Florida Department of Environmental Protection

Division of Water Resource Management

Alternative Hardbottom Mitigation

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Lainie Edwards, Ph.D.

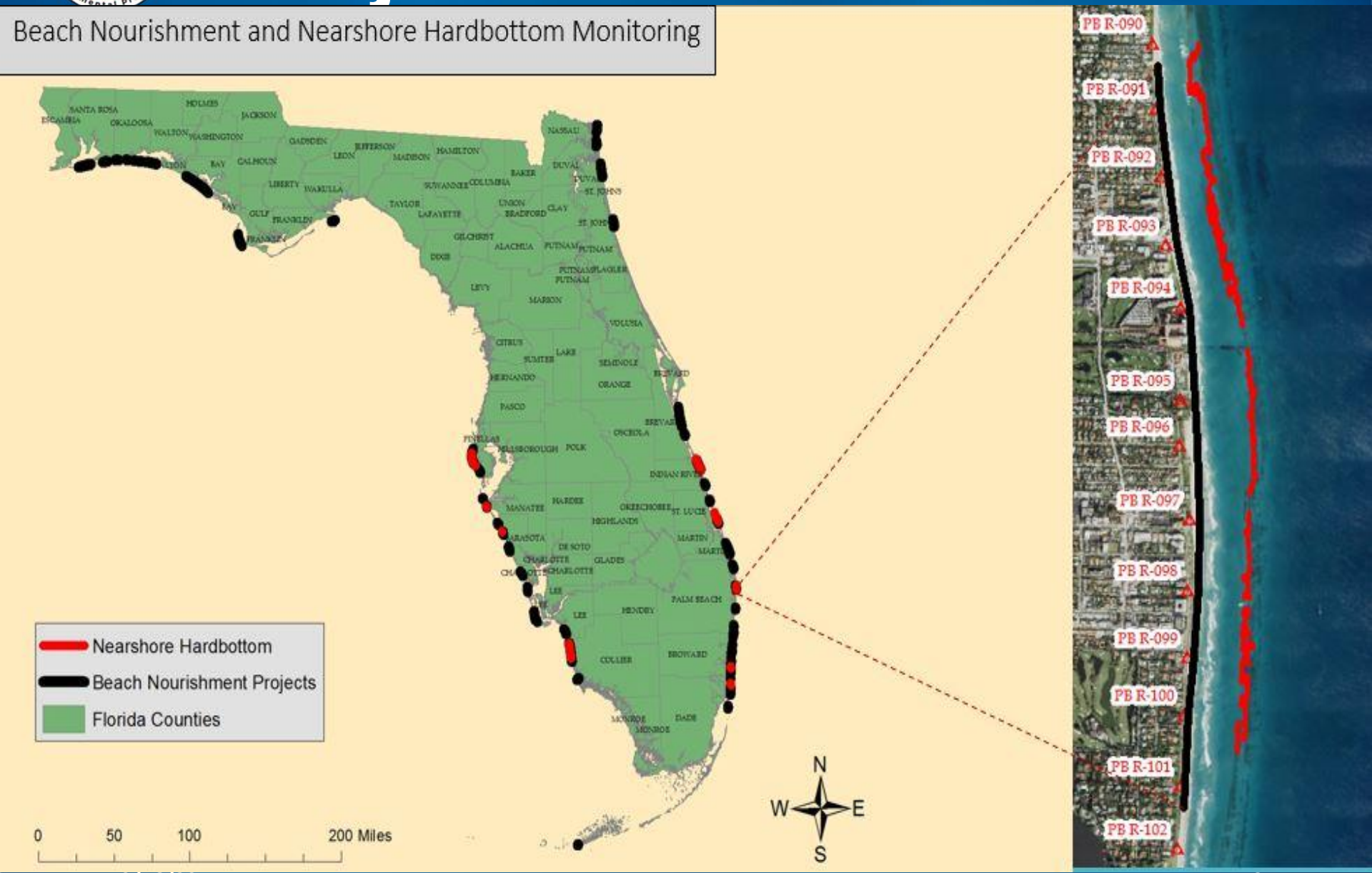
Program Administrator – Beaches Inlets and Ports

Hardbottom

- Rocky *substratum*, normally immobile, that functions as an attachment surface (substratum suitable for recruitment) for benthic flora and sedentary fauna.
- Ecologically diverse:
  - 7 federally protected corals that are listed as threatened under the ESA
- Provide essential ecological functions:
  - Nursery, spawning, foraging areas
  - Provides shelter and recruitment surfaces
  - Contributes to local food webs
  - Maintains water clarity

