#### Atlantic Coastal Fish Habitat Partnership Spring 2015 Meeting Summary

April 20 – 22, 2015 Hyatt Regency Pier Sixty-Six Crystal Room Ft. Lauderdale, FL

ACFHP Staff Present: Lisa Havel, Patrick Campfield (on telephone).

**Guests/Presenters:** Jeff Beal (FL FWCC, also ACFHP Science and Data Committee), David Gilliam (Nova Southeastern University), and Erin McDevitt (FLFWCC), Jessica Coakley (MAFMC), Jessica Graham (SARP), Steve Perry (EBTJV)

**SC Members Present:** Russ Babb (NJ), Lou Chiarella (NMFS-NE), Julie Devers (USFWS-NE), Bob Groskin (International Federation of Fly Fishers), Jimmy Johnson (NC), Wilson Laney (USFWS-SE), Gary Mahon (USGS SE Ecological Science Center, proxy for Rachel Muir), Callie McMunigal (USFWS-NE), January Murray (GA), Cheri Patterson (NH), Chris Powell (RI), Dawn McReynolds (NY), George Schuler (TNC), Kent Smith (FL), Caroly Shumway (Merrimac River Watershed Council), and Marek Topolski (MD).

SC Members On telephone: Ben Lorson (PA).

After introductions, three invited speakers provided presentations to the ACFHP Steering Committee on local fish habitat issues. Dr. Dave Gilliam from Nova Southeastern University gave a presentation on his lab's staghorn coral restoration efforts in South Florida. Erin McDevitt, from Florida FWCC presented on the effects of marine debris (focusing on derelict vessels, abandoned fishing gear, tires, and a case study on an abandoned net) on fish habitat. Jeff Beal, also from Florida FWCC, updated the Committee on lionfish invasion into the local estuaries, and the measures the state is taking to reduce their expansion.

Marek Topolski gave a presentation on estuarine acidification, and the Steering Committee committed to incorporating more of an estuarine acidification-focus both in science and data efforts and in the next Conservation Strategic Plan.

There was an update on the Mid-Atlantic Fishery Management Council habitat work from Jessica Coakley, and Jessica Graham presented the Southeast Aquatic Resources Partnership's current data and restoration projects.

Marek Topolski provided an update on the progress ACFHP and the ASMFC Artificial Reef Committee has made toward developing a proposal for offshore reef restoration and monitoring, and the Steering Committee agreed to continue pursuing these efforts and apply for the Mid-Atlantic Fishery Management Council funding once the Request for Proposals is released later this year.

National, Coastal, and Regional Fish Habitat Partnership updates were provided by Ryan Roberts, Lisa Havel, and Steve Perry, respectively. National updates include details on the status of the 501(c)(3) fund, rebranding and marketing, major items from the November and March Board meetings, and an overview of the NFHP and USFWS reports that were submitted earlier this year. Coastal updates included continued communication via conference calls and a newsletter four times per year, as well as a presentation provided by the ACFHP Coordinator at the 2014 Restore America's Estuaries Meeting on Coastal Fish Habitat Partnership accomplishments. Regional (Whitewater to Bluewater) updates included the status of the 2015 Multi-State Conservation Grant, our intention to participate in the Letter of Intent for the 2016

Multi-State Conservation Grant, and our fish passage and outreach work over the past six months.

Lou Chiarella updated the Committee on the National Marine Fisheries Service's National Recreational Fisheries Implementation Plan, which carried into discussions throughout the rest of the meeting.

The Steering Committee discussed the status of each task in the Implementation Plan, and because a majority of the tasks had been completed, new tasks were added for 2015. This discussion led into the status of the Conservation Strategic Plan, which operates from 2012 – 2016.

Julies Devers presented a review of the projects that were funded through US Fish and Wildlife Service funding (NFHP-USFWS) last year, and discussed the projects that ACFHP has funded since 2009. The projects recommended for funding for this year were discussed, and a subcommittee was formed to deliberate on updating the funding criteria. Julie Devers also gave an update on the North Atlantic Landscape Conservation Cooperative-funded decision support tool to assess aquatic habitats and threats in North Atlantic watersheds. The winter flounder assessment report is in the process of being written, and the river herring assessment is likely going to move forward using The Nature Conservancy's anadromous fish prioritization data.

Caroly Shumway updated the Committee on the river herring habitat restoration strategies final report due to the National Fish and Wildlife Foundation on April 30<sup>th</sup>. She also led the discussion on science and data needs for the year, which will include an in-person meeting in the summer.

Pat Campfield shared a first draft of the ACFHP Business Plan with the Committee, and after the subcommittee reviews it, he will distribute it to the Steering Committee for comments.

The Steering Committee voted the North Carolina Coastal Federation into the Partnership after Christine Miller, Assistant Director, gave a presentation on the history and accomplishments of the Federation.

On the last day of the meeting the Steering Committee visited four restoration sites within the Lake Worth Lagoon, including Grassy Flats, a site that ACFHP endorsed in 2012.

#### Action Items Summary (page numbers refer to the meeting notes)

Page 12

Action item: Lisa will contact Lisa Debruyckere to see if we can discuss OA during the next coastal FHP call, and see if we can bring someone in to talk about it. We could then see if the collective group would want to move forward on this issue.

#### Page 14

Action item: Lisa will like the ACFHP website to the habitat committee papers on offshore wind, dredging, etc.

Action item: Lisa will follow up on the possibility of having Roger Pugliese present at the fall 2015 meeting.

Action item: Kent and Lisa will look into large grants for the coastal FHPs to apply for together.

#### Page 24

Action item: Kent will contact Brad and Margaret to discuss working with ACFHP.

Action item: Lisa will share the link to Lou's presentation with the steering committee.

Action item: Lisa will work with Kent to invite all ACFHP partners to the fall 2015 meeting. A call

will be placed in August to further discuss this.

#### Page 26

Action item: Chris will look into replacing all conservation mooring buoys with the green buoys.

#### Page 27

Action item: The subcommittee on coastal threats action item needs to get together to discuss the desired product. Wilson will contact Lisa to set this up.

Action item: The subcommittee on coastal threat will consider Mark's suggestion, found in the text.

#### Page 28

Action item: Cheri will continue to move forward with the fish passage action items, and get more information, and compile it in a form useful to the committee.

#### Page 30

Action item: Dawn will continue to analyze the data from the survey and will reach out to people who responded to the survey and determine why they gave certain answers to some of the questions.

#### Page 33

Action item: Dawn will reword Restoration Objective 2 Action 1 Task 2 (Compile list of projects by survey of the committee and/or partners (NEP state management plants etc.) on what subregional priority habitats they are focusing and specifics on restoration sites) to reflect the actual work that has been carried out.

#### Page 37

Action item: Lisa will work with Chris on updating the status of the tasks and incorporating the new tasks that are being addressed. Chris will present the updated version at the fall meeting.

#### Page 43

Action item: All Steering Committee members should submit their top 3 answers to the question: What do we need from the Partnership that we can't do well without it? to Lisa at your earliest convenience.

#### Page 45

Action item: Lisa will add links to the one-page description of each project to the map.

Action item: Lisa will update all of the on-the-ground project one-pages to replace plans with accomplishments (including photographs).

#### Page 47

Action item: Lisa will include Russ Babb and January Murray in the reviews this year.

#### Page 49

Action item: Lisa will contact the Evaluation Criteria subcommittee to address the rewriting of the criteria: George, Dawn, Jimmy, Mark, Kent, and Julie.

#### Page 50

Action item: Lisa will work with Caroly and Marek to find the information needed for the Whitewater to Bluewater overlapping areas and common priority areas.

#### Page 56

Action item: Lisa will share the images and branding with the SC after the May 28<sup>th</sup> FHP call.

#### Page 63

Action item: Caroly will contact the Science and Data Committee to see if they are still interested in serving on the Committee.

#### Page 64

Action item: Everyone on the SC should go through the action items from last meeting (Appendix 1) and let Lisa know the status of the ones that you are involved in.

# Why we are here!

From USA Today - TODAY!

Opinion page

"In parched California, the water wars boil over"

Last year, delta (Sacramento-San Joaquin River Delta) overflows for fish habitat totaled 244.4 billion gallons, or enough water for 6.7 million people's annual needs......

A good way to improve supply would be to further reduce environmental diversions...... Moving more water south to parched farms and communities would help save jobs, protect food supplies and preserver groundwater.

Times like these require shared sacrifice, and some smelt might have to make the ultimate one.

**USA Today's View** 

There is an opposing view from the Golden State Salmon Association

# Staghorn Coral Nurseries: Species Recovery and Coral Reef Restoration David Gilliam, PhD and

**CRRAM Lab Past and Present Research Assistants** 





NSU Oceanographic Center





## Florida Reef Tract

- 358 miles: Dry
   Tortugas
   National Park to
   the St. Lucie
   Inlet in Martin
   County.
- Only state in the continental United States to have extensive shallow coral reefs near its coast.

# St. Lucie Inlet / Port St. Lucie Martin Lake Worth Inlet / Port of Palm Beach Palm Beach Palm Beach Broward Fort Lauderdale, Port Everglades Baker's Haulover Inlet Miami-Dade Miami. Government Cut/ Port of Miami Everglades **National Park** National

# Southeast Florida Coral Reefs

- **4 Counties**
- Miami-Dade
- Broward
- Palm Beach
- Martin



Map by B. Walker

# **Threats to Reef Health**













# Why Are Coral Reefs So Important?

Habitat & Fisheries

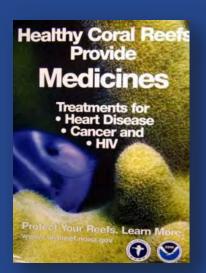
(recreational and commercial)



## **Coastal Protection**



Food & Medicine



## What Can We Do!?

Investigate and Promote Species Recovery & Reef Restoration

NSU Staghorn Coral (*Acropora cervicornis*)

Coral Nursery Project and Initiative













**Nursery establishment** 



Nursery grow-out



Coral Nurseries – species recovery and reef restoration and tool



Outplanting



Reproduction



**Outplanting growth** 

# Staghorn Coral (*Acropora cervicornis*) Importance

Major contributor to Caribbean reef complexity and fisheries habitat

- Branching coral
- High growth rate
- Provides complex living structure



# **Staghorn Coral Reproduction**

### Sexual

- Simultaneous hermaphrodite
- After the full moons of July or August
- Increase genetic diversity

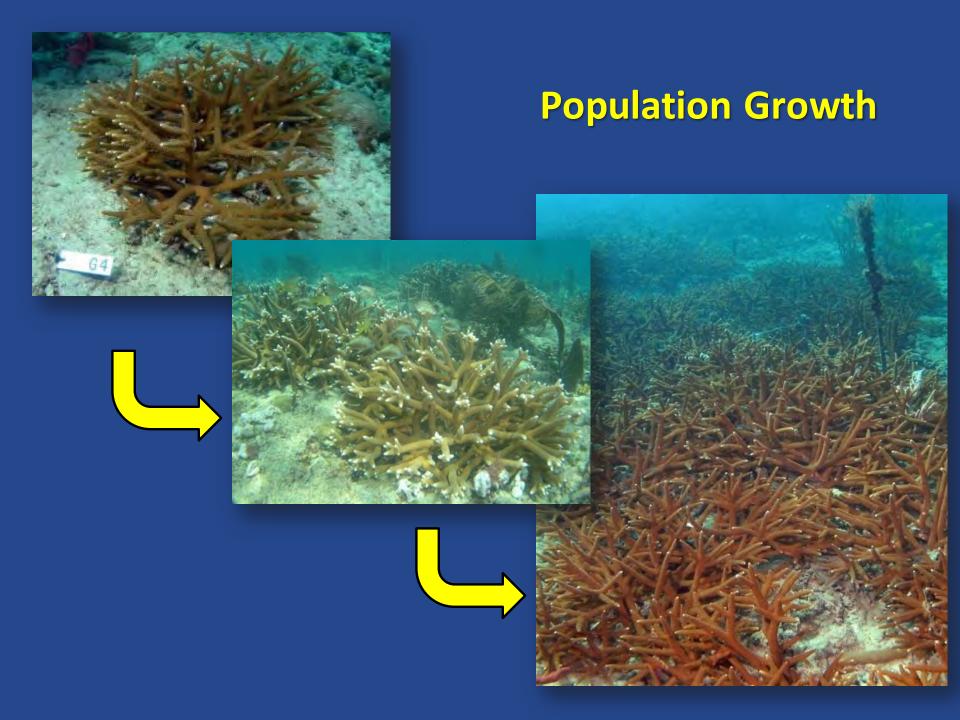
#### Asexual

- Fragmentation (most common)
- Need suitable substrate
- May cause a decline in genetic diversity



Mass Spawning - 15 Aug 2014





# **Species Status**

- Dramatic population decreases in the 1970's and 1980's
- Listed as a Threatened species under the ESA in May 2006 and was petitioned to be up-listed to Endangered status
- Recovery is inhibited by dispersed populations of colonies which prevents successful sexual reproduction





# Why Staghorn Coral Nurseries?

- Reef keystone species fisheries habitat
- Threatened species
- Traits appropriate for nursery efforts
  - Fast growing, branching species
  - Reproduces sexually and asexually (fragmentation)

#### **Restoration Results**

- Reef Community Scale
- Self-sustaining fragmentation & increased sexual reproduction
- Measurable 'See-able'
- Community Involvement



Collect 3- 10 cm donor colony branch clippings from wild colonies







3cm fragments are attached to a nursery structure





# Fragments grow into nursery colonies

Nursery colonies are clipped to create more fragments



**Photos by Tim Calver ©** 









New nursery fragments are relocated within the nursery to expand the nursery population



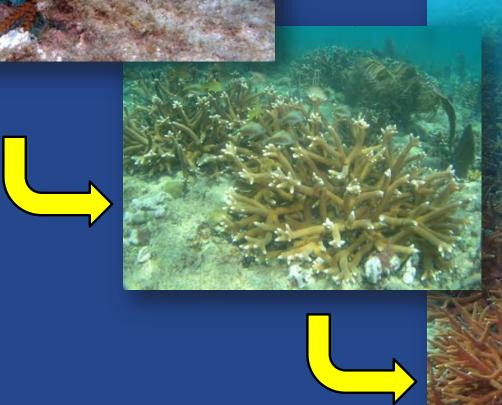
New nursery fragments are outplanted onto the natural reef to promote restoration







# **Population Growth**



# **Nursery Monitoring and Maintenance**

- Monitoring
  - Survival
  - Branching events
  - Linear growth
  - Tissue extension
- Maintenance
  - Cleaning
  - Predator Removal
  - Disease Pruning





# **Nursery Construction**

# Platform Designs

- Modules
- Arrays





# Floating Designs

- Trees
- Lines





# Our history...and where we are today

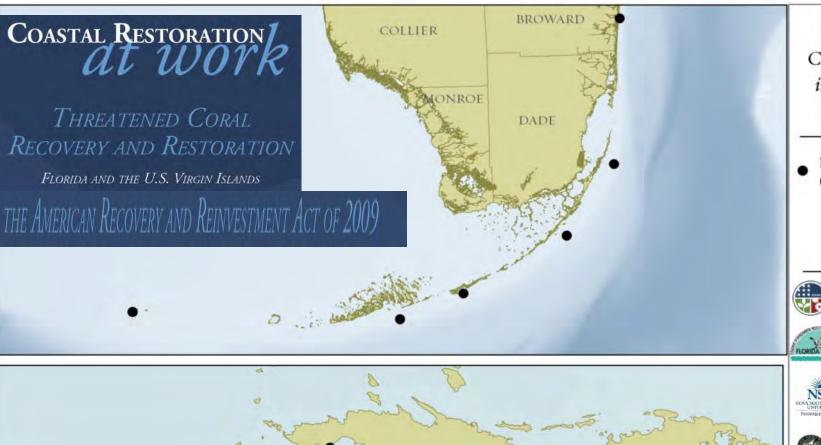
- 2007: Staghorn Restoration Project funded by the TNC-NOAA Community-Based Restoration Project
  - Pilot Nursery establishment and outplanting
- 2009: TNC -ARRA- Threatened Coral Recovery in Florida and the U.S. Virgin Islands
  - Nursery expansion, outplanting, and outreach
- <u>Current</u>: TNC-NOAA Coral Reef Conservation Program; CNI Donations (DiveBar, Indiegogo, and individuals), LBTS

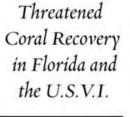
Nursery efforts in Florida and US Caribbean are a partnership











Nursery (Approx. Location)

























Copyright 2009 The Nature Conservancy Prepared by J. E. Knowles Data FL Counties (FGDL) Zones (RSMAS/TNC)

Parks (FNAI)



# **Initial collection**

**30 Donor Colonies** 



270 - 3 cm clippings



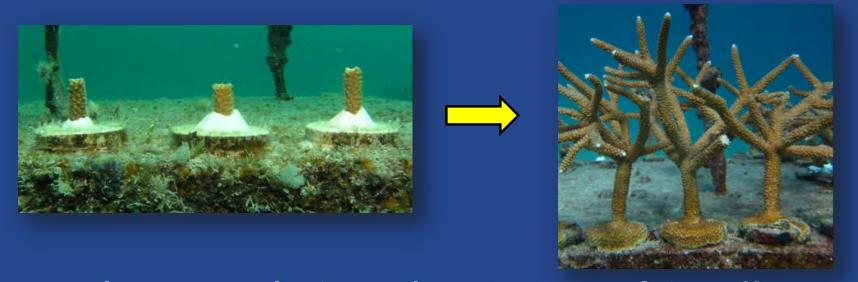




Total linear extension of tissue = 810 cm

# **Nursery production**

Current status = ~2,000 colonies - avg colony = 25 cm of tissue = ~50,000 cm of tissue !! - 6,000% increase



Total = >4500 colonies and >200,000 cm of tissue!! (over 1 mile of tissue!)

1-Year production = ~1,000% increase in tissue

# **Restoration - outplanting**

- Sites = 14 all offshore Broward County
- Colonies = ~4,000
- Area = ~1,200 m² (about ½ a football field)





Annual capacity = >2,000 colonies

# **Nursery production**

(Liz Larson MS, Zach Ostroff MS, Cody Bliss MS, and Kate Correia)

- We can grow staghorn coral!
- Nursery colonies grow / survive similar to natural colonies
- Fragmenting is best when water temps are cooler (late fall-late spring)
- Predator removal increases nursery colony survival and health
- Monthly maintenance is optimal for predator removal, structure upkeep, and colony pruning







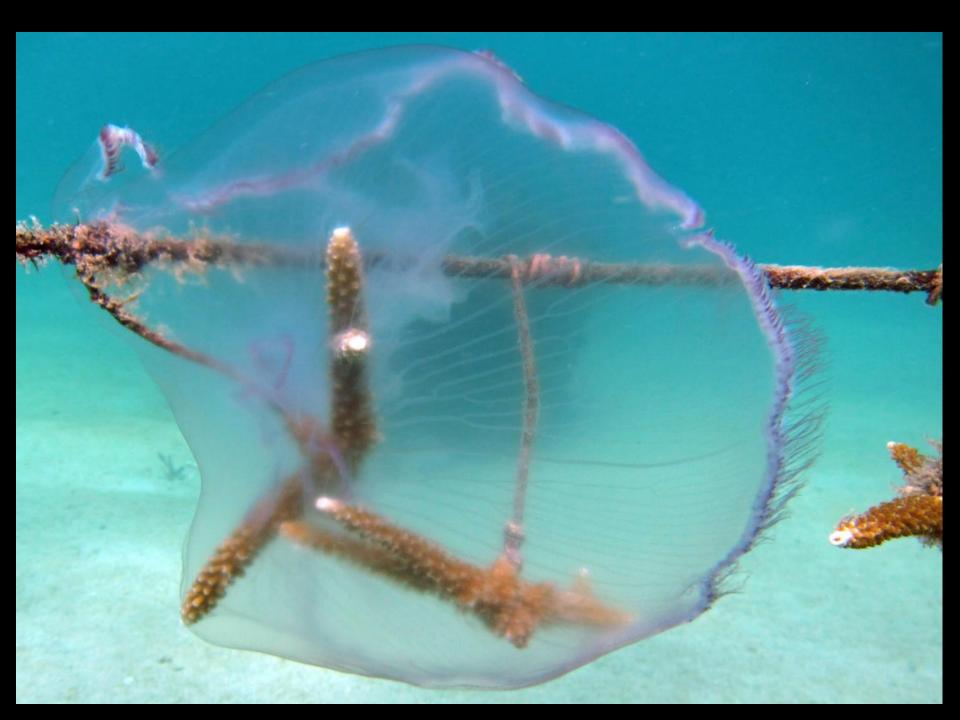
# **Nursery production**

(Liz Larson MS, Zach Ostroff MS, Cody Bliss MS, and Kate Correia)

- Predation and disease are reduced on floating-line platforms
- Nursery colonies can be relocated between nurseries (Broward corals do really well!)
- Nursery colonies can be reproductive (spawning observed 2014)
- Expect the unexpected













### **Restoration - outplanting**

(Liz Larson MS – PhD Candidate)

- Site selection matters
- Outplanted colony survival / growth is similar to natural colonies
- Outplanted colonies quickly create habitat for fish and other reef organisms
- Outplanted colonies often populate surrounding areas through fragmentation
- Predation / disease are present but storms / waves cause most outplanted colony mortality





# Current and future research Nursery production

- Are colony growth rates similar on all nursery structures?
- What is causing disease and does it spread?
- At what size and/or age will outplanted nursery colonies spawn?



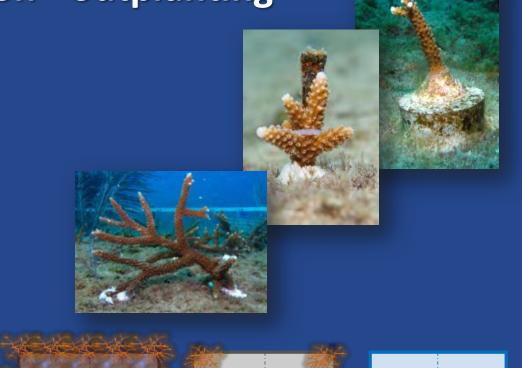


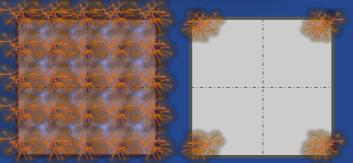




# Current and future research Restoration - outplanting

- What defines good outplant sites?
- How should corals be outplanted? Size?
   Technique? Spacing (density)?
- What is causing disease and does it spread?
- What size and/or age do outplant colonies spawn?







Medium Density 2 m spacing

Low Density
Isolated Colony

### Outreach, education, and media

(Liz Larson MS, Kate Correia, Cody Bliss MS, and Mauricio Lopez-Padierna)

- On-line articles / videos / social media = 15
- Print articles = 11
- TV news stories = 5 (local and national)
- Public and group lectures /
   Outreach events = 25
- Scientific presentations = 15
- Nursery field trips = 7



#### **Future Plans**

- Maintain Nursery Population
- ♠Outplant Population –♠colonies/year and add new sites
  - 2015-2016 = 2,250 colonies within 5 or 6 sites
- Research
  - Improve nursery success and outplant success
  - Evaluate species recovery and restoration benefits
  - Reef restoration ecology and in particular staghorn coral population ecology
- Increase Outreach and Support!!

## The Coral Nursery Initiative



Website: www.nova.edu/ocean/coralnursery/

Facebook: www.facebook.com/NSUCoralNursery

Twitter: twitter.com/NSUCoralNursery

YouTube Video: youtu.be/3vK\_9krsXTY

# Thanks!

# Many hard-working CRRAM Lab Research Assistants!

Non-CRRAM Photo credits: Kirk Kilfoyle MS, Tim Carver,

Heather Weeter









Lauderdale By the Sea





**CNI Donations** 

#### **Marine Debris Threats to SE Florida Habitats**



Atlantic Coast Fish Habitat Partnership Steering Committee Meeting Ft. Lauderdale, FL - April 20, 2015



**Erin McDevitt,** Florida Fish and Wildlife Conservation Commission, Marine and Estuarine Habitat Management

### What is marine debris?

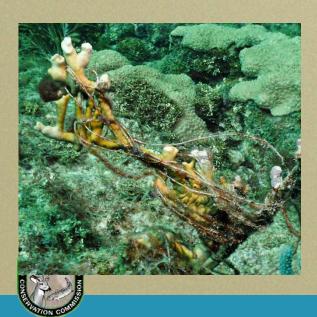
 Marine debris is human-created waste that has deliberately or accidentally been released into the ocean and remains in the ocean or ends-up on beaches and coastlines.





