

Beach and Dune Stabilization with Sand Fencing and Vegetation

Sand Fencing

Sand fences slow sand movement by reducing the wind velocity in their immediate vicinity. While sand fences are very effective in trapping wind-blown sand, once they are filled they have little or no further effect on sand movement (Woodhouse, 1978). However, the advantage of sand fences is that they can be installed during any season and they are fully effective as sand traps as soon as they are installed (Woodhouse, 1978). Research on the use of snow fences has demonstrated that a porosity ratio of 0.8:1 (40%) is the most effective (Carter, 1988). Typically commercial snow fencing has a 50% porosity, and works quite well in stabilization projects along Lake Huron. Snow fencing is usually an interim measure. Once dune vegetation has become established, the need for

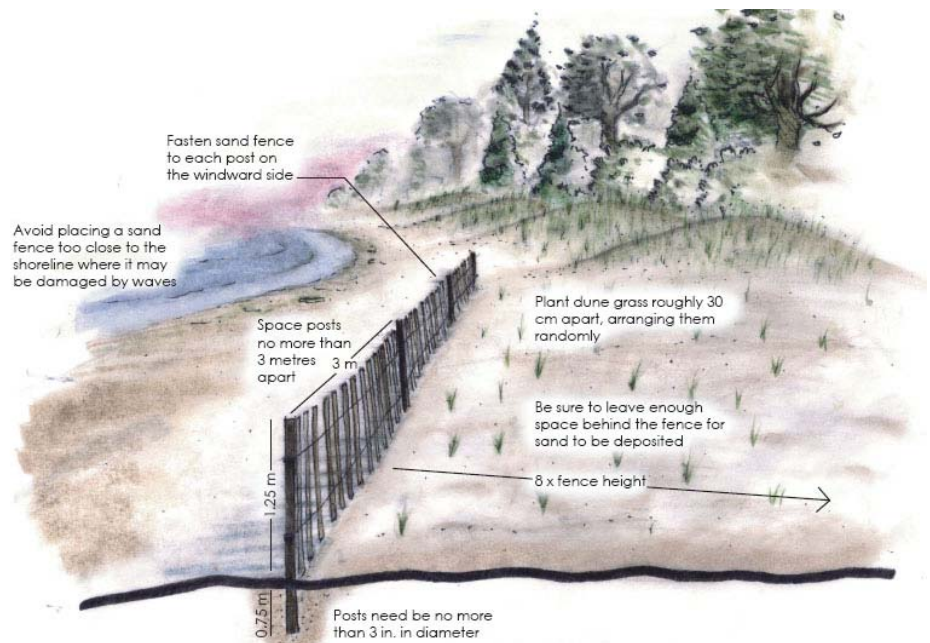
snow fencing is substantially reduced

Mats and Netting

Mats and netting are also techniques that have been used for protecting bare sand surfaces. Coarse netting and mats have been used in protecting dunes while transplanted dune grasses are establishing (Dahl, 1975). This technique does protect the sand surface but does not collect much sand, so the best use of netting and mats is to protect new seedlings (Woodhouse, 1978).

Brush

Brush is another effective but temporary stabilizer of dune sites when placed over bare sand (Woodhouse, 1978). This method is not commonly used though, since it has high labor requirements and it interferes with subsequent planting (Woodhouse, 1978). Use of this





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method should be limited to small blowout areas.

Vegetation

The most effective method of stabilizing coastal dunes is through the use of vegetation (Woodhouse, 1978). In many cases, vegetation is the least expensive, most durable, most aesthetically pleasing, and only self-repairing technique available (Woodhouse, 1978). Dune plants are especially effective at stopping and holding wind-borne sand. Their growth produces surface roughness which decreases the wind velocity near the ground, reducing wind erosion at the sand surface. Also, the plant stems and leaves above the sand surface greatly interfere with sand movement by saltation and surface creep (Woodhouse, 1978). As the grass fills and becomes buried, sand spills farther and farther into the interior of the stand of dune grass. A cover of dune plants tends to regenerate trapping capacity by growth even as it fills because the plants are stimulated to grow by the deposition of sand around them.

The coastal environment is typically harsh for plant growth: for plants to be successfully established, they must have special adaptation characteristics that allow them to survive such a harsh environment. These plants must be able to tolerate rapid sand accumulation, flooding, sandblast, wind and water erosion, wide temperature fluctuations, drought, and low nutrient levels. American Beachgrass, or Marram grass, (*Ammophila breviligulata*) is perhaps the most effective pioneer colonizer in most areas along Lake Huron. While it has been used extensively in dune restoration projects along Lake Huron, sourcing the plant in close proximity to the restoration site is important to avoid contaminating genetic make-up of endemic plants by importing plants from a large distance from the site. Marram grass from the Pinery/Ipperwash area is genetically different from the Marram grass found at Southampton, as an example.

There are various types of dune vegetation, and careful consideration should be made concerning the type of vegetation that will be used at a particular restoration site. Certain plants do well in certain areas, while others are invasive and may overtake established plants. By contacting the Coastal Centre, trained staff are available for technical consultations. It should be noted that dune restoration is not possible in all locations along Lake Huron. Check with the Coastal Centre before beginning this type of project. Centre staff can make an evaluation of the site to determine whether or not conditions are appropriate for dune restoration, and recommend techniques to enhance the project's likelihood of success.

Dune restoration usually involves a combination of Marram grass planting and the placement of sand fencing. The fencing is used as a temporary sand barrier until the grasses become established.



American Beachgrass, or 'Marram' grass (*Ammophila breviligulata*)