

SEAGRASS RECOVERY IN WEST GALVESTON BAY

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BACKGROUND

Submerged aquatic vegetation (SAV) beds have been all but extirpated from the Galveston Bay system. Estimates of their aerial coverage during the 1950s range from 2,500 to 5,000 acres. West Bay contained the most extensive seagrass meadows with approximately 2,200 acres of SAV beds, comprised primarily of shoalgrass, *Halodule wrightii*. By 1989 seagrasses in West Bay were completely eliminated and by 1993 only about 700 acres remained in the Galveston Bay system primarily in Christmas Bay (Figure 1). Their loss has been attributed to numerous causes, including subsidence,

increased water column turbidity from dredging, shrimp trawling, contaminant discharges, chemical spills, or other factors that reduced light attenuation or otherwise inhibited SAV growth.

In 1995 numerous sites were identified along the south shoreline of West Bay that were colonized naturally by wigeongrass, *Ruppia maritima*. The growth of this ephemeral SAV indicated that water clarity or other environmental conditions may have recovered to conditions suitable for the restoration of permanent seagrasses in West Bay.

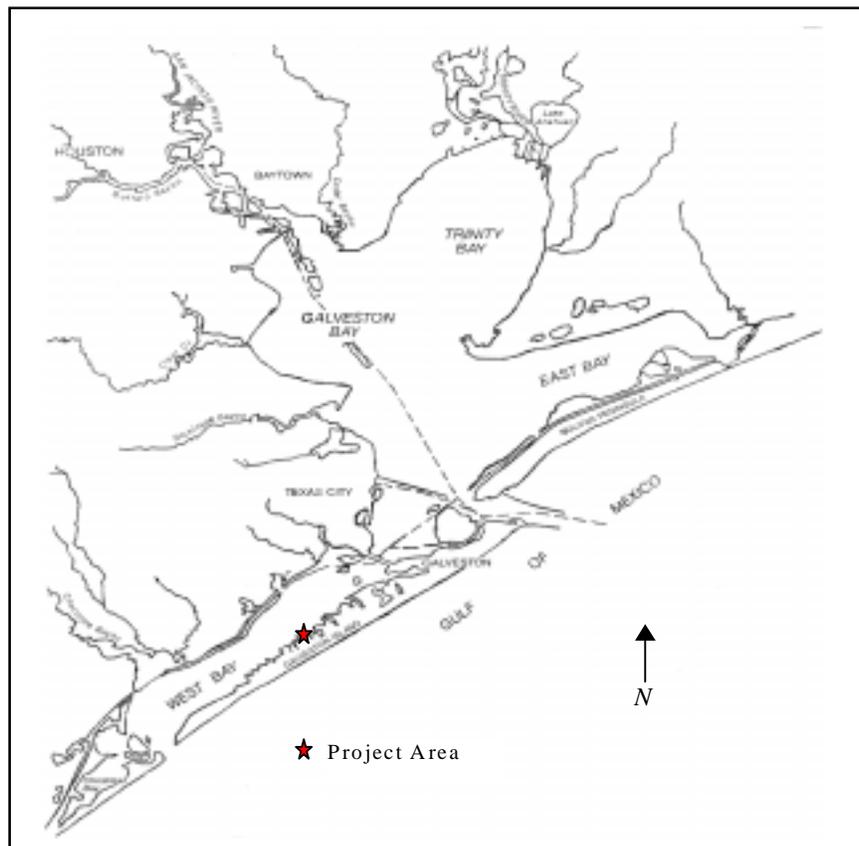


Figure 1. Galveston Bay system. In 1991 all remaining SAV beds were found in Christmas Bay in extreme SW corner of the system.

