

## Characteristics of Beach Dunes

Dunes are naturally occurring coastal features that play an essential role in the stability of coastal communities. Dunes provide the first line of coastal defense during storms. They absorb the energy of storm waves and provide sand to the beach during periods of erosion.

Dunes and their vegetation also provide shelter and food for a variety of animals and shorebirds including many endangered species. In Brevard County the dunes provide globally important nesting grounds for sea turtles. The three sea turtle species that nest in Brevard County are each endangered or threatened. During spring and early summer, sea turtles emerge from the sea to dig nests in the sand and lay their eggs.

Vegetation plays a major role in dune stabilization and growth. The deep root systems of Sea Oats and other native coastal plants help to anchor the dune and defend it from erosion. Onshore winds move sand grains inland until dune plants trap them, causing the dune to grow by a slow process called accretion. Dune plants grow upward with the dune as their lower stems are buried by the dune's vertical growth.

Most plants cannot tolerate the extremely harsh environment of the dune. Native dune plants have special characteristics that make them capable of growing in loose, dry, unstable, nutrient poor soils, and capable of sustaining exposure to wind, salt spray, intense light, and storms. Some have deep root systems that tap into underground water. Some have thick, leathery or wax-coated leaves that reduce water loss. Some are stimulated to grow faster when pummeled by the wind-driven sand. These and other adaptations allow native dune plants to survive in harsh environments and to trap sand for the formation and growth of dunes.

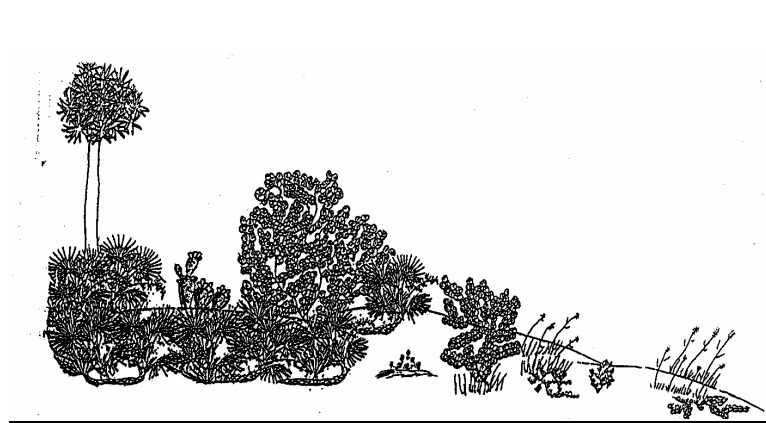
Beach dunes in Brevard County may be divided into three zones characterized by their location and dominant vegetation.

- The most seaward zone of the dunes is the **fore dune**. It is characterized as a low, wind-deposited dune that is sparsely vegetated with the hardiest of dune stabilizing plants. Fore dune plants must be able to tolerate periods of drought, salt-water spray, storm waves, and alternating periods of sand burial and erosion.
- The **dune crest** is located behind the fore dune and may be identified by its higher elevation. Frequently, the vegetation of the dune crest and fore dune will overlap. Plants on the dune crest grow in patches and species vary from dune to dune within the county.
- The **back dune** is a more stabilized coastal dune that is vegetated with a dense thicket of salt-tolerant shrubs. Also known as coastal strand, the back dune is probably the most rapidly disappearing community in Florida because it is prime real estate for resort and residential development. The back dune originally grew in a continuous band along the Atlantic shoreline. Now it grows in broken, isolated stretches between developed areas.

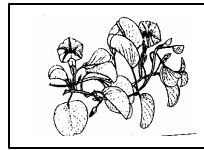
## Back Dune

## Dune Crest

## Fore Dune



## Fore Dune Vegetation



Railroad Vine (*Ipomoea pes-caprae*) is one of the most important fore dune vines in our area. The Railroad Vine has traveling stems that grow up to 30 feet long and form a ground cover. The thick, succulent leaves of the vine are kidney-shaped with a notch at the apex. The vine produces purple morning glory flowers and fruit almost all year.



Bay Bean (*Canavalia rosea*), also known as Beach Bean, is another important vine that forms a ground cover in both the fore dune and the dune crest. The leaves are rounded or notched on the apex, oval to almost round, and unlobed. The vine produces rose-purple flowers and beans almost all year. This vine has the ability to extract fresh water from sea spray and waves.



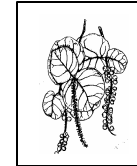
Dune Sunflower (*Helianthus debilis*) is a common daisy-like wildflower found on the fore dune. The flower of the low growing Beach Sunflower is yellow with a brown center. It makes a colorful ground cover on poor soils in sunny locations. Like most native plants, it provides food for native wildlife.

Other native plants that withstand fore dune conditions include Sea Oats (see below), Sea Purslane (*Sesuvium portulacastrum*), Inkberry (*Scaevola plumieri*), also known as Beach Berry, Beach Morning Glory (*Ipomoea purpure*), Beach Elder (*va imbricata*), Panicgrass (*Panicum amarum*), also known as Bitter Panicum, Seashore Dropseed (*Sporobolus virginicus*), and Beach Croton (*Croton punctatus*).

