Update on Atlantic Coastal Fish Habitat Partnership Science and Data Initiatives

South Atlantic Fishery Management Council Habitat Advisory Panel Meeting
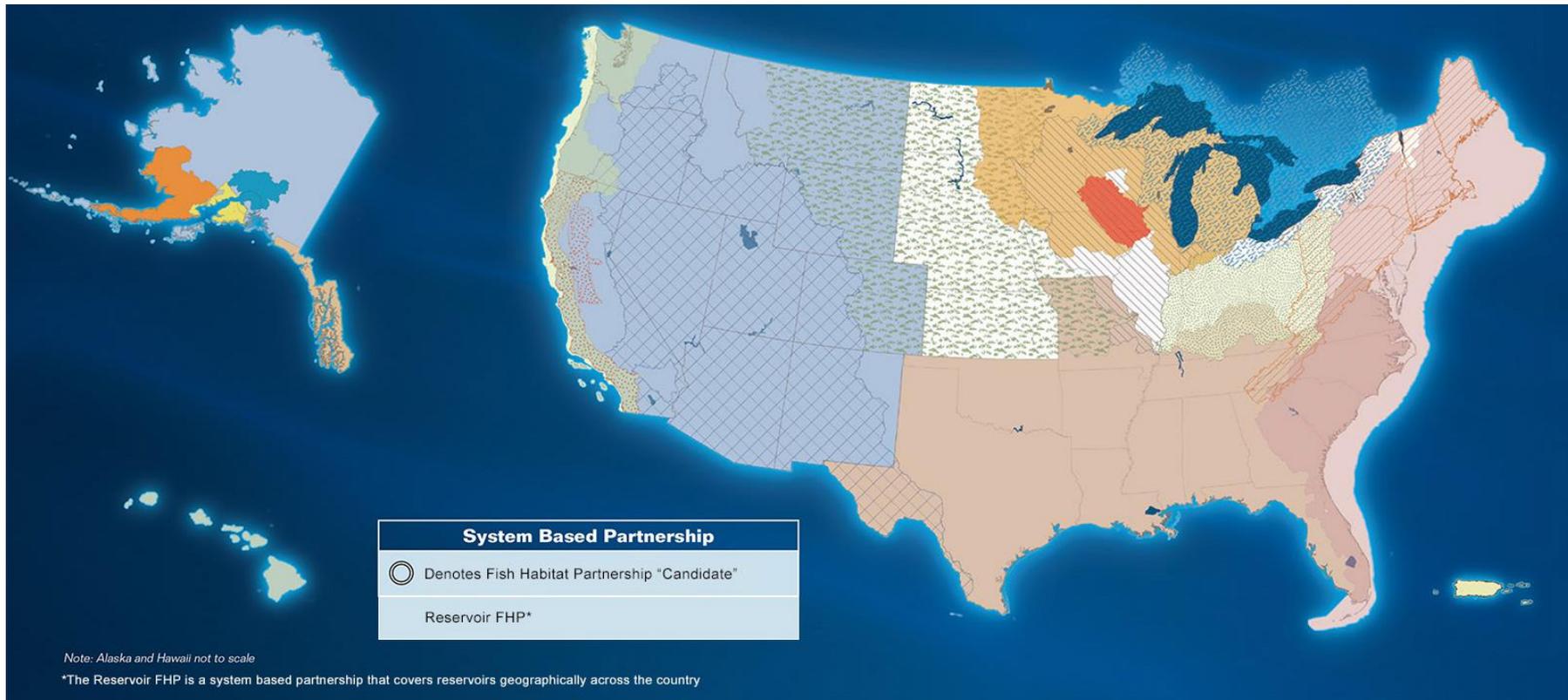
St. Petersburg, Florida

November 6 – 8, 2018

Lisa Havel, ACFHP Coordinator

A Quick Background…

- National Fish Habitat Action Plan developed in 2001
- Attempts to address loss & degradation of fish habitat
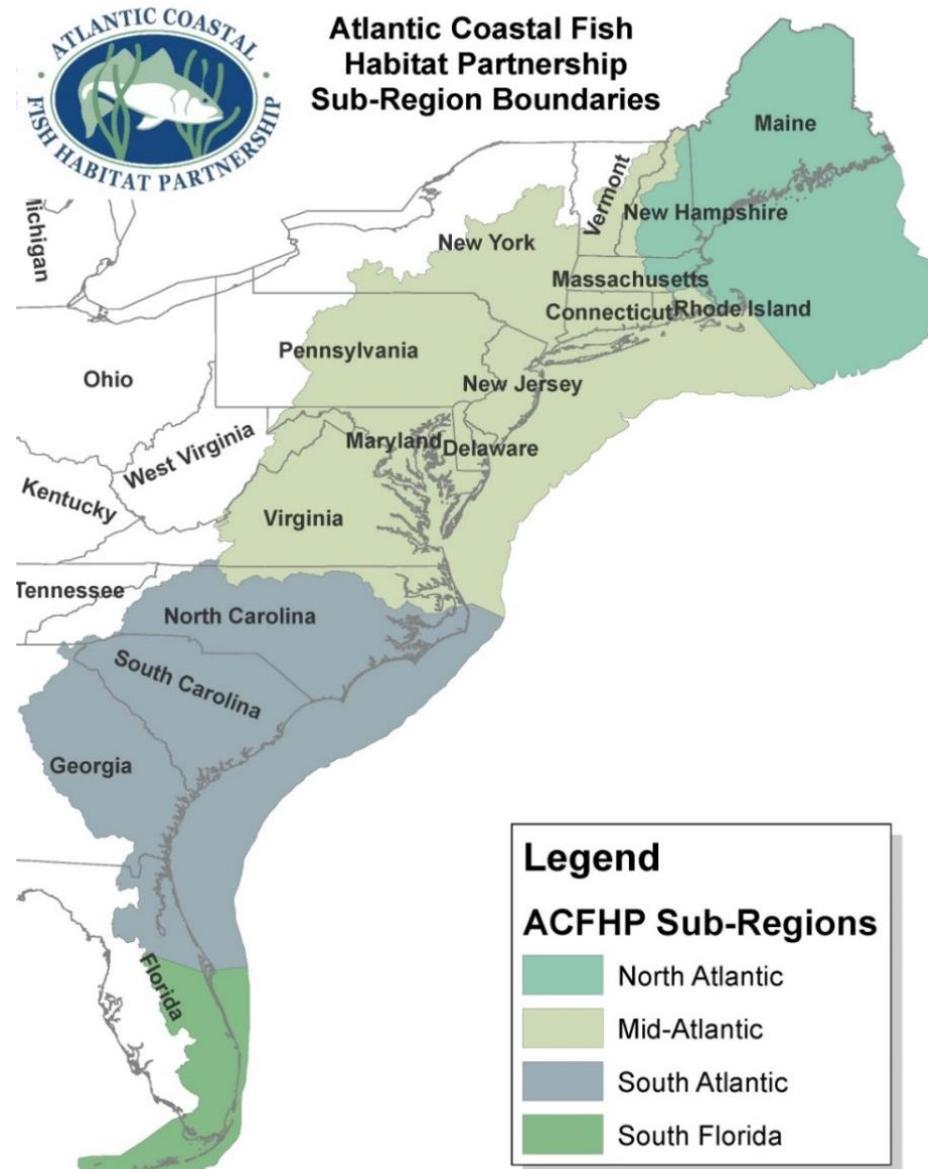- 20 regional partnerships under national umbrella

