

Green Infrastructure for Coastal Resilience

Hyannis, MA

March 28, 2017

Training Notes

Green Infrastructure Terms and Hazards and Ecosystem Services

<u>GREEN INFRASTRUCTURE</u>	
Natural protection	
Plants	Limited
Nature-based	Oyster reefs
Denial	Temporary
Money + maintenance	Wildlife
Biodegradable	Habitat
Renewable energy	Change
Space	Sustainable
	Expensive
	Permitting

<u>HAZARDS</u>	<u>ECO SERVICE</u>
Stormwater run off (elevate roadway) (bacterial) (erosion)	Groundwater recharge Bio-filtration Flood control/ Stormwater retention Nutrient uptake erosion control/ Wave attenuation
Coastal erosion + flooding (mv) (sandwich) (Shoaling + flushing) (N. side Brewster; sand migration S. side)	Wave attenuation Coastal buffering ↳ DIKE
Tidal flooding Overwash flooding Sea level Rise Contaminants/algae	

Green Infrastructure Implementation Barriers and Solutions

BARRIERS	SOLUTIONS
<p>Permitting</p> <ul style="list-style-type: none"> - Div of Marine Fish - Natl Fisheries - Wetland Regs (converting) - Regulatory inflex (Stat/town) but not local enough 	<ul style="list-style-type: none"> - Training for permitting agencies in permitting process (expedite) - Streamline prog. (agencies in room, comment at end) - Get DEP here to listen! Need to hear from parties - Reg discussion in June (agencies, etc)
<p>Local opposition/ (change is hard; ownership lack of awareness (at a larger scale))</p> <ul style="list-style-type: none"> - outreach to decision-makers 	<ul style="list-style-type: none"> - engage communication at start - collaboration w/ lots of partners - flyers, mktg, schools, citizen science

<ul style="list-style-type: none"> - Cost - expensive + not all tax payers see benefits (signs regs.) - Maintenance + cost 	<ul style="list-style-type: none"> - Public/private partners - CO to raise \$ + business (educate & buy in) - Show better ways to do it even tho more \$. - More partners / more \$ options - manage expectations - templates for cost/benefit analysis for green vs hard - Some examples but template showing comparisons choice architecture - \$ eco services (damages avoided, recreation) * part of cost/benefit
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Green Infrastructure Projects – Completed, Underway, Planned, or Ideas

HERRING RIVER RESTORATION

TABLE 1
(P)

- RESTORING TIDAL INUNDATION
TO HERRING RIVER

LOCATION:

HERRING RIVER (WATERSHED)
TOWN OF WELFLEET

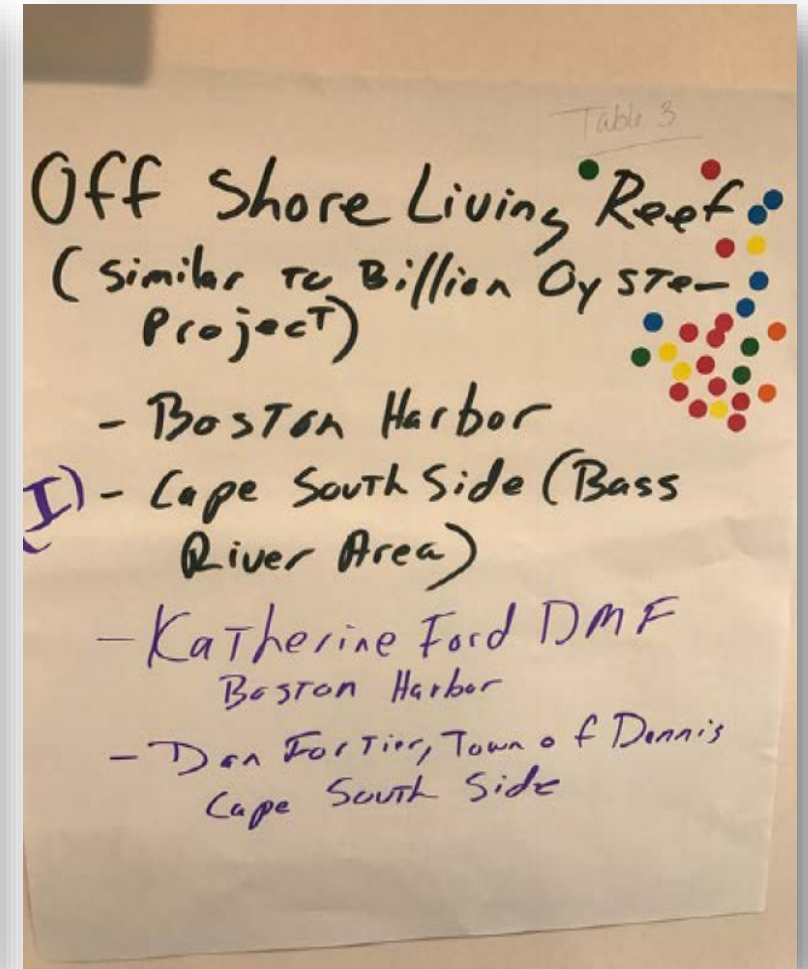
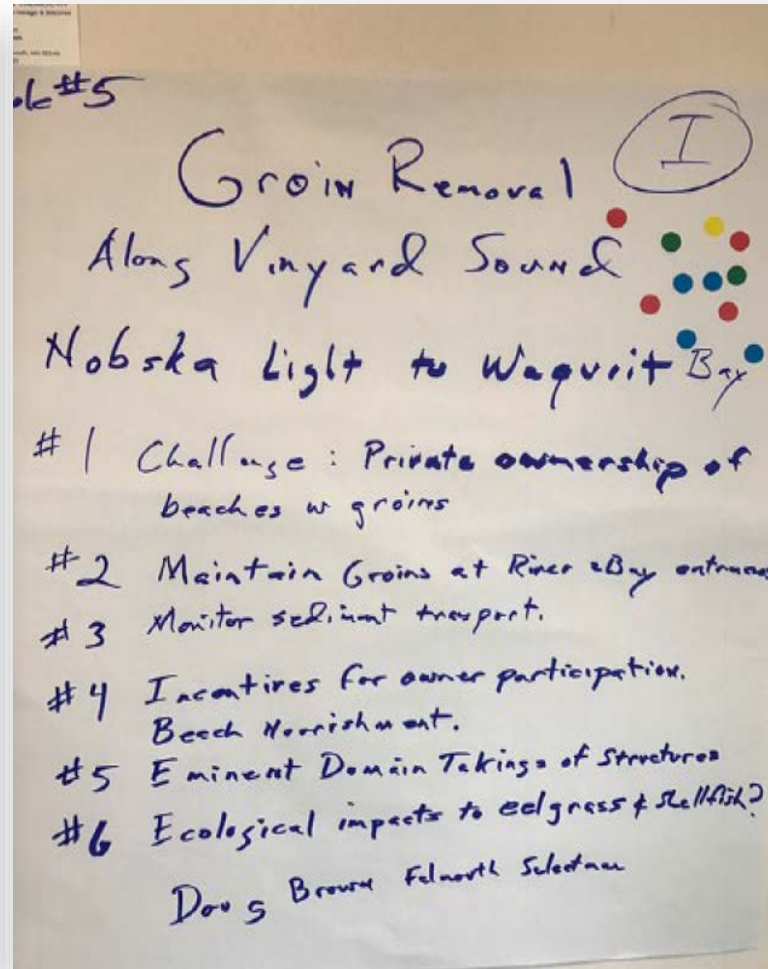
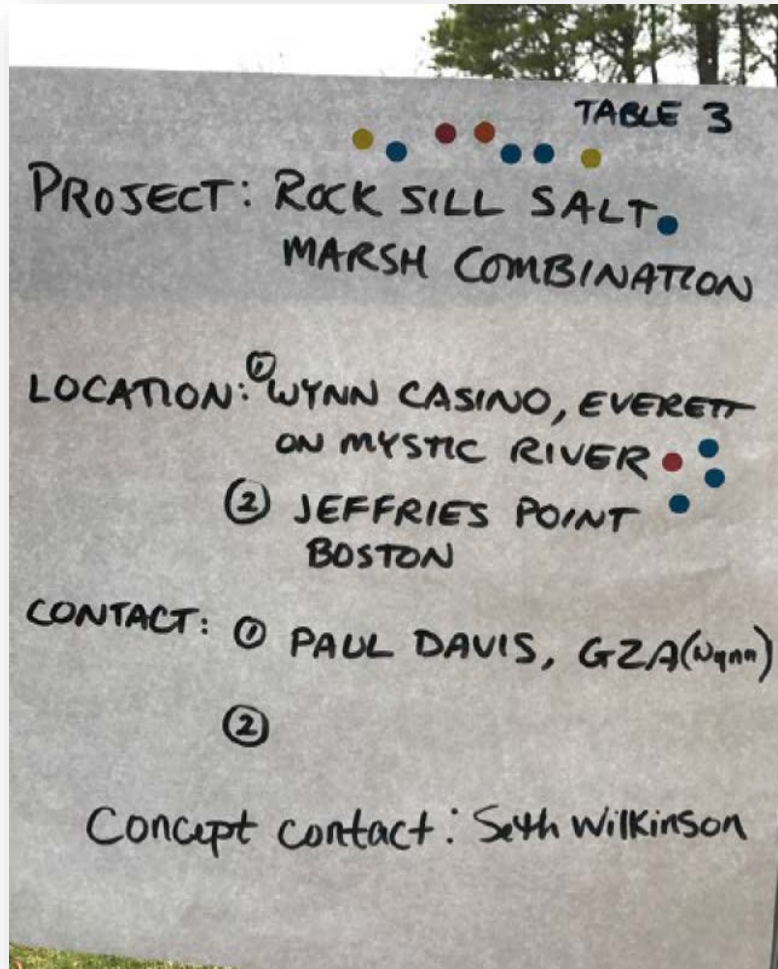
CONTACT:

