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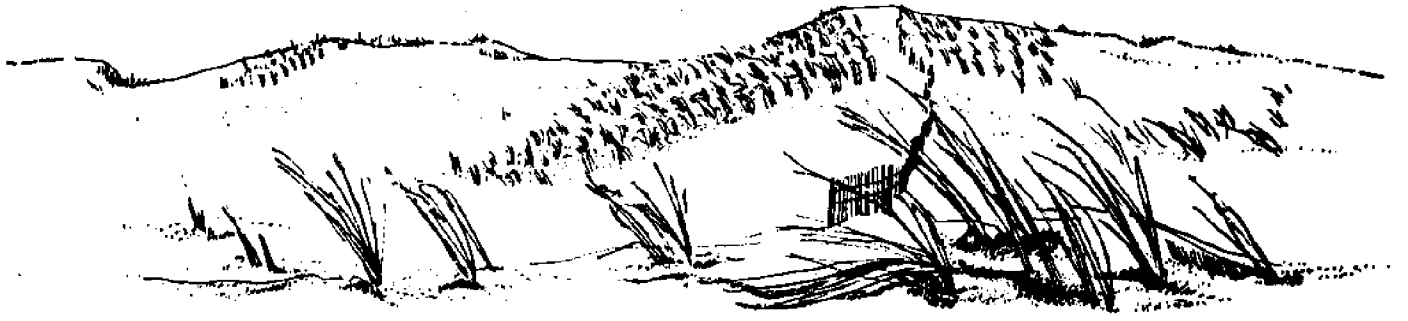
FIRST AID FOR DAMAGED BEACHES AND DUNES



Dr. Judy Stout, Assistant Director
Marine Environmental Sciences Consortium
Dauphin Island Sea Lab
Dauphin Island, AL. 36528

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FIRST AID FOR DAMAGED BEACHES AND DUNES

Sandy beaches and dunes along our coasts form a fragile and dynamic system. They are the first lines of defense against the sea, and when storms hit, dunes act as flexible barriers to high tides and winds. When the dunes do give way to storm winds and water, the shifting mounds of sand will reappear in time.

As winds carry particles of sand across the beaches, they are slowed by anything--a grass stem, a log, a piece of trash--and drop a portion of their load of sand. If the obstacle to the wind is a plant, the growth of the plant will keep up with the gradual accumulation of sand and a small hump will form. The process will continue until a sand dune covered by its community of grasses rests on the shore. However, if sand is initially trapped by inanimate objects, the accumulation will be temporary, and the sand will eventually continue its wind-driven migration inland. The establishment of a stable dune requires the constant sand trapping of the grass stems and leaves and the mat of roots to bind and hold the sand grains in place against the wind.

The natural recovery of damaged beaches and dunes is a slow process and where damage is severe, as from hurricanes or other major disturbances, it may be desirable to assist the natural processes to speed up the rebuilding. Shoreline-property owners may consider a number of approaches to restoration. Some efforts have little or no costs other than manhours expended, while others may be expensive in both money and time. Though all alternatives listed below are effective, combinations of two or more compatible techniques will give more rapid results. The technique(s) selected will depend on individual situations. Guidelines for each follow the listing.

Techniques to Assist in the Restoration of Damaged Beaches and Dunes

(1) Restrict traffic flow, pedestrian and vehicular, over damaged area to allow maximum recovery of remaining vegetation.

(2) Fertilize remaining vegetation and seedlings to enhance regrowth.

(3) Erect barriers to promote sand accumulation by the use of brush fences or slat fences.

(4) Revegetate damaged area with purchased plants or transplants from surviving vegetation.

RESTRICTING TRAFFIC

All efforts should be made to protect struggling plants from the additional damage of traffic through disturbed areas. Where it is

necessary to cross an area, temporary boardwalks may minimize any damage. However, this is effective only if the walks are used. Public awareness is the best approach to reduce traffic damage.

FERTILIZATION

Most sands are infertile and the addition of fertilizer will increase the number of plants and result in a denser cover in a much shorter period of time. Nitrogen and phosphorus are the principal nutrients required. A complete fertilizer such as 8-8-8 or 16-8-8, with the nitrogen in a soluble form (ammonium sulfate, ammonium nitrate, sodium nitrate or urea) will produce the best results. An initial application of approximately 300 pounds per acre (5-10 pounds per 1,000 square feet) in the spring with a repeat fertilization after six weeks with 100 pounds per acre is desirable. Fertilization is most successful in the spring and summer months. Application should not be just before a rain storm to avoid loss by dilution.

SAND FENCES

Sand fences may be erected to trap and accumulate sand. Fences should be placed crosswise to the winds carrying the sand. In general, a fence parallel to the shoreline is most effective. A double line of fencing, 15 to 20 feet apart, is effective if funds are available. Lines should be well above high water to prevent wave destruction and far enough back on the upper beach that winds can move an adequate supply of sand inland, a minimum of 200 feet is recommended. Care should be taken in locating fences to avoid burying existing plants. Fences should not be so high that sand accumulates more rapidly than the growth rates of beach plants, thus burying them (maximum of five feet).

