Restoration: What has worked where, and why ?

Ryan Davis

Status, Trends, and Conservation of Eelgrass in Atlantic Canada and the Northeastern United States

A Brief History of Eelgrass Restoration

- Started with Addy 1947
- Status of the science summarized in Fonseca et al. 1998
- Material Type and Source
  - Bare root adult plant
  - Adult plants with sediment
  - Sod
  - Seeds
- Methods Development
  - Installation
- Site Selection

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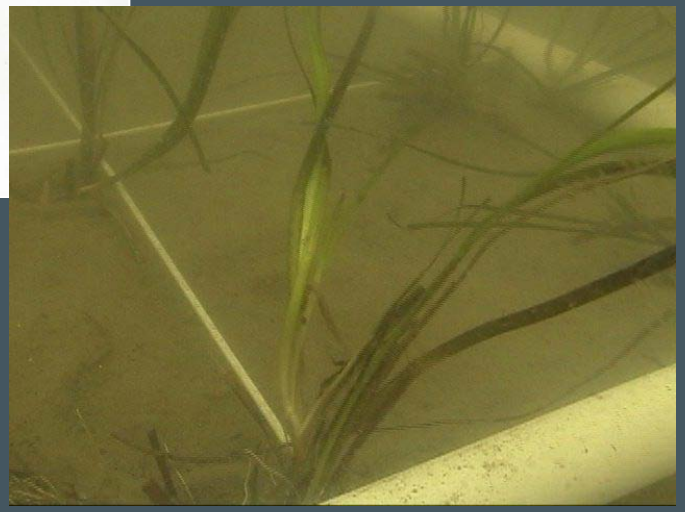
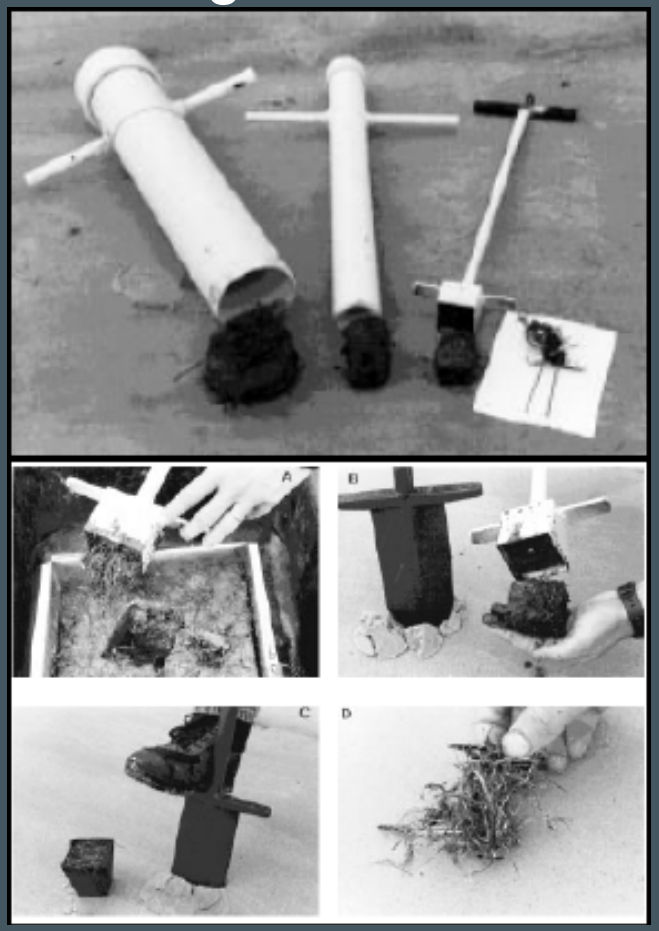
Methods – Transplant adult shoots