## Dune Crest Vegetation



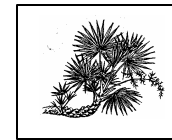
Sea Oats (*Uniola paniculata*) play a major role in stabilizing all three areas of the dune. Sea Oats can tolerate the wind driven salt spray and sand better than any other dune plant. These grasses grow up to 7 feet tall. The flower stalk is composed of numerous, straw-colored spikelets. Due to its dune stabilizing importance, picking Sea Oats is prohibited by Florida State law.



Sea Grape (*Coccoloba uvifera*) is an extremely important shrub of the dune crest. The large rounded leaves of the Sea Grape are green with a bright red midrib. Sea Grape thickets are sculptured by "salt pruning." These trees provide shelter for gopher tortoises and the grapes provide a valuable food source for wildlife.

Other native plants that withstand dune crest conditions include Partridge Pea (*Chamaecrista fasciculata*), Coastal Mock Vervain (*Glandularia maritima*), Marshy Cordgrass (*Spartina patens*), Purple Muhly Grass (*Muhlenbergia capillaris*), Florida Privet (*Forestiera segregata*), Necklace Pod (*Sophora tomentosa*), and Wax Myrtle (*Myrica cerifera*).

## Back Dune Vegetation



Saw Palmetto (*Serenoa repens*) grows on the back dune. The low growing palm is recognized by multiple fronds that protrude from the terminal end of long, prostrate trunks that begin at, or just below, ground level. The stalks of the fronds have two rows of sharp, saw-like projections, thus its common name "saw."



Cabbage Palm (*Sabal palmetto*) is named for its large leaf-bud or "cabbage" at the top of the trunk. The fronds are 5 to 8 feet long in mature height, growing from a single terminal bud at the top of the tree. The Cabbage Palm has been designated as the Florida State Tree.



Prickly Pear Cactus (*Opuntia humifusa*) grows on the dune crest and the back dune area. The waxy coating covering its pads, aids in preventing water loss. The cactus yields yellow flowers and edible red fruit for wildlife and butterflies. The armor of small spines on the fruit prevents some from relying on the Prickly Pear Cactus as a food source.

Other native back dune plants include Sea Oats (see above), Firewheel (*Gaillardia pulchella*), Sea Ox-eye Daisy (*Borrchia frutescens*), Lantana (*Lantana involucrata*), White Indigoberry (*Randia aculeata*), Cocoplum (*Chrysobalanus icaco*), Florida Privet (*Forestiera segregata*), Simpson's Stopper (*Myrcianthes fragrans*), and Live Oak (*Quercus virginiana*).

## Planting Dune Vegetation

To establish rapid dune stabilization, plant Sea Oats in all three zones, covering 60-80% of the open dune area. Disperse a variety of other plants in small clumps amid the Sea Oats. To select the proper vegetation for your project, identify the project area as either fore dune, dune crest, or back dune (as described previously) and then select from any of the native plants listed for that zone.

Sea Oats, as well as other grasses, vines, and wildflowers should be planted on 18-inch centers in staggered rows. These plants will grow rapidly, but unevenly. A dense cover is possible in two or three years. Shrubs and trees should be spaced sufficiently to allow them room to grow. Saw Palmetto grows up to 5 feet tall, Prickly Pear Cactus grows to 4 feet tall, and a mature Cabbage Palm can reach 80 feet tall. Install smaller plants between shrubs and trees to stabilize the dune until the full canopies of the trees and shrubs develop.

To plant dune vegetation, dig a hole that is considerably deeper and at least one and a half times larger than the root ball of the plant. Bury the roots well below the sun-scorched surface of the dune. The root balls of Saw Palmetto, Prickly Pear Cactus, and Cabbage Palm should be planted 3-4 inches below the soil surface. The root balls of Sea Oats and Sea Grapes should be planted 6-8 inches below the soil surface. Place the plant in the hole and back fill with sand. When back-filling the hole, leave a shallow depression around the plant to allow water to accumulate and soak in near the root ball.

November to January is the best time of year to plant the dunes. At this time, the sun is not as intense, there are occasional rains, and many plants tend to concentrate their energy on root growth. For a few weeks after planting and during dry periods, supplemental watering may be necessary. It is better to water less frequently and more copiously than to water lightly and often. In some instances, it might take a full year before a plant can cope with dry weather on its own.

To plant vegetation on the dune, a permit is required from the State. Please contact the Florida Department of Environmental Protection, Office of Beaches and Coastal Systems at their toll-free paging service 1-877-332-4307 or call (850) 487-4475. Dune planting permits are usually issued within a few days at no charge.

Many different plants from around the world share the same common name. This brochure provides the Latin name of each dune plant (*in italics*) in addition to the common name. To ensure that you purchase native plants that are appropriate for Brevard County's dunes, take this brochure to your nursery and request plants by their specific Latin name.

## For more information on native dune plants:

Association of Florida Native Nurseries  
[www.afnn.org/](http://www.afnn.org/) or phone 1-877-352-2366

Florida Department of Environmental Protection  
[www.dep.state.fl.us/beach/pub](http://www.dep.state.fl.us/beach/pub)

Florida Native Plant Society  
[www.fnps.org/](http://www.fnps.org/) or phone (727) 856-8202



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*Railroad Vine, Bay Bean, Dune Sunflower, and Sea Grape illustrations provided by Penelope Churchill.*  
*Sea Oat and Prickly Pear Cactus illustrations provided by Canaveral National Seashore.*  
*Saw Palmetto illustration provided by Wendy B. Zomlefer.*

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# Stabilizing Our Beach Dunes