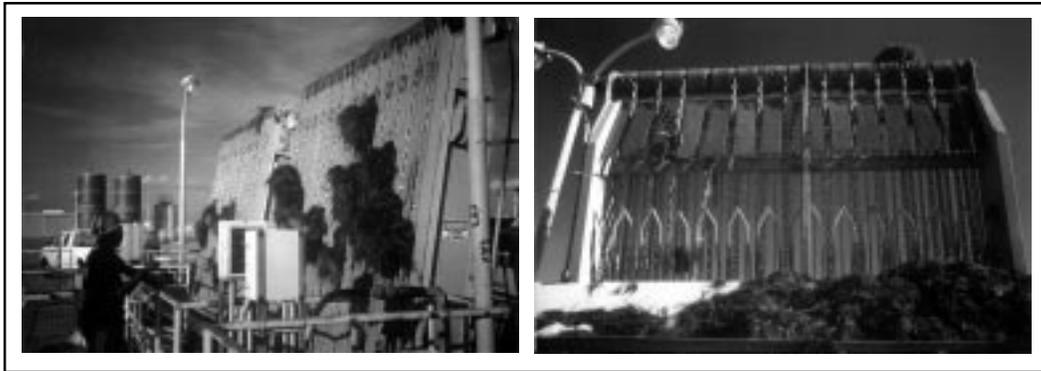


Figure 2. Mechanical rakes at the power plant remove seagrass debris off the intake screens (left). Seagrass wrack is continuously removed and landfilled (right).

OBJECTIVE

Seagrass wrack from the Laguna Madre (largest areas of seagrasses on the Texas south coast) composed of turtle grass *Thalassia testudinum*, manatee grass *Syringodium filiforme*, clovergrass *Halophila engelmanni* and shoalgrass collects in large amounts on the water intake screens at the Central Power and Light Plant in Corpus Christi, Texas. The seagrass that collects on the screens consists primarily of dead leaf litter throughout the year and is removed from the screens and landfilled by the truckload (refer to Figure 2). When feeding ducks and typically stronger waves arrive in late fall, the volume of wrack increases and more viable seagrass material is trapped on the screens. The objective of the project was to determine if seagrass wrack, collected during these high load periods, could be used to successfully restore seagrass beds. The successful use of the seagrass wrack would provide a very inexpensive and simple method of SAV restoration in Galveston Bay.

Broadcasting Seagrass Wrack

Two enclosures, 60 meters in diameter, were constructed to detain the seagrass wrack collected from the power plant. The enclosures were built in areas where wideongrass had been found at the Galveston Island State Park (Figure 3) in West Bay. In October 1996, the Texas

Coastal Program collected seagrass wrack material and with help from National Marine Fisheries Service personnel (NMFS), distributed the seagrass wrack into each of the enclosures (Figure 4). It was anticipated that the enclosures would retain the material for approximately six months. Small wooden stakes were also placed within the enclosures to catch drifting seagrass material and facilitate establishment of viable pieces.

RESULTS

The enclosures were first inspected two months after seagrass wrack was distributed. Portions of the fence were found cut or damaged on site inspections in February and March 1997 and most wooden stakes were missing. The fences were repaired and some material was found remaining in the enclosures. One plant was found growing during the March visit. No evidence of the introduced material was subsequently seen and the fence enclosures were removed about a year after their construction.

In 1998, in preparation for a marsh restoration project at the Galveston Island State Park, several small patches of clovergrass were first discovered in an area slated for marsh terracing approximately 200 meters south of the one enclosure. As a result of this discovery, the project was revised to avoid impacts to these seagrasses.