FRIENDS OF HERRING RIVER

- ### TABLE 1
- BEACH NOURISHMENT TO PROTECT CRITICAL INFRASTRUCTURE
 - NEW BEDFORD
 - NEW BEDFORD DEPT. OF PUBLIC INFRASTRUCTURE
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- HYBRID NOURISHMENT/STRUCTURE PROJECT TO PROTECT PUBLIC ROADWAY
 - DENNIS
 - DENNIS DEPT. OF NATURAL RESOURCES
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- DUNE NOURISHMENT TO PROTECT A PARKING AREA
 - MASHPEE
 - MASHPEE DEPT. OF PUBLIC WORKS

- ### GREEN INFRASTRUCTURE PROJECTS
- #### TABLE 2
- HORSENECK BEACH: WESTPORT
PAVED ROAD REMOVAL. EROSION CONTROL. JORGE AYUB AT DCR
 - STEPHEN'S FIELD: PLYMOUTH
SOFT STRUCTURES COASTAL PROTECTION
STORM WATER RETENTION AREAS
PLYMOUTH CONSERVATION COM?
 - LINNELL LANE: BREWSTER
STORM WATER RUNOFF FILTRATION
ELEVATION OF PARKING AND CREATING A BACK TILT, WITH CATCH BASINS
CHRIS MILLER TOWN OF BREWSTER
NATURAL RESOURCE DIRECTOR
 - ELLIS LANDING: BREWSTER
RETREAT AND "SACRIFICIAL" PROTECTION
BEACH DUNE. CHRIS MILLER.

Green Infrastructure Projects – Completed, Underway, Planned, or Ideas



Green Infrastructure Projects – Completed, Underway, Planned, or Ideas

Table 6 Hypothetical Barnstable
Richard Elrick

PULLING BACK

- * PARKING AREAS
 - STORMWATER CONTROLS
 - EXTEND LIVING SHORELINES
- * DOCKS - MOVEMENT
- * LOWER ROAD ELEVATION TO PRESERVE INTEGRITY
 - SOFTEN ROAD BED FORM
 - HANDLE STORM EVENTS
- * ZONING? → CAN PROHIBIT DEVELOPMENT
BUILDING CODE? CHANGE?
FEMA?
- * SALT MARSH DITCH REHABILITATION

#7

— Discript - Beach Nourish Courts
PROVINCETOWN - HARBOR MASTER.
AREA IDENTIFIED IN COASTAL RETI.
Still in PERMITTING. - Rex McKamy

— FRINGE MARSH - Oyster Reef stabil
BREWSTER - HARBOR MASTER
Looking for Pilot Funding. - Chris Miller

— Bypassing + Back-passing
Dredging / Beach Nourishment /
shorebird Habitat Projects
Chatham Dept. of Natural Resources
- Projects completed
- Other projects under development
- Robert Quacchini

#8 • Eastham Oyster

- Create Oyster Reef, Propagation
 - Recreation shellfish
 - Possible Storm Mitigation

Location - South Snaken Beach
Contact: Conservation Town of Eastham
- Volunteer Support Needed

Falmouth Aquaculture

- Multiple locations, Private Leases
- Includes Town Funded Propagation, Commercial, Recreation benefits
- Water Quality
- Chuck Martinsen, Shellfish Constable

Green Infrastructure Projects – Completed, Underway, Planned, or Ideas

TABLE # 8
Bourne's Pond Inlet Widening

- Water quality benefit/svc.
- One element of multi-prong WQ approach
- Bridge Replaced/Widened
- Limit Future Sewer

Contact - Peter McConarty
Falmouth DPH

Location - Falmouth
Vineyard Sound

Tara Nye: HW Table #10
Gray's Beach Revetment
(Living Shoreline)
in Kingston, MA

Problems:

- Erosion
- Public ~~Health~~/Safety
- Stormwater

Goal: Improve Coastal Resilience
Improve Habitat and
Improve Public Safety

Solution: Salt Marsh and Dune Creation

Barriers: Permitting
Public Education

Jeff Gilby, Yarmouth Table #10
Parkers River Bridge

- Tidal Restriction Project
- Route 28 in Yarmouth, MA

Hazards

- Erosion
- Water Quality

Solutions

- Increase tidal flow/Flushing
- Health of Salt Marsh

Barriers

- Permitting
- Money

Green Infrastructure Projects – Completed, Underway, Planned, or Ideas

Table 11

① Description: Dune restoration + response to sea level rise, parking lot and roadway retrofit.

Location: Duxbury Beach

Contact: Jim O'Connell

② Description:

Location:

Contact:

Questions: 1. Permeable pavement applications?
- Issues - maintenance issues

2.