System Based Partnership

◎ Denotes Fish Habitat Partnership "Candidate"

Reservoir FHP*

Note: Alaska and Hawaii not to scale

*The Reservoir FHP is a system based partnership that covers reservoirs geographically across the country

A Quick Background…

Atlantic Coastal Fish Habitat Partnership

Mission

To accelerate the conservation, protection, restoration, and enhancement of habitat for native Atlantic coastal, estuarine-dependent, and diadromous fishes through partnerships between federal, tribal, state, local, and other entities

Atlantic Coastal Fish Habitat Partnership Sub-Region Boundaries

Legend
ACFHP Sub-Regions
- North Atlantic
- Mid-Atlantic
- South Atlantic
- South Florida

Date: 5/1/2011   Author: George E. Schuler

A Quick Background…

The ACFHP Region

- Over 25% of the U.S. population
- Nine o...
- The la...
- The m...
- The la...
- The o...
- The la...
- The o...
- Fish co...
  temperate to tropical Atlantic
- Four national marine sanctuaries and one National Monument
- Most marine habitat of any Fish Habitat Partnership
- One of the most rapidly warming areas in the world

Strong interactions between people and fish habitat

Making the Connection

From the headwaters to the continental shelf

Between fish and people

Among partners

Making the Connection
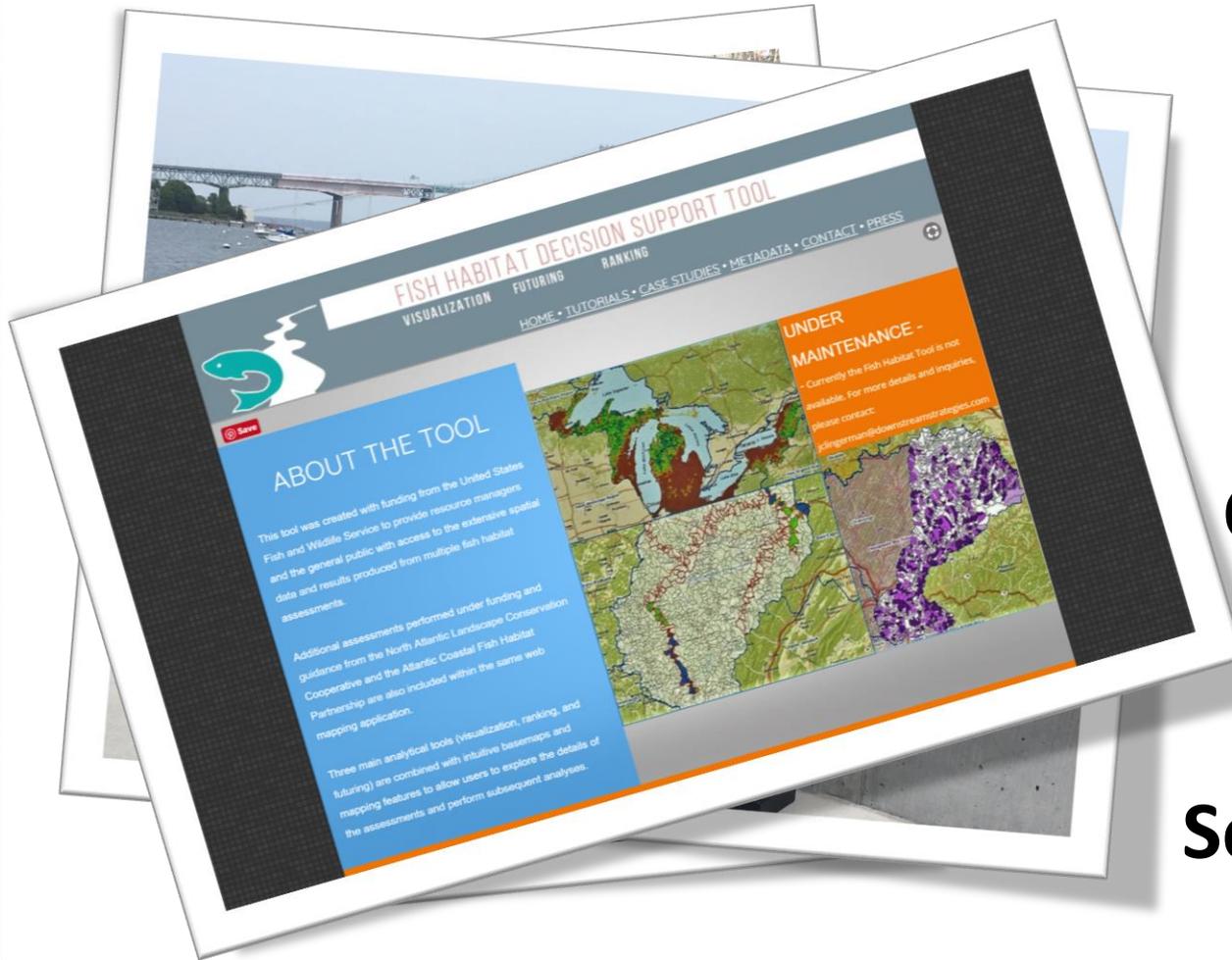
On the Ground Conservation

Outreach and Communication

Science and Data

A Quick Background…

ACFHP Accomplishments over past five years

- Coordinated the development of the estuarine and diadromous portions of the Fish Habitat Decision Support Tool
- Opened 75 river miles and restored over 25 acres of SAV, tidal vegetation, and oyster reefs
- Increased communication and collaboration among over 60 different federal, state, county, local, academic, tribal, non-profit, private, and conservation entities
- Contributed over $400,000 directly to conservation projects, leveraging over $4 for each ACFHP restoration dollar
- Added an estimated $41 million economic value to the Atlantic Coast
- Published Species-Habitat Matrix*

