Creation and Restoration of Coastal Plant Communities

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TABLE OF CONTENTS

Chapter 7

LOW MARSHES, PENINSULAR FLORIDA

Roy R. Lewis, III

TABLE OF CONTENTS

I. INTRODUCTION

Previous chapters in this volume have dealt in detail with the restoration and creation of tidal marshes along the Atlantic coast (Knutson and Woodhouse), the western Gulf of Mexico (Webb), and the Northeast Gulf of Mexico including Florida (Kruczynski).

This chapter will not repeat any of that information except to refer the reader to those chapters and the general literature on southeastern U.S. tidal marshes.[1-6] This chapter will be limited to discussing the usefulness of the smooth cordgrass *Spartina alterniflora* Loisel in situations where it is not the dominant member of the coastal plant community.

II. THE NATURAL PLANT COMMUNITY

The southern half of Florida has, as its dominant coastal estuarine vegetation, mangrove forests composed of *Rhizophora mangle* L., *Avicennia germinans* (L.) Stearn, and *Laguncularia racemosa* (L.) Gaertn. f.[7-8] A less conspicuous member of this community is smooth cordgrass (*S. alterniflora* Loisel.) which typically forms a band in front of the forest (Figure 1) in deeper water than can apparently be colonized by mangrove propagules. Davis[9] has noted that "*Spartina alterniflora* grows best in the outer deep-water zone of swamps and may be effective in holding soil materials, thus aiding in establishment of a pioneer *Rhizophora* family". He also cites Fryberg[10] as recognizing "that the mangrove plants contribute to the accretion processes, from the pioneer stage of *Spartina brasiliensis* on the offshore mud flats to the tall, close stands of red mangroves of the swamps".

III. THE ROLE OF SMOOTH CORDGRASS IN THE RESTORATION AND CREATION OF SOUTH FLORIDA COASTAL WETLANDS

The normal practice when attempting to restore or create a coastal wetland in South Florida has been to attempt to replant mangroves since they are the dominant "climax" community (see Chapter 8).

Attempts have been made, however, to utilize *S. alterniflora* in place of mangroves[11-16] for several reasons:

1. More rapid coverage and stabilization of substrates[11-16]
2. Establish preferred nesting habitat for Clapper Rails (*Rallus longirostris*) and Willets (*Catoptrophorus semipalmatus*)[16]
4. More cost effective[16]
5. Greater value in erosion control[15]
6. Greater value in trapping sediments in street runoff[14]

In addition, as discussed in the mangrove chapter of this volume, *S. alterniflora* acts as a nurse species trapping floating propagules of mangroves and eventually being replaced by mangroves as they shade out the grasses.

Martyn[17] in reporting on the foreshore vegetation of Georgetown, British Guiana noted: "The part played by *S. brasiliensis* in the primary colonization of the newly raised mud bank is of interest... the appearance of a grass in this role would appear to be unusual in the tropics, where muddy foreshores are more usually colonized directly by "mangrove"... once established, these plants of the mangrove association climax grow very quickly, becoming dominant to the *Spartina*, which finally almost entirely disappears beneath them."

Ranwell,[18] in discussing successional processes in *S. anglica* marshes in Great Britain

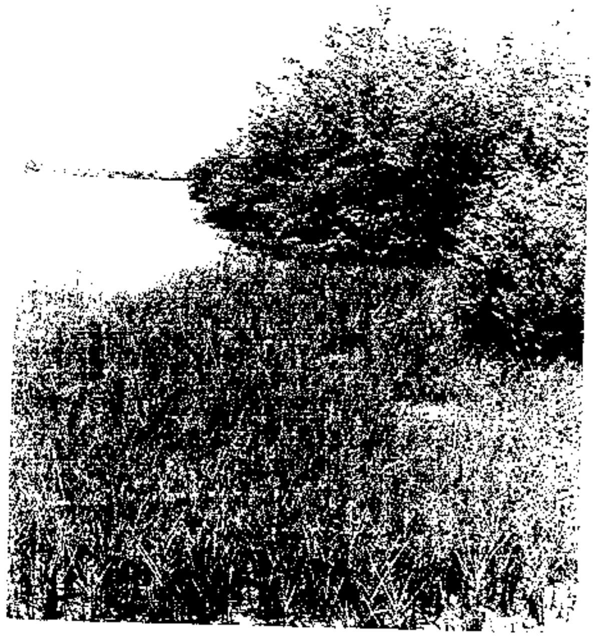

FIGURE 1. Typical view of a stand of smooth cordgrass (*Spartina alterniflora* Loisel.) situated in the lower intertidal zone in front of black mangroves (*Avicennia germinans* (L.) L. Tampa Bay, Fla.

