CTA-059-Restoring Coastal Habitats-World's Oceans

Join us to save coral reefs

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FORWARD: This article serves as an analog for our Coastal Protection Master Plan which includes coral, seagrass and mangroves planting events. This is a great "How To" guide for coastal restoration.

"We all should realize that there is a problem with our oceans and should be addressed globally, it's our ocean to save……Executive Director WFCRC

Restoring Coastal Habitats
for Rhode Island's Future

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Our Mission

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Restoration Methods

Seagrass - **Salt Marsh** - **Anadromous Fish Habitat**

Seagrass

Seagrass beds can be restored by encouraging natural recolonization in areas that have experienced improvements in surface water quality. Proactive methods of eelgrass restoration include transplanting of individuals taken from healthy donor beds or seedlings reared under laboratory conditions. In some cases seeds can be planted or broadcast. Seeding can be used alone, or in concert with transplant techniques. Several technical guidance documents have been published to assist restoration practitioners in selecting transplant sites, and in choosing appropriate restoration methods for eelgrass beds.

Natural Recolonization | Transplants | Seeding

Natural Recolonization

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This approach to eelgrass restoration focuses on water quality improvement in the study area with the assumption that once suitable conditions are established, seagrass will naturally re-colonize. This approach involves a long-term coordinated effort to upgrade municipal sewage systems, and a program to identify and curtail point and non-point discharges from industrial, residential and agricultural areas in the coastal zone.

Eelgrass bed below the water surface.
Courtesy: NOAA

Transplants

Transplantation of eelgrass is a proactive approach to restoration involving the relocation of viable seedlings grown in aquaria, or mature plants taken from healthy donor beds to the restoration site, once suitable conditions have been established for eelgrass survival. This is not a new technique; the earliest recorded transplant effort involving eelgrass was documented by Addy (1947a, 1947b) from Massachusetts and several other locations in the mid-Atlantic. However, in recent years, transplant methods have been refined. Save The Bay has used a specialized transplant methodology known as "Transplanting Eelgrass Remotely with Frames" (TERF), developed by Dr. Fred Short of the University of New Hampshire. The TERF method involved using clusters of plants temporarily tied with degradable crepe paper to a weighted frame of wire mesh.

Attaching eelgrass transplants to frames.
Courtesy: Save The Bay

Transplanting is very labor intensive, as it requires divers to plant the individual units by hand. Often, trained volunteers can be used to defray the considerable time and labor costs associated with eelgrass transplant projects. Save The Bay has successfully used volunteer divers to transplant live plants and in some cases scatter seeds around transplants.

Eelgrass transplant techniques, along with cost and labor estimates, are documented by Fonseca et al. (1982a, 1982b, 1982c, 1984, 1985, 1987a, 1987b). Fonseca (1994) reviewed all aspects of seagrass restoration, including planting guidelines and monitoring programs for the Gulf of Mexico; however, this information is applicable to seagrass restoration in general.

Descriptions of planting methods, including seeding, stapling, use of anchored and unanchored sprigs, plugs, peat pots, and transplanting of individual mature plants are provided by Phillips (1980a), Fonseca (1994), and Fonseca et al. (1998). Fertilization of transplants to accelerate growth and bed coalescence is described by Fonseca et al. (1987, 1998) and Kenworthy and Fonseca (1992). The benefits of fertilization in eelgrass restoration projects have been inconclusive (Fonseca 1994).

Seeding

Eelgrass seeds.
Courtesy: University of Rhode Island

Eelgrass can be propagated in estuarine waters by application of seeds. In Chesapeake Bay, eelgrass seeds have simply been broadcast by hand off a small motorboat and success rates are documented by Orth et al. (1994). Researchers in Great South Bay, New York developed a method of seeding which involved attaching seeds to a biodegradable tape. The tape is then planted just below the sediment surface at the desired restoration site (Churchill et al. 1978).

Recently, Steve Granger, a research scientist at University of Rhode Island Graduate School of Oceanography has developed a boat-pulled sled which deposits seeds below the sediment surface. His colleague, Mike Traber, has developed a procedure to encase seeds in a Knox gelatin matrix. This prevents or reduces seed predation and loss of seeds from waves and currents. Gelatin-encased seeds are injected into the sediment from the sled using a food processing pump similar to that which is used to make jelly donuts. A metal flange mounted on the back of the sled sweeps sediment over the furrows created by the pump, covering seeds under one inch of sediment. Test plantings were conducted at two locations in Narragansett Bay in Fall, 2001. The investigators were able to plant a 400 square meter area in less than two hours, exceeding initial expectations. Ongoing research efforts include monitoring the growth of eelgrass in the newly seeded areas and the evaluation of alternative gelatin agents (CICEET 2002).

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*The only thing necessary for the triumph of evil is that good men do nothing"….**Edmund Burke***