Species-Habitat Matrix

- A tool for evaluating the relative importance of a specific habitat type to a given life history stage for an individual species

- Assess importance of habitat in terms of:
  - Shelter
  - Direct trophic links
  - Spawning
  - Nurseries

Species-Habitat Matrix

- The Species-Habitat Matrix is **not**:

    An assessment of either the status or the full ecological importance of these habitats in terms of:
    - Nutrient processing
    - Securing sediments
    - Maintaining water quality (filtration, etc.)
    - Broader trophic linkages

Species-Habitat Matrix

- The Species-Habitat Matrix does **not address**:
  - o All species or habitats
  - o The natural rarity of a habitat type
  - o Habitat trends
  - o Pelagic habitats

Species-Habitat Matrix

- ## Separate matrices for 4 subregions
  - o Different geographical assemblages
  - o Geographic variation in habitat use (and availability)

- Regional leads assembled teams of experts, each assigned a set of species

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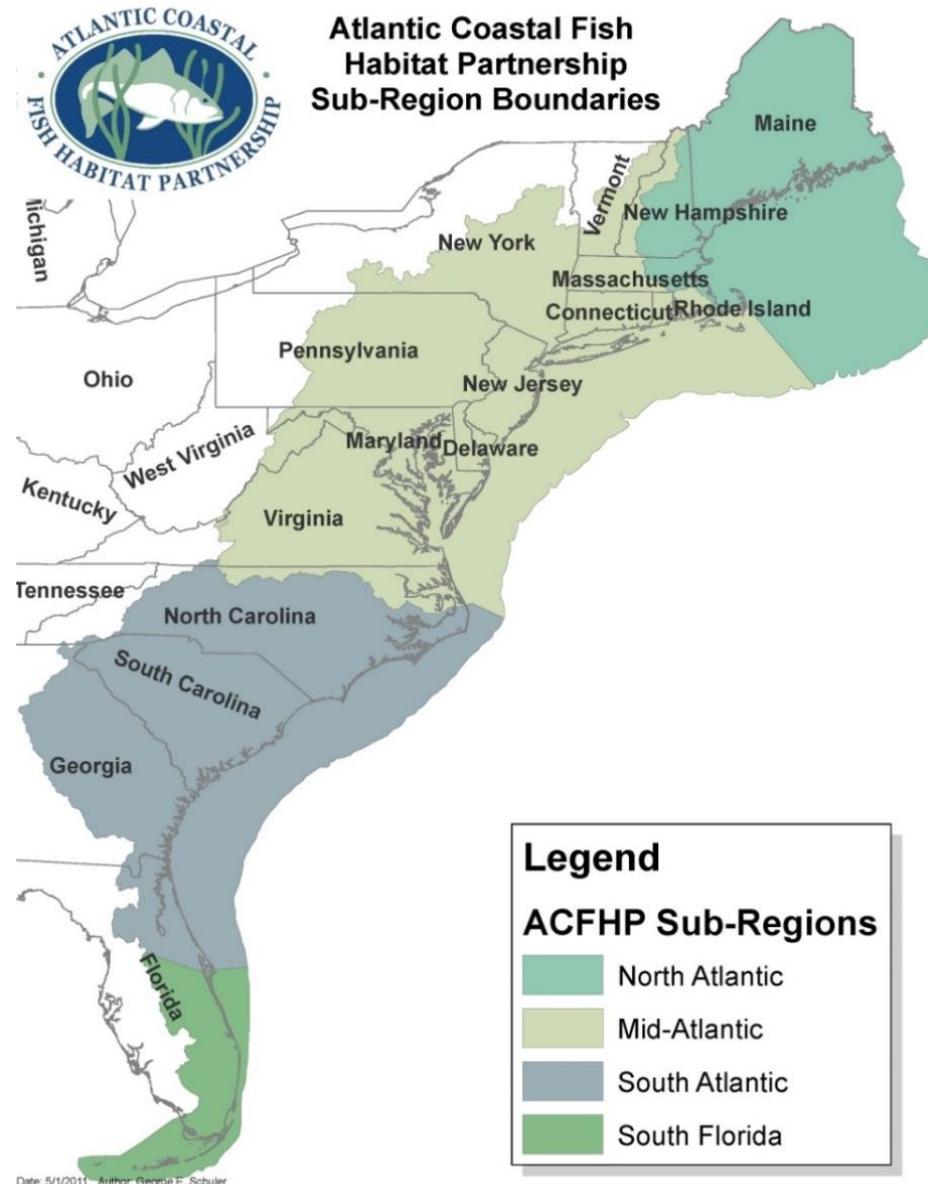
Species-Habitat Matrix

- 131 different species across four regions
  - All ASMFC-managed species
  - All Council-managed species
  - All other native diadromous species
  - Select state-managed and unmanaged species
  - Not included: bivalves and species without a marine or estuarine life stage
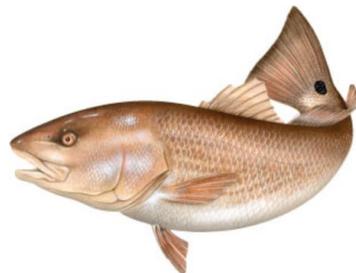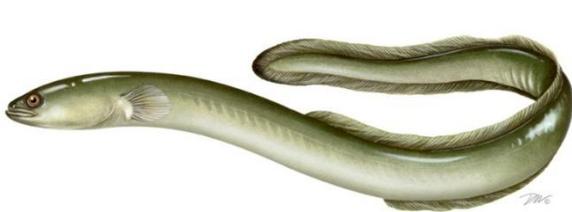
Species-Habitat Matrix

- Life stages
  - Eggs – Larvae
  - Juvenile/Young of Year (YOY)
  - Adults
  - Spawning Adults
    - Only if fundamentally different from adult, non-spawning habitat

