



**NOAA**  
**FISHERIES**

Greater Atlantic Regional  
Fisheries Office

# Living Shorelines in Connecticut: Projects into Practice

## Federal Fisheries Habitat Considerations

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# NOAA, living shorelines, and coastal resiliency

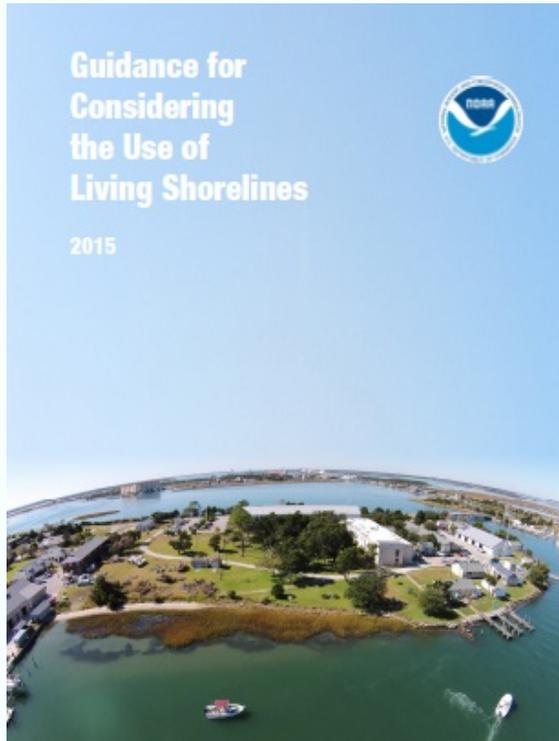
- Living shoreline projects support NOAA's habitat conservation and resiliency goals when constructed along shorelines experiencing active erosion.
- NOAA is funding living shoreline applications and related research post-Storm Sandy in Connecticut, New York and New Jersey.

<http://www.habitat.noaa.gov/restoration/techniques/livingshorelines.html>

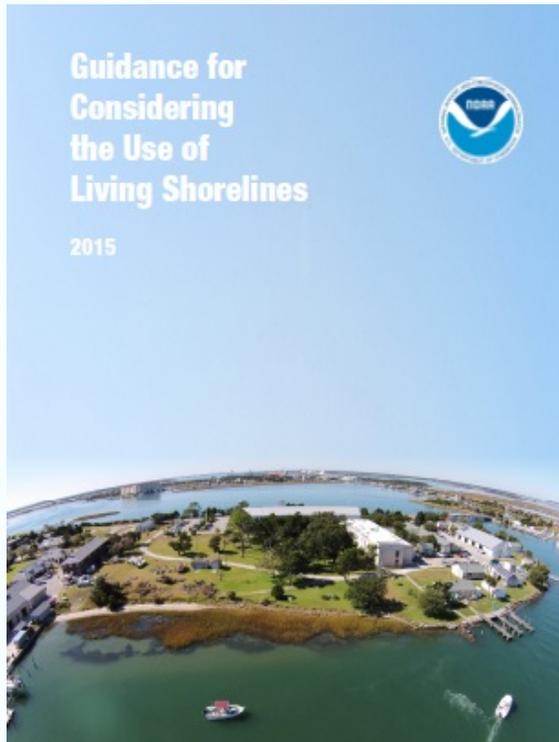
# NOAA's position on living shorelines

- NOAA encourages the use of living shorelines techniques to preserve or improve natural intertidal habitat and the ecosystem services provided while sustaining connectivity between the land and water interface.
- Living shorelines are not a way to control flooding and storm surge. Even smaller storm surges inundate most living shorelines, and do not combat storm surge.
- There is always the caveat that every site is unique and there may be reasons why a living shorelines is not appropriate for shoreline stabilization and erosion control – generally consider living shorelines along sheltered embayments rather than along ocean-facing coasts.
- NOAA encourages shoreline protection practices that avoid or minimize seaward encroachment into subtidal areas and those that minimize use of hardened protective measures to protect against habitat trade-offs.