# Types of marine debris

- Consumer debris
- Fishing and Diving
- Household
- Boating
- Microplastics
- Derelict Vessels
- Other









# Harmful impacts of marine debris?



### Threats to Habitats

- Derelict Vessels
- Abandoned Fishing Gear
- Tires
- "Other"- debris posing immediate threats to people, wildlife and/or habitats



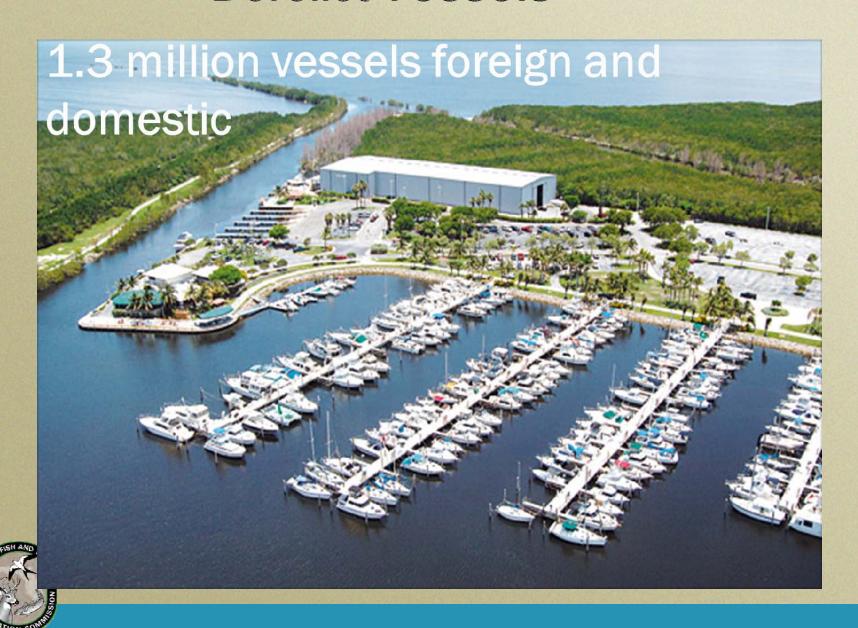
## Threats to Habitats

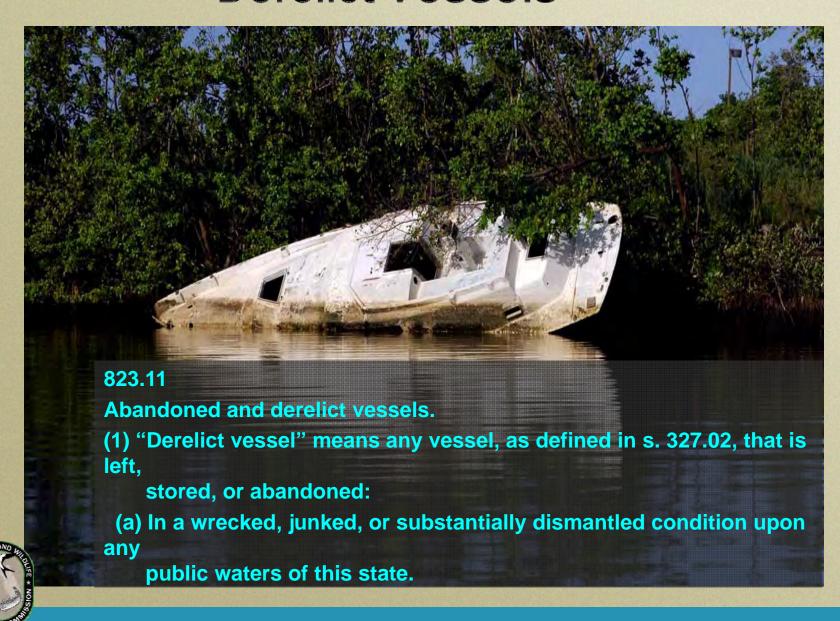
Derelict

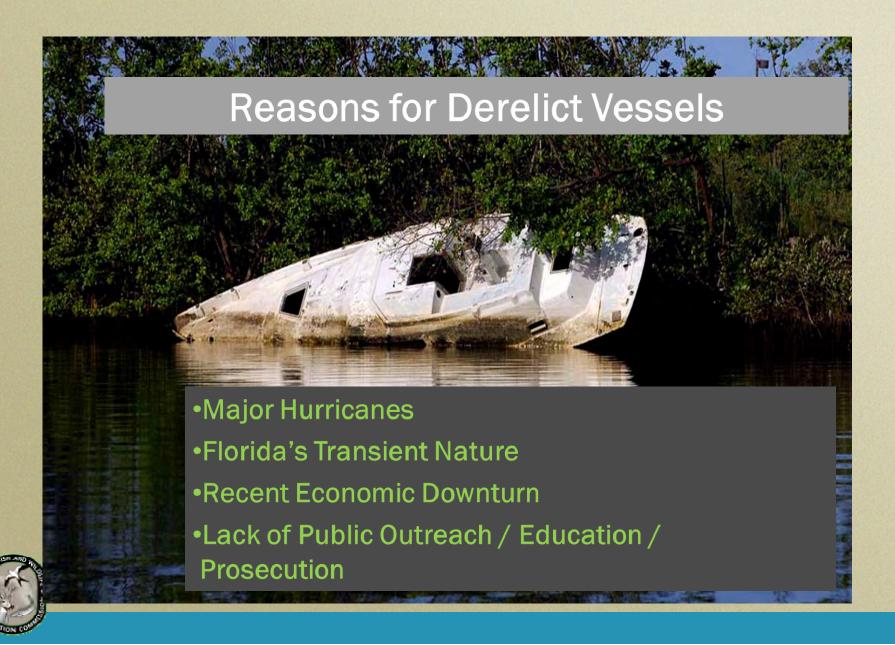




Phil Horning, NOAA Marine Debris Workshop, 2014,St.
Petersburg, FL







#### **Habitat Impacts:**

- Initial impact
- Prolonged presence
- Movement from wind and waves
- Release of hazardous materials (oil, fuel, etc)

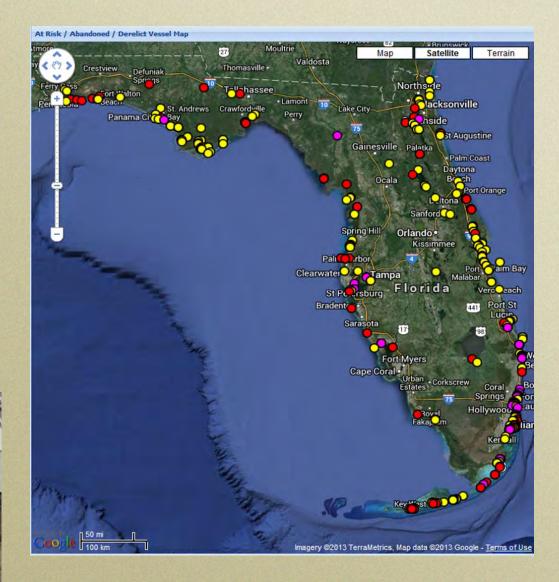




#### Challenges:

- Too many!
  - Currently over 300 known DV's
- Costly
  - Current estimate = \$1.5 million
- Legal issues
  - Multiple jurisdiction
  - > Higher priorities







### Threats to Habitats

Abandoned
 Fishing Gear
 (traps)



abrielle Renchen, FWC, NOAA Marine Debris Workshop, 2014,
St. Petersburg, FL

#### Types:

- Hook and Line
  - > 2.4 million recreational anglers
  - ➤ Commercial anglers (?)
    - o ~10,000 fishermen with SPL



Photo Credit: CSA International, In





- Commercial Trap Fisheries
  - ➤ Lobster (~477,000 traps)
  - ➤ Stone Crab (~1.1 million traps)
  - ➤ Blue Crab (~265,000 traps)





### Examples:

Non-fishing lobster trap



Monofilament



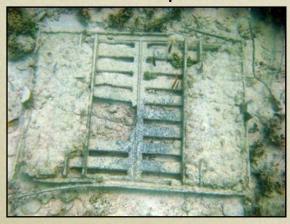
Trap throat/lid



Trap rope



Concrete trap slabs



Ghost fishing stone crab trap



#### Causes:

- Cut-offs
- Hurricanes
- Theft
- Abandoned
- Intentional discard
- Gear degradation



Photo Credit: Hulltruth.com

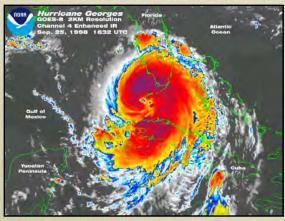


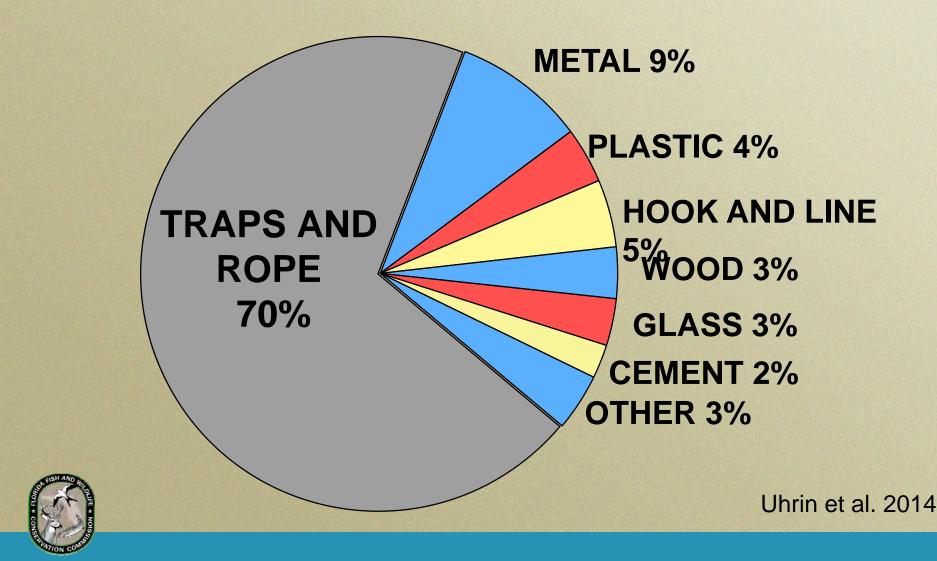
Photo Credit: NOAA



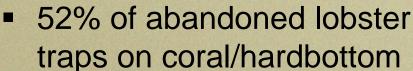




Traps dominate submerged debris in FL Keys

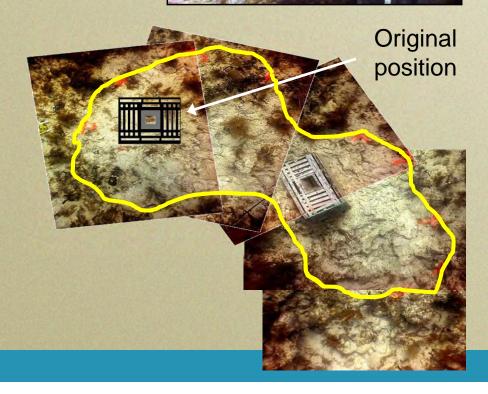


#### Habitat Impacts:



Trap movement causes
 habitat loss in
 coral/hardbottom (Lewis et
 al. 2009) and seagrass
 (Uhrin et al. 2005) habitats







### Wildlife Impacts:

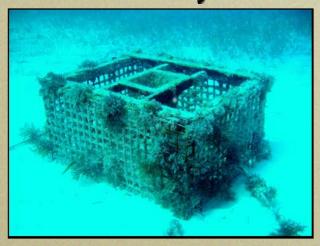
- Ghost fishing- lost traps continue to fish
  - ➤ Estimated 650,000 lobsters killed in ghost traps annually (Butler and Matthews 2015)



Wood: 1.4yrs



Wire: 1.7 yrs





#### Successes:

- FWC Trap Retrieval Program
  - > Established in 1985
  - Allows volunteers or FWC contracted groups to participate
  - > Supported by trap fishery fees:
- Lobster Trap Certificate Progran
  - ➤ Reduced # lobster traps
    - **1991: 939,000**
    - Present: 477,000



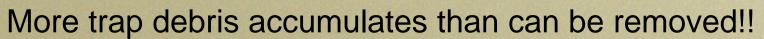


#### Challenges

- Mainly recovers buoyed traps:
  - >~1,700 lobster traps
  - >~2% of lost lobster
- Subfrienderged debris
  - ➤ Location / removal is difficult
  - **▶**Limited funding
  - > Few programs
  - ➤ About 85,000 ghost traps
  - ➤ About 1,000,000 non-fishing traps



os





### Threats to Habitats

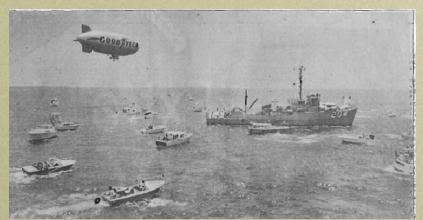
The Osbourne Tire Reef, Ft. Lauderdale





Dr. Pat Quinn, Broward County, Artificial Reef Summit, 2014

Approx. 2 million tires intentionally dumped offshore in 70's and 80's with intent to enhance fisheries.











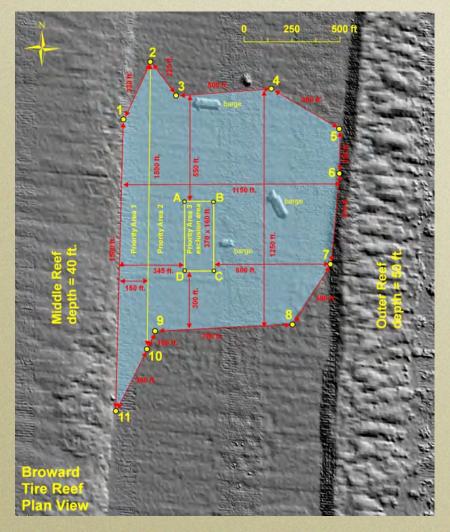
- Tires do not make good habitat
- Corals and other benthic organisms do not readily grown on tires
- Tires are unstable and are now dispersed over large area
- Tires have caused physical damage to reefs





#### **Broward County field surveys:**

- Defined the bounds of the tire field and identified priority clean-up locations
- Approx. 700,000 tires over
   36 acrea area
- Estimated cost to remove
   700,000 tires = \$49 million





#### Removal Effort:

- •Florida Dept. Environmental Protection Division of Waste Management (Florida Legislature=\$2.2 million)
- Broward County Environmental Protection and Growth Management Department, Port Everglades, Parks and Recreation Division, Broward Sheriff's Office
- NOAA Restoration Center, Fisheries Service
- US Dept. of Defense Innovative Readiness
   Training (IRT) program





#### Removal Efforts:

•3 missions: 2007, 2008, 2009 (1 to 2 months

•61 tractor trailer loads of tires removed = 72,000 tires





### Threats to Habitats

 "Other" Marine Debris- Debris that poses immediate threats to people, wildlife and/or habitats





Erin McDevitt, FWC, NOAA Marine Debris Workshop, St. Petersburg, FL May 20-22, 2014

# Other Debris – no established authorities or protocols and poses an immediate threat of harm to humans or the environment

### **Examples:**

- Ghost nets
- -Vessels grounded and unstable on or near sensitive habitats
- -Vessels grounded on public beaches
- -Cargo containers
- -Any debris leaking hazardous materials
- -Etc!!



Photo credit: <a href="http://www.oceannavigator.com/">http://www.oceannavigator.com/</a> March-April-2013/A-legendary-offshore-danger





Photo courtesy of Miami-Dade County



- Initial report by Miami-Dade DERM to FWC on 1/7/13
- One sea turtle and multiple fish dead in the net
- Net in a popular dive location posing a threat to recreational divers
- Net still "fishing"
- No protocols in place





### The Debris:

- Monofilament entangling fish net
- Approx. 30 ft high and 200 ft long
- -- Used legally to "gill" mackerel, sharks, blurunners, jacks in federal waters
- Not legal in state waters.









### The Habitat:

- Popular artificial reef dive location
- Largest AR in SE Florida
- Deployed in 1985
- 5 decommissioned oil production platforms
- Depths 100ft to 190ft
- Near Miami-Dade/Broward Co line approx 2 miles offshore







### Challenges:

- A danger to divers (entanglement!)
- Ghost net- still "fishing"
- Deep water (70' 104')
- Net entangled in the structure
- Net large and heavy
- Winter weather\*
- No protocol in place for emergency debris
- No funding available through existing programs









#### Team:

- •FWC Marine / Estuarine Habitat
- FWC Law Enforcement
- •FDEP Coral Reef Conservation Program
- NOAA Marine Debris Program
- Wildlife Foundation of Florida
- The US Coast Guard
- Miami-Dade County
- Broward County EPGMD
- Broward's Sheriff Office
- Industrial Dive Corporation





















WILDLIFE FOUNDATION OF FLORIDA ESTABLISHED 1994





Funding was a Challenge!

- National Save the Sea Turtle Foundation
- National Fish and Wildlife Foundation
- FDEP Coral Reef Conservation Program
- •NOAA Marine Debris Program
- •FWC Marine Estuarine Habitat
- •US Navy (dock and crane services)
- Covanta Energy (disposal fees)











MARINE DEBRIS PROGRAM LOFFICE OF RESPONSE AND RESTORATIO



## Removal:

- Removed March 5, 2013
- \$11,950



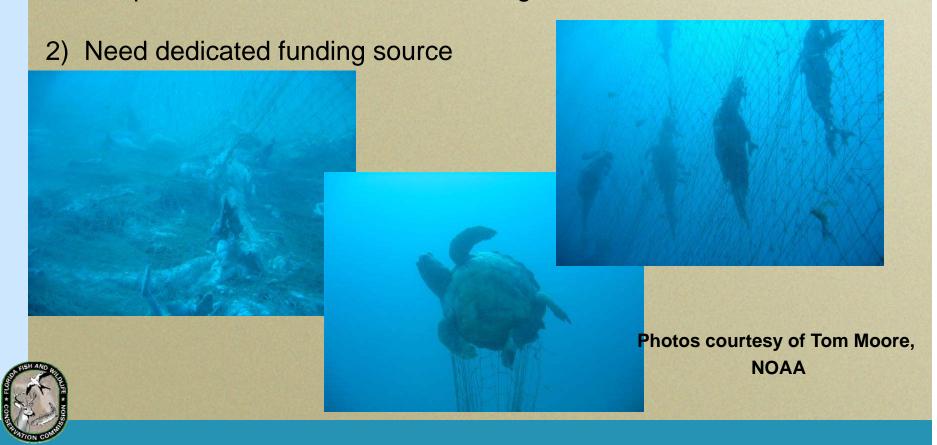






### **Lessons Learned: Tenneco Towers Net**

- Net was removed successful thanks to great cooperation among many partners.
- Incident highlighted definite needs for marine debris response and readiness:
- 1) Need Statewide Regional Working Groups to develop response plans and protocols for marine debris emergencies



# Florida Coastal Zone Management Marine Debris Rapid Response Program

### The Program:

- Statewide network to address "other" debris
- Team coordinated in SE FL
- Debris identified to be a test case

## Challenges:

- Funding not "quick"
- NEPA reviews
- Permits
- State contracting issues





# Questions?





Brownie Troop 30054 cleaning up the Hobe Sound National Wildlife Refuge. Sept. 2014.

# Investigation of the Lionfish Invasion along the Indian River Lagoon Region



Ernie Cowan at St Lucie Inlet State Park, May 2011



Jeff Beal, Marine/Estuarine Habitat Emily Dark, Antioch Univ.



# Indo-Pacific Lionfish

- Scorpaenidae
- 16 Species of lionfish
- Indian Ocean, Central and Western Pacific, Red Sea
- Grow to 18 inches
- Weigh up to 3 lbs.
- Live 15 years
- Tropical to subtropical on reefs, structured habitats

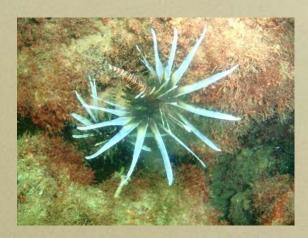




**Photo: REEF** 

# Lionfish Invasion of Space/Treasure Coasts

-Offshore hardbottom: widespread reports summer 2009



St Lucie Reef 2010



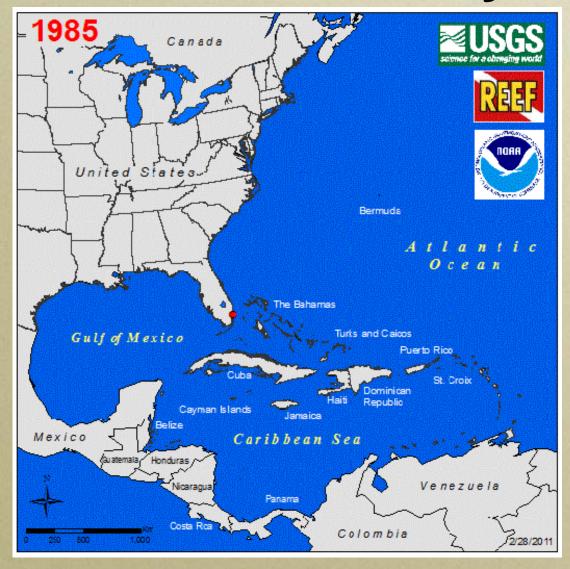
Sebastian reefs 2012

-Inshore reports as early as 2010 (Jupiter, Ft. Pierce);

widespread reports summer 2012



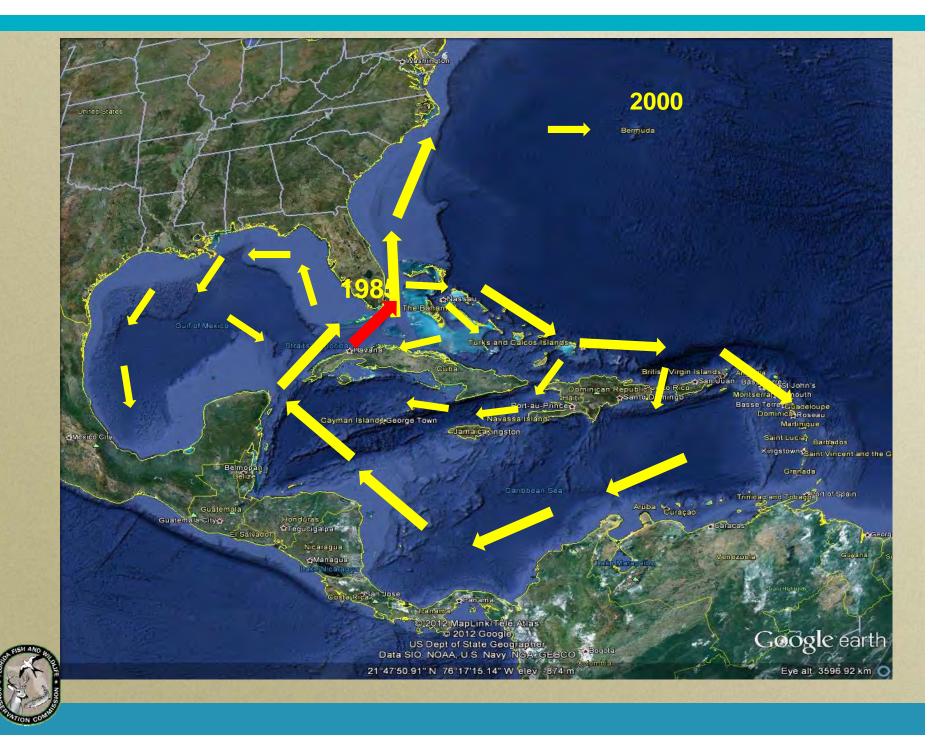
# **Invasion History**







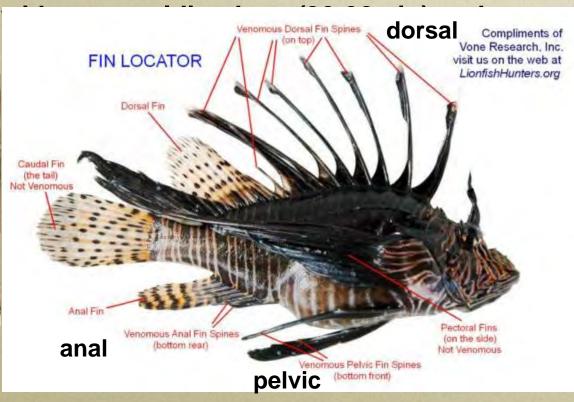




# Key issues

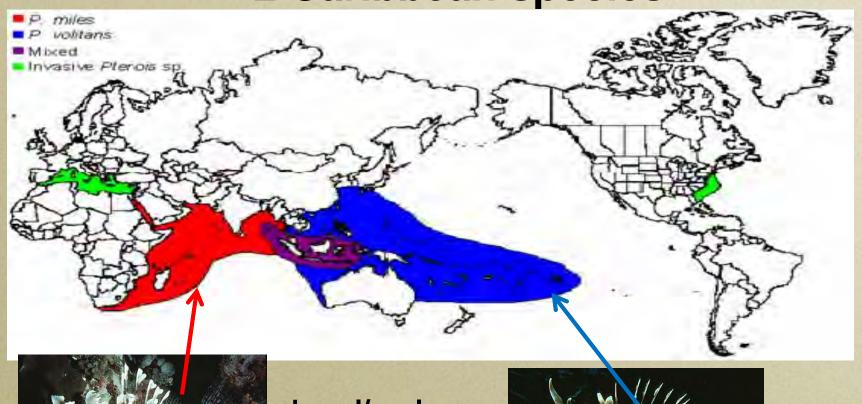
- Venomous vs. poisonous
- Venomous spines on dorsal (13), pelvic (2), anal (3) fins
- Treat wounds painkillers







2 Caribbean species





dorsal/anal rays (10, 6) 7% of Carib popn



(13, 7-8)

93%

Devil Firefish P.

Ailes

Red Lionfish P. volitans

9 female mitochondrial haplotypes of P. volitans

# **Ecology**

- Caribbean-wide, >70 prey species of fishes and invertebrates
- Bahamas reef study: reducing patch reef recruits up to 80%
- NC reef study: small serranids, grunts, parrotfishes, jacks, shrimps
- •Ft. Pierce 80ft reef: 25 found every 100ft
- Bamahas reef study: 75-95% reductio
   required to benefit native species





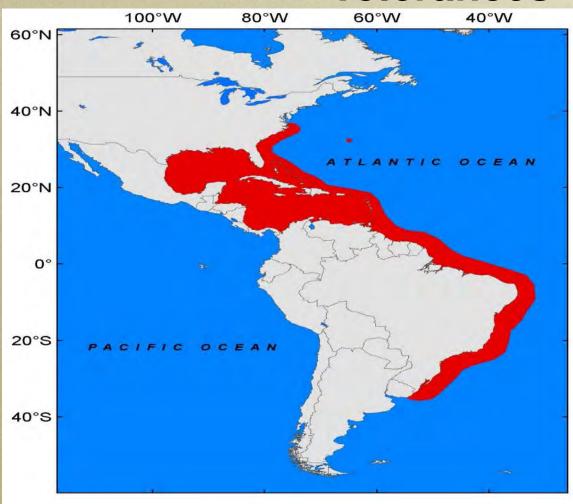
# Reproduction



- Sexually mature at ~1yr (4.3in female; 3.5in male)
- Females spawn as frequently as every 4 days
- Clutch size up to 30,000 eggs
- Unpalatable floating egg mass
- Courtship observed



# **Tolerances**



10C isotherm at Rhode Island (juvenile death)

16C isotherm at NC (feeding stops)



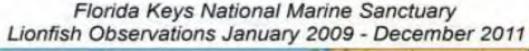


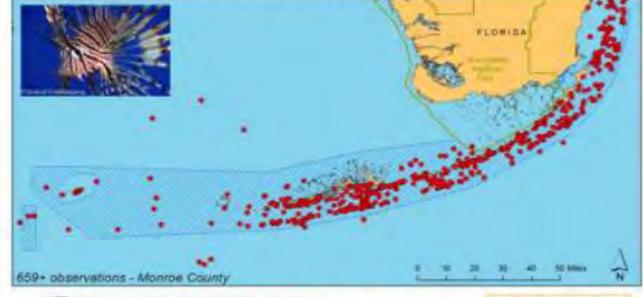


FL to NC at depths 50-100m, 2<sup>nd</sup> most abundant to scaring

## Other issues

- Max. Caribbean size of 22in; native range 15in
- 0.5mm/day growth rate
- Caribbean densities 10x Indo-Pacific (40/100m² of reef)
- Fish surveys (REEF, RVC, FDM, FIM)
- Ciguatera
- Mercury low