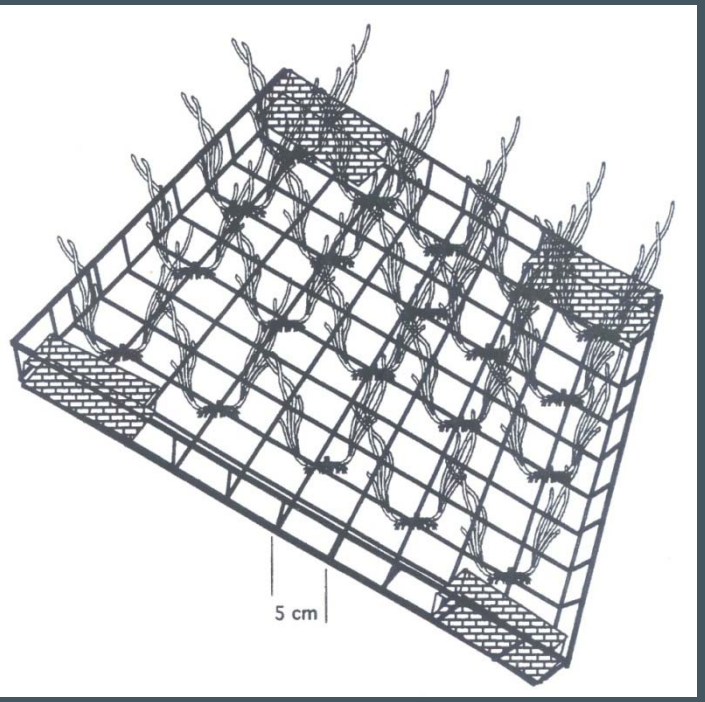
Bare root shoots



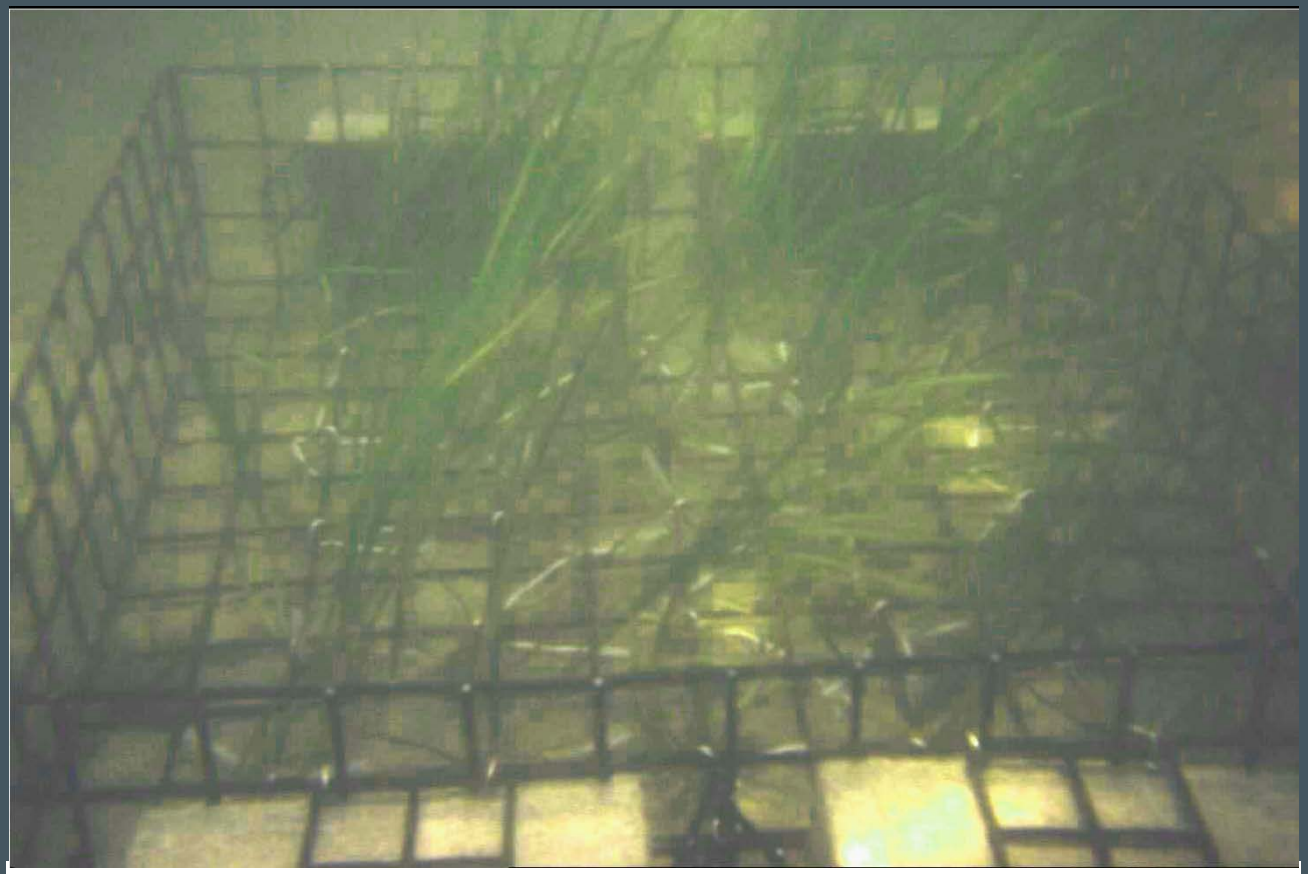
Plugs



Methods - TERFS



Methods - TERFS



Methods –Seeds

Buoy Deployed Seeding

Broadcast

Seed Injection

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Methods – Mechanical

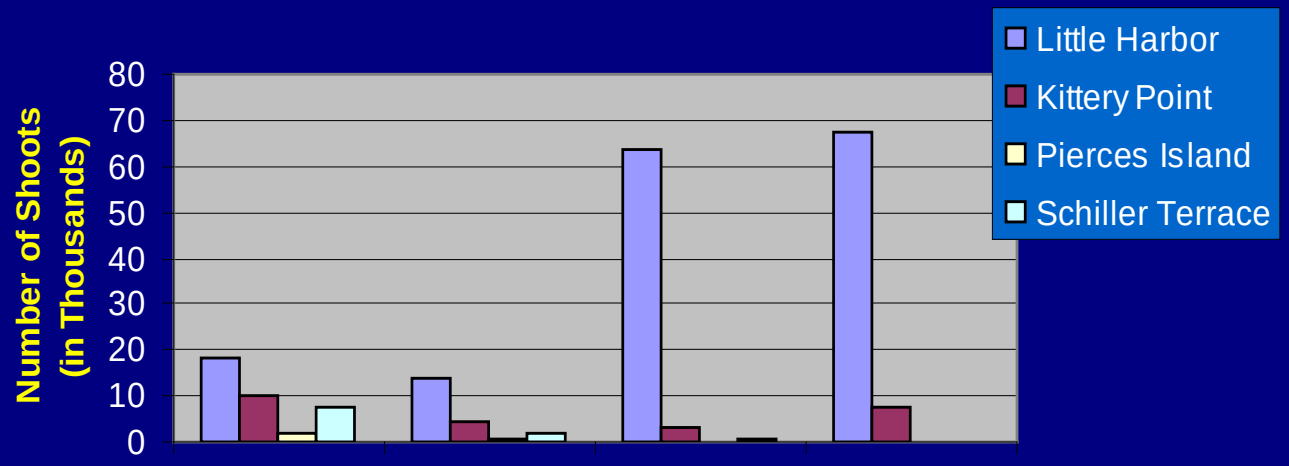
GUTS

JEB

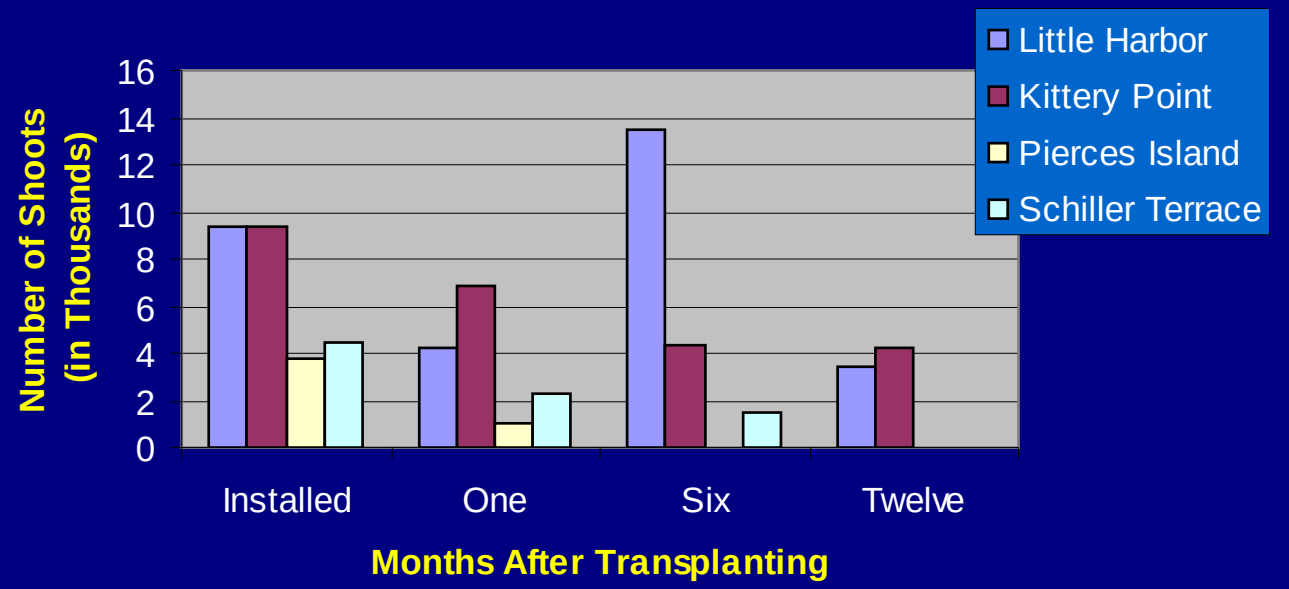
Methods – Mechanical

EcoSub

Horizontal Rhizome Method



TERFS



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Site Selection

- The three most important factors affecting the success of restoration efforts:
  - "Location, Location, Location"
- Site Selection Models
  - WEMo
  - PSTI/PTI
  - Project specific (e.g., Boston Harbor HubLine)
- Generally compare potential restoration areas to reference areas

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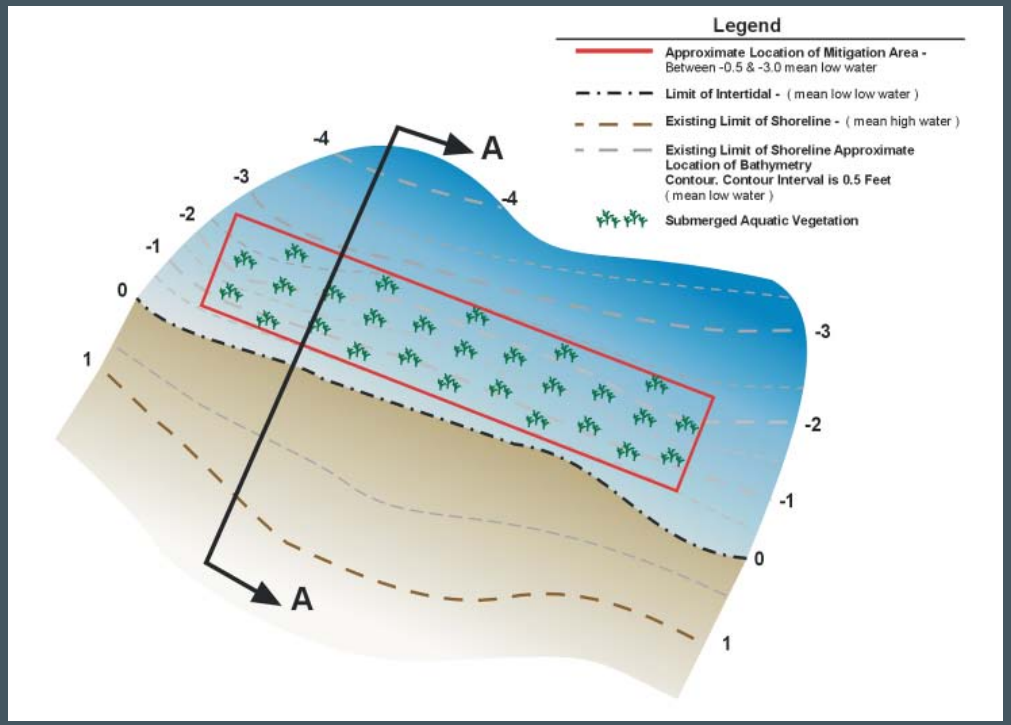
Site Selection – Local factors

- Light ($I_z = I_o\ e^{-kdz}$)
  - Water column
  - Epiphytes
- Sediment
  - Percent fines
- Historical SAV
- Bathymetry
  - Light
  - Energy
  - Dessication



Site Selection – Regional factors

- Shoreline configuration
- Conflicting site uses
- Landscape position

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Have We Been Successful?

- Define Success
  - Public outreach and education
  - Creation of target acreage
  - Persistence
- Overall "success" rate for transplanted material is around 50%
- Why are some projects more successful?
  - Site Selection

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Data Needs

- Standardized monitoring frequency and duration
  - Consideration of abiotic and biotic factors
- Better spatial and temporal data sets for site selection
- Minimum patch size
- Minimum sustainable population