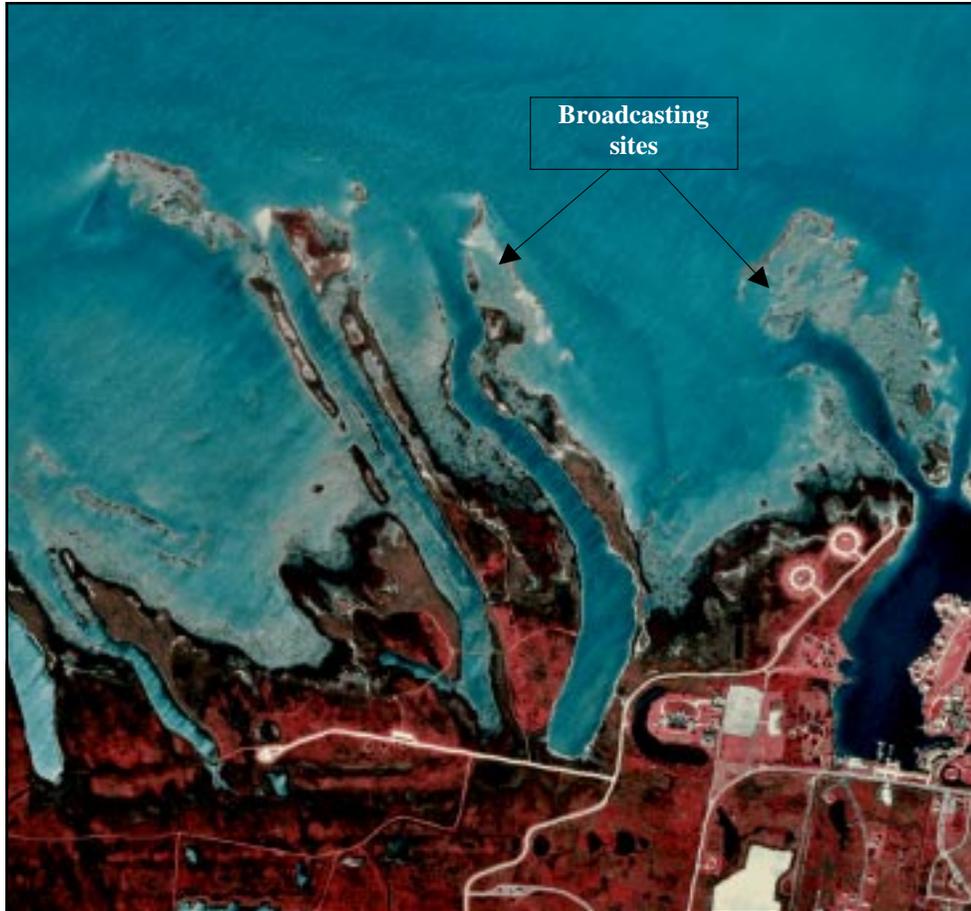


Figure 3. Galveston Island State Park, December 1995, prior to seagrass and marsh restoration projects.

Further surveys found more SAV beds throughout the West Bay cove where the two enclosures were located. Four years after initial broadcasting of the seagrass wrack, over forty acres total of clovergrass and shoalgrass beds have recovered in the Galveston Island State Park area as seen in December 2000 aerial photograph (Figure 5). Efforts to quantify the extent of SAV in the Galveston Island State Park are continuing.

DISCUSSION

The rapid expansion of clovergrass and shoalgrass from this project may be attributed, at least in part, to an abundance of seeds in the wrack material. Prior to this project, no beds of stargrass were present in West Bay and only small (less than 1 acre) planted beds of shoalgrass exist. Reviews of recent aerial photographs and field

investigations have not identified the colonization by clovergrass in any West Bay coves other than the area planted by this project. It is highly unlikely that any material from existing SAV beds caused such rapid colonization in the project area. New projects underway will test this and other methods to restore seagrass meadows to West Galveston Bay.

New Restoration Efforts

The presence of healthy seagrass beds expanding in the area has encouraged new efforts in seagrass restoration in West Galveston Bay. Several projects have been initiated through the FWS' Texas Coastal Program such as; a test of planting techniques (the use of seagrass wrack, peat pot plugs and mechanical injection methods) by the NMFS, planting an additional 2 acres with mechanical inject-



Figure 4. Broadcasting seagrass wrack collected from the power plant intake screen into an enclosure in West Galveston Bay. Fragments were allowed to drift within the enclosure freely and settle to the substrate naturally.



Figure 5. Aerial photo of the seagrasses taken December 2000. Preliminary estimates indicate that more than 40 acres of seagrass (*Halophila engelmanni* and *Halodule wrightii*) have been re-established.

tion in cooperation with Texas Parks and Wildlife, and new aerial surveys and monitoring. The recovery of SAVs at the Galveston Island State Park has renewed efforts and hopes of restoring some of the 2,200 acres of seagrasses that were lost in West Galveston Bay. The results of these projects will provide guidance for expanded restoration efforts in the future.

REFERENCES

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