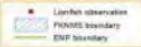


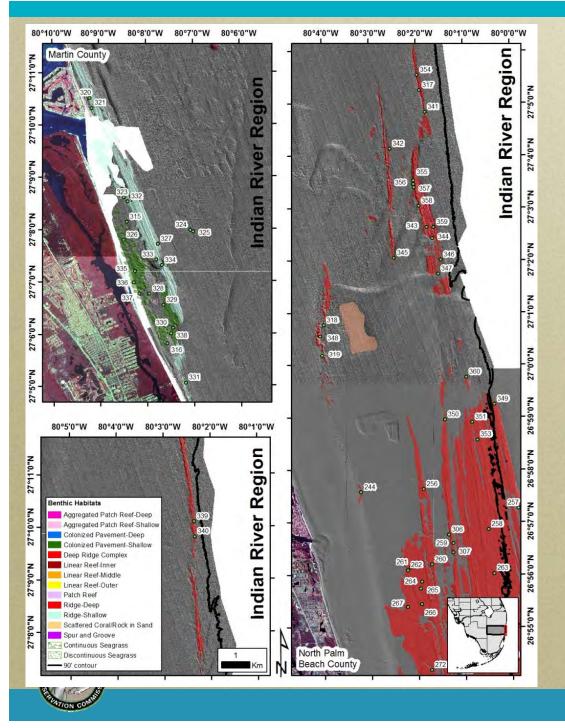




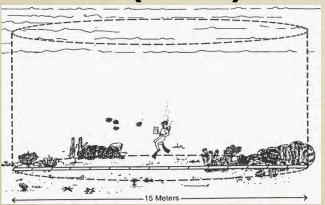






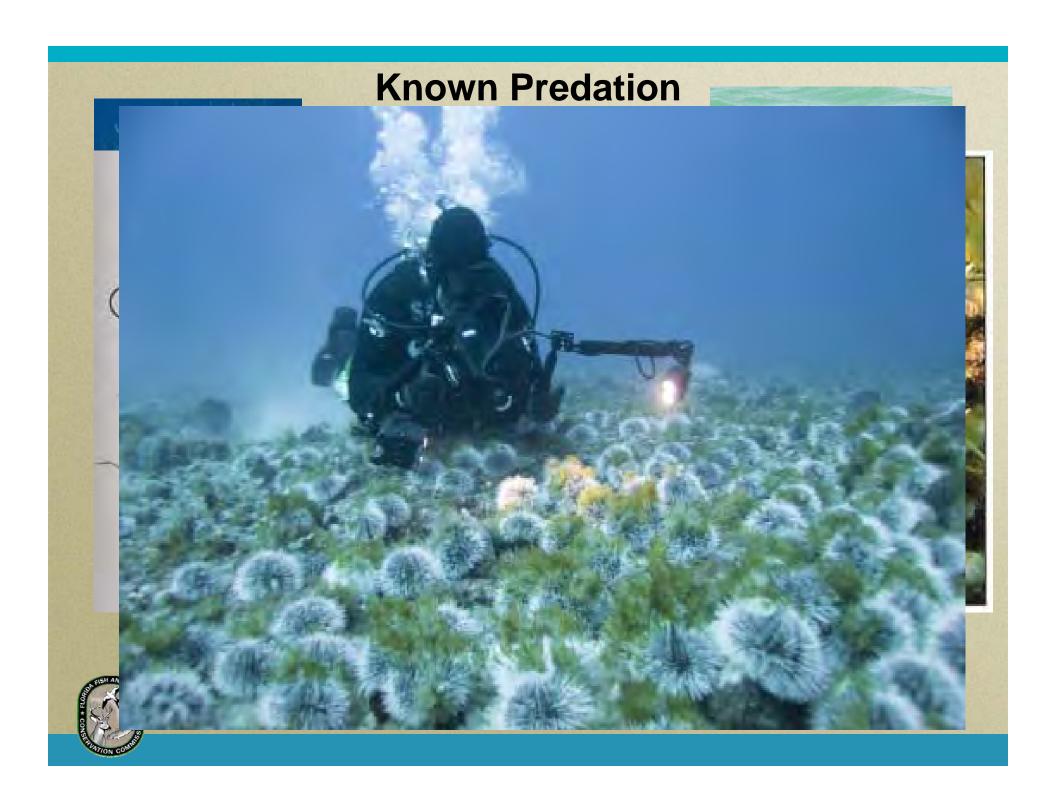


# Reef Visual Census (RVC)

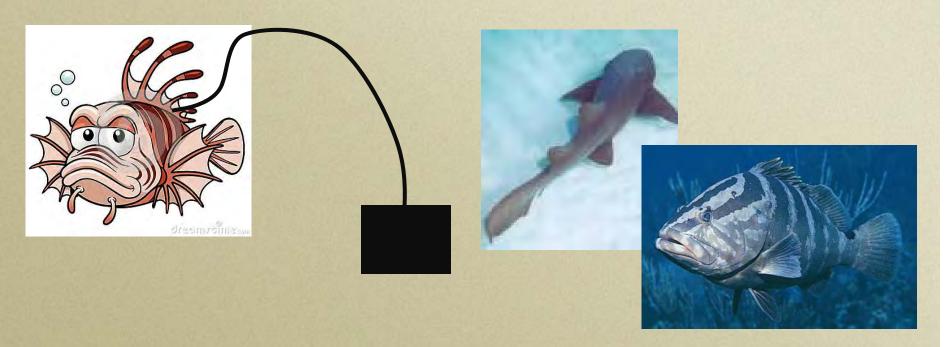




Stuart to Miami reefs in 2012: 870 cylinders showed 8% occurrence of lionfish



# **Cayman Tethering Experiment**



Lionfish on an intensely culled reef

- -13X more likely to be eaten than those on rarely culled r
- -30X more likely to be eaten than those in a seagrass bed Size is important
  - -over 90% of lionfish 12cm or greater were eaten





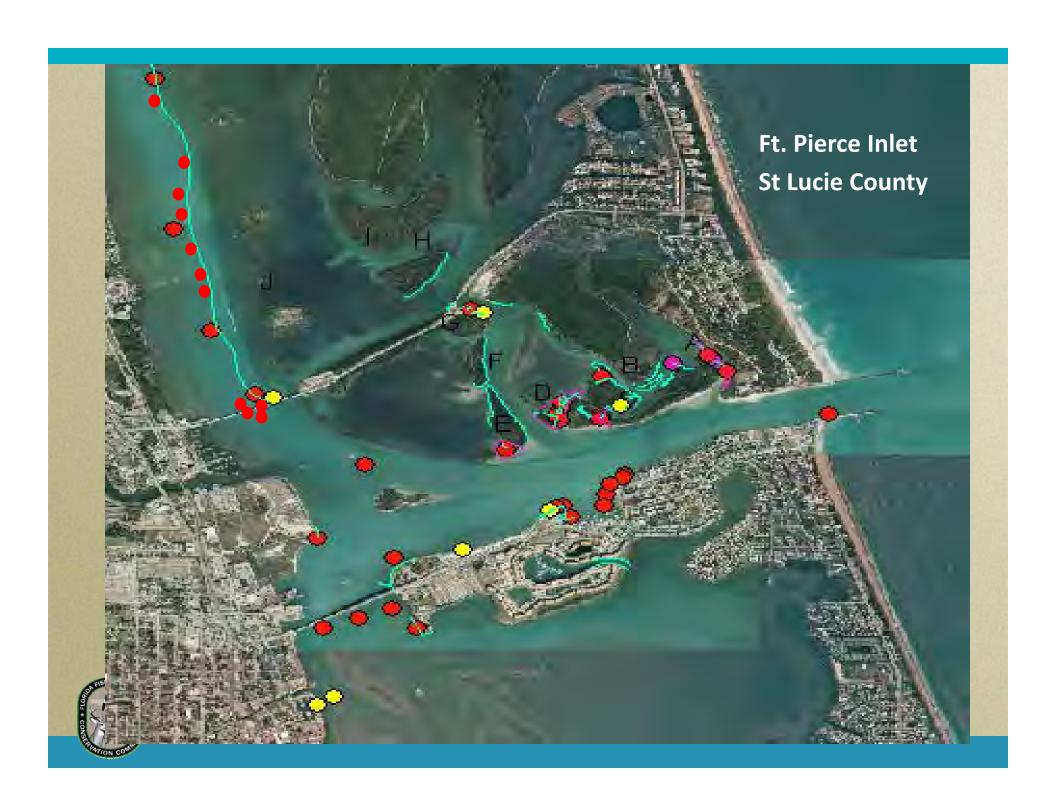


## IRL: Invasion of back reef habitats

- Inlets (outcrops)
- Manmade structures (seawalls, pilings, rip rap)
- Oyster reefs (Loxahatchee, St Lucie)
- Mangroves
- Lagoonal reefs (artificial, channel wall outcrops)
- Seagrass beds?
- Ontogenic shift? (ex.Turks and Caicos)





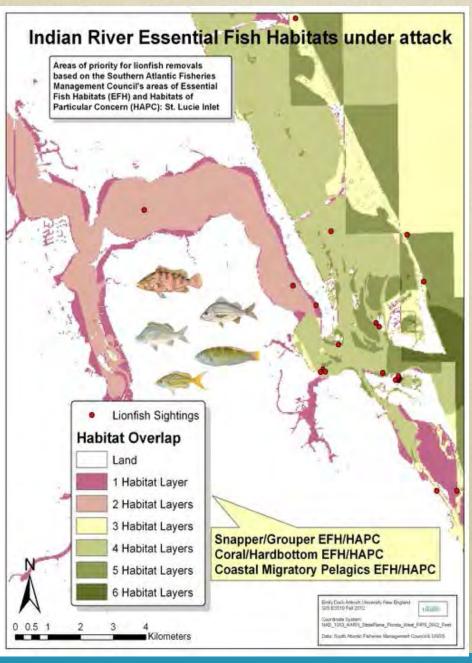




# South Atlantic Fishery Management Council

- -1996 Sustainable Fisheries Act amended Magnuson Act of 1976 becoming law and The Magnuson-Stevens Fishery Conservation and Management Act signed Jan. 1, 2007
  - -Management plans including research/monitoring
- -Ecosystems –based approach to sustainable fisheries management





# Overall Goals for the Indian River Lagoon

"...predation may be a major structuring force shaping shallow water estuarine fish assemblages."

-R.Baker & M. Sheaves (2005)

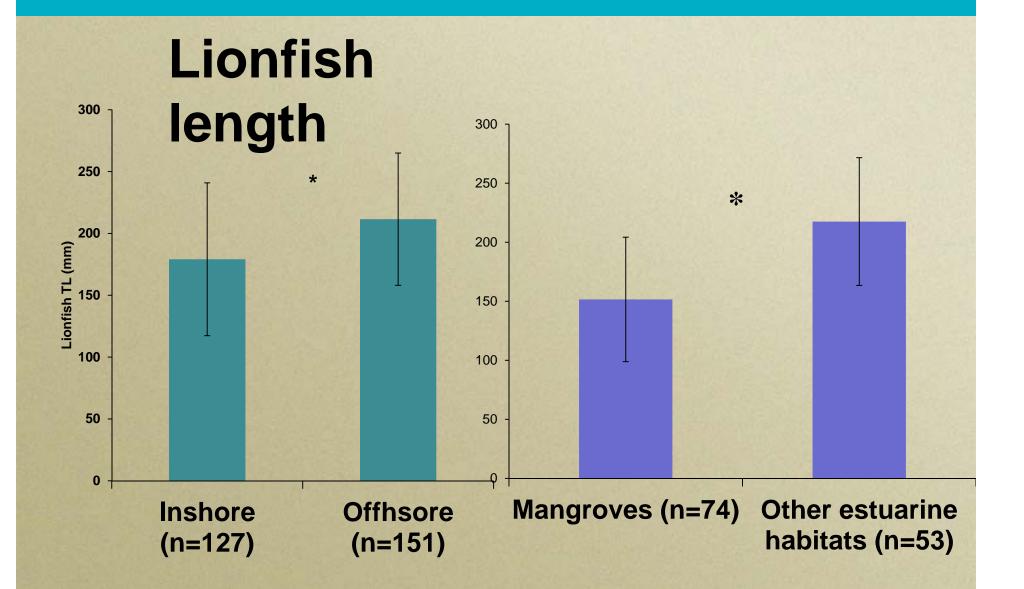
•Knowledge of the population (geography, demographics, dynamics of estuary/habitat use)



- •Understanding their possible ecological effects (concern towards local fisheries, biodiversity)
- •How can we possibly mitigate these effects?

  (ie., develop effective /strategic removal efforts)





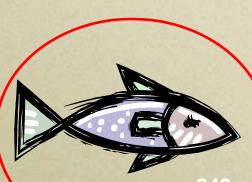


Non-parametric one-way analysis (Wilcoxin Rank-Sums)

### Mangrove lionfish (n=68)



55mm



43mm



Other estuarine lionfish (n=59)

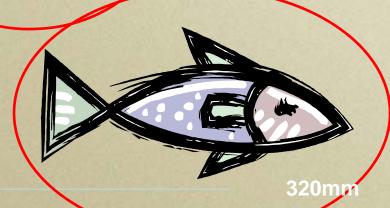


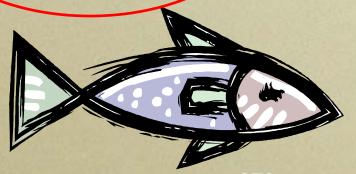
80mm

Offshore lionfish (n=151)



116mm

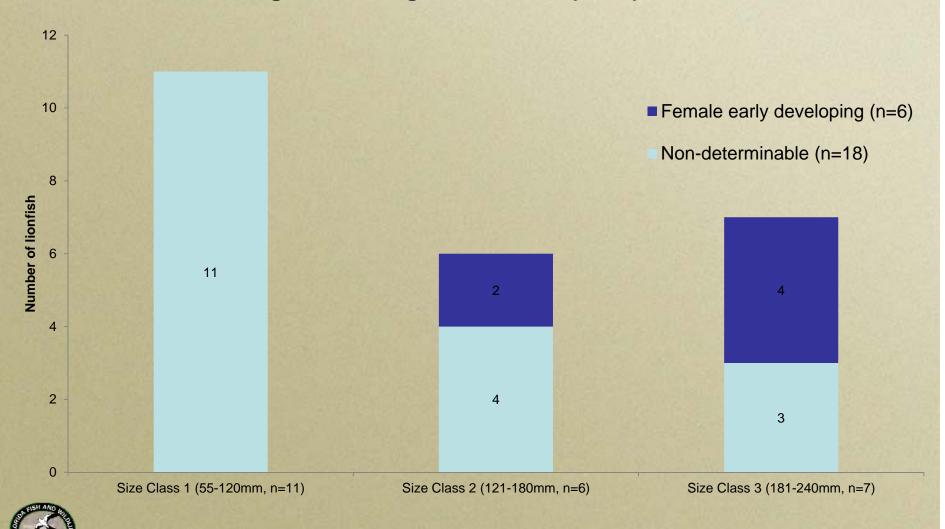


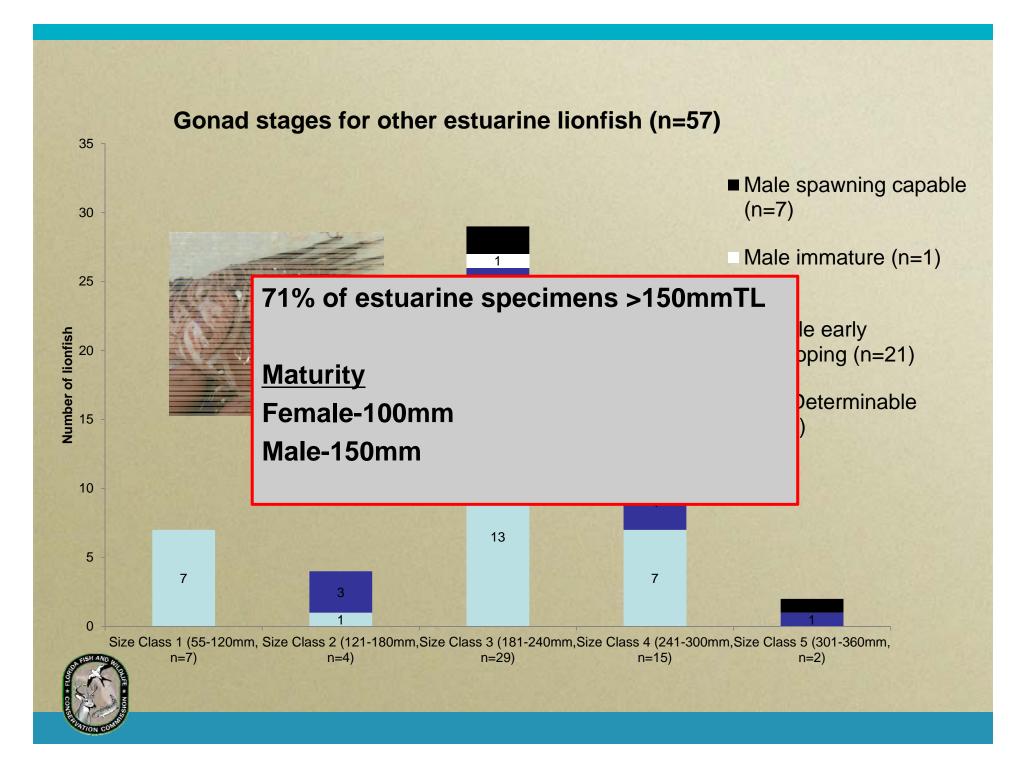


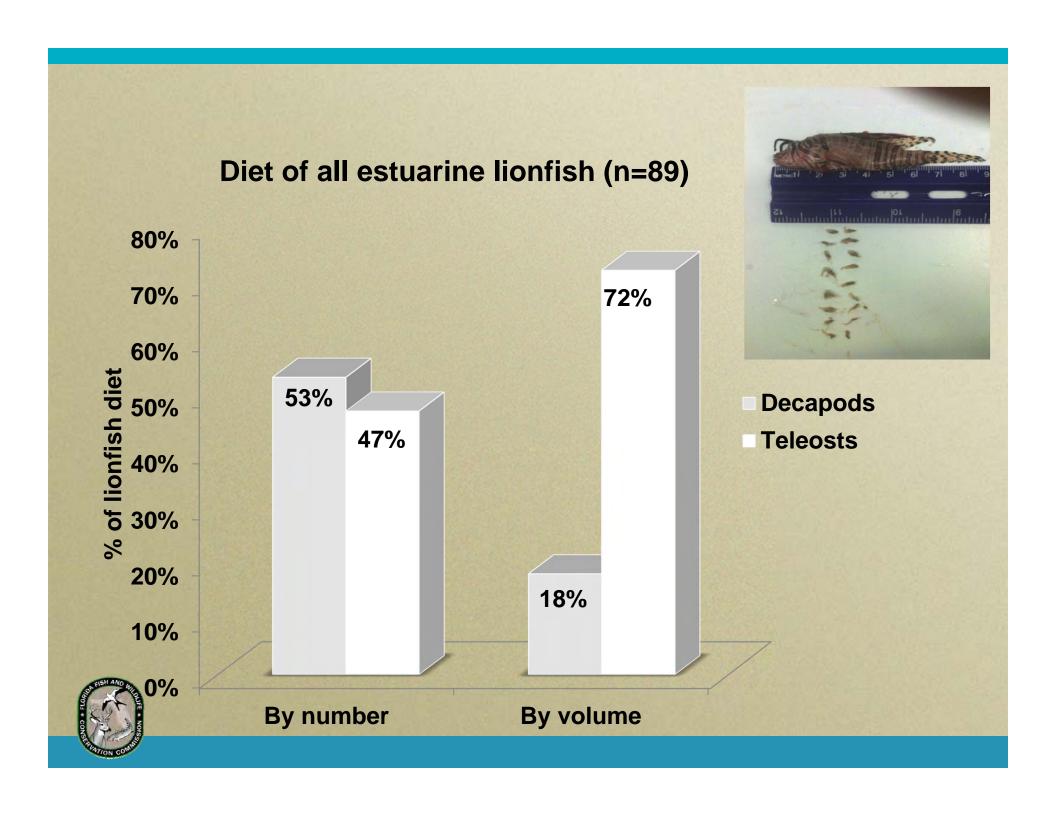


376mm

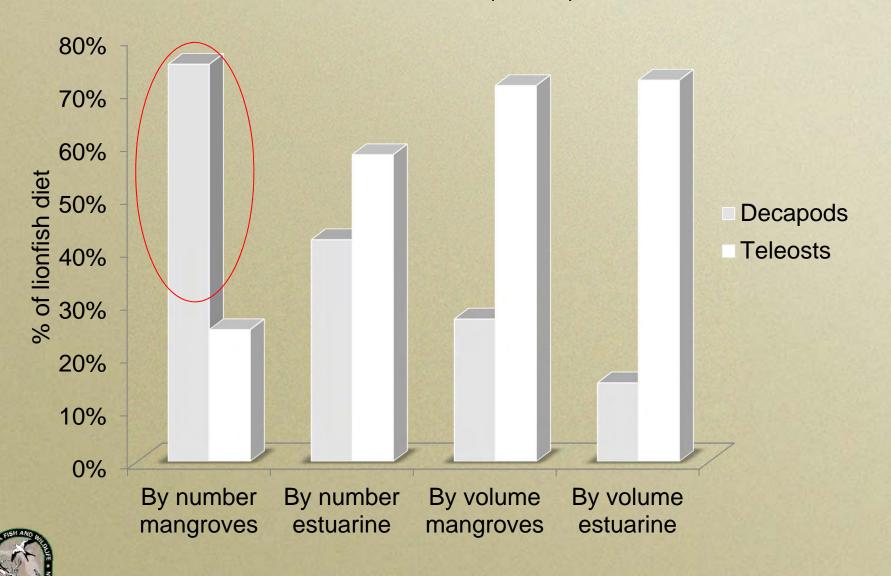
### Gonad stages for mangrove lionfish (n=24)







# Diet of lionfish in mangroves (n= 38) vs. other estuarine habitats (n= 51)

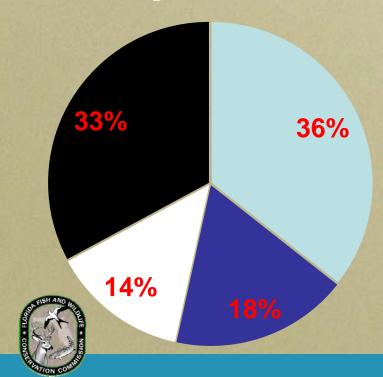


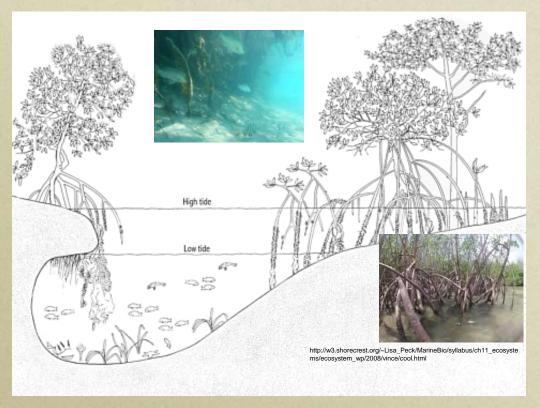


### Habitat



Where did we find the lionfish in the mangroves? (n=73)





- In the roots
- Under peat bank
- ■<1m off roots
- **■>1m off roots**

- •Average depth= 1.6m
- •Within 5km of inlets
- •90% Erosional vs. 10% depositional
- •Average growth for 5 fish was
- .39mm/day (.41 inches /month)

### **Fidelity**

Is it worth it for us to look in the mangroves? YES

27 Tagged fish April-Sept 2013

17 were 'recaptured' at least once (63%)

One fish was seen in same spot for 92 days

7 total fish were seen in same spot for over 50 days

------





Fish1

× Fish3

X Fish4

Fish5

+ Fish6

- Fish7

- Fish8

• Fish9

Fish10

▲ Fish11

× Fish12

Fish13

Fish14

+ Fish15

- Fish16

Fish17

F: 1.40

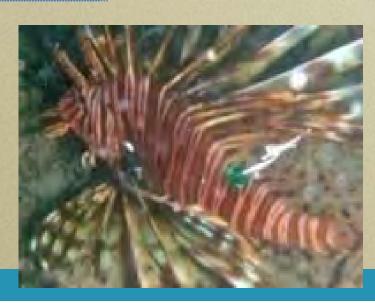
Fish18
Fish19

Fish20

×Fish21

Fish22







# Found at all 5 inlets and 4 of 5 inlet mangroves

Estuarine population increases north to south

>600 IRL specimens (>300 in Loxahatchee)



### The good news

- Early in estuarine invasion
- Strong site fidelity
- Highly motivated IRL natural resource community
- Native predation...a learned behavior

Opportunities for applied research

Round-up events







#### **FWC** Rule for Lionfish

- No recreational fishing license required for pole spear, Hawa sling, lionfish-specific device, hand held net
- Harvest with hook and line or as bycatch in other legal gear commercial or recreational fishing
- No limit for commercial or recreational harvest
- Does not allow spearing in prohibited areas
  - 1. Within 100 yards of a public swimming beach, any commercial or public fishing pier, or any part of a bridge from which public fishing is a
  - 2. Within 100 feet of any part of a jetty that is above the surface of the sea except for the last 500 yards of a jetty that extends more than 1,500
  - yards from the shoreline
    3. Within prohibited areas (eg, State Parks, by county ordinance) or wi
    prohibited gears (explosives, fish traps, certain nets)

### **FWC Lionfish Summit October 2013**



**Major Stakeholder Recommendations:** 

#### Research:

- 1) Continue research on development and application of lionfish specific traps
- 2) What is the effort required to maintain control on managed sites? (e.g. diver return frequency)
- 3) Research on lionfish in estuaries Policeds to be a priority in Florida
- 1) Place a Bounty on lionfish: reward would be increased bag limit on native species for recreational fishers; or a financial reward
- 2) Develop a formal lionfish Management Plan
- 3) Create a protocol to allow private individuals to experiment with lionfish specific



### **Thanks**



### Marine Cleanup Initiative, Inc.





















### Ocean Acidification

# Evolution of Understanding: open ocean to estuarine

#### v1.0 open ocean

pH is driven by atmospheric CO<sub>2</sub> input

#### v2.0 coastal ocean

- + v1.0
- Upwelling of deep sea water
- Geochemical processes
- Decomposition of organic material (CO<sub>2</sub>) exported to deep water



Global carbon dioxide budget

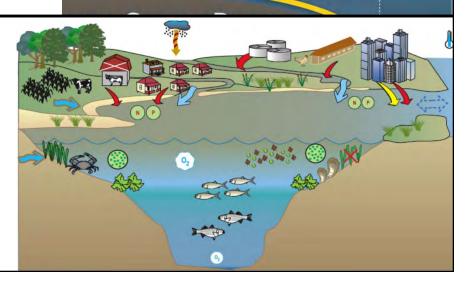
(gigatonnes of carbon per year) 2002-2011

Land sink

1.0 ± 0.5

#### v3.0 estuarine

- + v1.0
- + v2.0
- Input/removal by organisms from respiration and photosynthesis
- Decomposition of organic material (CO<sub>2</sub>) remains in system (shallow water)



## Carbonate Chemistry Refresher

$$CO_2 + H_2O \leftrightarrow H_2CO_3 \leftrightarrow HCO_3^- + H^+ \leftrightarrow CO_3^{2^-} + H^+$$
carbonic acid bicarbonate ion carbonate ion

Adding CO<sub>2</sub> "pushes" → reaction to right = ↓ pH pH buffering removes CO<sub>3</sub><sup>2</sup>

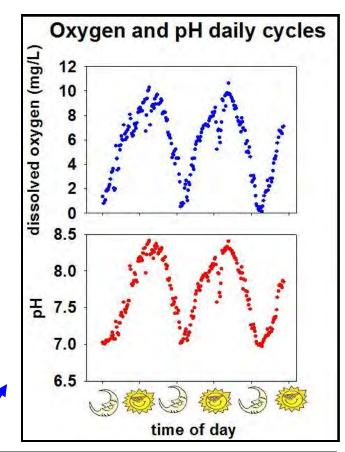
Removing  $CO_2$  "pulls"  $\leftarrow$  reaction to left =  $\uparrow$  pH pH buffering releases  $CO_3^2$ 

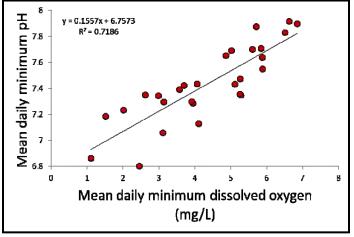
pH changes the CaCO<sub>3</sub> saturation horizon (equilibrium between CaCO<sub>3</sub> formation and dissolution)

↑ CO2 =  $\downarrow$  pH = removal of CO<sub>3</sub><sup>2<sup>-</sup></sup> to buffer pH ↑ energetic cost for organisms to produce CaCO<sub>3</sub>

### **Data Overview**

- CO<sub>2</sub> partial pressure (pCO<sub>2</sub>) preferred metric
- Ocean acidification
  - Annual range of diurnal pCO<sub>2</sub> fluctuation
    - ~125 ppm
  - pH fluctuates <1 unit diurnally</li>
    - Not precise enough to detect trends
- Estuarine acidification
  - Annual range of diurnal pCO<sub>2</sub> fluctuation
    - several thousand ppm
  - pH can fluctuate up to ~3 units in a few hours
    - Sufficient precision to detect trends
    - Correlates with DO trends
      - Relative measure for monitoring





### Focus on v3.0 - Estuarine

## CO<sub>2</sub> drivers vary spatially

- Smithsonian Envir. Research Center (SERC)
- Spatial changes to CO<sub>2</sub> level
  - -2 sites 1 km apart (Rhode River)
    - SERC pier → CO<sub>2</sub> fluctuation driven by temperature
       pH varied between 7.5 & 8.0
    - Upstream marsh → CO<sub>2</sub> fluctuation driven by decomposition/respiration & tidal transport
      - pH varied between 6.5 & 7.5
- Biology is a significant driver of estuarine pH

# Biological response to \CO2

### Oyster & clam

- ↓ growth rate
- Delayed metamorphosis
- Smaller size at metamorphosis
- † shell erosion
   (reduced calcification rates)

#### Red abalone

 Larvae have less tolerance to temperature increase

Talmage & Gobler 2009 Miller et al. 2009 Waldbusser et al. 2010 Zippay & Hofmann 2010

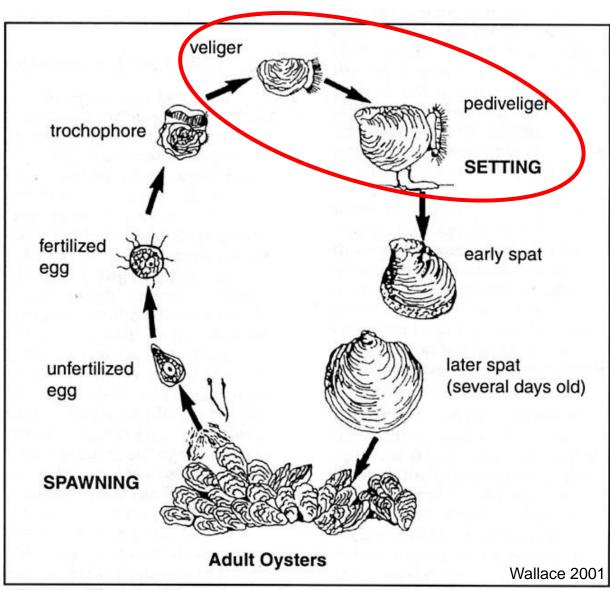
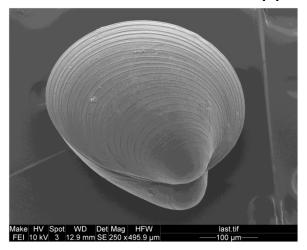


Figure 1. Life cycle of the eastern oyster, Crassostrea virginica.

