



Timucuan Ecological and Historic Preserve (Duval County)

Photo by Gary E. Schultz

### **Coastal Interdunal Swale**

**Description:** Coastal interdunal swales are marshes, moist grasslands, dense shrubs, or damp flats in linear depressions formed between successive dune ridges as sandy barrier islands, capes, or beach plains build seaward. Dominant species are quite variable depending on local hydrology, substrate, and the age of the swale. Wetter areas are often dominated by sawgrass (*Cladium jamaicense*), cattail (*Typha* spp.), or needle rush (*Juncus roemerianus*), while shallower areas have a diverse mixture of herbs, including southern umbrellasedge (*Fuirena scirpoidea*), Carolina redroot (*Lachnanthes caroliniana*), spadeleaf (*Centella asiatica*), and broomsedges (*Andropogon virginicus*, *A. glomeratus*; Johnson 1997). Shrubby areas are often dominated by wax myrtle (*Myrica cerifera*), with coastalplain willow (*Salix caroliniana*) on the Atlantic coast; on the Panhandle coast Atlantic St. John's Wort (*Hypericum reductum*) forms clumps on the low flats in the more stable portions of the barrier islands. Moist grasslands may be dominated by hairawn muhly (*Muhlenbergia capillaris*), lovegrass (*Eragrostis* spp.), sand cordgrass (*Spartina bakeri*) or saltmeadow cordgrass (*Spartina patens*). Damp sand flats have a sparse cover of such herbs as yellow hatpins (*Syngonanthus flavidulus*), Le Conte's flatsedge (*Cyperus lecontei*), and Engler's bogbutton (*Lachnocaulon engleri*). Nearer the shore, where swales are exposed to occasional salt water intrusion, they may be dominated by halophytic species such as seashore paspalum (*Paspalum vaginatum*) and marsh fimbry (*Fimbristylis spadicea*). Hurricanes and tropical storms can flood swales with salt water, after which they are colonized for a time by more salt-tolerant species

such as needle rush, Gulf Coast spikerush (*Eleocharis cellulosa*), and yellow spikerush (*Eleocharis flavescens*). Loose, blowing sand prevalent after storms favors the spread of saltmeadow cordgrass which tolerates burial better than the other grass species (Johnson et al. 2000).

Coastal interdunal swales are found along sandy coastlines in Florida, principally along the Gulf coast and the northeast Atlantic coast south to Cape Canaveral. The community varies from flooded to completely dry depending on rainfall, as well as on height and area of the surrounding dunes.

**Characteristic Set of Species:** sawgrass, hairawn muhly, broomsedge, seashore paspalum, sand cordgrass, saltmeadow cordgrass

**Rare Species:** none

**Range:** Within Florida, coastal interdunal swales are found along the Panhandle coast from the Alabama border west to the Ochlockonee River and along the Gulf coast from Anclote Key to Cape Romano and on Cape Sable; on the Atlantic coast they are found on the broader barrier islands from the Georgia border south to Cape Canaveral. Outside Florida, coastal interdunal swales with similar vegetation are found on barrier islands north to Virginia and west to Louisiana (NatureServe 2009).

**Natural Processes:** Barrier islands are naturally dynamic systems, subject to both building and erosion as sand is delivered or removed by waves. As barrier islands build seaward, a series of dune ridges are formed. The low areas between the dunes are progressively more protected from blowing sand and seawater intrusion, allowing a succession of several associations of herbaceous species, and ending with woody species (Johnson 1997). Salt water intrusion and increased sand movement following storms can set this successional process back to its initial stages, or storm surge and storm waves may obliterate the ridge-swale topography completely, leaving a level plain (Johnson et al. 2000), which is in turn colonized by the dune grassland community.

**Community Variations:** Black mangrove (*Avicennia germinans*) may occur in interdunal swales in South Florida.

**Associated Communities:** Coastal interdunal swale differs from both coastal grassland and beach dune communities in that it lacks species intolerant of inundation, such as seaoats (*Uniola paniculata*), Gulf bluestem (*Schizachyrium maritimum*), and crimson bluestem (*S. sanguineum*).

**Management Considerations:** Salt water intrusion and sand burial during storm overwash may leave coastal interdunal swales vulnerable to invasion by exotic species, principally torpedo grass (*Panicum repens*) and Chinese tallow (*Sapium sebiferum*) in North Florida and Brazilian pepper (*Schinus terebinthifolius*) and Australian pine (*Casuarina equisetifolia*) in South Florida.

**Exemplary Sites:** Gulf Islands National Seashore (Okaloosa County), St. George Island State Park (Franklin County), Little Talbot Island State Park (Nassau County), Anastasia Island State Park (Flagler County), Cayo Costa State Park (Lee County), Rookery Bay National Estuarine Research Reserve-Keewaydin Island (Collier County)

**Global and State Rank:** G3/S2

**Crosswalk and Synonyms:**

Other synonyms: interdune area (Johnson et al. 1974), transitional zone (Johnson and Barbour 1990)

**References:**

Johnson, A.F. 1997. Rates of vegetation succession on a coastal dune system in northwest Florida. *Journal of Coastal Research* 13:373-384.

Johnson, A.F., and M.G. Barbour. 1990. Dunes and maritime forest. Pages 429-480 in R.L. Myers and J.J. Ewel, editors. *Ecosystems of Florida*. University of Central Florida Press, Orlando.

Johnson, A.F., H.E. Horne, and C.E. Kindell. 2000. Status of rare plant and lichen species and natural communities on Eglin Air Force Base, Santa Rosa Island, Florida. Unpublished report to Eglin Air Force Base. Florida Natural Areas Inventory, Tallahassee, Florida.

Johnson, A.S., H.O. Hillestad, S.F. Shanholtzer, and G.F. Shanholtzer. 1974. An ecological survey of the coastal region of Georgia. National Park Service Scientific Monograph Series No. 3. United States Government Printing Office, Washington, D.C.

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. <http://www.natureserve.org/explorer/>. URL: <http://www.natureserve.org/explorer/>