Species-Habitat Matrix

Habitats

- Marine & estuarine shellfish beds
  - oyster aggregations/reef
  - Dead shell accumulations
  - Scallop beds
  - Hard clam beds
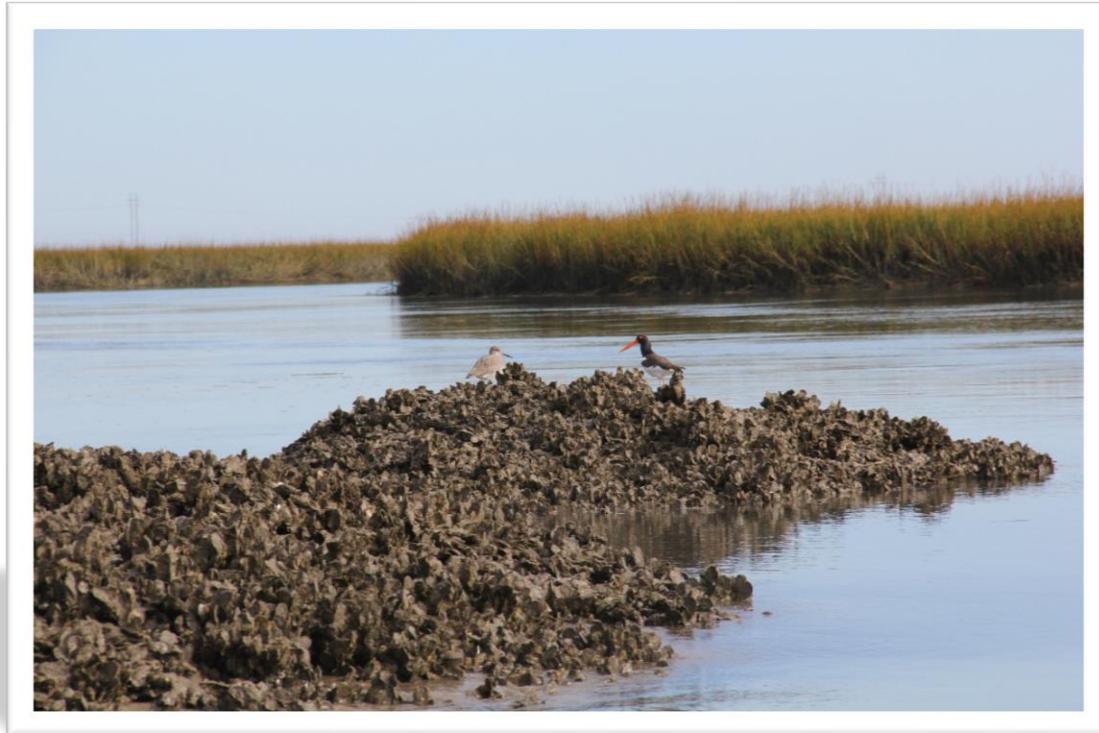
Species-Habitat Matrix

Habitats

- Coral and live/hard bottom
  - Coral reefs
  - Patch reef, soft corals, or anemone
  - Live rock

January Murray

Species-Habitat Matrix

Habitats

- Macroalgae
  - *Fucus* spp.
  - *Laminaria* spp.
  - *Ulva lactuca*

Stemonitis on en.wikipedia

Species-Habitat Matrix

[Habitats](#)

- Submerged aquatic vegetation
    - Tidal fresh & oligohaline spp.
    - Mesohaline & polyhaline spp.

January Murray

Species-Habitat Matrix

Habitats

- Tidal vegetation
  - Estuarine emergent marsh
  - Tidal freshwater marsh
  - Mangrove

USFWS

Species-Habitat Matrix

Habitats

- Unvegetated coastal bottom
  - Loose fine bottom
  - Loose coarse bottom
  - Firm hard bottom
  - Structured sand habitat

Wikipedia.org/Simm Sepp

Species-Habitat Matrix

Habitats

- Riverine bottom
  - Higher gradient headwater tributaries
  - Lower gradient tributaries
  - Higher gradient large mainstem rivers
  - Lower gradient large mainstem rivers
  - Low order coastal streams
  - Non-tidal freshwater mussel beds
  - Coastal headwater ponds
  - Non-tidal freshwater marsh

Species-Habitat Matrix

Scoring and analysis

- 1 team lead + team members for each region
- Each finding was cited at least once
- Team lead compiled and combined results for 1 matrix/region
- Ranks:
  - Very high (4): essential contributor
  - High (3.5): primary habitat
  - Moderate (2): 1 of many habitats used
  - Low (1): used incidentally
  - Unknown (to science)
  - Blank: not present

Species-Habitat Matrix

Publication

- *BioScience* April 2016
- Kritzer et al.
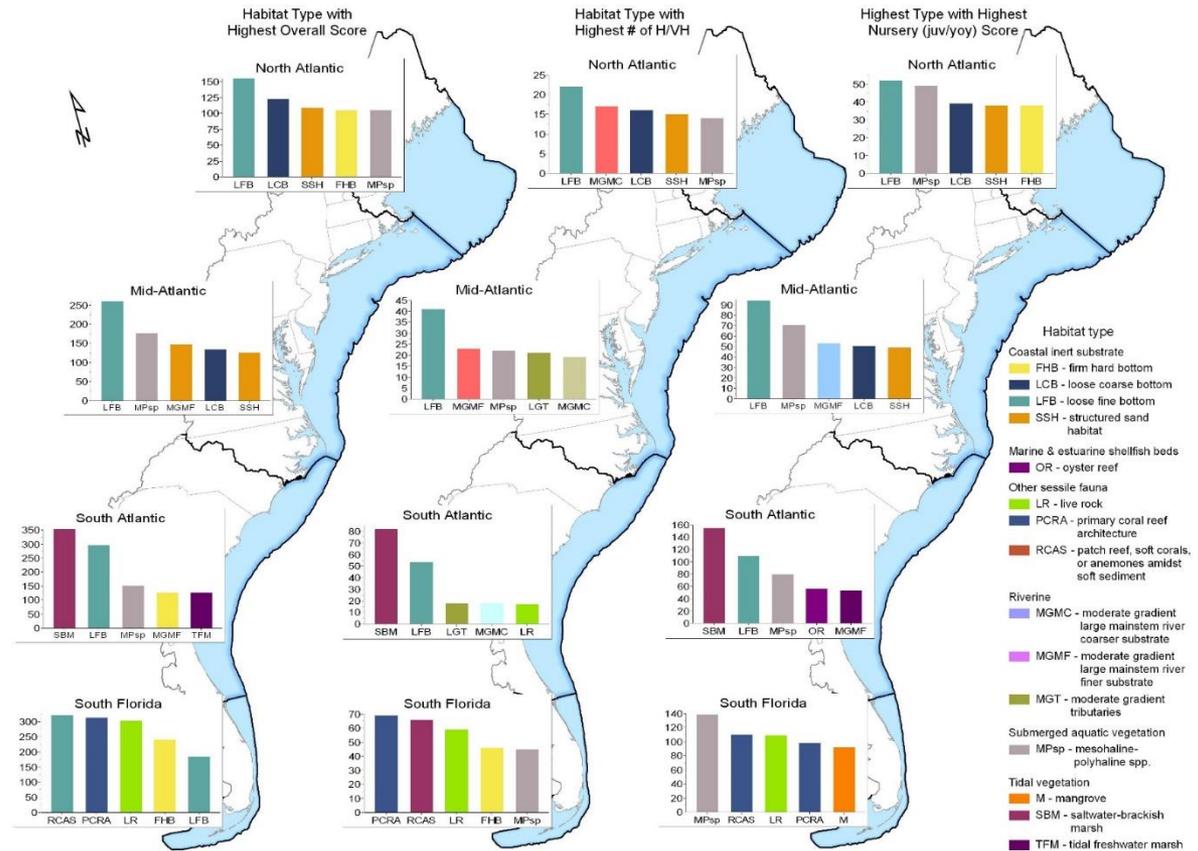
Species-Habitat Matrix