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[http://www.habitat.noaa.gov/pdf/noaa\\_guidance\\_for\\_considering\\_the\\_use\\_of\\_living\\_shorelines\\_2015.pdf](http://www.habitat.noaa.gov/pdf/noaa_guidance_for_considering_the_use_of_living_shorelines_2015.pdf)

## How is NOAA involved?

- Most living shoreline projects require federal, state, and sometimes, local permits.
- Any federal action, including authorizing a permit, triggers NOAA Fisheries consultation requirements under the MSA, FWCA, and the ESA.

# Magnuson-Stevens Fishery Conservation and Management Act (MSA)

- Identify and describe Essential Fish Habitat (EFH) for each federally-managed fish species (through FMPs)
- Consultation requirements for federal agencies including USACOE, FEMA, and others
- Encourages *protection, conservation and enhancement of EFH*

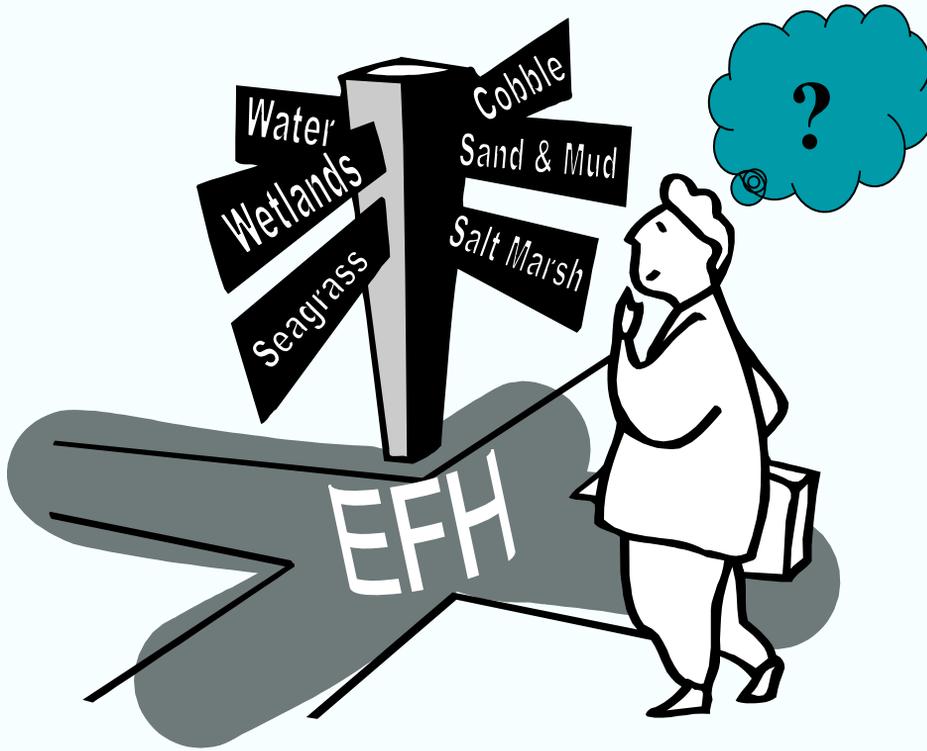
<http://www.greateratlantic.fisheries.noaa.gov/habitat/efh/efhoverview.html>

## EFH consultations

- Federal agencies are required to consult with NOAA Fisheries on any action or proposed actions which they authorize, fund or undertake, and that *may adversely affect* Essential Fish Habitat.



# So...what is EFH ???



## EFH defined.....

### Essential Fish Habitat

*“those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity”*



## EFH Final Rule (2002)

“Waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and *aquatic areas historically used by fish*, where appropriate



## .....but, it is not just about EFH

### Other Authorities:

- Fish and Wildlife Coordination Act
- National Environmental Policy Act
- Federal Power Act



### *What this means:*

Numerous living marine resources have to be considered in project development including diadromous species, shellfish, and forage species.

