effective than either vegetation or fencing techniques alone.
- When complementing fencing with vegetation, do not plant closer than ten feet and no further than 15 feet from the fence lines. Vegetative strips should be about 20 ft. wide

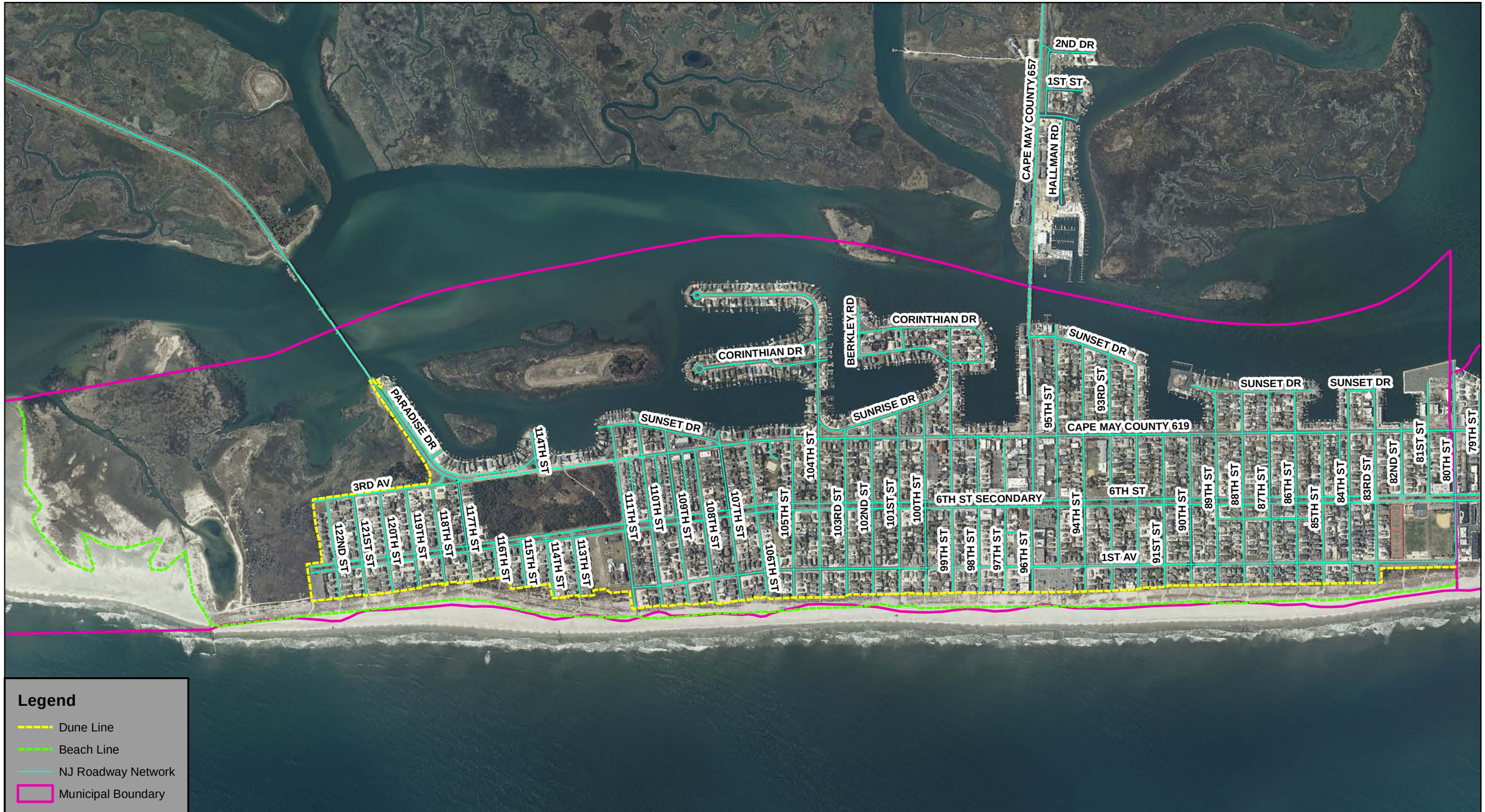
3. **MECHANICAL EXCAVATION**

- With the use of various earth moving machines temporary, excavated sand dunes are quickly created.
- Since time is required for settling and cohesion to occur, such dunes are often short lived and only provide minimal protection to the public and private resources behind them.
- This method is often useful in the repair of storm damaged sand dunes during the fall and winter months. Any blow-out areas can be quickly filled.
- Front-end loaders of all sizes can be used. Various grading machines are also useful.
- Pumped sand from off shore dredging can be shaped and positioned with machinery

APPENDIX E

Dune Vegetation Management Plan Base Map

Prepared by The Lomax Consulting Group, dated December 4, 2014



APPENDIX E: DUNE VEGETATION MANAGEMENT PLAN BASE MAP
FIGURE 1 2012 AERIAL OVERVIEW OF BOROUGH OF STONE HARBOR

SOURCE: GIS DATA PROVIDED BY THE NJDEP AT http://njgin.nj.gov/ &
THE CAPE MAY COUNTY PLANNING DEPARTMENT

DATE: 12-4-14	DRAWN BY: ACB
1 inch = 1,000 feet	

the LOMAX Consulting group

PRJ\Act\12-782\StMpg\Aerial Base Map