# Biological response to \CO2

#### Preindustrial - CO2 280 ppm



Year 2100 - CO2 800 ppm



(Miller et al. 2009)

Altered oyster biofouling community pH = 7.9 pH = 7.45



(Keppel et al., unpublished)

# Biological response to \CO2

- Effects to organisms other than Molluscs
  - Blue crab
    - † in shell hardening time (Lane & T. Miller, unpublished)
  - Finfish
    - Atlantic silverside: ↓ larval survival & growth (Murray et al. 2014)
    - Inland silverside: ↓ larval survival (Seth Miller)
    - Summer flounder: 
       | embryo survival, 
       | larval energy reserves, 
       | metamorphosis size, developmental abnormalities (Chambers et al., 2014)
    - Coral reef fish
      - larval olfactory impairment, settlement wrong time day/night (Devine et al., 2012)
      - no behavioral response to common predators (Ferrari et al. 2011)
    - Cobia: ↓ otolith size in juveniles (Bignami et al., 2013)

## Ecosystem response

- Measure acidification at ecologically relevant [spatial] scales
  - Organism
  - Community
  - Discrete habitat
  - Sub-watershed
  - **—** ?
- Effects to ecosystem services?
  - — \( \psi\) oyster biofouling community
     abundance, diversity, and
     ecological processes when \( \p\) H



- Multiple stressors (pH, DO, °C, salinity, calcite saturation, etc.) can have synergistic effects
  - Correlates with DO trends
    - Other relative measures for monitoring?
  - Is there an effect from biological feedback mechanisms (photosynthesis, respiration, etc.)?

The need to address ocean acidification has been largely driven by [shellfish] industry.

### Maryland Task Force species conclusions

#### Oysters

- — ↓ pH threatens ecological oyster restoration efforts.
- → pH threatens wild capture oyster fisheries.
- → pH threatens the economic feasibility of oyster aquaculture.
- Monitoring programs (scale and frequency) are insufficient to assess chemical changes in ways useful to water quality dependent industries like shellfish aquaculture.

#### Crab

Scientific studies are insufficient to assess risks of ↓ pH to blue crab stocks & fisheries

#### Striped Bass

Prior pH experiments did not ↓ pH by ↑ CO<sub>2</sub> so the effects of ocean acidification chemistry is not known.

#### Forage Fish

 There has not been sufficient scientific study of the effects of ↓ pH in Bay & near-shore coastal waters to predict risks to forage fish populations.

#### Finfish in general

- → pH impacts physiology, growth, survival, & behavior in other fish species may be relevant.
- Bay water pH can reach levels harmful to early life stages of some shallow-water species.

# Compiled Task Force recommendations (Washington, Maine, & Maryland)

- Reduce emissions of carbon dioxide.
- Reduce land-based runoff of nitrogen, phosphorus, etc.
- Investigate effects of ocean acidification on a key species and life history stages, biological communities, and various spatial scales of ecosystems.
  - Focus on ecologically and economically important species
- Provide direct support to affected industries.
- Assess socio-economic impacts from ocean acidification.
- Increase capacity to adapt to the impacts of ocean acidification.
- Coordinate with other states and federal government.

# Compiled Task Force recommendations (Washington, Maine, & Maryland)

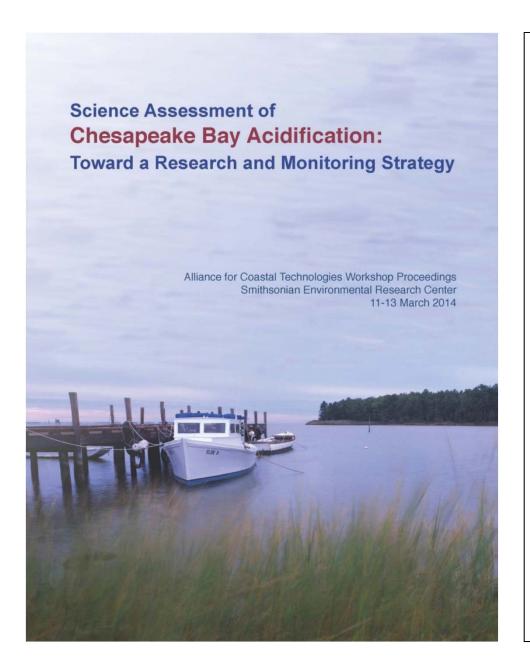
- Leverage and invest in existing programs to monitor acidification and biological responses.
- Create an Ocean Acidification Council to coordinate data streams/monitoring and analysis.
  - Engage various levels of government, industry, environmental groups, and trained citizen scientists to actively monitor ocean acidification parameters (chemical & biological).
  - Identify additional needs and implement necessary programs.
  - Maintain a sustained and coordinated focus on ocean acidification.
- Implement outreach and education programs for stakeholders: decision makers, industries, general public, etc.
- Implement legislation to establish necessary programs and secure funding.

## Federal Programs related to OA

- FOARMA Federal Ocean Acidification Research and Monitoring
  - (http://oceanacidification.noaa.gov/AboutUs/FOARAMAct.aspx)
- IWGOA Interagency Working Group on Ocean Acidification
  - (http://oceanacidification.noaa.gov/IWGOA.aspx)
  - (ftp://ftp.oar.noaa.gov/OA/IWGOA%20documents/IWGOA%20Strategic%20Plan.pdf)
- OAP Ocean Acidification Program
  - (http://oceanacidification.noaa.gov/Home.aspx)
- SECOORA Southeast Coastal Ocean Observing Regional Association
  - (http://secoora.org)
- NE-CAN Northeast Coastal Acidification Network
  - (<u>http://www.neracoos.org/necan</u>)
- California (C-CAN), Northeast U.S. (NE-CAN), and Southeast U.S (SE-CAN)
  - (http://oceanacidification.noaa.gov/EngagementActivities/USRegionalNetworks.aspx).

### State Commissions and Task Force

- Washington State 2012
  - http://www.ecy.wa.gov/water/marine/oceanacidification.html
  - http://www.ecy.wa.gov/water/marine/oa/2012panel.html
- Maine 2014
  - http://www.maine.gov/legis/opla/oceanacidificationmtgmatrls.htm
- Maryland 2014
  - http://mddnr.chesapeakebay.net/mdoatf/index.cfm
- Ocean Science Trust (California, Oregon, Washington, & British Columbia)
  - The West Coast Ocean Acidification & Hypoxia Science Panel
    - http://westcoastoah.org/)





United States Government Accountability Office

Report to Congressional Requesters

September 2014

OCEAN ACIDIFICATION

Federal Response Under Way, but Actions Needed to Understand and Address Potential Impacts

GAO-14-736

# Habitat Pilot Project Update

Ft. Lauderdale, FL April 20, 2015





### **Habitat Project Update**

- Initiated with support from NOAA Fisheries
- Began in Summer of 2014





### **Habitat Project**

- 3 parts
- Review/Report on Habitat Practices
- Policy Statement Development and Objectives for EAFM



Identifying multi-species HAPCs, etc. (which will include EFH-5yr reviews)



### **Oversight Team Formed**

- NOAA Fisheries Habitat Division (Terra Lederhouse and Dr. Howard Townsend)
- NOAA Fisheries Northeast Fisheries Science
   Center (Dr. Vince Guida and Dr. Beth Phelan)
- NOAA Fisheries Greater Atlantic Region (Lou Chiarella and Dr. David Stevenson)
- Council staff (Chair, Jessica Coakley)



### **Contractor Services Identified**

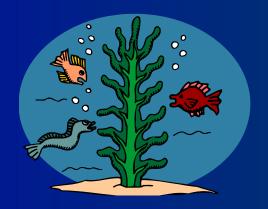
- Fisheries Leadership & Sustainability Forum (aka Fisheries Forum)
- Background/policy draft documents
- Habitat Practices Report





## Habitat Practices Report Under Development

- Provide information on current methods used in the identification of HAPCs and critical fish habitat areas in the U.S.
- Synthesize regional experiences with effective use of the HAPC provision





# Council Background/Policy Documents Under Development

- Energy (petroleum, wind, liquified natural gas)
- Marine Transport (development of infrastructure, maintenance, and dredging)
- Coastal Development & Maintenance (shoreline hardening, wetland and estuarine alteration, dredging and filling, beach renourishment, coastal resiliency)
- Offshore Mining (sand)
- Fishing Impacts (gears and operations)



# Council Background/Policy Documents Under Development

- Provide an overview of the anthropogenic activity,
- Impacts on fish habitat,
- Mechanism of impact,
- Broad overlay of the activity with MAFMC resources, and their habitat, and
- Any indirect impacts.





## **Project Timeline**

- May 2015 wrap up document/report preparation with contractors
- Begin review/work with Ecosystem-Ocean-Planning Advisory Panel (+ some) and Committee on Policy Docs
- Goal to have habitat objectives completed in 2015 to be part of EAFM document
- Other aspects of project will continue; EFH/HAPC development, etc.



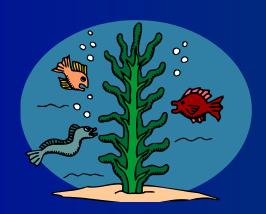
## **Project Timeline**

- Fall 2015 Begin EFH/HAPC technical review
- Meet 5-year EFH review requirements for all species
- Explore use of HAPCs and how to achieve Council habitat objectives
- Move changes into FMPs via Omnibus or individual actions



## Improved Engagement

- Identifying how best to engage with partners
- BOEM, MARCO, MARACOOS, RPB, ACFHP, ASMFC Habitat Ctte.
- NALCC and Urban Waters?
- Other groups?



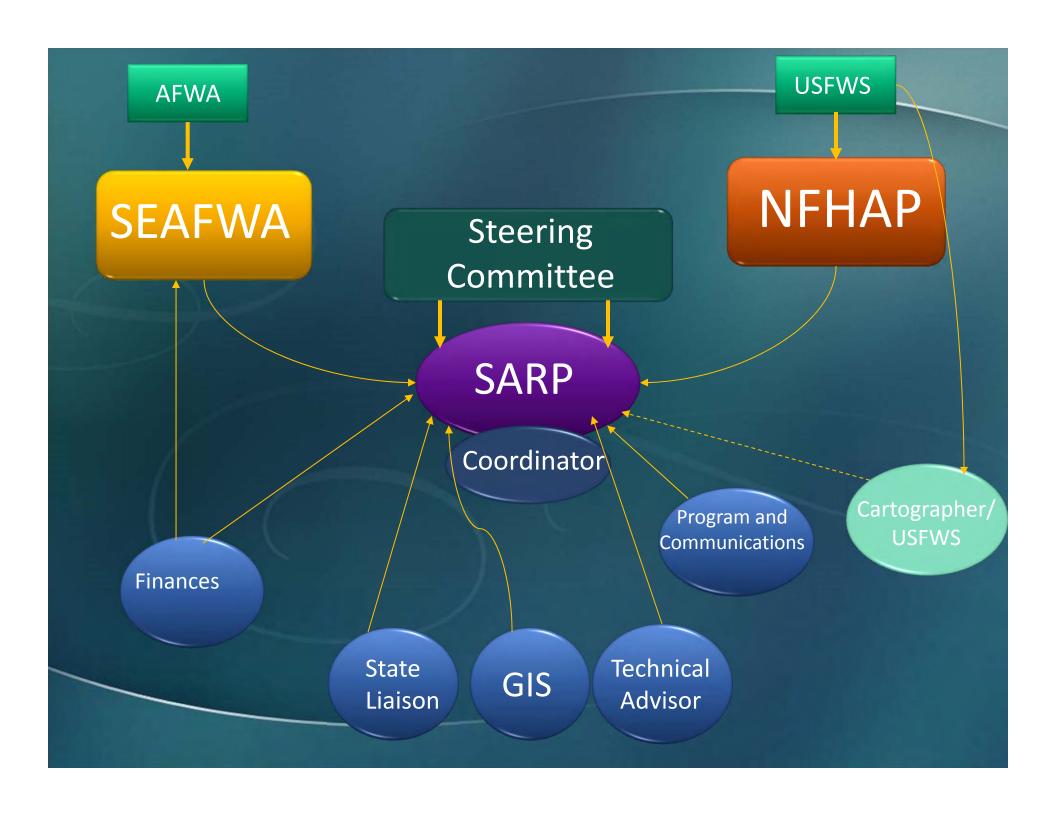


## **Questions?**



## Southeast Aquatic Resources Partnership

Jessica Graham



## Connectivity

Tool to determine which dams have the greatest adverse impact on connectivity.

Gives managers the information to identify dams that would provide the most ecological benefit if fish passage were re-established.

## Connectivity Program

Assessment

Desktop Reconnaissance

**Connectivity Teams** 

**Projects** 

SEACAP (SALCC)

Chesapeake Fish Passage
Prioritization

NC BPT

TN/CU Fish
Barrier Inventory

Region 4
Barrier
Inventory

## Habitat Suitability Models

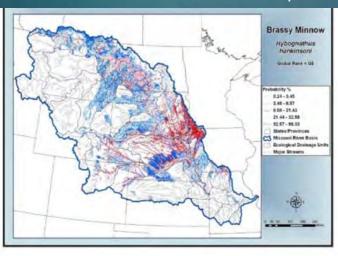
**Habitat Condition** 

**Habitat Location** 

**Habitat A Condition Assessment** 



Habitat A Occurrence Probability



## **Native Black Bass Initiative**







A Business Plan for the Conservation of Native Black Bass Species in the Southeastern US:

A Ten Year Plan



February 2010





# Conserving Fish Habitat from Whitewater to Bluewater







Atlantic Coastal Fish Habitat Partnership
Steering Committee Meeting
April 20, 2015

## **Briefing Overview**

• Whitewater to Bluewater Phase III: 2014 - 2015

• Whitewater to Bluewater Phase IV: 2015

• Whitewater to Bluewater Phase V: 2016

Action 1.1: Advance each partnership's habitat assessments through identification of mutual data needs, data acquisition, and landscape-level-analysis techniques.

- ACFHP and EBTJV collaborated with the North Atlantic LCC and Downstream Strategies to develop decision support tools that would assist in prioritizing conservation actions for Winter Flounder, River Herring, and Brook Trout.
- SARP worked with the Gulf Coast Prairie LCC to complete an Instream Flow Project (http://southeastaquatics.net/) that assists in making management decisions.

Action 1.1: Advance each partnership's habitat assessments through identification of mutual data needs, data acquisition, and landscape-level-analysis techniques.

- SARP is also collaborating with the Gulf Coastal Plain and Ozark LCC to develop Aquatic Species-Habitat Models that support the regional landscape conservation plan and assisted with completing the Southeast Aquatic Connectivity Assessment Project, which provides a decision support tool that prioritizes the removal or bypass of dams (http://maps.tnc.org/seacap/).
- The EBTJV completed its second range-wide assessment of Brook Trout population status and partnered with the Appalachian LCC to complete a web-based project tracking system and an open source mapping platform (http://www.conservationdesign.org/).

Action 2.1: Coordinate ACFHP, EBTJV, and SARP partner engagement and outreach activities to strengthen and expand an already robust base of on-the-ground conservation partners.

- The three eastern FHPs continue to maintain the Whitewater to Bluewater webpage: http://easternbrooktrout.org/groups/whitewater-to-bluewater
- ACFHP, EBTJV, and SARP are also collaborating to develop a fish passage barrier removal informational template.

Action 2.2: Implement strategies developed previously by the Whitewater to Bluewater partnership and via the National Fish Habitat Partnership Excellence Workshop to enhance organizational capacities.

• The EBTJV is implementing its 5-year Business Plan, which is aimed at enhancing its organizational capacities; while ACFHP and SARP continue to address the recommendations that resulted from organizational assessments completed by River Network and Water Words That Work.

Action 3.1: Retain and enhance critical capacity to implement each of the individual FHP's Strategic Plans by facilitating completion of prioritized, on-the-ground, partner-led fish habitat conservation projects that achieve measurable results towards NFHAP goals and strategies.

- The three eastern FHPs each completed the process for submitting their Accomplishment Report and Work Plan to the FWS for 2015 NFHAP funding considerations.
- Our partnerships also worked with the NFH Board to develop a LOI for the 2015 MSCGP funding cycle.

Phase III is supported by a 2014 MSCGP grant, which is in the process of being approved for a 1-year extension, so the expected ending date for this grant is December 31, 2015.

- The eastern FHPs were recently notified that Phase IV of Whitewater to Bluewater was approved for funding under a 2015 MSCGP grant.
- Total funding available from this grant is \$150k, which is being divided equally so that ACFHP, EBTJV, and SARP will each receive \$50k in funding support.

• The eastern FHPs have submitted a scope of work for this phase of Whitewater to Bluewater, which is centered around building on the work we initiated during our previous phases as well as adding an additional focus on addressing aquatic habitat connectivity issues.

- The eastern FHPs are assisting the National Fish Habitat Board with developing a Letter of Intent for the 2016 MSCGP cycle.
- Phase V of Whitewater to Bluewater is intended to build on what our partnerships accomplish during Phase IV.

# Conserving Fish Habitat from Whitewater to Bluewater

**Questions?** 







### Conservation Mooring Project Update to ACFHP Steering Committee

April 21, 2015 - Ft Lauderdale, FL



Working together to conserve coastal, estuarine-dependent, and diadromous fish habitat

# Conservation Moorings Project "A Quick Review"

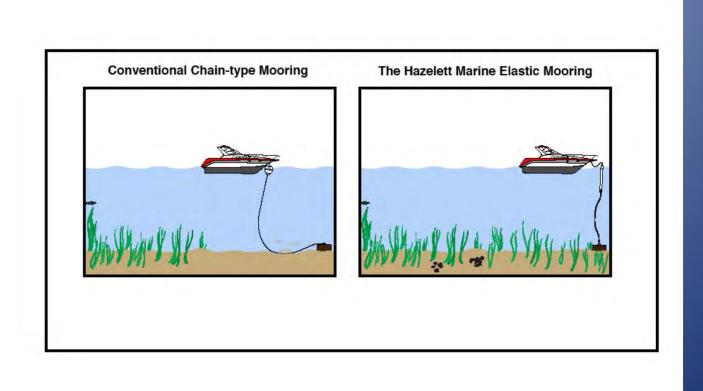
- NOAA Funding agency
- ACFHP Received a \$20,000 grant for this project
- Previous projects: Vinyard Haven & Buzzards Bay
- Project location: Jamestown, Rhode Island on Narragansett Bay

## **Conventional Moorings**



"Haloing" by chain sweep of conventional moorings destroying SAVs

### Conventional vs Conservation Mooring



### **Project Partners**

- Atlantic Coastal Fish Habitat Partnership -Lead
- NOAA- Funding
- Town of Jamestown Harbor Commission
- Town of Jamestown Conservation Commission
- RIDEM Div. of Fish & Wildlife Monitoring
- Aquidneck Mooring Service Hardware & Installation
- Conanicut Marine Services 2 moorings
- Clark Boatyard 1 moorings
- Jamestown Boatyard 1 mooring

# Conservation Mooring Ideal - Embedded Helix Mooring

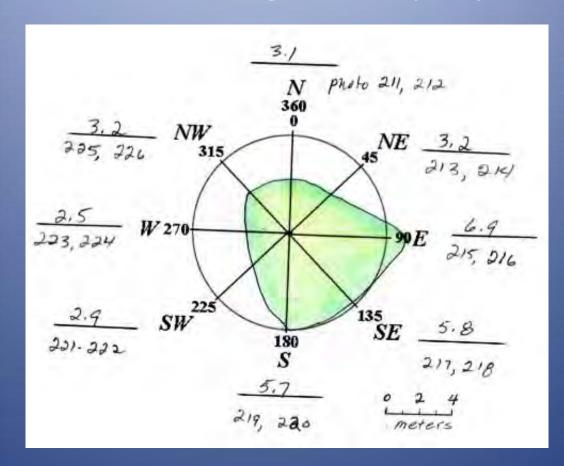


We will install a Helix anchor where possible – otherwise the mooring block will remain in place.

## Selection of Moorings to Retrofit

- Reviewed 2012 aerial photos of mooring areas
- Selected candidate moorings at three marinas
- Diver survey to confirm candidates June 2014
- Pre-installation eelgrass survey of selected moorings to retrofit - August 2014
- Final selection of four moorings to retrofit May
   2015

## Conservation Mooring Pre-Installation Eelgrass Survey Map



This was done for each candidate mooring in August 2014

### **Updated Estimated Cost per Conservation Mooring**

Conservation Moorings Hardware & Labor:

Helix Embedded Anchor \$400 (if possible, or use current anchor

if adequate - 2000lb min.)

Conservation Mooring System \$1720

Total \$2120

Labor - Remove old system if necessary \$250-400

Labor - Install Helix embedded anchor \$400

or new 2000lb block

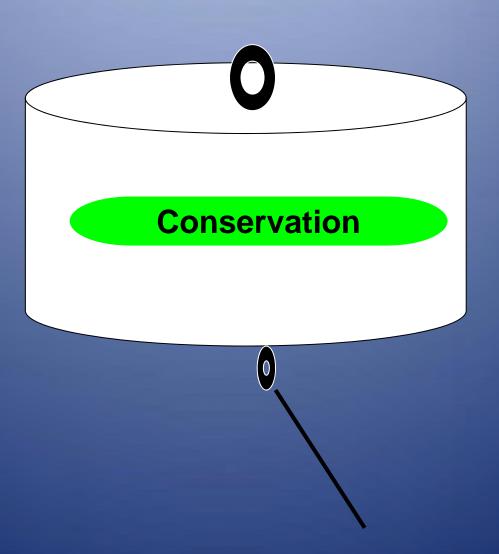
Total \$650 - \$800

**Grand Sub-Total** \$2770 - \$2920

Less Donation (10% discount) \$277 - \$292

Estimated Final Cost/Mooring \$2493 - \$2628

### Conservation Mooring Buoy Design



## Conservation Mooring Interpretative Sign Draft To be located on the East Ferry waterfront in Jamestown

## Protecting eelgrass fish habitat through the use of conservation moorings

The National Oceanic and Atmospheric Administration has partnered with the Atlantic Coastal Fish Habitat Partnership, the Rhode Island Division of Fish and Wildlife, Town of Jamestown Conservation Commission, Clarks Boat Yard, Conanicut Marine Services Inc., Jamestown Boat Yard, and Aquidneck Mooring Company to protect fish habitat around Conanicut Island (Jamestown). Through this partnership, four traditional boat moorings systems were replaced with alternative conservation moorings that significantly reduce adverse impacts to important eelgrass fish habitat.

#### What are conservation moorings?

A conservation mooring is a mooning. system designed to avoid contact with the seafloor, thereby reducing physical damage to eelgrass. The system uses an elastic connection, akin to a bungee cord to connect the surface buow with: the anchoring device. This eliminates any chain sweep that physically damages or eliminates the eclorass. Depending on the seafloor, helical (i.e. some like anchors may be used to replace traditional concrete mooring blocks. These significantly reduce the environmental footprint within the eelgrass hapitat, and allow for eelgrass growth in the previously affected area.

#### Monitoring to assess eelgrass habitat recovery

Prior to installing conservation moorings, the status of eelgrass habitat around each of the existing traditional moorings was documented. After installation, the leve of eelgrass recovery will be monitored and documented. This monitoring effort will help researchers understand the effectiveness of this technology as a coastal resource management sooi.











### Importance of eelgrass habitat

Eeigrass is an entremely valuable spawing and mussery habitat for a variety of fish and invertebrate species including winter flounder, summer flounder, and bay scallop. It is also an important species at the bottom of the food chain. Eelgrass habitat has been declining throughout the Northeast due to poor water quality, increased turbuilty, and physical elterations such as erodging filling, and breating related activities.

#### Impacts to eelgrass habitat from moorings

Eelgrass habitat is vuinerable to a number of boating related activities, including prop damage and the use of traditional chain moorings. When placed within or adjacent to eelgrass beds, traditional chain moorings can severely damage habitat through physical removal of the eelgrass shoots, causing a "habiting" effect. Additionally, disturbance to the seaffoor by mooring thams suspends sediment, increasing turbidity which reduces water clarify. This dimmishes the amount of light penetration critically important to eeigrass growth and survival.



















## Estimated Project Budget

Con. Mooring Hdw. & Installation \$2493 - \$2628 each

Estimated Total for Four Moorings \$10,000 - \$11,000

Interpretative Sign \$1500

Workshops (Travel, Materials, Announce) \$1500

Administration & Overhead \$ 4000

Misc. (unknown costs, e.g. new mooring block) \$2000

ESTIMATED TOTAL PROJECT COST \$20,000

# Project Timeline

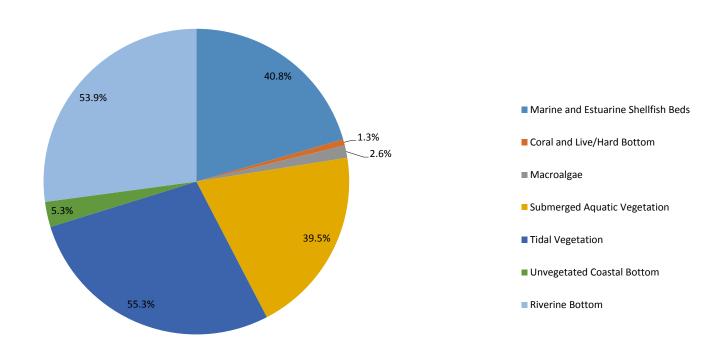
- Project Cost Estimates Done
- Interpretative Sign Design Final Draft Done
- Final Site Selection Summer 2014
- Pre-SAV Monitoring RI F&W Completed summer 2014
- Approval of MOU language April 2015
- MOU with three boatyards to be signed early May, 2015
- System Installation May 2015
- Order Interpretative Sign May 2015
- Interpretative Sign Installation Summer 2014
- Post-SAV Monitoring RI F&W Summer 2015 & 2016
- Preliminary Report to NOAA Winter 2015
- Final Report to NOAA Winter 2016

# Thank You!

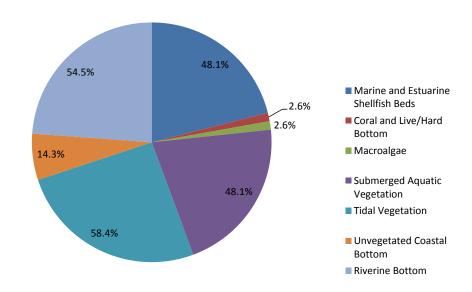


Questions?