# How does this relate to living shoreline projects?

- General support for softer, living shorelines.
- Recognize the value of wetlands, as fishery forage, refuge, spawning and nursery habitats.
- When sited properly, a living shoreline can limit the amount of erosion and maximizes the value of the habitat restored



Living shoreline, MD  
Source: Takacs, NOAA

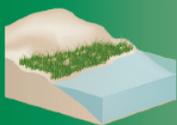
# So....

## HOW GREEN OR GRAY SHOULD YOUR SHORELINE SOLUTION BE?

GREEN - SOFTER TECHNIQUES

GRAY - HARDER TECHNIQUES

### *Living Shorelines*



**VEGETATION ONLY** - Provides a buffer to upland areas and breaks small waves. Suitable only for low wave energy environments.

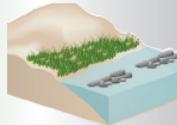


**EDGING** - Added structure holds the toe of existing or vegetated slope in place.



**SILLS** - Parallel to existing or vegetated shoreline, reduces wave energy, and prevents erosion. Suitable for most areas except high wave energy environments.

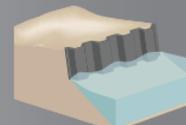
### *Coastal Structures*



**BREAKWATER** (vegetation optional) - Offshore structures intended to break waves, reducing the force of wave action, and encourage sediment accretion. Suitable for most areas.



**REVETMENT** - Lays over the slope of the shoreline and protects it from erosion and waves. Suitable for sites with pre-existing hardened shoreline structures.



**BULKHEAD** - Vertical wall parallel to the shoreline intended to hold soil in place. Suitable for areas highly vulnerable to storm surge and wave forces.

# Trade-offs and balancing

- Existing habitat at the project site.
  - Is it a Special Aquatic Site, HAPC?
  - SAV, shellfish, gravel and cobble, spawning area?
  - What species are using the site now?
- What type of habitat is being proposed?
  - What are the functions and values of the proposed habitat?
  - Will the project increase value of the area as fishery habitat?
  - What species will benefit?



# Trade-offs and balancing

- NOAA Fisheries Habitat Program focus is on habitat benefits – our roll is to provide recommendations to conserve and protect EFH for managed fish species
- EFH is important, but it is not a roadblock
- Applies to all, equally – ACOE, USFWS, or NOAA projects
- Because each project site presents its own unique issues, case-by case review often provides the most effective means of achieving mandated resource protection requirements



Jamaica Bay marsh restoration,  
Rockaway, NY  
Source: Turek, NOAA

# Living Shoreline or restoration?

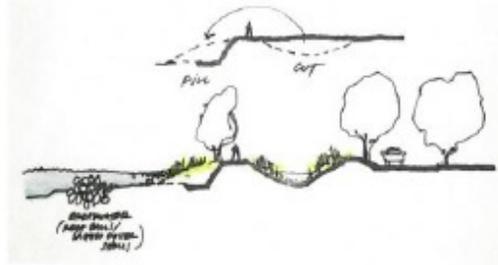
NOAA definition of Living Shorelines:

“Living shoreline is a broad term that encompasses a range of shoreline stabilization techniques along estuarine coasts, bays, sheltered coastlines, and tributaries. A living shoreline has a footprint that is made up mostly of native material. It incorporates vegetation or other living, natural “soft” elements alone or in combination with some type of harder shoreline structure (e.g. oyster reefs or rock sills) for added stability. Living shorelines maintain continuity of the natural land–water interface and reduce erosion while providing habitat value and enhancing coastal resilience.”

# East Shore Park: Concept #1



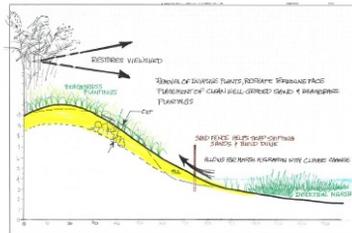
Resulting conceptual design



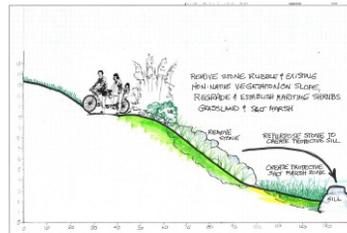
## DESIGN CONCEPT SUMMARY:

Increase coastal resiliency while improving park functionality and habitat. Restore upland wetlands through "cut" and create a gradual slope along the park's edge with the "fill" with walking path in between—creating a more interesting experience for park users and increasing access to the waterfront.