[Online Query Database](#)

- Available December 2018

Species-Habitat Matrix

Species	Region	Habitat Category	Habitat Type	Life Stage	Rank	Numeric Rank
	×South Atlantic / ×South Florida	×Submerged Aquatic Vegetation		×Egg & Larva / ×Juvenile & Young-of-Year		
American Eel	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Medium	2.00
American Eel	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Juvenile & Young-of-Year	Medium	2.00
American Shad	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Medium	2.00
American Shad	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Juvenile & Young-of-Year	High	3.50
Atlantic Croaker	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Medium	2.00
Atlantic Croaker	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Juvenile & Young-of-Year	Medium	2.00
Atlantic Menhaden	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Egg & Larva	Low	1.00
Atlantic Menhaden	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Low	1.00
Atlantic Menhaden	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Egg & Larva	Low	1.00
Atlantic Menhaden	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Juvenile & Young-of-Year	Low	1.00
Atlantic Sharpnose Shark	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Low	1.00
Atlantic Sharpnose Shark	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Juvenile & Young-of-Year	Low	1.00
Atlantic Silverside	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Egg & Larva	High	3.50
Atlantic Silverside	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Medium	2.00

Priority Habitats

North Atlantic

- Riverine bottom
- Shellfish beds
- SAV

Mid- & South Atlantic

- Riverine bottom
- Shellfish beds
- SAV
- Tidal vegetation

South Florida

- SAV
- Tidal vegetation
- Coral and live/hard bottom

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SE Fish Habitat Conservation Mapping
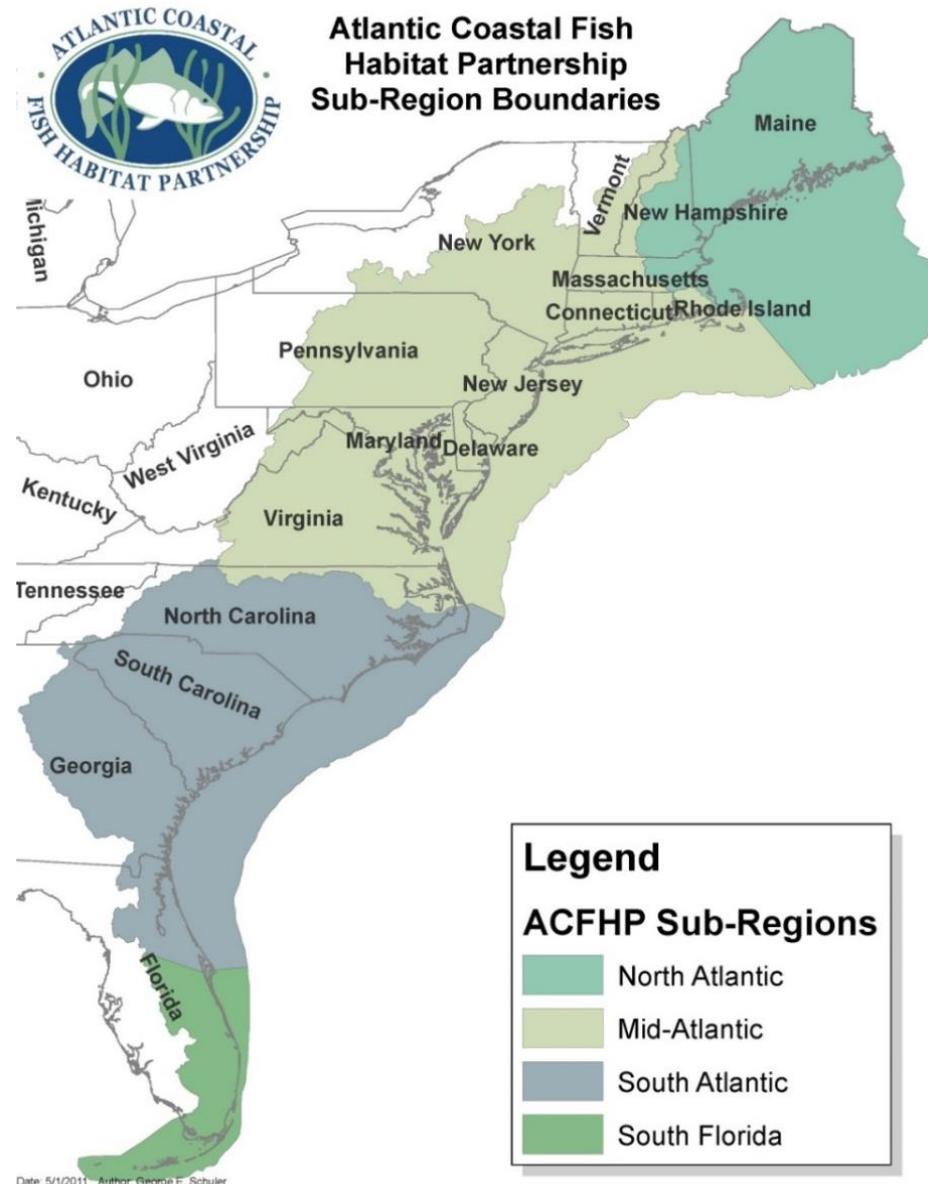
Objective

To spatially prioritize fish habitat protection and restoration sites through GIS mapping and analyses for the southeast region of the U.S. from NC to FL

Expected Outcome

To help ACFHP and partners identify where best to invest efforts and future project funds.