comments on a similar shading out of *S. anglica*: "It was found that *Spartina* retained dominance for about 20 years, but in the subsequent 12 years, about 50 percent of the *Spartina* had been replaced by the invading species..." These invading species came in along the landward edge of the marsh and included *Agropyron pungens, Scirpus maritimus*, and *Phragmites communis*.

Spartina also lends itself well to wetlands *creation* where upland areas may be excavated to tidal elevations and planted for mitgation.[19] Figures 2, 3 and 4 show the planting and growth of a 1.8 ha tidal marsh that was excavated from uplands and planted with 2127 plugs of *S. alterniflora* removed from an adjacent marsh. Mangroves, *Avicennia germinans* in particular have now begun invading the marsh.

Figure 5 shows aerial views of a man-made dredged material island in Tampa Bay, Fla., where natural colonization by *S. alterniflora* was observed.[11] Figures 6 and 7 show how the colonizing plants eventually spread and coalesced and are now being replaced by both *A. germinans* and *L. racemosa*.

S. alterniflora has been used specifically for its sediment binding qualities by planting it on dredged material in Florida.[11-12,16] It has the advantage of stabilizing these shifting sand substrates much more quickly than planted mangroves and can do the job for ½ to ⅓ of the cost of mangrove tree transplanting.[16]

IV. NEEDED RESEARCH

Development of strains of *S. aterniflora* for their genetically superior abilities in rate of growth and eventually stand height and robustness are needed. Good seed sources are also needed since most seed harvested in Florida to date is either sterile or damaged by insects.

FIGURE 2. View of a 1.8 ha marsh creation site along Archie Creek, Tampa, Fla., April 1978.

FIGURE 3. Archie Creek marsh site, August 1978.

FIGURE 4. Archie Creek marsh site, April 1979.

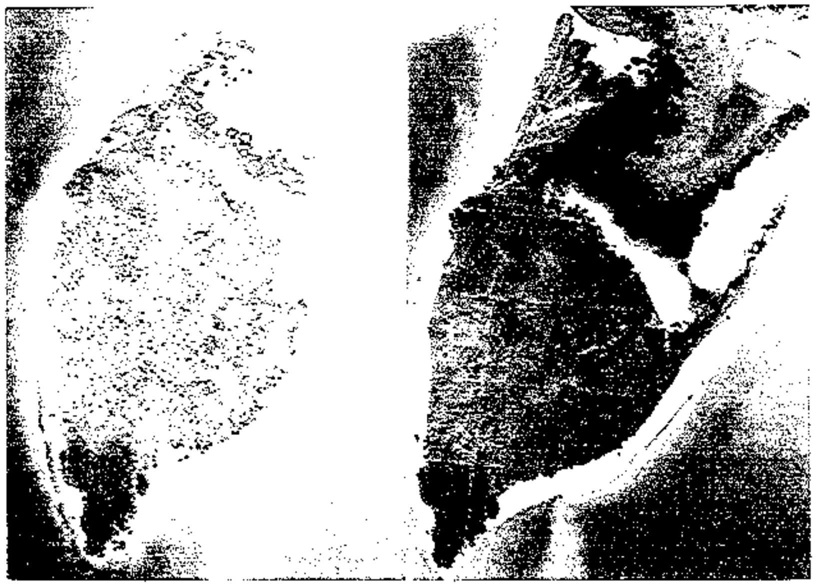

FIGURE 5. Vertical aerial photographs of a dredged material island in Tampa Bay, Fla.

FIGURE 6. Ground level view of a dredged material island in Tampa Bay, Fla.

FIGURE 7. Ground level view of a dredged material island in Tampa Bay, Fla.

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