Which habitats are you currently working to restore? Please check the THREE habitats on which you currently dedicate the majority of your time.



Which habitats do you anticipate working to restore over the next five years? Please check the THREE habitats on which you anticipate dedicating the majority of your time.



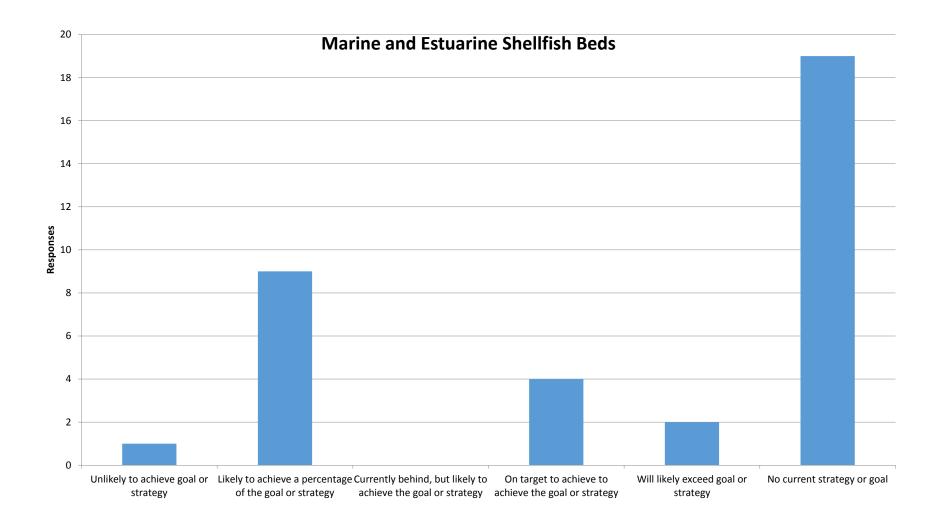
# Which habitats do you anticipate working to restore over the next five years? Please rank each of the choices below with a range between very unlikely to very likely.

Answer Options	Very Unlikely	Unlikely	Undecided	Likely	Very Likely	Rating Average	Response Count
Marine and Estuarine Shellfish Beds	13	12	6	10	23	3.28	64
Coral and Live/Hard Bottom	44	5	5	0	2	1.41	56
Macroalgae	38	13	5	2	0	1.50	58
Submerged Aquatic Vegetation	13	8	9	16	18	3.28	64
Tidal Vegetation	9	3	8	16	27	3.78	63
Unvegetated Coastal Bottom	22	14	8	10	3	2.26	57
Riverine Bottom	10	9	2	12	30	3.68	63
						answered question	69
						skipped question	12

#### For each habitat type, which local, state, regional, or federal restoration strategy or goal are you primarily seeking?

Answer Options	Restore or enhance # acres by this date	Remove or replace # of barriers by this date	# miles reconnected through fish passage by this date	Current restoration work is not guided by a local, state, regional, or federal goal or strategy	Other (please specify below)	Rating Average	Response Count			
Marine and Estuarine Shellfish Beds	19	0	0	13	6	2.22	38			
Coral and Live/Hard Bottom	3	0	0	17	4	3.55	24			
Macroalgae	1	0	0	17	3	3.83	21			
Submerged Aquatic Vegetation	21	1	0	14	2	2.19	38			
Tidal Vegetation	27	1	1	11	5	1.90	45			
Unvegetated Coastal Bottom	7	0	0	17	2	3.13	26			
Riverine Bottom	3	12	19	10	1	2.82	45			
If Other (please specify)										
answered question										

skipped question



Which statement below best describes current progress towards the strategy or goal you are primarily seeking to achieve for each habitat listed?

Answer Options	Unlikely to achieve goal or strategy	Likely to achieve a percentage of the goal or strategy	Currently behind, but likely to achieve the goal or strategy	On target to achieve to achieve the goal or strategy	Will likely exceed goal or strategy	No current strategy or goal	Other (please specify below)	Rating Average	Response Count		
Marine and Estuarine Shellfish Beds	1	9	0	4	2	19	3	4.54	38		
Coral and Live/Hard Bottom	0	1	0	1	0	22	2	5.75	26		
Macroalgae	0	0	0	0	0	22	2	6.00	24		
Submerged Aquatic Vegetation	3	9	1	2	0	20	1	4.34	36		
Tidal Vegetation	3	9	4	11	0	12	3	3.82	42		
Unvegetated Coastal Bottom	0	3	1	0	0	19	1	5.35	24		
Riverine Bottom	1	14	3	10	5	7	2	3.63	42		
If Other (please specify)											
answered question											
skipped question											

### Bad data?

Which of the following	threats ar	e you c	urrently w	orking/	to addre	ess for (	each habitat t	ype? P	lease c	heck all	l that a	oply.			
Answer Options	Moveme nt/Habit at	ng and Coasta I Maint	Quality Degradati	mptiv e Water Withd	Sedime ntation	TION	Water Contaminati on (ground and surface) and Sediments	е	е	worki	Rating Avera ge	Respo nse Count			
Marine and Estuarine Shellfish Beds	0	4	10	0	4	1	3	1	2	15	6.53	40			
Coral and Live/Hard Bottom	0	1	0	0	0	0	0	0	0	28	9.72	29			
Macroalgae	0	0	3	0	0	0	0	1	0	25	9.21	29			
Submerged Aquatic Vegetation	0	4	16	0	1	2	1	1	0	11	5.50	36			
Tidal Vegetation	4	8	5	0	1	0	0	8	8	11	6.36	45			
Unvegetated Coastal Bottom	0	7	1	0	1	0	0	0	0	18	7.48	27			
Riverine Bottom	32	1	5	0	3	0	0	1	0	7	2.90	49			
Other (please specify)												7	Oth er Res pon ses:		

Atlantic Coastal Fish Habitat Partnership Restoration Practitioners Survey

In your opinion, are there particular habitats in need of restoration, or threats in need of correction, which are currently under addressed in your geographic and along the east coast? (300 character limit)

Answer Options	Response Count	
	42	
answered question		42
skipped question		39

Relative to the scale of degradation caused by dams: the funding, incentives, and on-the-ground project management for dam removals all need to be dramatically increased.

Water Quality is being addressed by the Chesapeake Bay TMDL, but the goals are massive and it is unclear whether states and localities are able to fulfill their obligations. Ensuring progress throughout this process is a major concern. shell fish bed restoration

One of the most significant threats to shellfish in the South Atlantic is that it is not managed for it's habitat value, rather only as a harvestable resource. While there are still good numbers, without future conservation of the resource the populations will most likely continue to decline. high marsh

Salt Pond habitat degraded by intense shoreline development affecting water quality with non-point surface water runoff, and contaminated groundwater from inadequate waste disposal treatment.

I think all these issues are addressed. The corrections are too slow in coming! Lost in a quagmire of public debates and miss used funding to re-study the same issue. Money wasted on paper work and not on the physical solution. Breaching a dam that everyone except a small handful of people should not take 45 years.

56 river miles of Florida's Ocklawaha River--the southernmost suitable striped bass spawning habitat in the U.S.--needs to be restored to free-flowing again from Silver Springs to the St. Johns River which would be made possible by the breaching of Rodman (Kirkpatrick) Dam. seabed disturbance due to shellfish and finfish harvesting with mobile gear

Water quality improvements (stormwater and wastewater) are needed before SAV restoration can be successful but water quality is underadressed due to the size of the problem and scale of resources needed to address it fully

# ACFHP Implementation Plan Status to April 2015



Ft. Lauderdale, FL – April 20<sup>th</sup> – 22<sup>nd</sup>, 2015

## The Process -in 2012

Conservation Strategic Plan has:

16 Objectives

37 Strategic Actions

79 Tasks

We winnowed this for the Implementation Plan to:

9 Objectives

14 Strategic Actions

29 Tasks

## What we are going to do today

- Review the process and our commitments
- Review the current status of each Task
- Agree on the current status of each Task
- Decide on future actions:

Continue with no changes or additional Tasks added

Continue Tasks selected & add new non-selected Tasks

Selectively add additional Objectives, Strategic Actions and Tasks

Winnow a new set of Objectives, Strategic Actions and Tasks

## Task Status Color Code

This Power Point has color coding to categorize each selected Task.

- Item(s) Selected Red
- Completed tasks Blue
- Ongoing tasks— no endpoint Yellow
- Ongoing tasks with endpoint, not complete Orange
- To Do or Action needed tasks
   – no activity yet Green

## **Habitat Protection Objectives:**

#### **OBJECTIVES Selected:**

- 1. Ensure adequate and effective fish movement past existing or potential barriers to maintain connectivity within Sub-regional Priority Habitats.
- 4. Minimize or reduce adverse impacts to Sub-regional Priority Habitats associated with coastal development and water dependent activities (e.g. recreational boating, and marine transportation).
- 6. Increase public awareness of the threats facing sub-regional priority habitats and the protection measures available to avoid and minimize those threats.

## **Habitat Protection Objectives:**

#### **OBJECTIVES Not Selected:**

- 2. Maintain or improve water quality and hydrology in Sub-regional Priority Habitats that are currently functioning, through incorporation of BMPs and/or technological controls.
- 3. Define the water flows and volumes needed to sustain the structure and function of healthy aquatic ecosystems (including groundwater and surface water interactions, maintaining appropriate salinity regimes) and ameliorate consumptive water usage where detrimental to Sub-regional Priority Habitats.
- 5. Maintain or increase the resiliency of Sub-regional Priority Habitats to the impacts of climate change.

**Protection Objective 1:** Ensure adequate and effective fish movement past existing or potential barriers to maintain connectivity within Subregional Priority Habitats.

#### STRATEGIC ACTION Selected:

1. Coordinate with partners to synthesize existing information in order to identify and prioritize watersheds for conservation where fragmentation of, or barriers to, fish dispersal are a potentially critical threat to be addressed.

#### STRATEGIC ACTION Not Selected:

1. Coordinate with partners to develop and disseminate a "standardized toolbox" of fish passage technologies (techniques and methodologies) and guidance to assist ACFHP partners in the development and implementation of effective fish passage protocols designed to alleviate this threat for new projects.

**Protection Objective** 1: Ensure adequate and effective fish movement past existing or potential barriers to maintain connectivity within Sub-regional Priority Habitats.

**Strategic Actions 1:** Coordinate with partners to synthesize existing information in order to identify and prioritize watersheds for conservation where fragmentation of, or barriers to, fish dispersal are a potentially critical threat to be addressed.

- 1. Consult with appropriate ASMFC entities (diadromous species management entity; Fish Passage Working Group; TCs for each diadromous species) to determine whether there are existing priority lists for restoration, subregionally.
- 3. Compile existing lists, i.e, American Rivers in NC through the Aquatic Connectivity Team, is presently compiling a list of priority barriers. In NH, get Restoration Partners priority list; compile FERC filed diadromous fish restoration plans for watersheds in which they have been prepared; TNC NE Connectivity Project
- 7. Determine (Science and Data Committee task) what scale of watershed (HUC 8?, HUC 12?) ACFHP wishes to address.

**Protection Objective 1**: Ensure adequate and effective fish movement past existing or potential barriers to maintain connectivity within Sub-regional Priority Habitats.

**Strategic Actions 1:** Coordinate with partners to synthesize existing information in order to identify and prioritize watersheds for conservation where fragmentation of, or barriers to, fish dispersal are a potentially critical threat to be addressed.

TASKS: Not Selected

- 2. Coordinate with existing National Estuary Programs and partnerships (APNEP-NC, PREP-NH; DEBEP?; IRNEP-FL, Narragansett Bay NERR
- 4. Contact each Regional Alliance (i.e., SAA, MAR) to determine whether they have developed priority watershed lists.
- 5. Work with partners to make the lists, i.e., during ASMFC Shad and River Herring Habitat Plan development (Amendment 3; plans due 2014, so defer this action; we think that ACFHP makes this recommendation to ASMFC-HC, who in turn will make it to ASMFC SRHTC for implementation, with information developed to come back to ASMFC-HC and back to ACFHP) encourage development of priority lists.
- 6. Look in state Wildlife Action Plans to see if there are priority lists, and/or information which can contribute to the development of such lists.

**Protection Objective 4:** Minimize or reduce adverse impacts to Sub-regional Priority Habitats associated with coastal development and water dependent activities (e.g. recreational boating, and marine transportation).

**Strategic Action 1:** Identify current work being done on this objective (e.g. guidance on dredging and low impact development) and determine how ACFHP can best partner with these efforts.

#### TASK Selected:

2. Communicate impacts to audiences that can make a difference; e.g., for recreational boating scouring impacts, communicate with Recreational Boating and Fishing Foundation to disseminate our guidance; also state boat annual licensing offices within DNRs or other state agencies.

#### TASK Not Selected:

1. State and federal representatives on SC and SDWG contact local zoning commissions (or other local govt entities), tell story of maintaining habitat for fish from broad Atlantic coast or sub-region perspectives, include \$\$ values of intact habitats.

**Protection Objective 6:** Increase public awareness of he threats facing Subregional Priority Habitats and the protection measures available to avoid and minimize those threats.

**Strategic Action:** Develop and disseminate public outreach materials on the adverse impacts of human activities on fish and fish habitat as well as ways to avoid and minimize those impacts.

TASKS: No specific – this is ongoing

# Habitat Restoration Objectives

#### **Objectives Selected:**

- 1. Restore and enhance hydrological or physical connections between Sub-regional Priority Habitats to promote fish utilization and improve overall aquatic health.
- 2. Restore Sub-regional Priority Habitats, such as replanting eelgrass beds or restoring oyster beds, in locations where threats have been minimized or removed (does not include dam or other barrier removal).

#### **Objectives Not Selected:**

- 3. Restore water quality in areas where it has degraded or eliminated Subregional Priority Habitats.
- 4. Maintain or increase the resiliency of Subregional Priority Habitats to the impacts of climate change through restoration activities.

**Restoration Objective 1:** Restore and enhance hydrological or physical connections between Sub-regional Priority Habitats to promote fish utilization and improve overall aquatic health.

#### STRATEGIC ACTIONS Selected:

- 2. Restore tidal hydrology in priority wetland areas (e.g. repairing or removing culverts or berms restricting flow or separating wetlands).
- 3. Identify priority areas in each sub-region where Priority Habitats have been degraded or eliminated by past alterations to hydrology, and where conditions for restoration of habitats exist.
- 5. Coordinate with partners to compile fish movement/habitat restoration techniques and guidance documents to aid partners in the planning, design, implementation, and monitoring of effective fish movement improvement projects.

**Restoration Objective 1:** Restore and enhance hydrological or physical connections between Sub-regional Priority Habitats to promote fish utilization and improve overall aquatic health.

#### STRATEGIC ACTIONS Not Selected:

- 1. Remove dams and other physical barriers in areas identified as a priority for fish movement restoration.
- 4. Compile information to identify barriers where fragmentation of habitats or barriers to fish movement exist.

**Restoration Objective 1:** Restore and enhance hydrological or physical connections between Subregional Priority Habitats to promote fish utilization and improve overall aquatic health.

**Strategic Action 2:** Restore tidal hydrology in priority wetland areas (e.g. repairing or removing culverts or berms restricting flow or separating wetlands).

#### **TASK Selected:**

2. Fund on-the ground projects through USFWS-NFHAP funding

#### Task Not Selected:

1. Consult with NERRS regarding salt marsh restoration projects (culverts, berms, water control structures, etc.); instream flow models.

**Restoration Objective 1:** Restore and enhance hydrological or physical connections between Subregional Priority Habitats to promote fish utilization and improve overall aquatic health.

**Strategic Action 3:** Identify priority areas in each subregion where Priority Habitats have been degraded or eliminated by past alterations to hydrology, and where conditions for restoration of habitats exist.

#### **TASKS Selected:**

1. Determine where partners are already working to remove barriers, to identify priorities and gaps.

#### TASK Not Selected:

2. Solicit proposals for barrier removal in identified priority watersheds.

**Restoration Objective 1:** Restore and enhance hydrological or physical connections between Subregional Priority Habitats to promote fish utilization and improve overall aquatic health.

**Strategic Action 5:** Coordinate with partners to compile fish movement/habitat restoration techniques and guidance documents to aid partners in the planning, design, implementation, and monitoring of effective fish movement improvement projects.

#### TASKS:

No 2012 tasks identified for this action.

**Restoration Objective 2:** Restore Subregional Priority Habitats, such as replanting eelgrass beds or restoring oyster beds, in locations where threats have been minimized or removed (does not include dam or other barrier removal).

#### STRATEGIC ACTION Selected:

- 1. Restore Subregional Priority Habitats in each subregion where:
  - (a) they have been damaged or destroyed by past declines in water quality or human activities, such as dredging, filling, development, or vessel operation; AND
  - (b) conditions for restoration of habitats exist; AND
  - (c) goal(s) of habitat restoration can be maintained.

#### STRATEGIC ACTION Not Selected:

2. Prevent and attempt to control invasion of non-indigenous species, where feasible.

**Restoration Objective 2:** Restore Subregional Priority Habitats, such as replanting eelgrass beds or restoring oyster beds, in locations where threats have been minimized or removed (does not include dam or other barrier removal).

**Strategic Action 1:** Restore Sub-regional Priority Habitats in each sub-region where: (a) they have been damaged or destroyed by past declines in water quality or human activities, such as dredging, filling, development, or vessel operation; AND (b) conditions for restoration of habitats exist; AND (c) goal(s) of habitat restoration can be maintained.

- 1. Establish funding mechanisms and or ideas for funding mechanisms to do on the ground work. Seek additional funding for ACFHP, eg. NOAA grants, FWS-NFHAP etc. (figure out what admin components are needed).
- 2. Compile list of projects by survey of the committee and or partners (NEP state management plans and etc) on what sub-regional priority habitats they are focusing and specifics on restoration sites.
- 3. Develop assessment criteria to in order to prioritize?

**Restoration Objective 2:** Restore Subregional Priority Habitats, such as replanting eelgrass beds or restoring oyster beds, in locations where threats have been minimized or removed (does not include dam or other barrier removal).

**Strategic Action 1:** Restore Sub-regional Priority Habitats in each sub-region where: (a) they have been damaged or destroyed by past declines in water quality or human activities, such as dredging, filling, development, or vessel operation; AND (b) conditions for restoration of habitats exist; AND (c) goal(s) of habitat restoration can be maintained.

#### TASKS Not Selected:

- 4. Prioritized list based on ability of project to be sustainable
- 5. Steer restoration practitioners to sub-regional priority habitats via compiled list of sub-regional priority habitat restoration projects.
- 6. Gap analysis. What needs to be done and is not getting done for sub-regional priority habitats

## Science & Data Objectives

#### **OBJECTIVE Selected:**

2. Work to achieve ACFHP Science and Data Needs (ACFHP, 2011) and fulfill science and data responsibilities established by NFHAP.

#### **OBJECTIVE Not Selected:**

1. Maintain or increase the resiliency of Sub-regional Priority Habitats to the impacts of climate change through restoration activities.

#### STRATEGIC ACTIONS Selected:

- 1. Develop additional products and conduct continuing analysis of the Species-habitat Matrix.
- 2. Continue to synthesize, update, and fill in information gaps in the Assessment, and identify new applications.
- 3. Beginning with the results of the Assessment and the work conducted by the National Fish Habitat Science and Data Committee, refine data and associated GIS layers to produce maps and other products that can be used to inform the goals and objectives laid out in this plan and to develop time-bound, spatially-explicit, and quantitative conservation objectives in future Plans or revisions to the Strategic Conservation Plan.

#### STRATEGIC ACTIONS Not Selected:

- 4. Develop Fish Habitat Occupancy Models and the information needed to support them.
- 5. Develop project tracking and evaluation capabilities for the purpose of capturing, assessing, and reporting conservation results to stakeholders.

**Strategic Action 1:** Develop additional products and conduct continuing analysis of the Species-habitat Matrix.

- 1. Identify number of publications and specific journals to submit manuscript for the existing matrix
- 2. Prepare outline
- 3. Prepare publication(s); submit for review to all coauthors
- 4. Peer-review

**Strategic Action 2:** Continue to synthesize, update, and fill in information gaps in the Assessment, and identify new applications.

- 1. Check with Caroly to see if fits under his work plan
- 2. Subcommittee conference call to ID work plan
- 3. ID funding sources if needed

**Strategic Action 3:** Beginning with the results of the Assessment and the work conducted by the National Fish Habitat Science and Data Committee, refine data and associated GIS layers to produce maps and other products that can be used to inform the goals and objectives laid out in this plan and to develop time-bound, spatially-explicit, and quantitative conservation objectives in future Plans or revisions to the Strategic Conservation Plan.

- 1. Check with Moe to see if fits under his work plan
- 2. Review habitat assessments that have been done for the FHPs in Region 3 and 6 and determine if ACFHP would like a similar product.
- 3. If steering committee and science and data committee are interested, determine if the organization that worked on the habitat assessments in Region 3(I think it was Downstream Strategies) is available and how much they would charge.
- 4. Subcommittee conference call to take ideas from the National Assessment and Midwest FHP's assessments and make a work plan to make them useful at a regional scale and for coastal habitats. Workplan would include action items and a timeline.
- 5. ID funding sources

Science and Data Objective 2: Work to achieve ACFHP Science and Data Needs (ACFHP, 2011) and fulfill science and data responsibilities established by NFHAP.

**Strategic Action 3:** Beginning with the results of the Assessment and the work conducted by the National Fish Habitat Science and Data Committee, refine data and associated GIS layers to produce maps and other products that can be used to inform the goals and objectives laid out in this plan and to develop time-bound, spatially-explicit, and quantitative conservation objectives in future Plans or revisions to the Strategic Conservation Plan.

#### TASK Not Selected:

6. Give contractor guidance on the incorporation of existing maps and/or data layers and/or geodatabases (species occurrence, impervious surface, ag. use, wetlands inventory, SAV). Determine how a coastal assessment would differ from inland assessments.

## Communication & Outreach Objectives

#### **OBJECTIVES Selected:**

- 1. Develop or maintain physical or virtual information or avenues for communicating information to partners and the broader conservation community.
- 2. Develop or maintain relationships with partners and the broader conservation community.

**Communications and Outreach Objective 1:** Develop or maintain physical or virtual information or avenues for communicating information to partners and the broader conservation community.

#### STRATEGIC ACTIONS Selected:

- 1. Maintain a website that meets the needs of partners and the broader conservation community.
- 3. Attend events such as conferences or meetings to promote ACFHP's mission and activities and encourage new partners to join.

#### STRATEGIC ACTION Not Selected:

2. Develop/use outreach materials (e.g. display, fact sheets) that meet the needs of partners and the broader conservation community.

**Communications and Outreach Objective 1:** Develop or maintain physical or virtual information or avenues for communicating information to partners and the broader conservation community.

**Strategic Action 1:** Maintain a website that meets the needs of partners and the broader conservation community.

#### **TASKS Selected:**

- 1. Update the Funding, Conference, Other Events, Funded Projects, Endorsed Projects, and Outreach pages
- 2. Send out periodic Breaking News items and maintain archives

#### TASK Not Selected:

3. Add a "Whitewater to Bluewater" page, or link to one

### **Communications and Outreach Objective 1:**

Develop or maintain physical or virtual information or avenues for communicating information to partners and the broader conservation community.

**Strategic Action 3:** Attend events such as conferences or meetings to promote ACFHP's mission and activities and encourage new partners to join.

#### **TASKS Selected:**

1. Present at American Fisheries Society Annual Meeting and/or Restore America's Estuaries Conference

Communications and Outreach Objective 2: Develop or maintain relationships with partners and the broader conservation community.

#### STRATEGIC ACTIONS Selected:

- 2. Cooperate and exchange lessons learned with other landscape or regional partnerships and the National Fish Habitat Board.
- 3. Promote the missions of ACFHP and NFHAP by participating in NFHAP's legislative strategy to further the objectives of all fish habitat partnerships and coordinate such activities with the legislative staff in each partner organization.

#### STRATEGIC ACTION Not Selected:

1. Develop a protocol for identifying and bringing in new partners.

**Communications and Outreach Objective 2:** Develop or maintain relationships with partners and the broader conservation community.

**Strategic Action 2:** Cooperate and exchange lessons learned with other landscape or regional partnerships and the National Fish Habitat Board.

#### **TASK Selected:**

2. Develop individual FHP and joint messaging strategies that would identify key target audiences and generate core messages for members of the partnerships to communicate clearly and consistently with those audiences.

#### TASK Not Selected:

1. Hold joint FHP Communications and Outreach meetings quarterly via conference call and/or WebEx to provide regular, focused coordination of overall communications and outreach efforts.

**Communications and Outreach Objective 2:** Develop or maintain relationships with partners and the broader conservation community.

**Strategic Action 3:** Promote the missions of ACFHP and NFHAP by participating in NFHAP's legislative strategy to further the objectives of all fish habitat partnerships and coordinate such activities with the legislative staff in each partner organization.

#### TASKS:

- No 2012 tasks identified for this action
- Lisa has been working with the NFHAP Board on this.

## Finance Objectives

#### **OBJECTIVE Selected:**

2. Secure ACFHP operational funding.

Objective Not Selected:

1. Develop a mechanism and infrastructure within ACFHP for managing finances.

Finance Objective 2: Secure operational funding for ACFHP.

### **STRATEGIC ACTIONS Selected:**

- 2. Secure project funding opportunities.
- 3. Identify private partners who can assist in providing matching funds to support operational and on-the-ground project activities.

STRATEGIC ACTION Not Selected:

1. Leverage conservation dollars.

Finance Objective 2: Secure ACFHP operational funding.

**Strategic Action 2:** Secure project funding opportunities.

### **TASKS Selected:**

- 2. Solicit, rank, and submit a list of priority projects to FWS for FY13 NFHP funding.
- 3. Apply for NOAA Community Based Restoration funding

#### THEN.....

1. Endorse applicable projects for NFWF/NOAA protection funding

Finance Objective 2: Secure ACFHP operational funding.

**Strategic Action 3:** Identify private partners who can assist in providing matching funds to support operational and on-the-ground project activities.