SE Fish Habitat Conservation Mapping

Compile existing GIS layers and maps

- List of over 100 data layers covering the Southeast
  - Habitats (e.g. artificial reefs and benthic cover)
  - Indicators (e.g. EFH areas, marsh extent, coastal condition)
  - Threats (e.g. 303(d) sites and impervious surface)
  - Fish presence (e.g. acoustic tagging, trawl data)
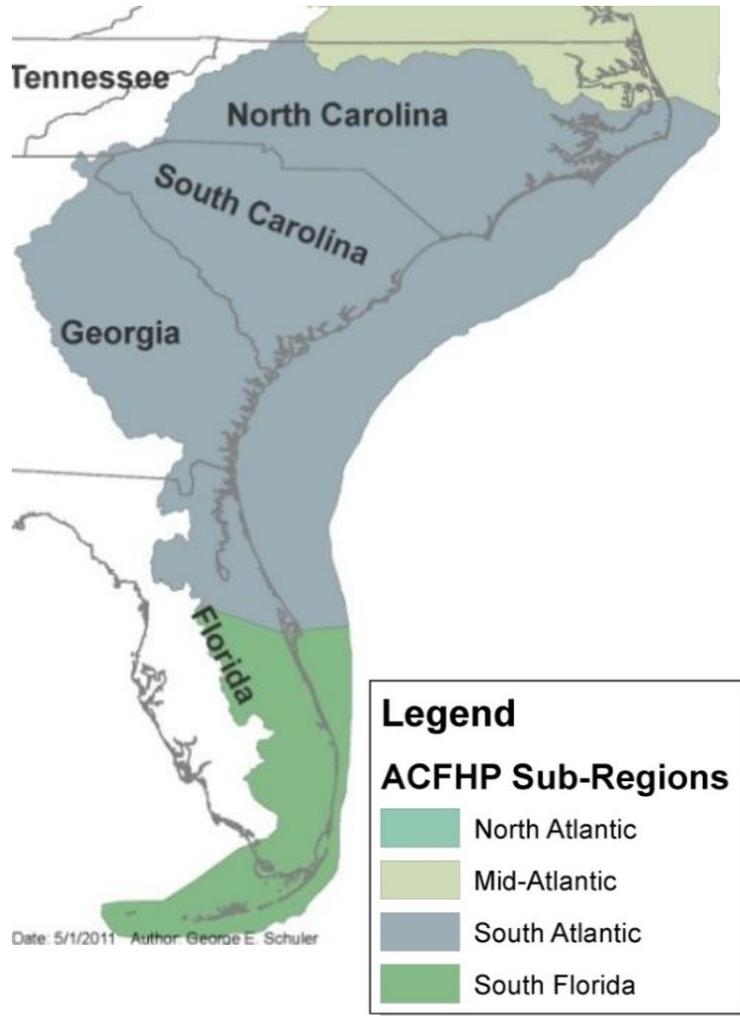
SE Fish Habitat Conservation Mapping

Compile existing GIS layers and maps

- Marine Cadastre
- South Atlantic LCC
- State agency layers
- US Fish and Wildlife Service
- EPA
- SAFMC
- SEACAP
- SECOORA
- USGS
- SERO
- TNC
- NFHP

SE Fish Habitat Conservation Mapping

Scope

Legend
ACFHP Sub-Regions
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- South Atlantic
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Mid- & South Atlantic

- Riverine bottom
- Shellfish beds
- SAV
- Tidal vegetation

South Florida

- SAV
- Tidal vegetation
- Coral and live/hard bottom

SE Fish Habitat Conservation Mapping

Scope

Date: 5/1/2011   Author: George E. Schuler

Legend

ACFHP Sub-Regions
- North Atlantic
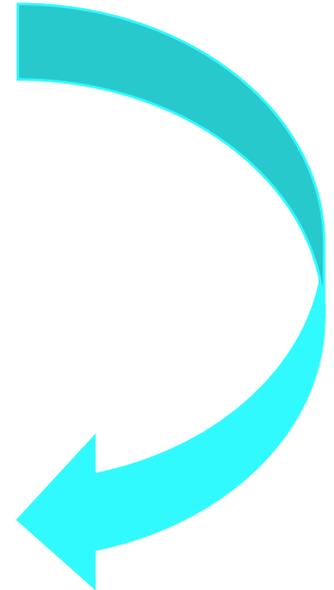- Mid-Atlantic
- South Atlantic
- South Florida
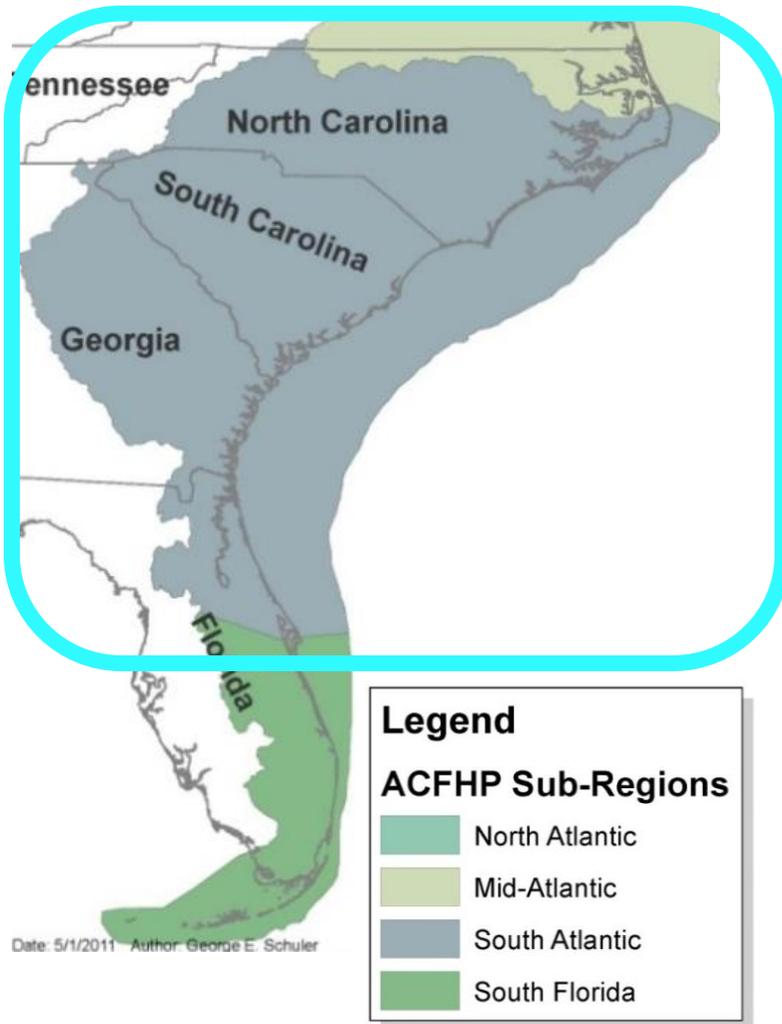
Northern Scenario