Brush Fences

Brush piled or spread loosely will effectively trap sand. Furthermore, little sand is lost from these piles as the wind shifts direction. For extensive use, brush must be readily available in large quantities at a reasonable cost.

Brush will collect more sand if placed in a standing position. Dig a trench 1½ feet deep and six inches wide. Place the butt end in the trench and firmly pack sand around it. To increase the stability of the brush in an upright position, fence posts with boards between them are often needed to support the brush. Posts spaced eight to 20 feet apart will probably hold up the fence.

Discarded Christmas trees make good fences but availability is seasonal. Local shrubs such as willow and wax myrtle may take root so should be used if available.

Brush fences are unsightly until buried and may be damaged by picnickers seeking firewood. However, they are as effective as slat fences and much more economical.

Slat Fences

Slatted fencing, such as commercial snow fence, is superior to solid materials for collecting sand. One by four inch slats, two to three inches apart are the typical arrangement. Anchor posts spaced eight to ten feet apart should be set three to four feet deep in the sand to withstand the winds and the weight of accumulating sand.

Where large amounts of sand blow about, fencing is buried quickly and additional fences may be erected to make the dune higher. Placing brush at the base of the fence will hasten sand trapping.

REVEGETATION

Fences, brush and other non-living barriers, are only temporary measures used to stabilize sand. They lose their effectiveness when buried and the sand moves on. Vegetation has been found to be the most satisfactory material. Salt and sand-resistant grasses grow upward through fresh sand deposits and spread laterally forming a dense cover of new plants. Lateral above-ground growth by stolons and below-ground by rhizomes stops wind and water from moving sand away.

To grow well at the ocean shore, a plant must be able to tolerate up to several feet of sand accumulation a year, sand blast strong enough to take the paint off a car, salt spray, salt-water flooding, drought, heat and low nutrient supply. Those species occurring naturally in an area are usually best adapted to local conditions and should be utilized where possible. However, in badly damaged areas, plants of native species should be obtained from nurseries before thinning natural stands. Four species are recommended for the Alabama coast. They are:

Sea Oats - Uniola paniculata
Dune panic grass - Panicum amarum, P. amarulum
Saltmeadow Cordgrass - Spartina patens

PLANTING GUIDELINES

To be successful, planting should be located where a dune would most likely occur in nature--in the path of blowing sand parallel to the high-tide line. It is wise to start dune plantings as far as possible from the water since dunes grow toward the sand supply which is usually the surf zone. Several hundred feet from the high tide line is recommended. Whenever feasible, leave room for two or more dune lines, a double line of protection. A grass planting 40 to 50 feet wide can trap several cubic yards of blowing sand per foot of beach in a year.

(1) Planting dates: Panic grass and cordgrass - March through June; Sea Oats - November through April.

(2) Planting depths: 6" - 10" (inches)

(3) Spacing: in small mounds 18" apart on all sides, one plant to a mound (1000 plants per area, 50 x 100 feet)

(4) Small areas and steep slopes should be planted by hand by setting plants into individual holes made with a shovel or dibble. Pack sand firmly around each plant. Larger and smoother sites can be planted more economically with tractor-drawn transplanters.

(5) A mixed planting with more than one species will usually provide better results in terms of disease and pest resistance, survival and coverage rates.

(6) Digging transplant material from the area of damage should be done with great care to leave at least half of the original material and in many cases should be discouraged. Younger plants transplant more happily than older, longer-rooted plants. Wrap roots with moist dirt in burlap or newspaper. Transplant as quickly as possible.

(7) Graduated plantings with greater spacing (up to four feet apart) around edges allows sands to get to the middle of the planting and build a wide-dune area.

(8) A sand fence in the middle of the planting area will help collect sand for the first six months while the plants get started.

(9) Fertilizer should be applied to transplants as an additional aid to successful plant establishment. During the first year, three or four equal applications (200 pounds per acre) of 30-10-0 during spring and summer should be applied. In the second year, reduce to two applications of 50 to 60 pounds per acre with one application in subsequent years.

FOR ADDITIONAL INFORMATION

For additional information contact the Sea Grant Advisory Service, 3940 Government Blvd., Mobile, AL. 36609, or your local County Extension office.

Further reading:

(1) The Dune Book: How to Plant Grasses for Dune Stabilization. North Carolina Sea Grant Publication No. 76-16. UNC Sea Grant, 1235 Burlington Labs, NCSU, Raleigh, N. C. 27607

(2) Restoration and Retention of Coastal Dunes with Fences and Vegetation. J. A. Jagschitz and R. S. Bell. Bulletin 382. Agricultural Experiment Station, University of Rhode Island, Kingston, R. I.

(3) Techniques for Coastal Restoration and Fishery Enhancement in Florida. Florida Marine Research Publications No. 15. Florida Dept. of Natural Resources, Marine Research Laboratory, 100 Eighth Ave., S. E., St. Petersburg, FL 33701.