Building and Planting Coastal Sand Dunes: Trees and Shrubs on Backdunes

Over time, as sand dunes become stabilized, shrubs and trees begin to colonize backdune areas. On the barrier islands of the Mid-Atlantic coast, maritime forests infrequently occur behind primary and secondary dune zones. The major function of tree and shrub vegetation on sand dunes is permanent structural stabilization. The USDA-NRCS Plant Materials Program has released a few coastal shrub cultivars to the growers industry. In addition, a few other commercial growers readily supply coastal shrub and/or tree species. For a complete list of plant vendors supplying needed species, please consult the Seed & Plant Vendors Guide at the following website address: http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/northeast/njpmc/

Woody Plants for Secondary Dune Stabilization

In addition to plantings of grass and forbs, where there is suitable habitat (largely secondary and tertiary dunes) in areas that are not used or set aside as habitat for rare, threatened, or endangered species (RTE), randomly distributed shrub clusters should also be planted about 25 feet apart from one another as habitat features allow. Ideally, clusters should comprise three to six shrubs planted within 5 feet of one another, and include species such as "Wildwood" northern bayberry *(Morella pennsylvanica)* and "ocean view" beach plum *(Prunus maritima)*. Woody species should not be planted in or near RTE species areas, as they provide perches for avian predators.

Many woody plants are adapted to secondary coastal dunes. Where humans or storms have not destroyed the vegetation, trees, shrubs and vines flourish and collectively provide excellent erosion protection. The permanent vegetation on areas other than the frontal dune will most certainly contain woody species. The most abundant native woody plants along the Mid-Atlantic coast are bayberry, wax myrtle, beach plum, highbush blueberry, inkberry, native roses, and choke cherry. The woody species recommended for planting are bayberry, wax myrtle, beach plum, winged sumac, and eastern red cedar. The survival rate for woody seedlings transplanted in dune sand is often lower than when planted in the general landscape. Growth may also be poor, unless efforts are made to enhance the environment into which the seedlings are transplanted and must live.

Desiccation of the plants during the establishment period undoubtedly accounts for some of the loss. The following steps are recommended to reduce desiccation and improve survival when transplanting adapted woody species onto sand dunes.

Woody plants provide protection from the wind. This is best accomplished by planting into established stands of 'Cape' American beachgrass or other herbaceous plants. Protection provided by buildings is also useful. Erection of a low barrier such as wood shingles around each plant is also effective.

Another step to reduce desiccation is altering the composition of the sand into which the seedling will be planted. This is accomplished by mixing one half gallon of organic material such as peat moss with about twice as much sand. To do this, dig a hole about 8 x 8 x 8 inches, place the organic material in the hole, and mix it with the sand as the hole is filled. This can be done at planting time or well in advance of the planting date.

Place the plant in the center of this amended hole slightly deeper than the plant grew in the nursery. Late fall or early spring is the best time to plant. The use of container-grown plants is highly recommended and may eliminate the need for organic amendments. Fertilizer at planting time is not recommended since it may reduce the survival rate.

General Guidelines for Planting Trees and Shrubs

Planting date: March 15 to April 30
Method of establishment: Transplant 1 or 2 year bare-root seedlings or containerized transplants.
Material size: ≥ 12 inches tall
Planting depth: Plant 2 inches below the nursery grown depth.
Plant spacing: Space 4 to 6 feet apart; off-set (stagger) rows for maximum protection.

Note: To ensure establishment (first two years) all competing vegetation must be removed from within 2 feet of each plant; it is important not to fertilize surrounding vegetation that could potentially out-compete the tree or shrub.

SHRUBS

Bayberry (*Morella pensylvanica)*

Bayberry is an upright, salt-tolerant woody shrub forming thickets 6 to 7 feet in height, less in exposed seashore conditions. The aromatic dark-green leaves, 2.5 to 4 inches long, may hang on the twigs through most of the winter. The clusters of waxy gray-white fruit develop from inconspicuous flowers, which bloom in the early spring from second-year stems. The fruit ripens in October and remains on the plant well into winter. This species is dioecious, meaning there are separate male and female plants. Once this shrub has become well established, it will slowly creep with rhizomes forming dense thickets. This plant fixes atmospheric nitrogen which helps it survive in stressed environments such as sand dunes and other sterile soil conditions.

Both common bayberry and the 'Wildwood' variety are commercially available.
http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/njpmcrb12118.pdf
http://plants.usda.gov/factsheet/pdf/fs_mope6.pdf

A related species is wax myrtle (*Morella cerifera*), an evergreen shrub. Southern New Jersey is the northernmost extent of this species. It has many of the same attributes as bayberry.
http://plants.usda.gov/factsheet/pdf/fs_mypu.pdf

Beach plum (*Prunus martima)*

Beach plum is a low-spreading shrub that is generally only a few feet high due to wind pruning but may reach heights of 15 feet in a more sheltered area. Snowy white flowers are produced in late April to early May with fruit ripening in late August to early September. The fruit is prized by wildlife and humans alike. It is suitable for making jams and jellies.

Common beach plum and the 'ocean view' variety of beach plum are commercially available.
http://www.nrcs.usda.gov/Internet/FSE_PLANTMAT

Beach plum *Louise Wootton photo*

ERIALS/publications/njpmcrb12123.pdf

http://plants.usda.gov/factsheet/pdf/fs_prma2.pdf

Winged sumac *(Rhus coppallina)*

Winged sumac is a native, deciduous, large shrub that rarely exceeds 10 feet in height. It has alternate compound leaves 16 to 24 inches long with a winged leafstalk. Compact clusters of greenish-yellow flowers bloom from July to September. Fruits mature later in the fall. The fruiting head is a compact cluster of round, red, hairy fruits called drupes. Sumac also makes good ornamental plantings and hedges because of its brilliant red fall foliage. It is best used on drastically disturbed sites where pioneer species are desirable.
http://plants.usda.gov/factsheet/pdf/fs_rhco.pdf

Virginia rose (*Rosa virginiana)*

Virginia rose is an upright shrub growing between four to six feet tall. The glossy dark green foliage develops excellent yellow to red fall color. This species bears fragrant pink flowers that are 2 to 3 inches in diameter and occur in clusters of five to eight. It is a good alternative to rugosa rose, which is a non-native rose that has invasive tendencies.
http://plants.usda.gov/plantguide/pdf/cs_rovi2.pdf

Trees on Dunes

Sassafras *Jeanne Heuser photo*

In a highly developed and expansive dune system, a maritime forest can exist that has predominantly tree and shrub species. This unique ecosystem occurs in New Jersey at Sandy Hook, Island Beach State Park, and as a small fragmented forest in Avalon, New Jersey. Some species that occur in the maritime forest include eastern red cedar *(Juniperus virginiana),* American holly *(Ilex opaca),* hackberry *(Celtis occidentalis),* black cherry *(Prunus serotina),* sassafras *(Sassafras albidum)*, pitch pine *(Pinus rigida),* and loblolly pine *(Pinus taeda)* in extreme southern New Jersey.