- **Riverine bottom**
- Shellfish beds
- SAV
- Tidal vegetation

Diadromous assessment

SE Fish Habitat Conservation Mapping

Scope

Date: 5/1/2011   Author: George E. Schuler

Legend

ACFHP Sub-Regions
- North Atlantic
- Mid-Atlantic
- South Atlantic
- South Florida

Northern Scenario

- Riverine bottom
- **Shellfish beds**
- **SAV**
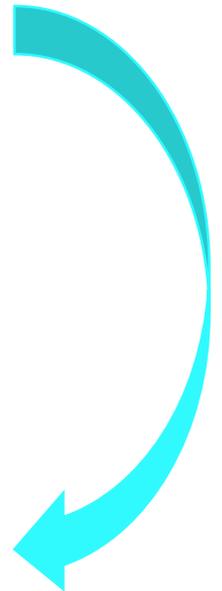- **Tidal vegetation**

Estuarine assessment

Scope

Date 1/1/2011 Author: George E. Schuler

Legend

ACFHP Sub-Regions
- North Atlantic
- Mid-Atlantic
- South Atlantic
- South Florida

Southern Scenario

- **SAV**
- **Tidal vegetation**
- Coral and live/hard bottom

Estuarine assessment

Scope

Legend

ACFHP Sub-Regions

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Mid-Atlantic
South Atlantic
South Florida

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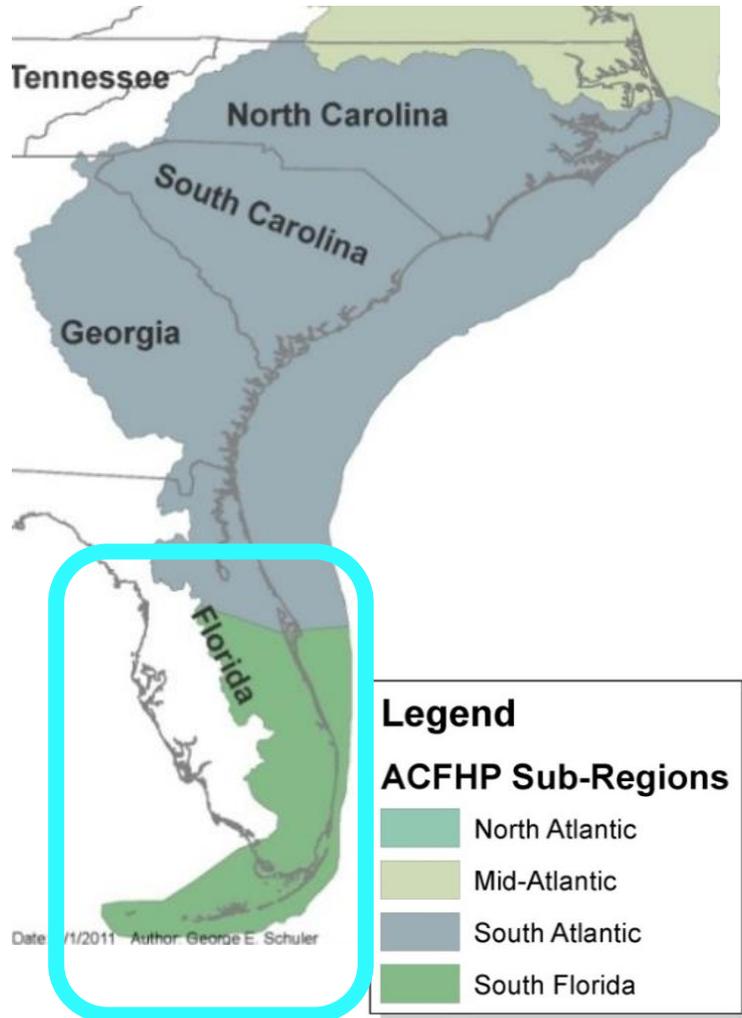
South Florida

- SAV
- Tidal vegetation
- **Coral and live/hard bottom**

Coastal assessment

SE Fish Habitat Conservation Mapping

[Scope](#)

- Northern diadromous scenario
  - NHD catchment in watersheds with diadromous fish or drained into them
- Northern and southern estuarine scenario
  - 1-km^2 hexagon
- Southern coastal scenario
  - 10' squares

[Metrics and scoring](#)

- Science & Data Committee webinar June 2017
- Science & Data Committee meeting Sept 2017
  - o Metrics that covered the entire region
  - o Metrics that most impact fish habitat
  - o Tried to not be redundant
- Steering Committee meeting Oct 2017 & May 2018
- Science & Data committee webinar June 2018
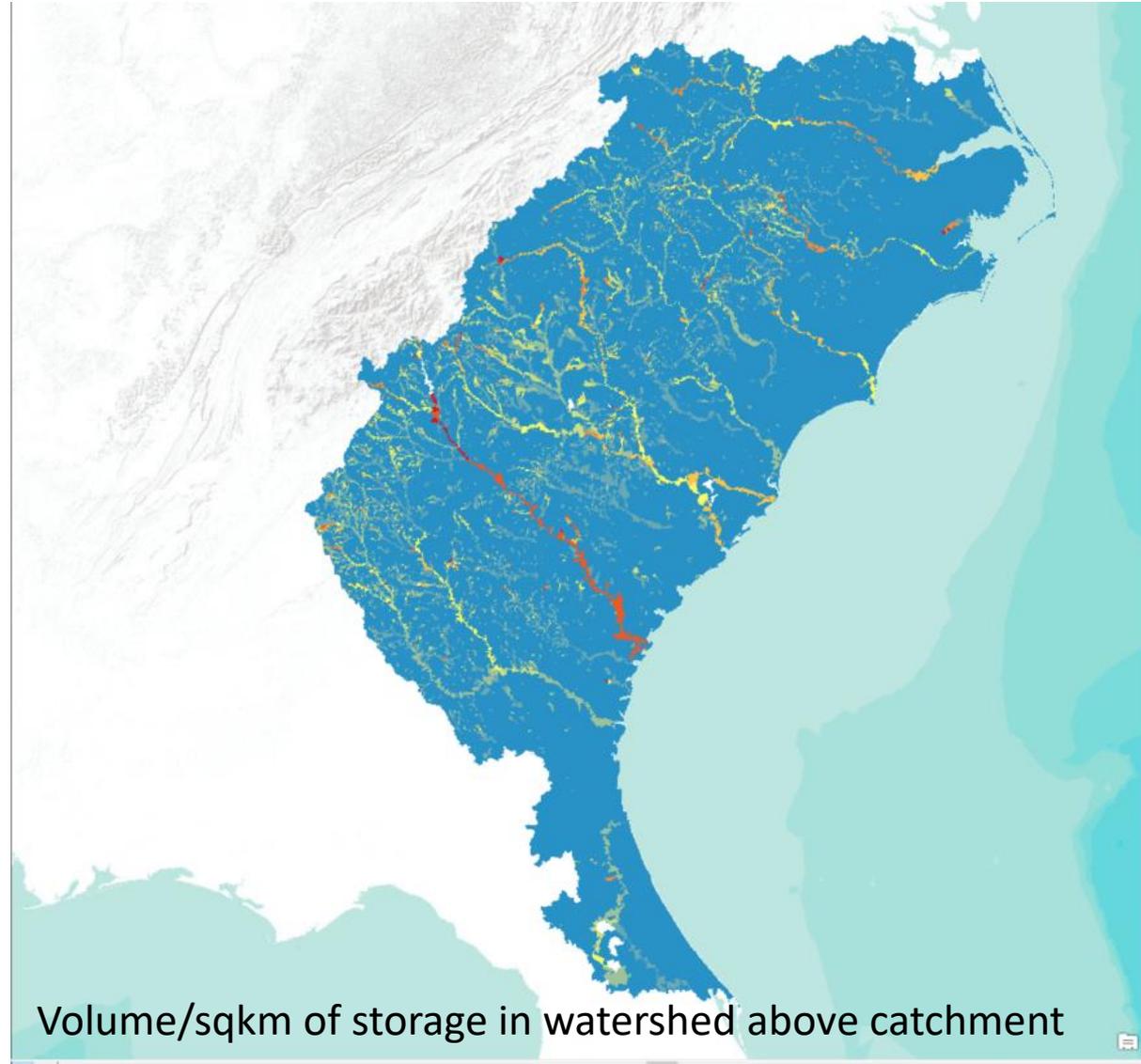
SE Fish Habitat Conservation Mapping