#### **TASK Selected:**

Identify a short list of foundations and schedule a phone call or meeting

## Summary Status of the 29 Tasks Selected

- Completed tasks Blue 13
- Ongoing tasks— no endpoint Yellow 9

   ( no specific task identified for 2)
- Ongoing tasks with endpoint, not complete Orange 8



## ACFHP Conservation Strategic Plan

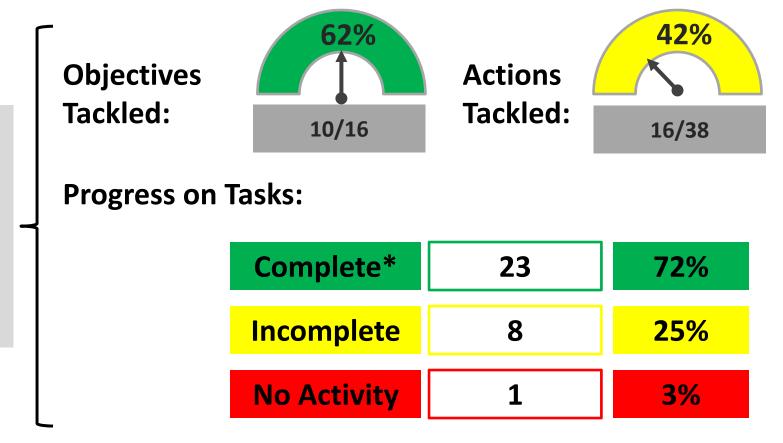
Ft. Lauderdale, FL

April 20<sup>th</sup> – 22<sup>nd</sup>, 2015

## **Looking Back/Looking Forward**

- What did we do (i.e. performance)? Which goals and objectives were completed? What strategic actions were successfully implemented?
- **Did it matter** (i.e. impact)? Was there/What were the measurable impacts?
- What have we learned? Should we do something different? Have we learned something to share?

## Performance: Overall

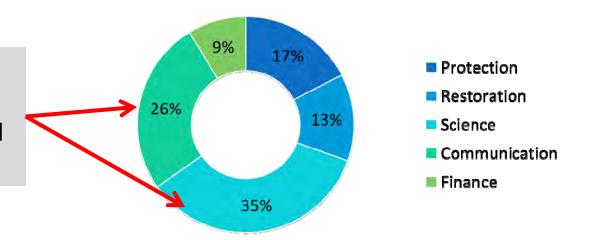


Overall, we performed at a fairly high level with respect to our Conservation Strategic Plan. We tackled over half of the plan's objectives and just under half of the strategic actions outlined in 2012. We completed the majority of tasks we set for ourselves as well.

### **Completed\* Tasks By Objectives**

Performance-wise,

Communications and Science
were s our most accomplished
areas over the past few years.

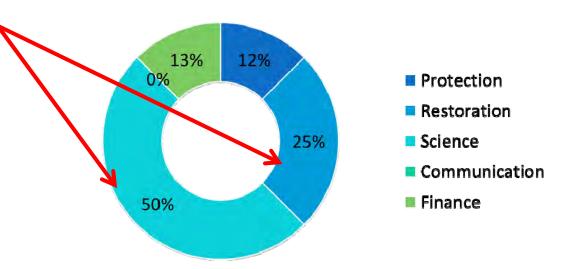


However, we overestimated our ability to accomplish

Science tasks and our

Restoration performance was enhanced by being able to fund on-the-ground projects.

### **Incomplete Tasks By Objectives**



## **Questions:** Performance

- Are our strategic actions being implemented as planned? Why or why not?
- Which objectives or strategic actions are receiving less attention than others? Should we revisit these?
- What do our previous answers suggest as to how (and when) we should adapt or change our strategic plan?

## Impact: Overall

- Protection
- Restoration
- Science & Data
- Communications
- Finance

How do we want to document or track our results and impacts? Right now, we don't have a good approach.

## **Questions:** Impact

- What have been our measurable results or impacts so far?
  - Protection, Restoration, Science, Communications and Finance?
- Are these the impacts or results that are needed (Do they contribute to change? Are other outcomes a higher priority?)
- How long-lived or "leverageable" are our impacts?

## **Next Strategic Plan (2016 – 2021)**

- What do we want to do for the next plan?
  - What are our strengths for our next plan?
  - New threats (e.g. ocean acidification)?
  - New tools/efforts we can directly work on?
  - How do we move forward with next CSP (timing, process, etc.)?

# NFHP Funded ACFHP Projects

2009 – Present

## 2014 Funding

Oyster Reef and Salt Marsh Restoration in Stump Sound, North Carolina



Oyster Reef Restoration in Great Bay Estuary, New Hampshire



	Amount				
Project Name	Requested	Total Cost	Applicant		
			Atlantic Coastal Fish Habitat Partnership/Atlantic States		
Atlantic Coastal Fish Habitat Partnership Operations FY14	\$30,000	\$150,256	Marine Fish Commission		
Seagrass, Mangrove and Tidal Marsh Restoration for Fish			Palm Beach County Department of Environmental		
Habitat in Lake Worth Lagoon, FL	\$50,000	\$2,660,309	Resources Management		
Oyster Reef and Salt Marsh Habitat Restoration, Stump Sound,					
Holly Ridge, NC	\$34,463	\$78,087	North Carolina Coastal Federation		
Barrier Removal, Westecunk Creek, Eagleswood, NJ	\$50,000	\$184,200	Barnegat Bay Partnership - Ocean County College		
Oyster Reef Restoration, Great Bay Estuary, Rockingham					
County, NH NFHAP	\$38,744	\$129,281	The Nature Conservancy, NH Chapter		
CFE Pond Lily Dam Removal, West River, New Haven County, CT	\$50,000	\$667,963	Connecticut Fund for the Environment/Save the Sound		
Daniel Island Shoreline Stabilization and Restoration – Wando					
River – Berkeley County / City of Charleston, SC	\$30,000	\$225,000	City of Charleston		
Cape Fear River Fisheries Enhancement Project	\$49,948	\$198,048	Cape Fear River Watch		
Sawyer Mill Dam Removals, Bellamy River, Dover, NH	\$15,000	\$118,000	Sawyer Mill Associates, Inc.		
Pelican Island Phase IV Hard Bottom Creation, Indian River					
Lagoon, Sebastian, FL NFHAP	\$42,000	\$102,037	Coastal Resources Group, Inc.		
South Middleton Dam removal (design phase), Ipswich River,					
Middleton, Essex County, MA	\$20,000	\$75,400	Ipswich River Watershed Association		
St. Lucie County Ontogenetic Fish Corridor – Phase I: Mid-Shelf					
Hard Bottoms, FL	\$49,600	\$127,172	St. Lucie County		
Millstone River Dam Removal Initiative: Restoring Migratory					
Fish Passage	\$50,000	\$395,396	Stony Brook-Millstone Watershed Association		
Oyster Reef Restoration Within Historically Impacted Grand					
Strand Tidal Swash Estuaries	\$45,981	\$99,787	Coastal Carolina University		
Oyster Reef Construction and Enhancement, Indian River			Brevard County Natural Resources Management		
Lagoon, Brevard County, FL NFHAP	\$45,000	\$65,000	Department		
Barrier Removal, Davis Creek, Worcester County, MD	\$34,850	\$61,900	U.S. Fish and Wildlife Service Chesapeake Bay Field		
Living Shorelines Project, Potomac River, Leesylvania, VA	\$50,000	\$95,048	Northern Virginia Regional Commission (NVRC)		
Cotton Gin Mill Dam Removal, Satucket River, Plymouth Co.,	\$50,000	\$85,000	The Nature Conservancy		
China Lake Outlet Stream Design and Permitting Study to					
Remove Masonry Dam in Vassalboro, ME NFHAP	\$20,000	\$35,000	Sebasticook Regional Land Trust		
	\$725,586	\$5,402,628	Total		

## Atlantic Coastal Fish Habitat Partnership Operations FY14

- Three in-person Atlantic Coastal Fish Habitat Partnership meetings
  - Two steering committee meetings - to address specific tasks from the ACFHP Conservation Strategic Plan
  - One Science and Data Working Group meeting
    - determine priorities for new science and data projects
    - advance ongoing projects

- Atlantic State Marine Fisheries Commission
  - Funding Amount Requested: \$75,000
  - Total Cost of Project: \$105,256
- ACFHP funding
  - NFHP \$30,000 (\$12,857)
- Partner funding
  - AFWA Multi-state grant: \$35,876
  - ASMFC Wallop-Breaux: \$39,380

# Oyster Reef and Salt Marsh Habitat Restoration, Stump Sound, Holly Ridge, NC



- Protect 200 ft of estuarine shoreline in Stump Sound, Holly Ridge, North Carolina
  - restore 0.05 acres of fringing oyster (Crassostrea virginica) reef
  - Resore 0.07 acres of tidal salt marsh (Spartina alterniflora) habitat.

- North Carolina Coastal Federation
  - Funding amount requested: \$34,463
  - Total cost of project: \$78,087
- ACFHP Funding
  - NFHP \$24,657 (\$10,567 indirect)
  - NOAA \$9,806

## Oyster Reef Restoration, Great Bay Estuary, Rockingham County, NH

Great Bay Estuary

Proposed 2 0 Acr Cypter Reef
Constructed Cypter Reef Cypter Cypter Cypter Cypter Cypter Cypter Cypter Cypte

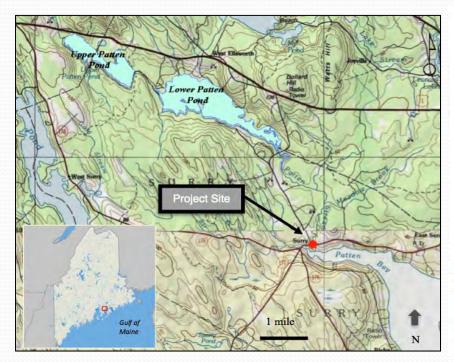
- Restore two acres of native oyster reef and o.5M oysters in Great Bay Estuary (GBE) using proven reef restoration methods
  - Reef foundation constructed on river bottom with surf clam shell spread by a barge
  - Finish layer is oyster seed in the form of spat on recycled oyster shell

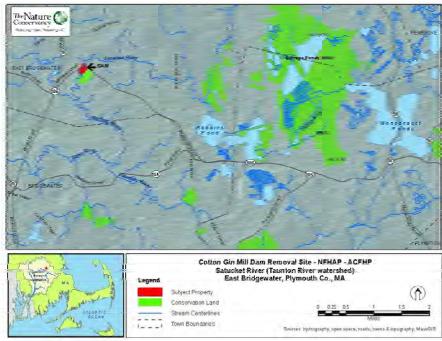
- The Nature Conservancy
  - Funding amount requested: \$ 38,744
  - Total Cost of project: \$129,281
- ACFHP funding:
  - NFHP: \$40,525 (\$17,368)

## 2015 Proposed Funding

Renewing Diadromous Fish Passage, Patten Stream, Maine

Cotton Gin Mill Dam Removal and Fish Passage Project, Satucket River, Massachusetts





## 2015 proposed

	Amount				
Project Name	Requested	<b>Total Cost</b>	Applicant		
			Atlantic Coastal Fish Habitat Partnership/Atlantic States		
Atlantic Coastal Fish Habitat Partnership Operations FY15	\$75,000	\$150,256	Marine Fish Commission		
Renewing Diadromous Fish Passage, Patten Stream, Surry, ME	\$50,000	\$234,548	Town of Surry		
Cotton Gin Mill Dam Removal and Fish Passage Project,					
Satucket River, East Bridgewater, MA	\$50,000	\$500,000	The Nature Conservancy		
CFE Pond Lily Dam Removal, West River, New Haven County,					
СТ	\$50,000	\$667,963	Connecticut Fund for the Environment/Save the Sound		
Daniel Island Shoreline Stabilization and Restoration – Wando					
River – Berkeley County / City of Charleston, SC	\$30,000	\$225,000	City of Charleston		
Cape Fear River Fisheries Enhancement Project	\$49,948	\$198,048	Cape Fear River Watch		
Sawyer Mill Dam Removals, Bellamy River, Dover, NH	\$15,000	\$118,000	Sawyer Mill Associates, Inc.		
	\$244,948	\$1,943,559	Total		

## Atlantic Coastal Fish Habitat Partnership Operations FY15

- Three in-person Atlantic Coastal Fish Habitat Partnership meetings
  - Two steering committee meetings - to address specific tasks from the ACFHP Conservation Strategic Plan
  - One Science and Data Working Group meeting
    - determine priorities for new science and data projects
    - advance ongoing projects

- Atlantic State Marine Fisheries Commission
  - Funding Amount Requested: \$75,000
  - Total Cost of Project: \$105,256
- Proposed ACFHP funding
  - NFHP \$30,000 (\$12,857)
- Partner funding
  - AFWA Multi-state grant: \$35,876? \$50,000?
  - ASMFC Wallop-Breaux:\$39,380? or less?

## Renewing Diadromous Fish Passage, Patten Stream, Surry, ME



 Nature-like fishway to restore access to 20 stream miles and 1,200 alewife spawning acres in Patten Stream in Surry

- Town of Surry, ME
  - Funding amount requested: \$50,000
  - Total cost of the project: \$234,548
- Proposed ACFHP Funding
  - NFHP \$12,000
  - NOAA \$13,000 (or maybe \$13,550?)
- Other Funding
  - Proposed FWS NFPP Funding - \$84,000

## Cotton Gin Mill Dam Removal and Fish Passage Project, Satucket River, East Bridgewater, MA



- Remove the dam
  - Connectivity to 4.4 river miles upstream
  - Fish passage from the ocean to Robbins Pond
  - 124 acres of spawning habitat.
  - Future improvements to Monponsett Ponds would provide 528 more acres.

- The Nature Conservancy
  - Funding amount requested: \$50,000
  - Total cost of the project: \$500,000
- Proposed ACFHP Funding
  - NFHP \$50,000 (\$21,429)
- Other Funding
  - NFWF Sandy Resiliency -\$401,308

## CFE Pond Lily Dam Removal, West River, New Haven County, CT

- Remove dam
- Restore 2.6 miles of the West River and 76 acres of Konold's Pond to migratory fish passage



- Connecticut Fund for the Environment/Save the Sound
  - Funding amount requested: \$50,000
  - Total cost of the project: \$667,963
- Proposed ACFHP funding
  - NFHP \$50,000
- Other funding
  - USFWS Sandy resiliency- \$628,425

## 2009-2014 NFHP funded projects



http://www.atlanticfishhabitat.org/projects/fundedprojects/

Project Name		Non-FWS Contributi ons	Total Project Costs	Completion Date
FY10 Alewife Brook/Scoy Pond and Staudinger's Pond Alewife Access and Habitat Enhancement, NY	\$51,000	\$30,000	\$60,000	not completed
FY10 Goose Creek Dam Eel Passage Restoration Project, SC	\$39,000	\$36,391	\$75,391	August, 2012
FY11 Restoring Diadromous Fish Passage and Habitat to Shorey's Brook, South Berwick, ME	19,410	\$319,193	\$343,603	November, 2011
FY11 Shoreline and Spartina Marsh Stabilization Along the Atlantic Intracoastal Waterway in SC	\$35,148	\$35,655	\$70,802	Summer 2012
FY12 Restoring the Mangroves of the Indian River Lagoon	\$71,429	\$64,375	146,069	Summer 2014
FY12 James River Atlantic Sturgeon Habitat Restoration	\$43,200	\$159,560	\$202,760	July, 2013
FY 12Eelgrass Restoration with Conservation Moorings in Buzzards Bay, MA	\$27,387	\$11,612	\$38,999	May, 2014
FY13 Expanding Marine Meadow Habitat in Peconic Estuary, NY	\$39,149	\$68,587	116,739	November, 2014
FY13 Restoring Coastal Fish Habitat Using Oysters, Mussels, and Marsh Grass at Guana Peninsula, FL	\$44,910	\$46,137	\$91,047	June, 2014
FY14 Atlantic Coastal Fish Habitat Partnership Operations	\$51,000	\$75,256	\$105,256	ongoing
FY14 Oyster Reef and Salt Marsh Habitat Restoration, Stump Sound, Holly Ridge, NC	\$49,233	\$36,356	\$78,087	ongoing
FY14 Oyster Reef Restoration, Great Bay Estuary, Rockingham County, NH	\$55,349	\$90,537	\$129,281	ongoing
Total	\$526,215	\$898,403	\$1,424,618	

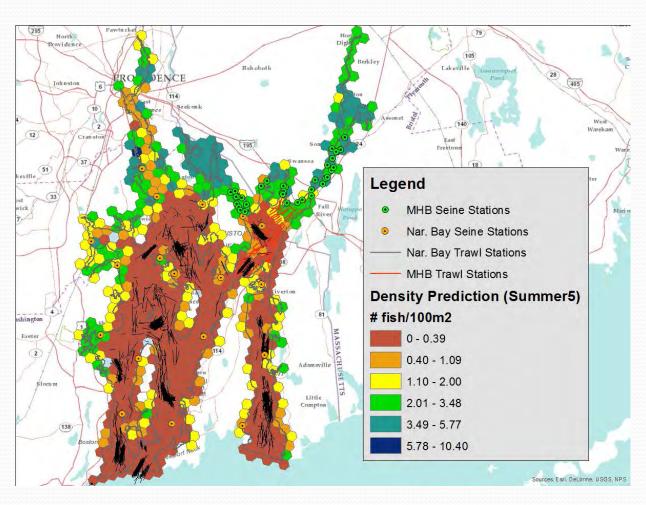
# NALCC Aquatic Habitat Assessment

USFWS
Downstream Strategies
ACFHP
EBTJV

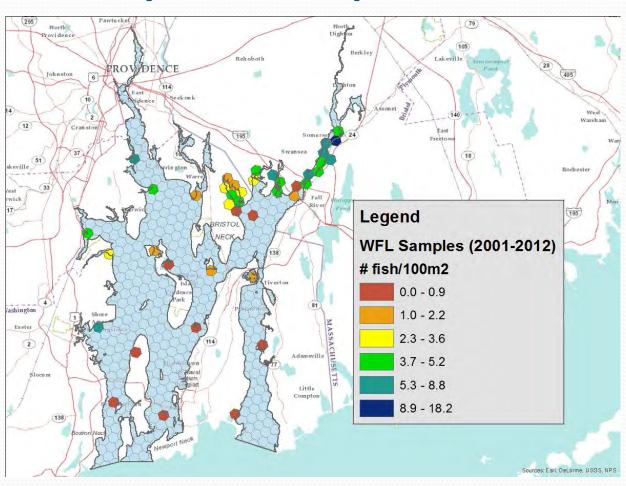
# Winter Flounder

- Narragansett Bay
  - Trawl and seine combined not accepted
  - Seine only complete
  - Trawl only future?
- Long Island Sound
  - Trawl and seine combined not trying
  - Trawl only working on this
    - Collecting predictor data Caroly
  - Seine only not enough data?
- Final Report
  - Intro, Narragansett Bay Seine Only, Long Island Sound Trawl Only, Lessons Learned – discuss drawbacks of trying to use two gear types for predictive model

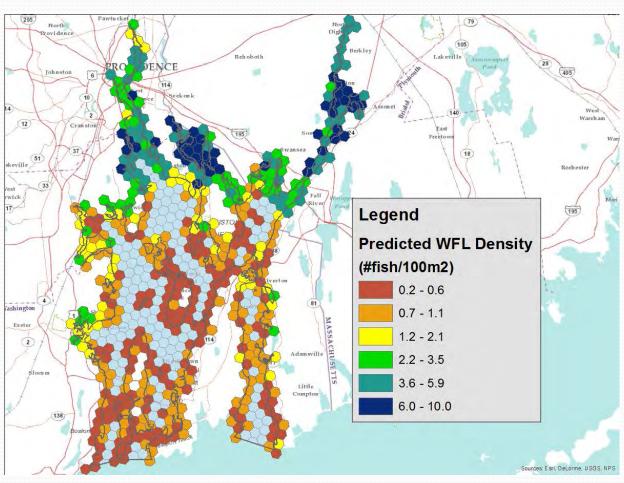
# Seine and Trawl



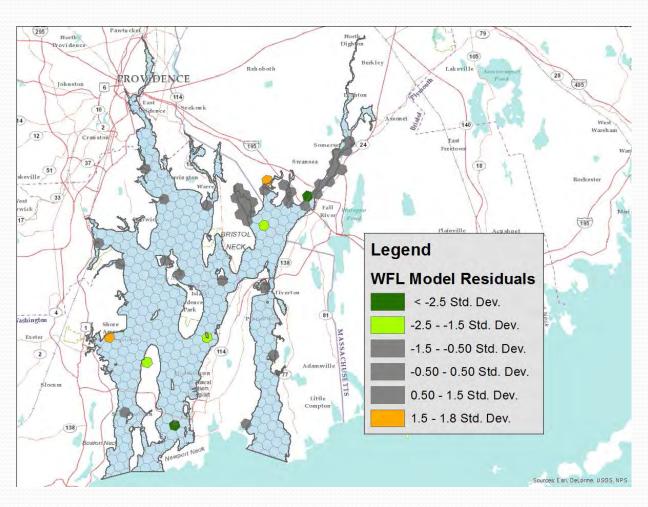
# Seine Only - Sample Sites

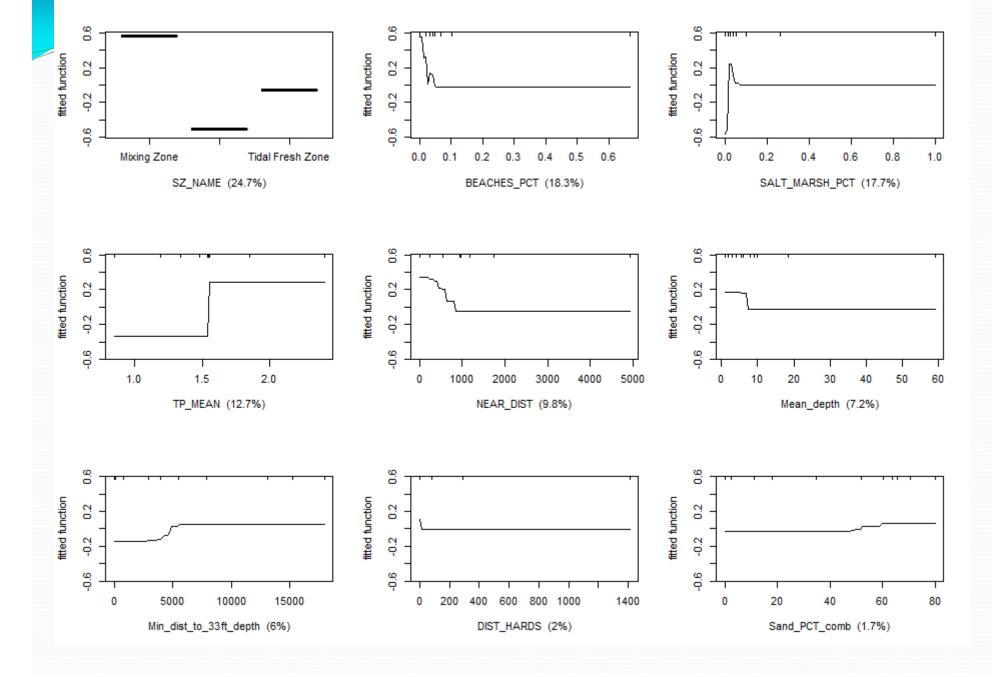


# Seine Only – Predicted Density

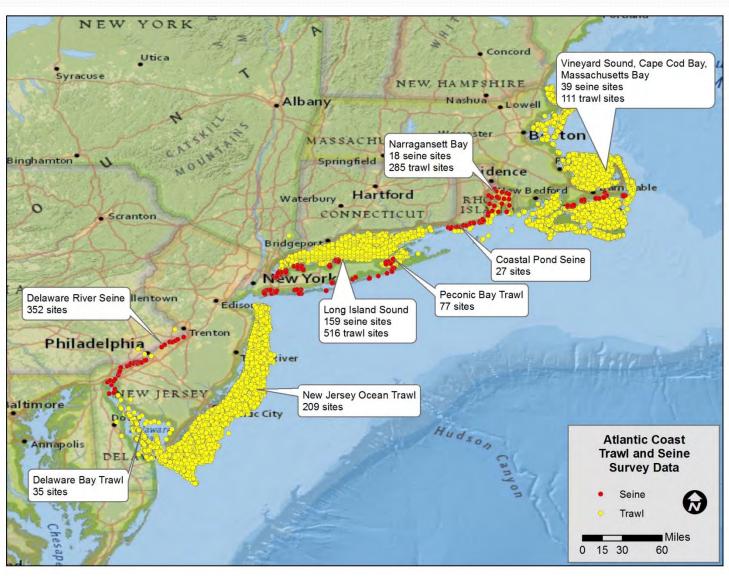


# Residuals





# Seine and Trawl Data



# River Herring

- Build a predictive model based on available stock assessment data –
  - Abundance influenced by effectiveness of fish ladder not by habitat
- Build a predictive model using presence/absence
  - Not enough absence data
- Use surrogate species white perch, white suckers
  - TC did not like this not enough data no confidence
- Use data that TU put together for NFWF and TNC has already mapped to create a decision support tool
- Nothing
  - Find funding for TNC to develop decision support tool
  - Use leftover NALCC funds to do more winter flounder models

# National Fish and Wildlife Foundation River Herring Project Update C. Shumway, MRWC April 21, 2015







# Goals, Outcome, Locations

Partners: TNC (Mari-Beth De-Lucia, Alison Bowden, Erik Martin)
ACFHP (Lisa Havel, Caroly Shumway (MRWC), Cheri Patterson)

**Goal:** to prioritize, plan, and strategize river herring needs by convening expert working groups in the SNE, Mid-Atl., and SE regions.

**Deliverable:** Final report with summary of threats, water quality impact, and ranked, actionable, habitat restoration priorities for next 10 years for river herring

#### **Locations:**

- Chesapeake Bay watershed
- Delaware River
- Hudson River
- Connecticut River
- ◆ Santee-Cooper River
- Gilbert-Stuart River (aka Narrow R/; aka Pettascquamscutt River)

# Why were these focal rivers chosen?

NFWF's River Herring Program and the resulting NFWF Business Plan for river herring conservation describes a comprehensive 10-year strategy to guide NFWF conservation investments to achieve a 300% increase in river herring spawning runs in key rivers along the eastern seaboard from 2008.

NFWF chose watersheds with historic or current important spawning runs that have a long time-series of measurable counts.