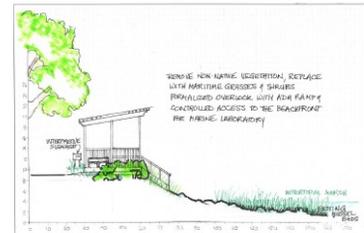
# East Shore Park: Concept #2



Restore viewed from land by removing invasive phragmites and establishing beachgrass. Install sand fence to help trap sands and build dune.

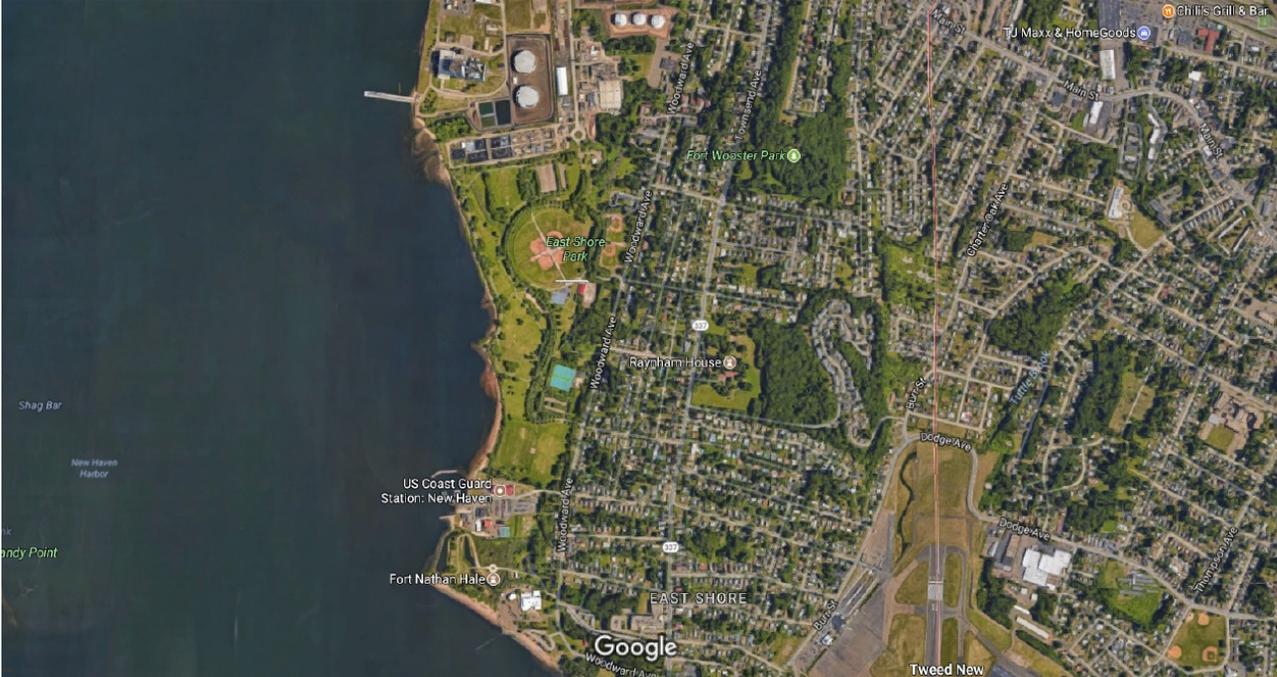


Remove stone revetment and repurpose to create a protective sill and establish new tidal marsh.



Create an overlook and other places of intentional access to the waterfront, opening up the shoreline as an amenity to park users.