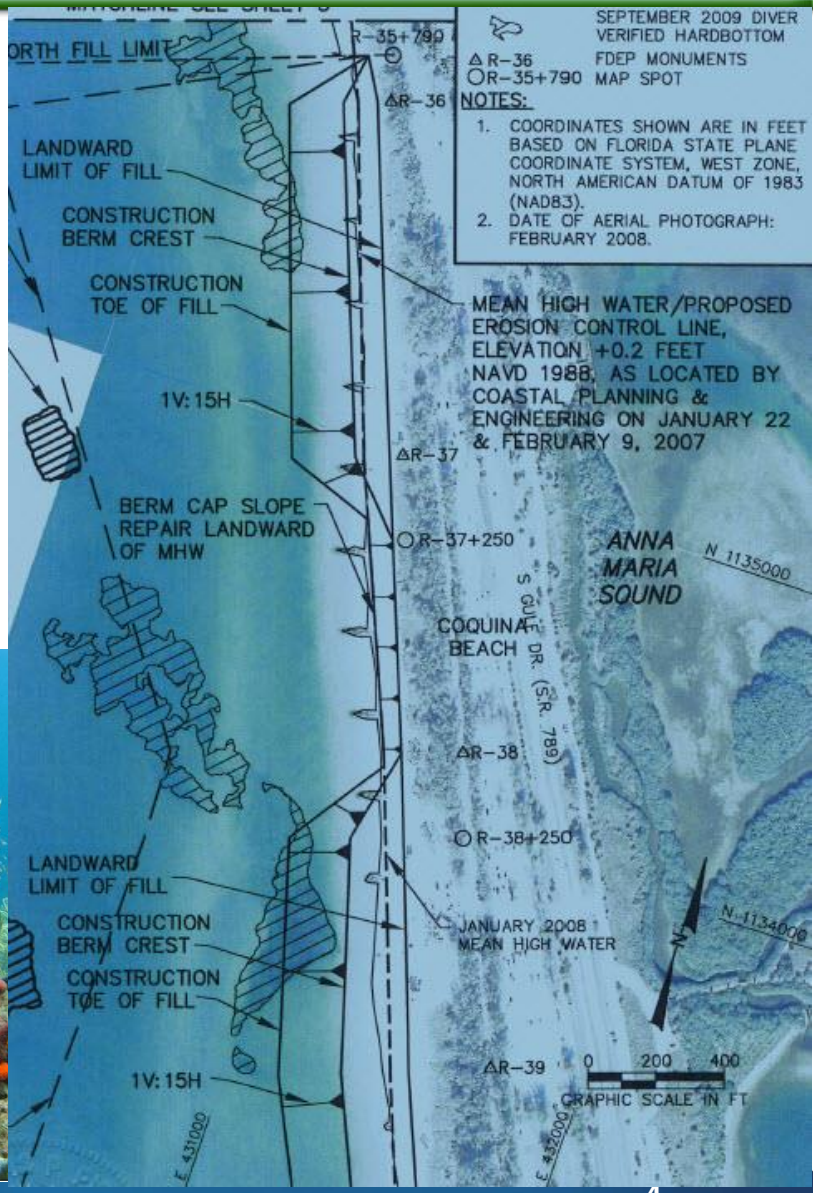


Projects with Hardbottom



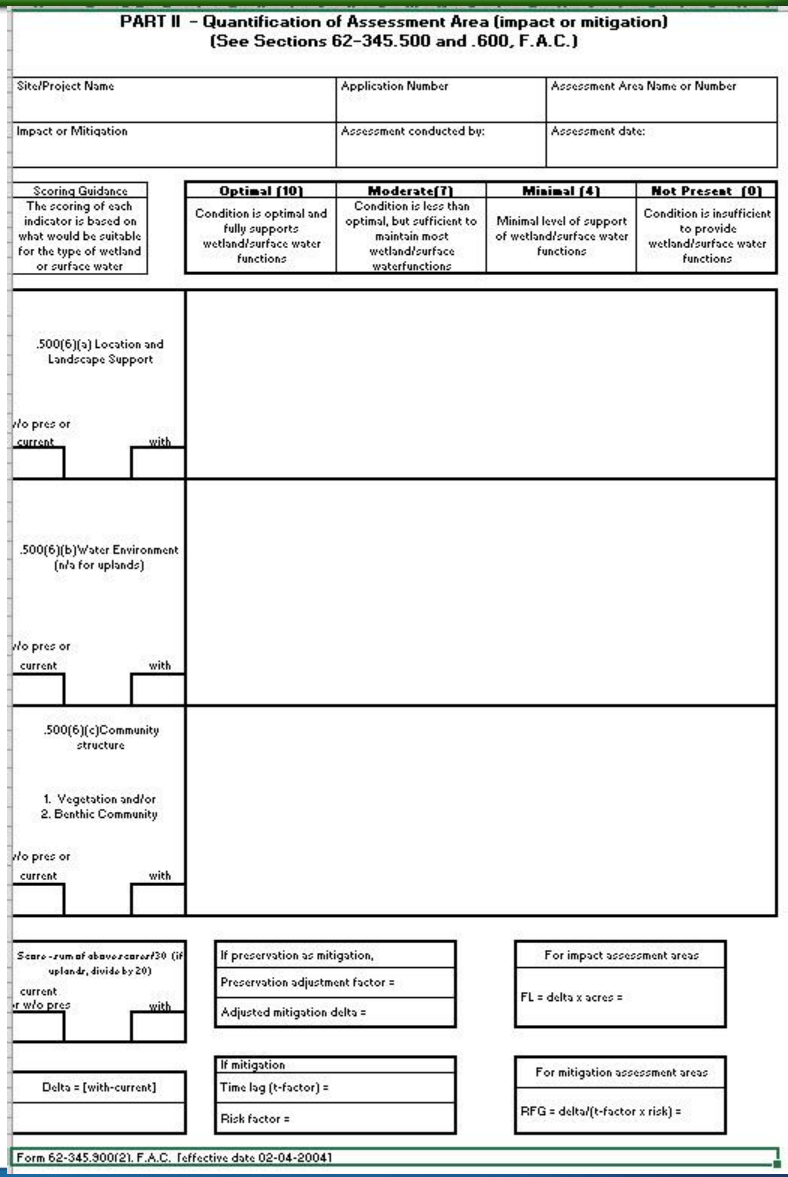
Managing Hardbottom

- Pre-project assessment
- Mitigation for predicted adverse impacts
- Monitor adjacent resources with impact potential



Mitigation Requirements

- Uniform Mitigation Assessment Method (UMAM)
- 62-345, F.A.C.; Fulfills requirements of 373.414.(18), F.S.
- Mitigation = appropriate
- Standardized procedure
- Calculation of mitigation



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Score - sum of above scores/20 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

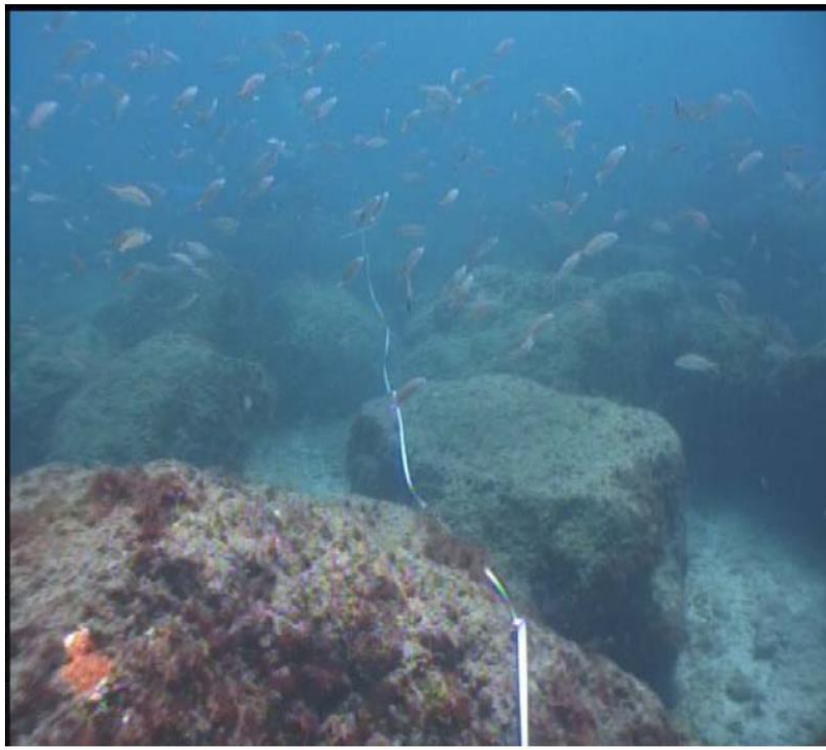
If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-20041

HB Mitigation - Traditional

- Artificial reef creation
- Limestone boulders or reef modules
- Most appropriate as *replacement for loss of HB habitat*
- *Permanent direct impacts*



Assessing Functional Loss

Direct permanent	**Direct temporary**
Secondary permanent	**Secondary temporary**

- Partial functional loss of habitat
- Temporal loss
- Is creation of new habitat most appropriate?
- Alternate mitigation strategies prevail
- Restoration and enhancement activities



Active Management

- Increase effectiveness of mitigation or natural HB
- Sediment scraping by divers prior to spawning
- Use of sea urchins
  - Scours surface
  - Clean attachment area
  - Increases recruitment
- Enhance natural HB through promotion of recruitment or
- Decreases the time for succession of artificial reef.

Orphan Reattachment

- Coral / octocorals / sponges
- Promotes survivorship
- Enhance degraded areas
- Increase diversity, larval supply

Coral Nurseries

- Corals of opportunity
- Actively managed
  - Attachment of calcareous algae
  - Algal/sediment scraping prior to spawning
- Larval source to adjacent areas; stimulant for local recruitment

Summary

- More mitigation options
  - Different types of impacts
  - Good for areas that are not substrate limited
- Can use in combination with traditional methods
- Growing field of knowledge
- Adaptive field
- Could lead to cost efficiencies

THANK YOU

……..Stay Tuned for CASE STUDY!!!

Lainie Edwards, Ph.D.
Lainie.edwards@dep.state.fl.us
850-245-7617