# Work Accomplished

- ◆ Chesapeake: One <u>workshop</u> on the Chesapeake Bay drainages (May 7-8, 2014): White Paper, Report
- ◆ Delaware: <u>Meeting and webinar</u> for the Delaware River Fish and Wildlife Management Cooperative
- ◆ Connecticut River: Worked with 30 experts within Connecticut River Atlantic Salmon Commission River Herring Subcommittee
- ◆ Santee-Cooper: <u>Presentation and restoration discussion</u> with 15 experts at Southern Divison American Fisheries Society 2015 meeting
- ◆ Hudson River: Used threat assessment and priorities from Hudson River Habitat Restoration Plan (2014).
- Gilbert Stuart: <u>Webinar and phone interviews</u>

#### To Do:

Final Report April 30, 2015 ? Webinar for public outreach

# Chesapeake Bay

#### **Threats**

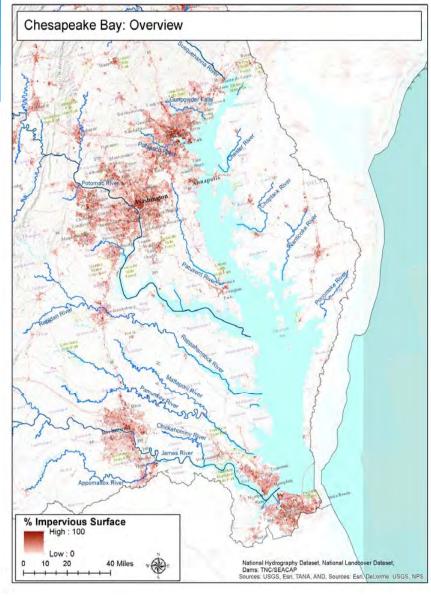
- Water Quality/Imp. Surfaces (H)
- Urbanization/Land Conversion
- Dams and Other Barriers (H)
- Predation by invasive catfish (M)
- Sedimentation (M)
- \* Climate Change and Climate Variability (M)

#### **Restoration Priorities**

- Reduce Impervious surfaces thru land protection, comp plan development, zoning
- Fish Passage Improvement

# Chesapeake Bay





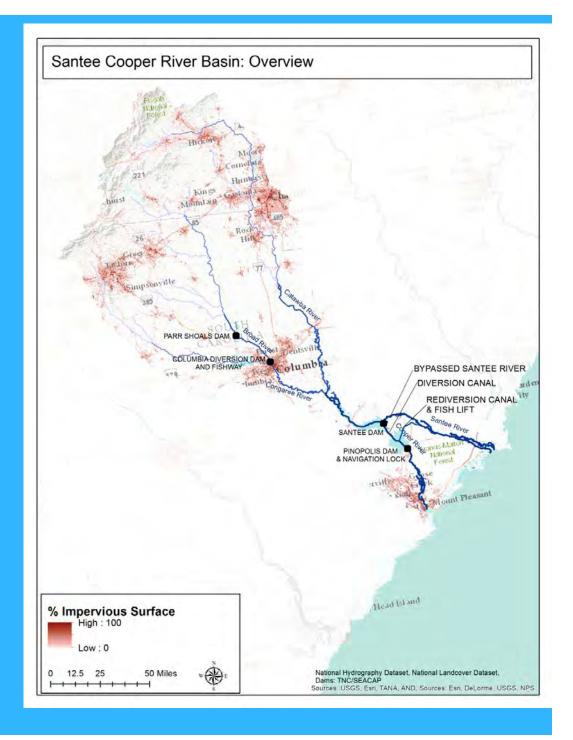
# Santee-Cooper River

#### **Threats**

- Barriers
- Predation (cormorants, fish)
- SAV destruction by power companies

#### **Restoration Priorities**

Fish Passage Improvement



#### Delaware River

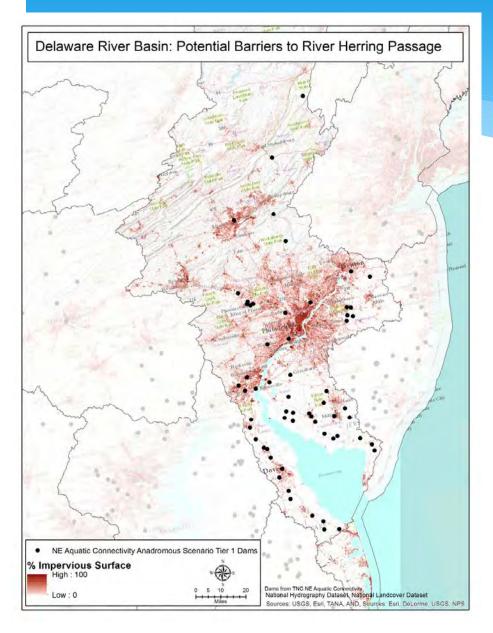
#### **Threats**

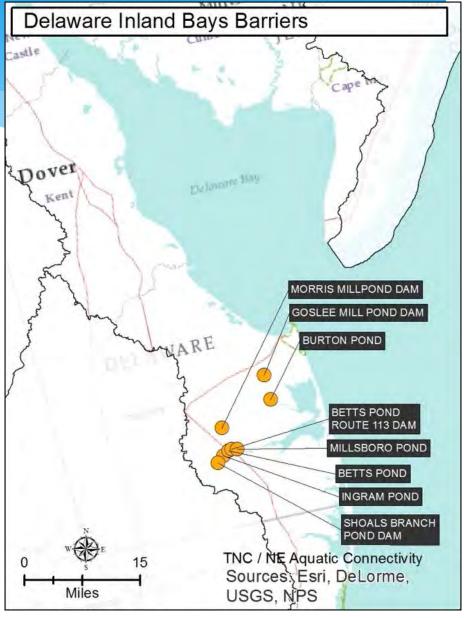
- Barriers on tributaries
- Altered predator-prey
- Impingement and entrainment
- Urbanization
- Water Quality

#### **Restoration Priorities**

- Assess efficacy of fish passages
- Dam removal
- Assess water quality and riparian impact (NJ, DE)

## Delaware River





#### **Hudson River**

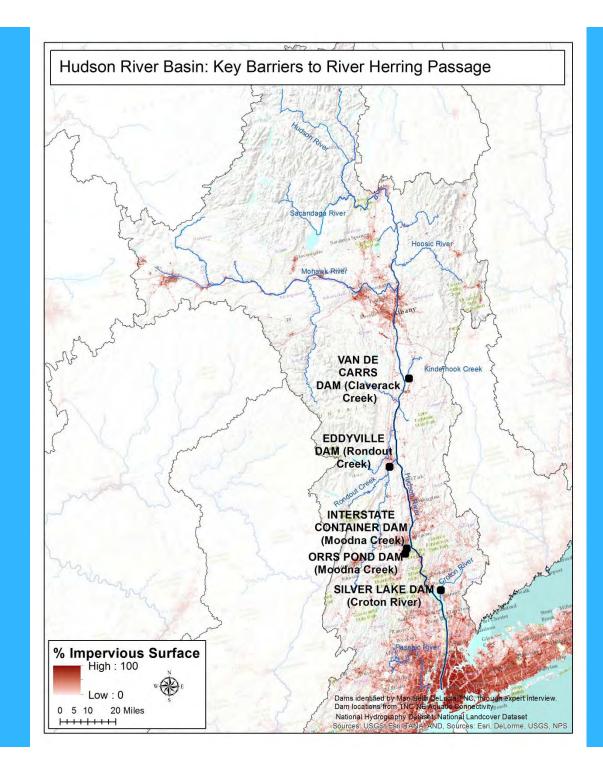
#### **Threats**

- Habitat loss (shallow water habitat)
- Loss of Habitat Complexity
- Zebra Mussels
- Sea Level Rise
- Urbanization
- Barriers

#### **Restoration Priorities**

- Side Channel Restoration
- Floodplain Restoration
- Fish Passage Improvement

# Hudson River (continued)



### Connecticut River

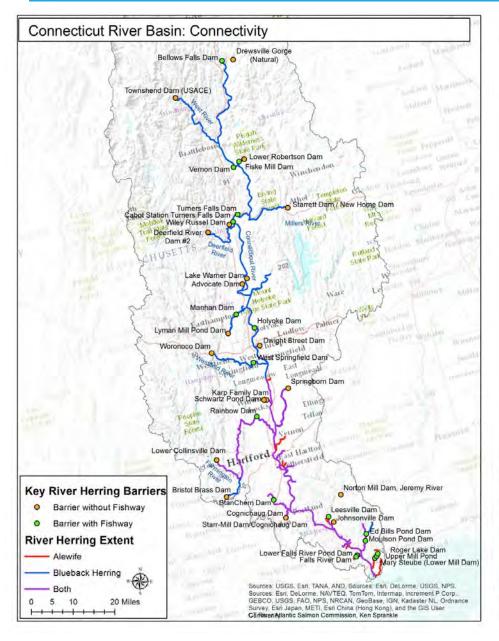
#### **Threats**

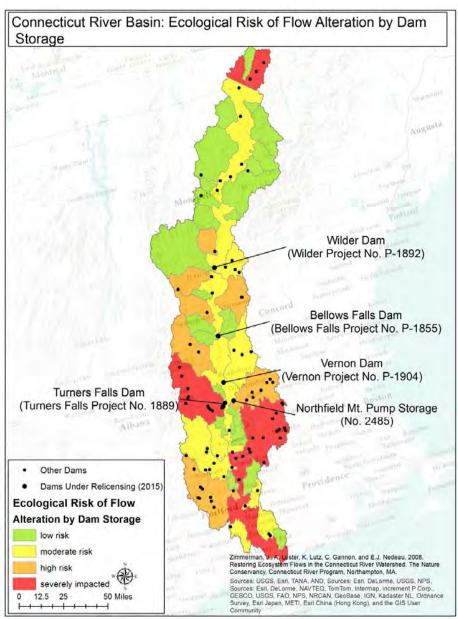
- Climate change (H)
- Barriers (H)
- Ocean bycatch (H)
- Water Quality (M)
- Habitat degradation (M)
- Culverts (M)

#### **Restoration Priorities**

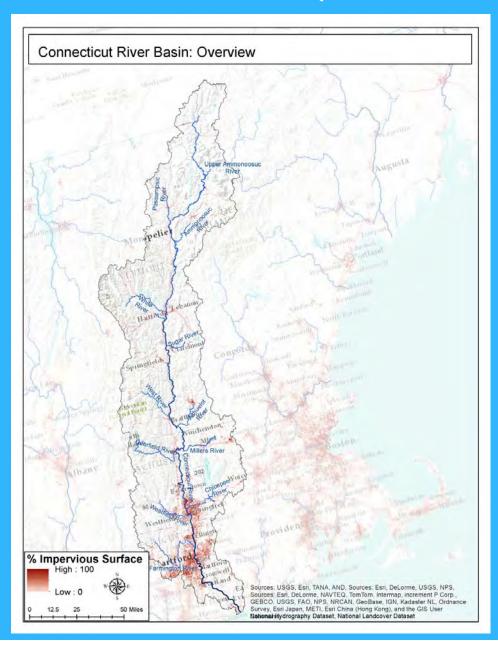
- Fish Passage Improvement at large dams
- Barrier removal and fish passage improvement
- Policy and demonstration projects for culverts
- Green infrastructure/LID for water quality

# Connecticut River





# Connecticut River (continued)



# Gilbert Stuart (aka Narrow River)

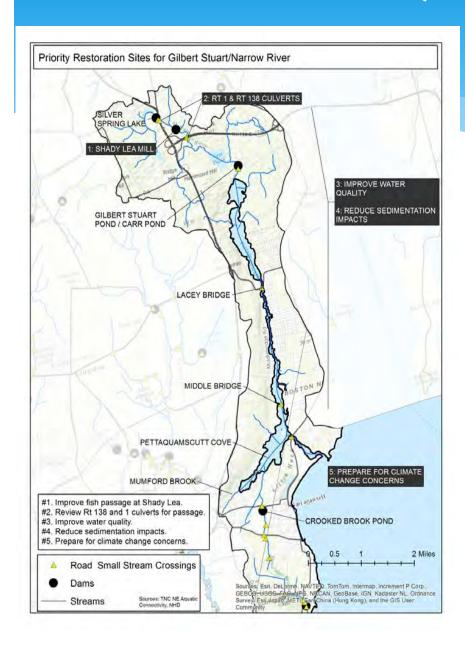
#### **Threats**

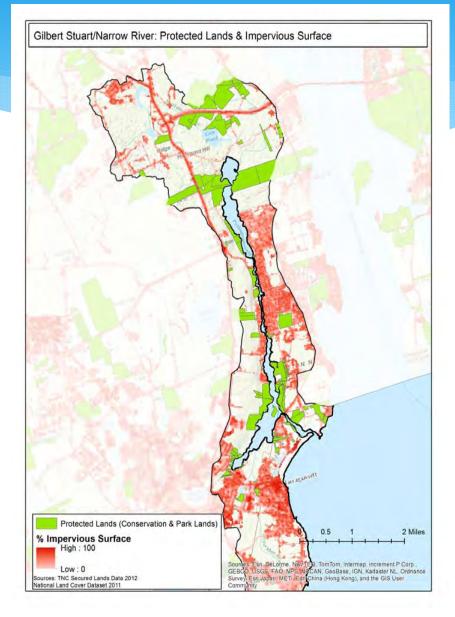
- Barriers
- Water Quality
- Ocean Bycatch
- Sedimentation
- Sea Level Rise

#### **Restoration Priorities**

- Fish Passage Improvement (dams and culverts)
- Improve water quality
- Reduce sedimentation
- Prepare for climate change

# Gilbert Stuart (aka Narrow River)



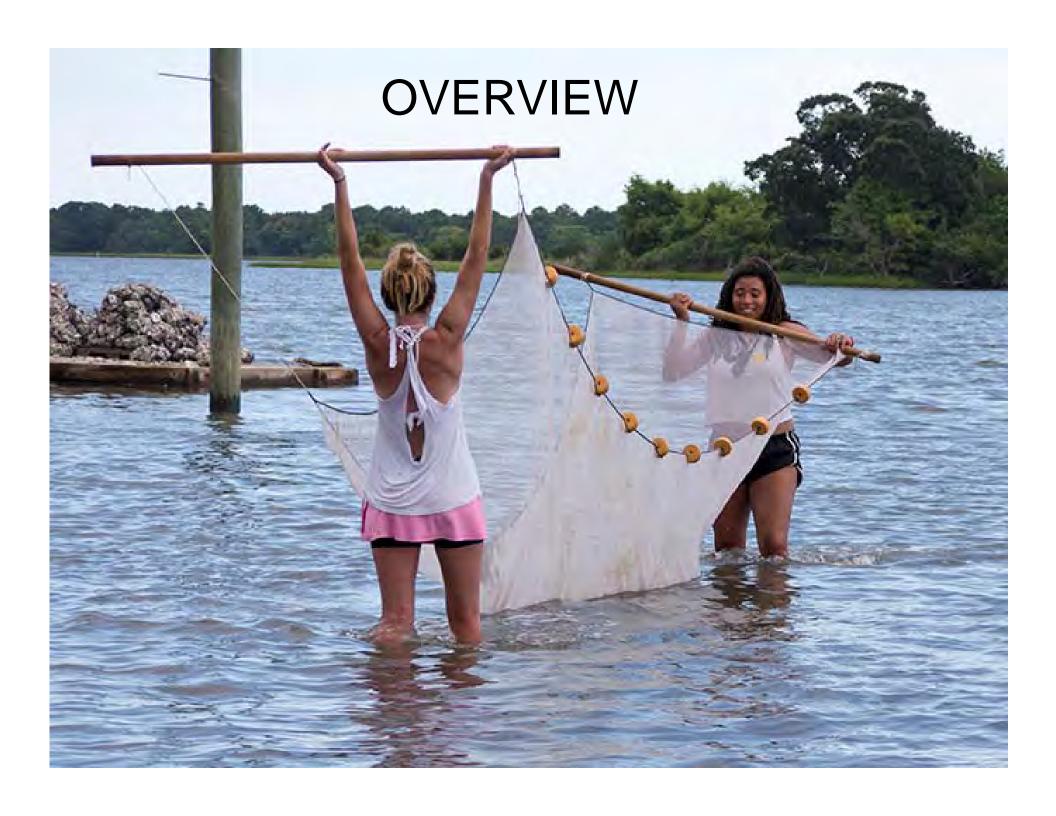






#### North Carolina Coastal Federation

Working Together for a Healthy Coast



# Our Mission



The N.C. Coastal Federation empowers coastal residents and visitors from all walks of life to protect and restore the water quality and critically important natural habitats of the N.C. coast.



# Bird's Eye

501(c)3 conservation nonprofit

Three offices: Manteo, Ocean, Wrightsville Beach (Raleigh)

30 staff—scientists, educators, planners, advocates

29-member volunteer board of directors—fishermen, bankers, lawyers, philanthropists, etc.

5,000+ volunteers and students annually

Dozens of federal, state, local and other partners



# Membership

Membership is open to anyone.

Currently more than 16,000 members and supporters.





# Budget

2015 operating budget: \$2 million

Restoration, protection and education projects: \$3.5 million





# Program Areas

- Restoring and preserving habitat and water quality
- Advocating for stronger environmental standards, laws and enforcement
- Educating students, community members and community leaders

North Carolina

Working Together for a Healthy Coast

# Restore and Preserve

- Oyster reef restoration
- Wetlands restoration: coastal marsh and large-scale wetlands
- Stormwater retrofits
- Living shorelines
- Land acquisition and easements
- Science: monitoring and modeling





# Advocate

- Champion low-impact development (LID)
- Advance natural beach preservation
- Support sensible coastal development and resource management
- Increase public access
- Support consistent and reasonable adoption and enforcement of laws, rules
- Safeguard estuarine shorelines



# Educate

- Accurate and timely information
- Hands-on learning
- Students, adults, professionals, governments

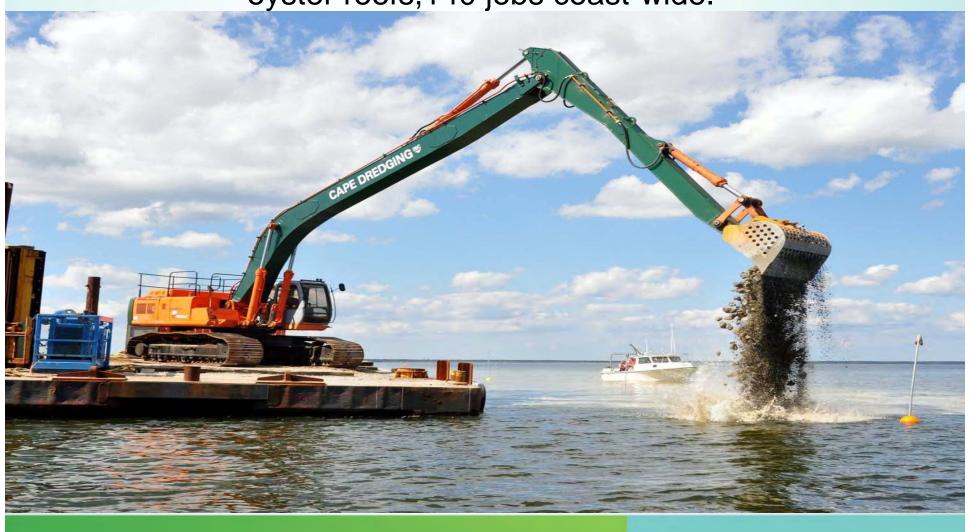
 Field trips, workshops, conferences, publications.





# Projects of Interest to ACFHP

\$5 million federal economic stimulus grant: over 60 acres of oyster reefs,140 jobs coast-wide.



#### Projects of interest to ACFHP

Mattamuskeet Drainage Association

- 42,500 acres
- Billions of gallons pumped annually
- Innovative partnership keeps runoff out of coastal waters, prevents subsidence



#### Projects of interest to ACFHP

- North River Farms
- 6,000 wetlands restoration
- More than 200 acres of shellfish waters opened





#### Projects of Interest to ACFHP: Environmental Restoration = Jobs



"Stimulus money funds oyster rehabilitation, jobs"



#### Stimulus money funds building local oyster reefs

Organizers hope restocking addresses oyster population shortage along coast



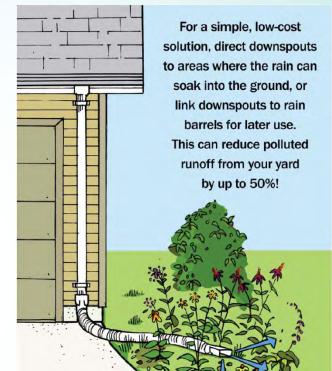
"It helps us in more ways than one," said Steven Galloway, 21. "It's work for now. It's good money. Then in a few years, we'll have more oysters and fish. It's sort of win-win all the way around."



# Projects of Interest to ACFHP: Low Impact Development (LID) & Smart Yards





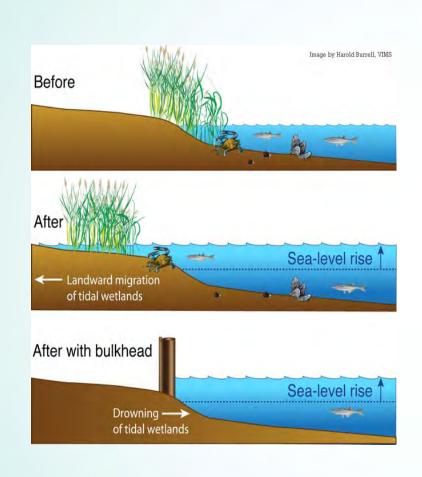






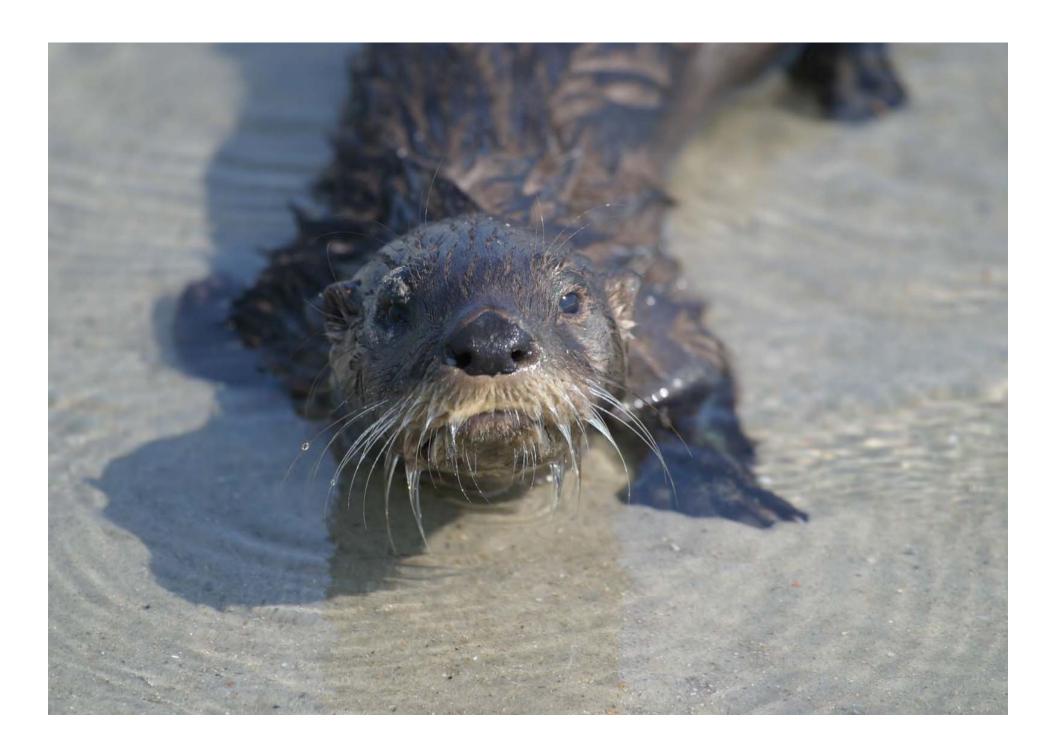
# Projects of Interest to ACFHP: living shorelines

Protect and restore natural vegetative buffers











#### WWW.COASTALREVIEW.ORG

Christine Miller, Assistant Director 3609 N.C. 24 (Ocean) Newport, NC 28570 252-393-8185

christinem@nccoast.org

#### ACFHP SCIENCE AND DATA NEEDS

C. Shumway (Chair)
Marek Topolski (Vice-Chair)
April 21, 2015

### ACFHP Science/Data Tasks

#### **MATRIX**

- Create searchable database (and map?) of species and references for matrix
- Improve matrix, incorporating rarity/vulnerability to climate change/(seasonality?)

#### **ASSESSMENT**

1. Improve assessment of existing information; add regional info

#### **WEB-BASED TOOL**

 Create decision-support tools that incorporate NALCC modeling, matrix, and assessment

# Current Members, Science and Data Committee

- \* Jeff Beal
- \* Alison Bowden
- \* Michael Celestino
- \* Jaclyn Daly
- \* Mari-Beth Delucia
- \* Julie Devers
- \* Roman Jesien
- \* Dan Kircheis

- \* Danielle Kreeger
- \* Jacob Kritzer
- \* William Lellis
- \* Rachel Muir
- \* David (Moe) Nelson
- \* David O'Brien
- \* Jay Odell

- Willian Shadel
- \* Caroly Shumway
- \* Albert Spells
- Marek Topolski
- \* Robert van Dolah
- i Alan Weaver
- \* Bartholomew Wilson
- Craig Woolcott

## Proposed Timeline

- Agree on Sci/Data Tasks (Steering Committee)
- Check with current members to see if want to remain on committee
- Set up Conference Call (May); In-Person meeting (June) date and location; assign subcommittees
- Follow-up with subcommittees

## **Grassy Flats Restoration Project**



Kent Smith, Florida Fish and Wildlife Conservation Commission

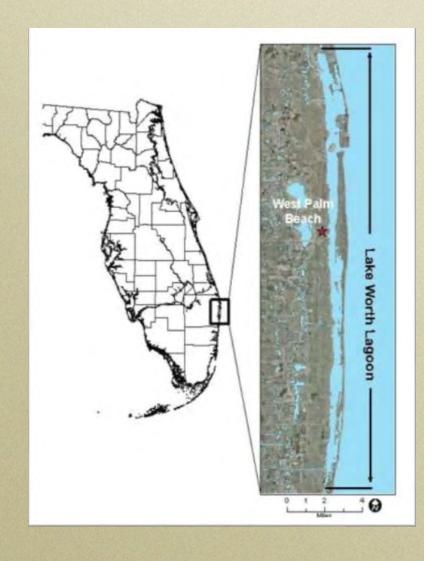
Eric Anderson, Project Manager, Palm Beach County Department of Environmental Resources Management





## Lake Worth Lagoon

- Located between Village of North Palm Beach and the Town of Ocean Ridge
- 20 mi long, ½ mi wide,
  6-10' deep
- Resources include:
  - 1,689 acres of seagrass
  - 283 acres of mangroves
  - 5 acres of oysters





## Muck in the Lake Worth Lagoon

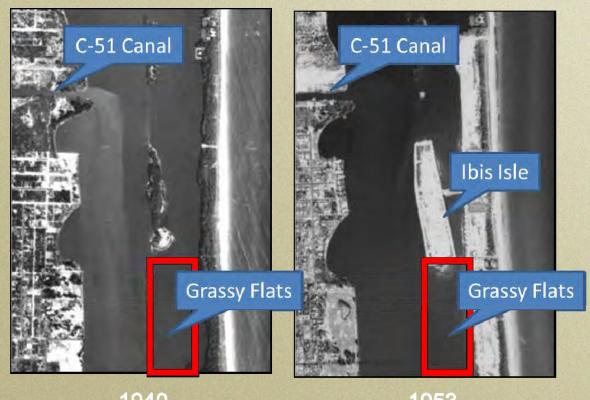
- Fine-grained, organic rich sediment
- Primarily from stormwater discharge
- Blankets natural sand substrate
- Reduces available benthic habitat
- Decreases biodiversity

Easily re-suspended



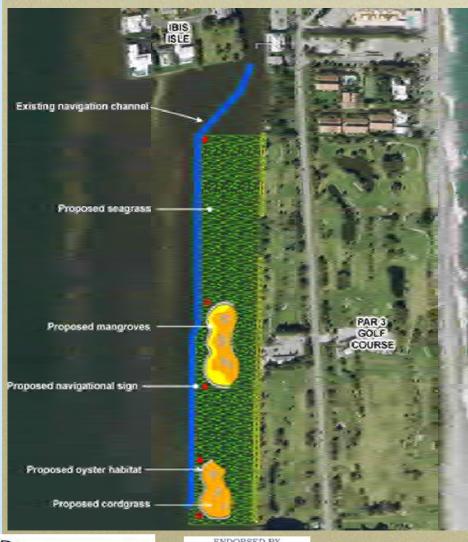
#### Stormwater Discharges

 Main source of stormwater discharge is C-51 Canal, just northwest of project site



1940 1953





Grassy Flats

Partners sharing cost \$3.4 million

- •USFWS (\$777K)
- •FDEP / NOAA (\$110K)
- •USACE (\$842K)
- •LWLPP FDEP (\$960K) FLORID
- PBC (\$800K)
- •FWC (in-kind)
- •WPBFC (in-kind)
- •MIA (in-kind)





US Army Corps of Engineers.