# Big(ger) Picture

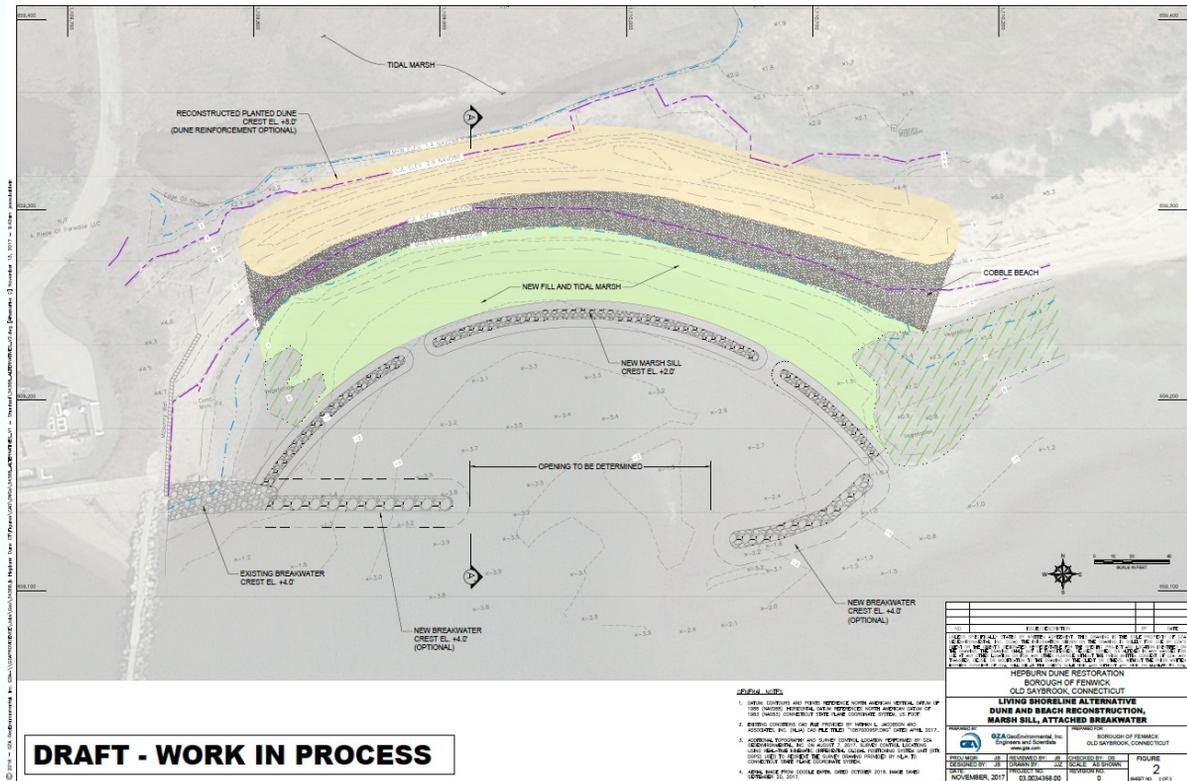


# Small(er) Picture

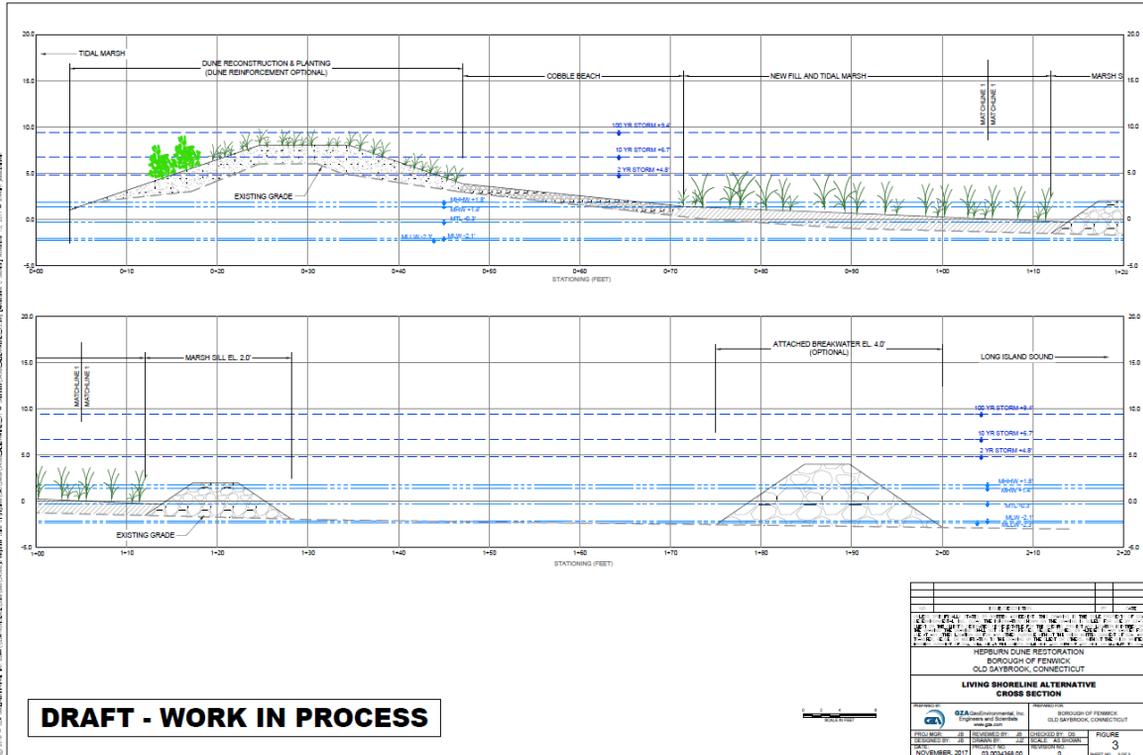




# Fenwick: Concept



# Fenwick: Cross



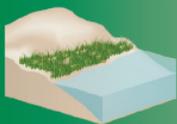
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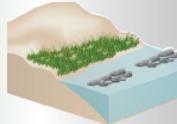


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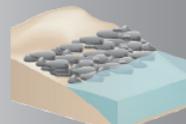


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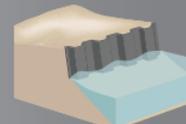
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# Big(ger) Picture



# Small(er) Picture



# Ways NOAA Can Help

- Early coordination with NOAA Fisheries Habitat and Restoration Center staff can speed consultations and permitting
- Can provide advice on design, timing, information needs, sensitive habitats.
- Website housing NOAA living shorelines resources, database, and other information: <https://www.habitatblueprint.noaa.gov/living-shorelines/>

Living shoreline, Save the Bay,  
Providence, RI  
Source: Turek, NOAA



# Thanks!



Photo Sources: Currin, Harris, Takacs, NOAA

# Questions?



Photo Sources: Currin, Harris, Takacs, NOAA

# Links

GARFO Habitat Conservation Division:

<https://www.greateratlantic.fisheries.noaa.gov/habitat/index.html>

HCD Regional Contacts:

<https://www.greateratlantic.fisheries.noaa.gov/habitat/contactus/index.html>

EFH Assessment Information and Worksheet:

<https://www.greateratlantic.fisheries.noaa.gov/habitat/efh/efhassessment.html>

EFH species designations by region (text descriptions):

<https://www.greateratlantic.fisheries.noaa.gov/hcd/list.htm>

EFH Mapper<sup>1</sup>\*:

<http://www.habitat.noaa.gov/protection/efh/habitatmapper.html>

EFH 10 minute square tables, Estuaries Waters tables, and Skate designations\*:

<https://www.greateratlantic.fisheries.noaa.gov/hcd/webintro.html>

*\*New England (NE) managed species and Highly Migratory Species (HMS) EFH designations are proposed to (NE), or have recently (HMS), changed. The new/pending designations have not yet been updated in the EFH Mapper, and are not reflected in the 10 MS, EW, or Skate designations. A decision on the NE proposed EFH designation changes is expect to occur in early January 2018 and the spatial extent of the designations will be reflected in the EFH Mapper.*

*<sup>1</sup> Habitat Areas of Particular Concern (HAPC) have been designated for multiple species and may not be represented on the EFH Mapper, please note the regional pop-ups within the mapper for information on HAPCs that are not spatially mapped. Information on individual species HAPCs are identified in each species EFH text description.*