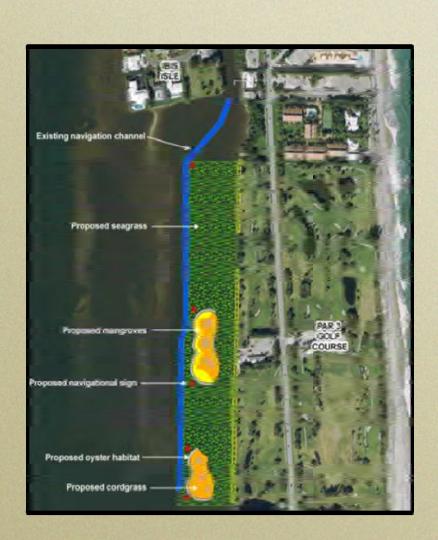


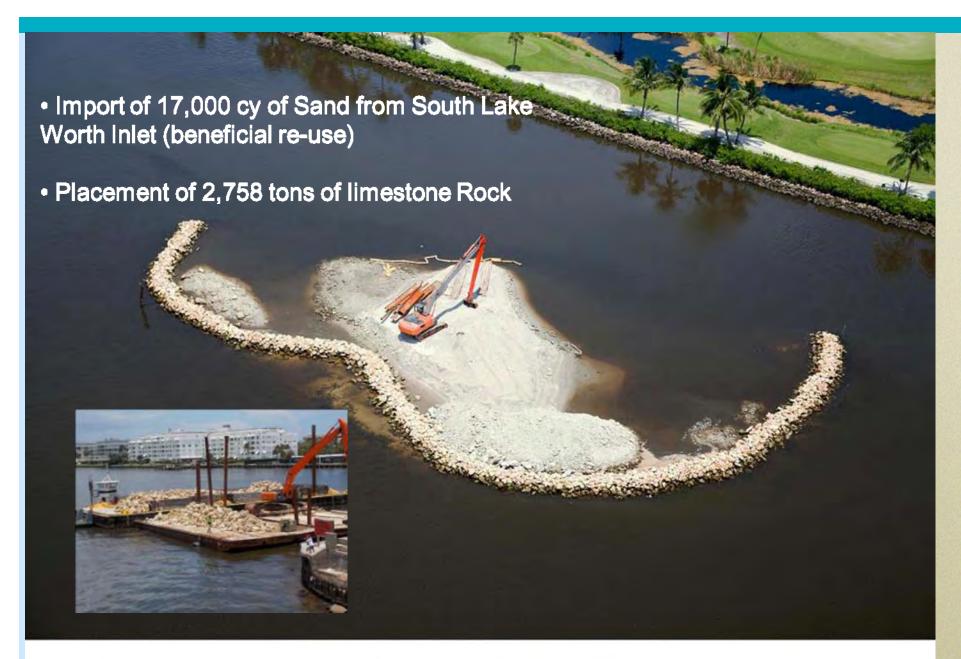




#### **Project Goals**

- Place approximately 52,000 cubic yards of sand over 12.2 acres to cap muck sediments and construct two islands
- Create 10.5 acres of seagrass habitat, 1.1 acres of salt marsh, 0.3 acres of mangroves, 0.3 acres of tidal flats, and 0.6 acres of artificial reef/oyster habitat
- Place approximately 2,800 tons of limestone rock to stabilize the two islands and provide a hard surface for the growth of oysters
- Plant approximately 2,900 red mangroves and 25,000 plugs of smooth cordgrass





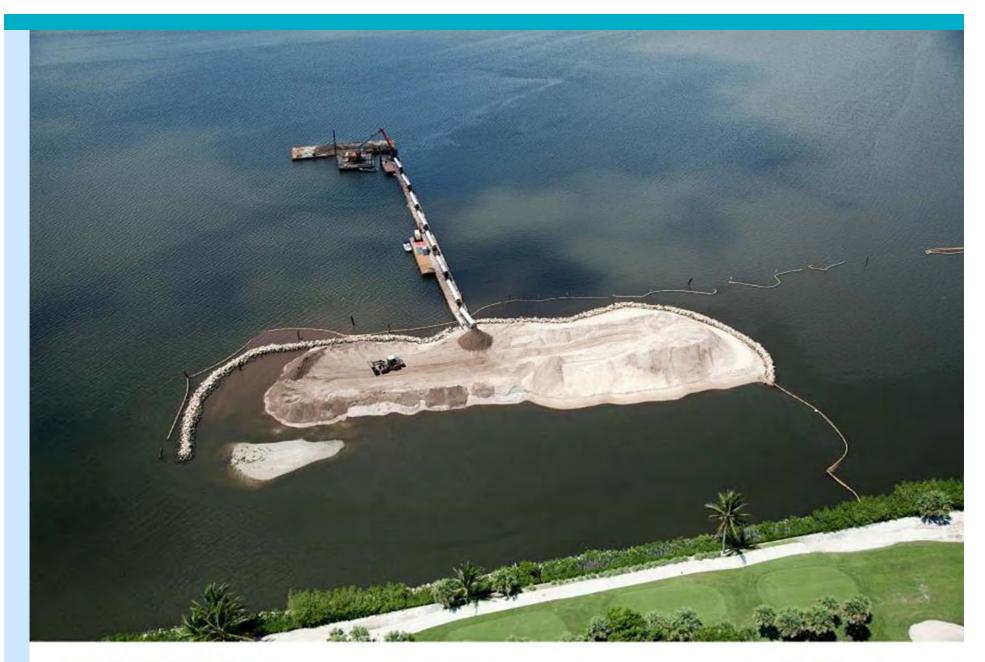


















- Create 10.5 acres
   of seagrass habitat
   by capping muck
   sediments
- 166 50' x 50' grids
- Broadcasted sand in 100 grids



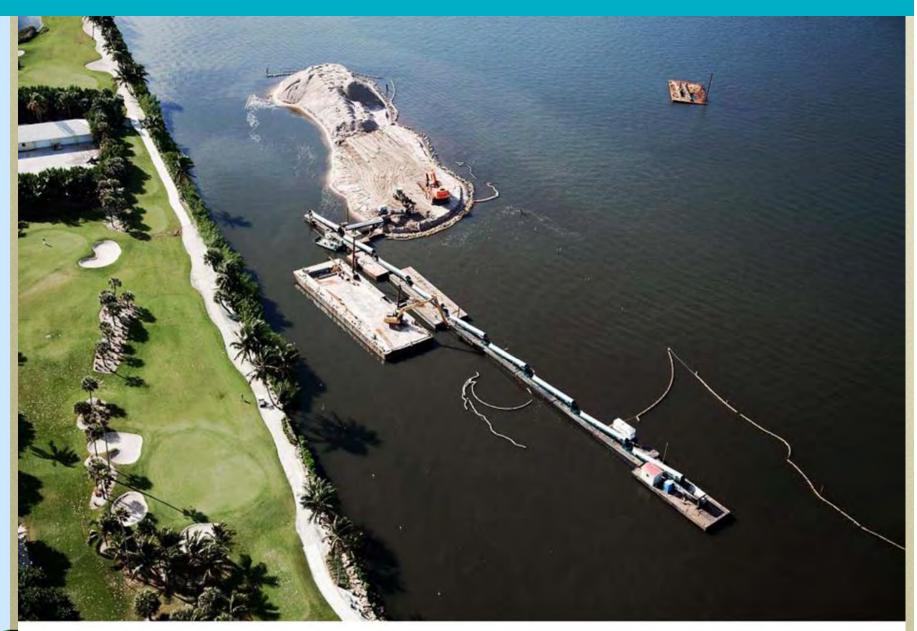






- 2 long stick excavator
- 1 transport barge









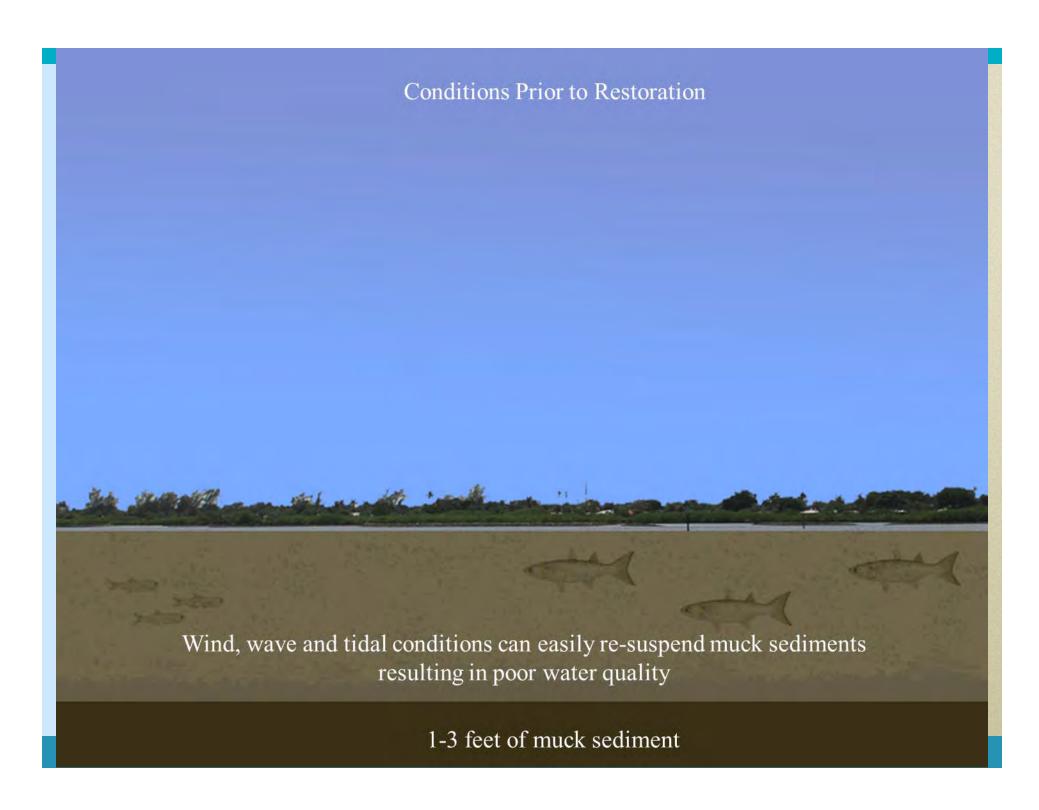




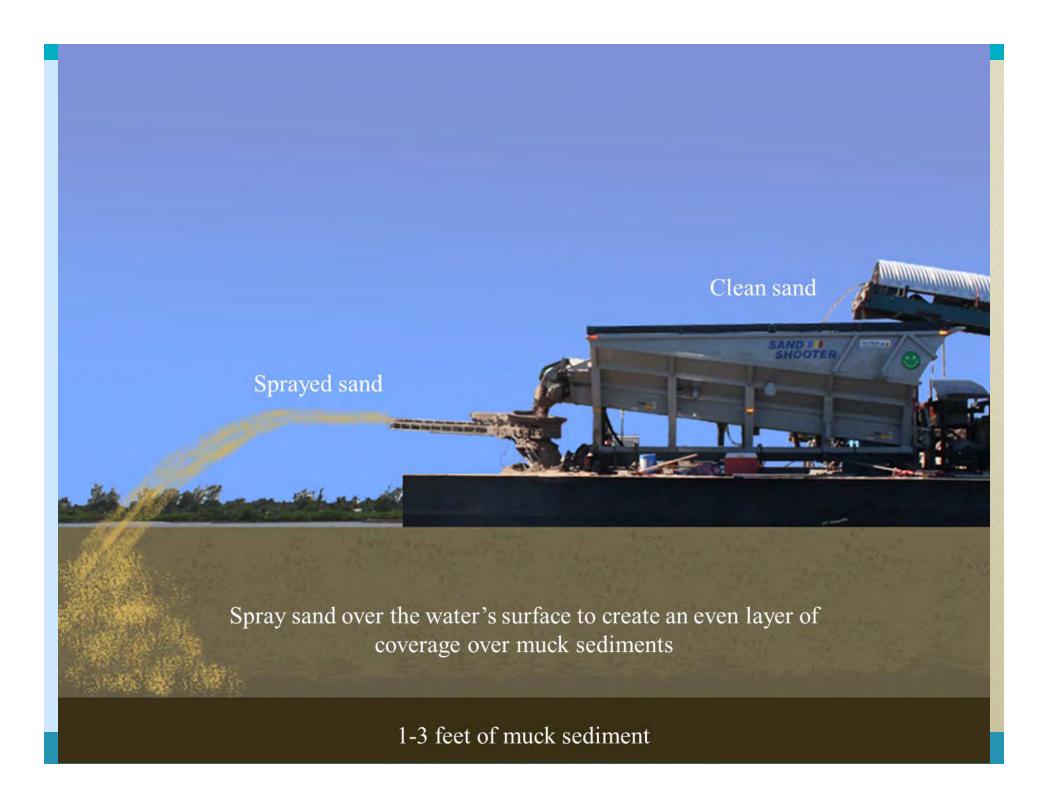
## **Muck Capping Process**

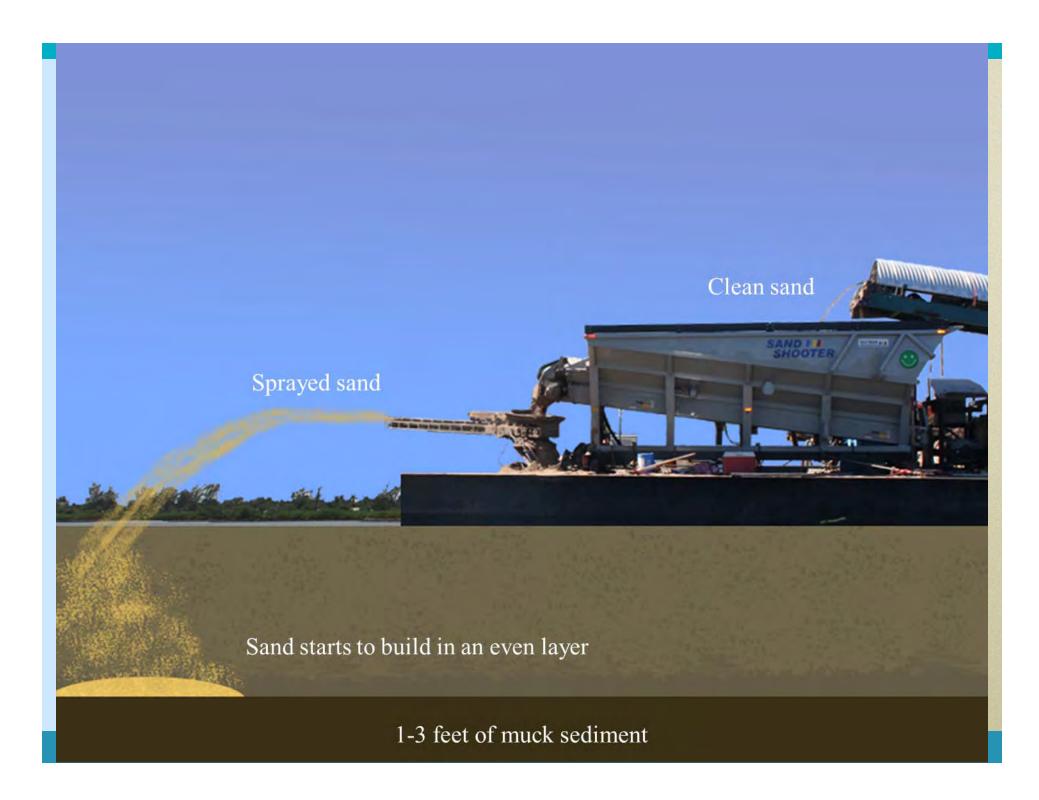


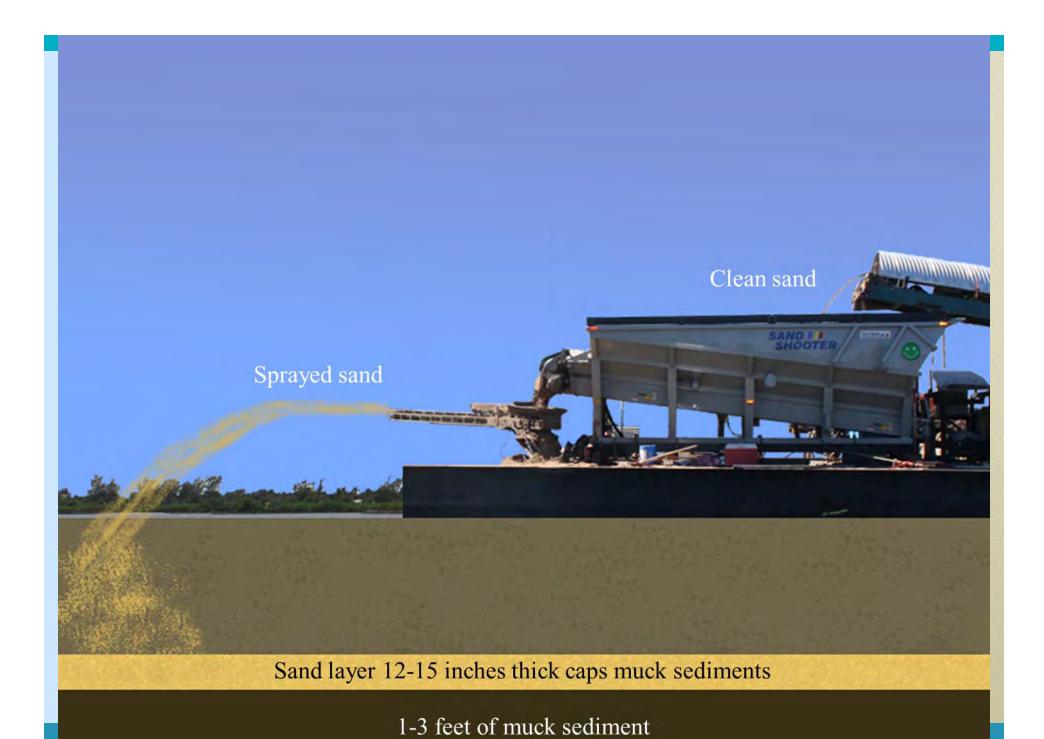












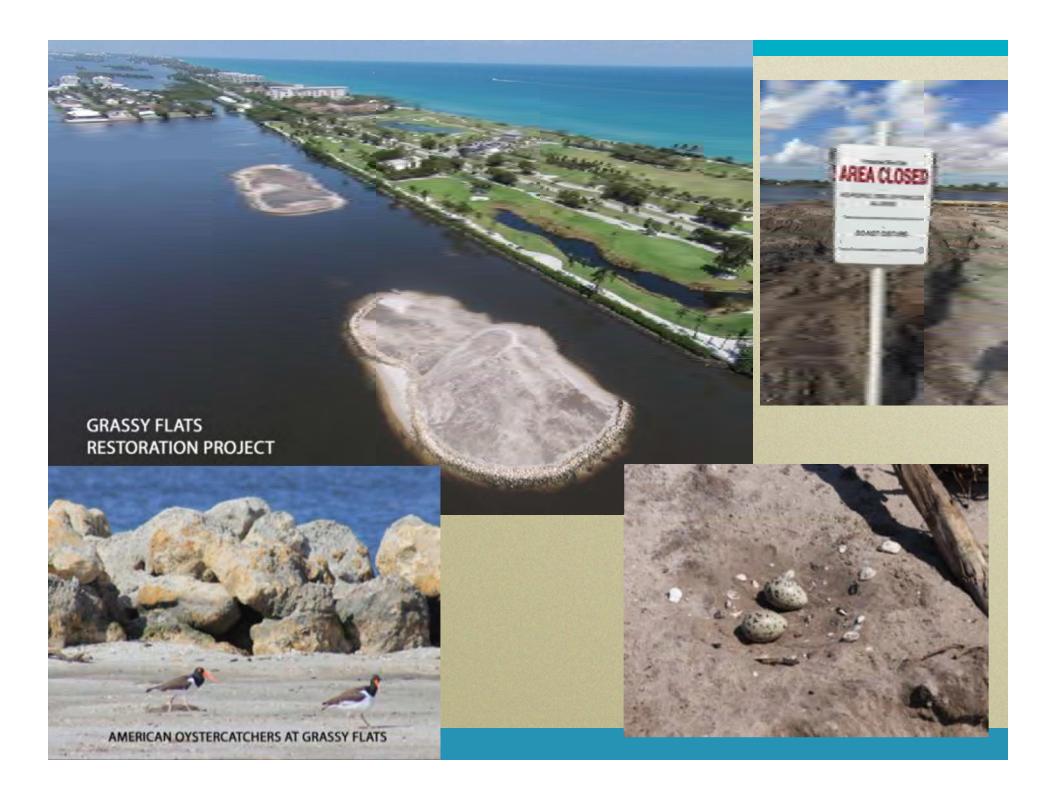


Water quality improves as muck layer is capped by sand and is no longer re-suspended

Sand layer 12-15 inches thick caps muck sediments

1-3 feet of muck sediment





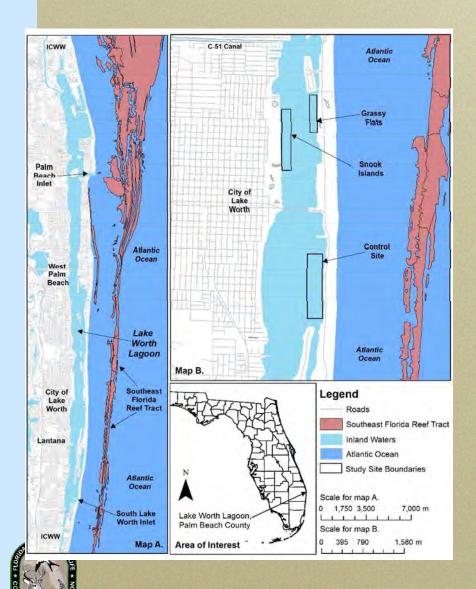
# FWC and FAU Fisheries Monitoring in Lake Worth Lagoon







#### Goal



• Assess utilization Grassy
Flats restoration project
site by juvenile and adult
fish species common in
the Central Lake Worth
Lagoon.

### Methods

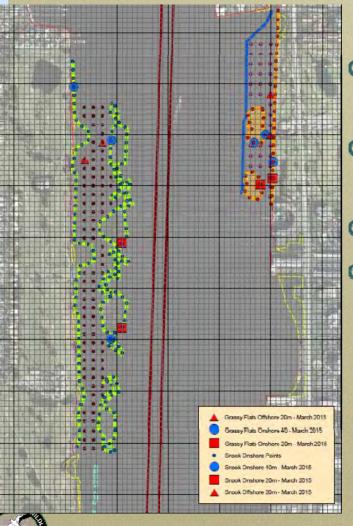




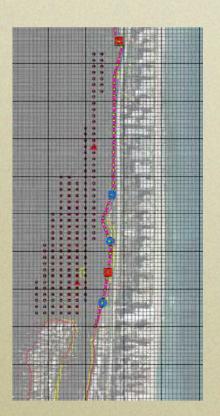




#### Methods

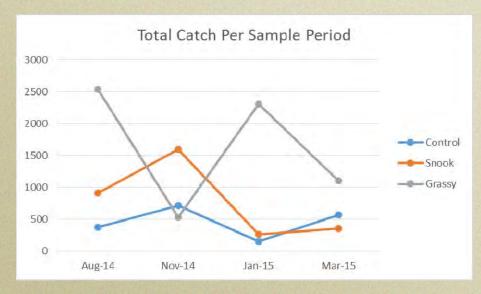


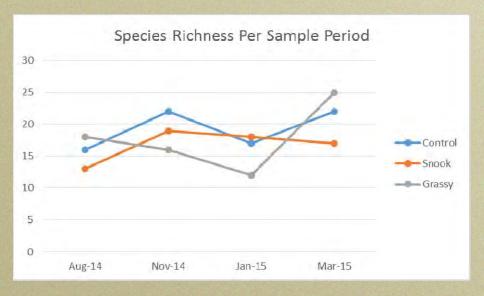
- Events in Aug `14, Nov
   `14, Jan `15, & Mar `15.
- o 21.3 m seine and a 40 m seine
- Inshore and offshore
- Sites: Grassy Flats,
   Snook Islands
   (established restoration site), Control Site



### Preliminary 1st Year Results

- o 11,463 fish over 4 events.
- 58 species of fish total.
  - Not including 3 blue crab species, and 1 shrimp.
- 96% of catch is composed of bay anchovy, menhaden, mojarras, scaled herring, and checkered puffers.







## Preliminary 1st Year Results

Harengula jaguana

Hippocampus erectus Jenkinsia lamprotaenia

Lagodon rhomboides Leiostomus xanthurus

Lobotes surinamensis

Lutjanus griseus Membras martinica

Menidia spp.

Microgobius thalassinus

Micropogonias undulatus

Muail cephalus

Muail curema

Mugil rubrioculus

Oligoplites saurus

Opisthonema oglinum

Orthopristis chrysoptera

Prionotus tribulus

Sciaenops ocellatus

Scorpaena plumieri

Selene vomer

Sphoeroides nephelus

Sphoeroides testudineus

Sphyraena barracuda

Strongylura marina

Strongylura notata

Synodus foetens

Trachinotus falcatus

Scaled herring

Lined seahorse

Rough silverside

Atlantic croaker

White mullet

Letheriacket

Pigfish

Red drum

Lookdown
Southern puffer

Red eye mullet

Bighead searobin

Spotted scorpionfish

Checkered pufferfish

Great barracuda
Atlantic needlefish

Redfin needlefish

Inshore lizardfish

Species Richness

Permit Total Catch

Flathead grey mullet

Atlantic thread herring

Pinfish

Tripletail Grey snapper

Silversides

Green goby

Spot

Dwarf round herring

54

1

2

1

6

27

2

49 9

4

4

3147

35

1

1

10

24

1

22

29

1

3

111

6495

40

Scientific Name	Common Name	Grassy Flats	Snook Islands	Control
Achirus lineatus	Lined Sole	7		1
Albula vulpes	Bonefish	3		2
Anchoa hepsetus	Broad-striped anchovy		1	
Anchoa mitchilli	Bay anchovy	4878	797	416
Archosargus probatocephalus	Sheepshead	1	3	7
Ariopsis felis	Hardhead sea catfish	8		
Bathygobius soporator	Frillfin goby		1	
Brevoortia spp.	Menhadens	380	1	310
Calamus spp.	Porgies	1		
Caranx latus	Horse-eye jack		2	7
Centropomus undecimalis	Common Snook	5	3	
Chilomycterus schoepfii	Striped burrfish	1	1	5
Citharichthys spilopterus	Bay Whiff	3	1	3
Ctenogobius boleosoma	Darter goby	3	6	5
Ctenogobius smaragdus	Emerald goby	3		
Cynoscion nebulosus	Spotted seatrout	2	1	
Dasyatis sabina	Atlantic Stingray	1	2	2
Diapterus auratus	Irish mojarra	439	331	96
Diodon holocanthus	Longspined porcupinefish		1	
Elops saurus	Ladyfish	1		
Eucino stomus gula	Jenny mojarra	134	9 <b>7</b> 1	333
Eucinostomus jonesii	Slender mojarra	2	9	8
Eucinostomus harengulus	Tidewater mojarra	50	469	179
Eucinostomus spp.	Mojarras	339	3 <b>7</b> 0	167
Eugerres plumieri	Striped mojarra	1		
Gastropsetta frontalis	Shrimp flounder		2	
Gerres cinereus	Yellow fin mojarra		4	
Gobionellus oceanicus	Highfin goby	7		1
Gobiosoma bosc	Naked Goby			1
Haemulon parra	Sailor's grunt		1	

#### Note:

• 3 Bonefish at Grassy (caught after construction)

5 Snook at Grassy (2 caught during construction and 3 after construction)