Diadromous Assessment

Variable	Measurement	Metric
Impervious Surface	% of area above the catchment that is impervious surface	10 points if <5%
Point Source Pollution	Density of sites in catchment	10 points if ranked lowest 25% for pollution (least polluted)
Non-point Source Pollution	% of catchment covered by agriculture	10 points if catchment is ranked lowest 25% for pollution (least polluted)
Riparian Buffers	% of floodplain area with natural landcover	10 points if catchment is ranked top 25% for natural coverage
Potential for species access	Reaches (1) with ocean connectivity x # of species in the catchment	10 points if catchment is ranked in top 25%
Water Usage	Volume all reservoirs (NID_STORA in NID) per unit area of watershed (cubic meters/square km)	10 points if catchment is ranked in top 25% for lowest volume.
Fragmentation	Density of road crossings + dams in catchment	10 points if catchment is ranked lowest 25% for fragmentation (least amount of dams and crossings)
Sturgeon Critical Habitat	Sturgeon Critical Habitat Designation	10 points if catchment is Atlantic sturgeon Critical Habitat

Water Usage

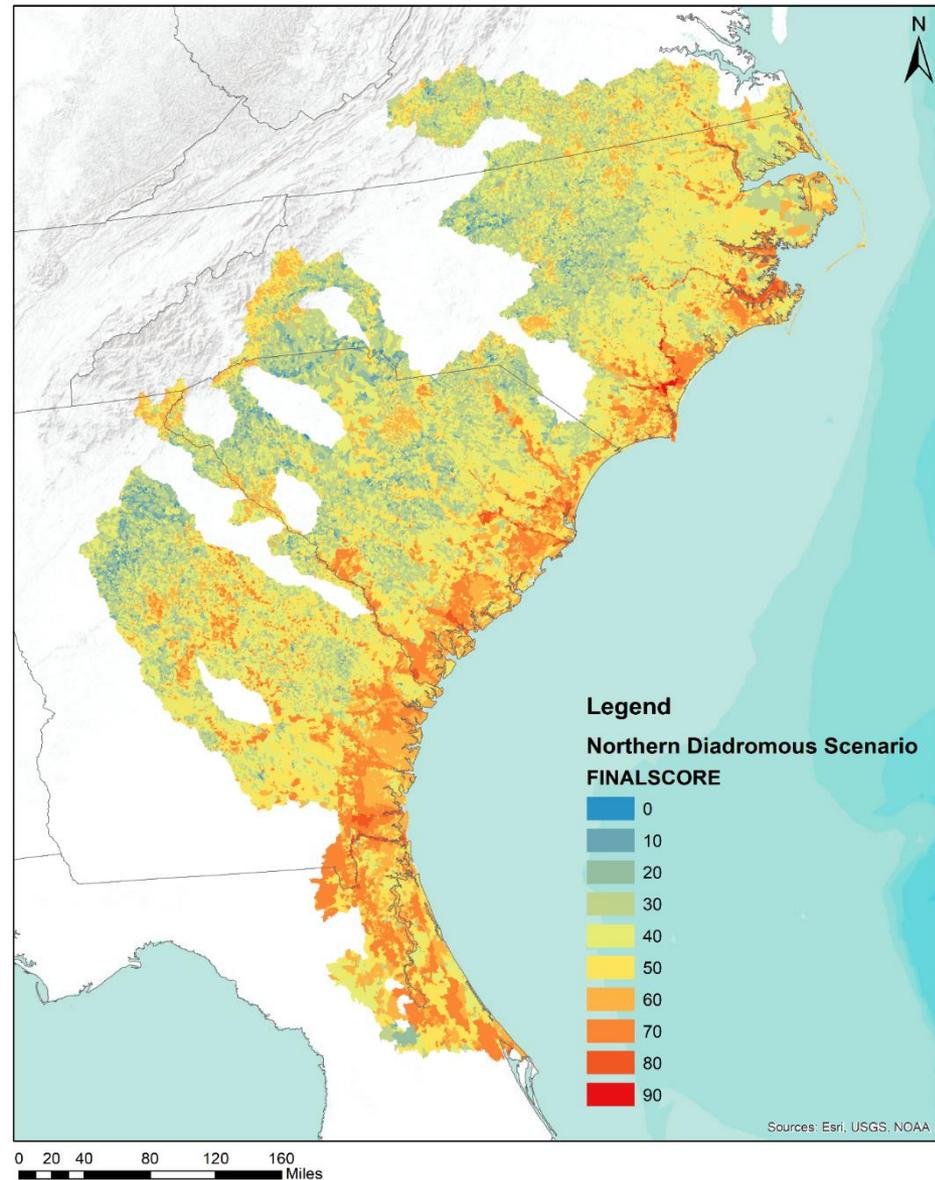Volume/sqkm of storage in watershed above catchment

SE Fish Habitat Conservation Mapping
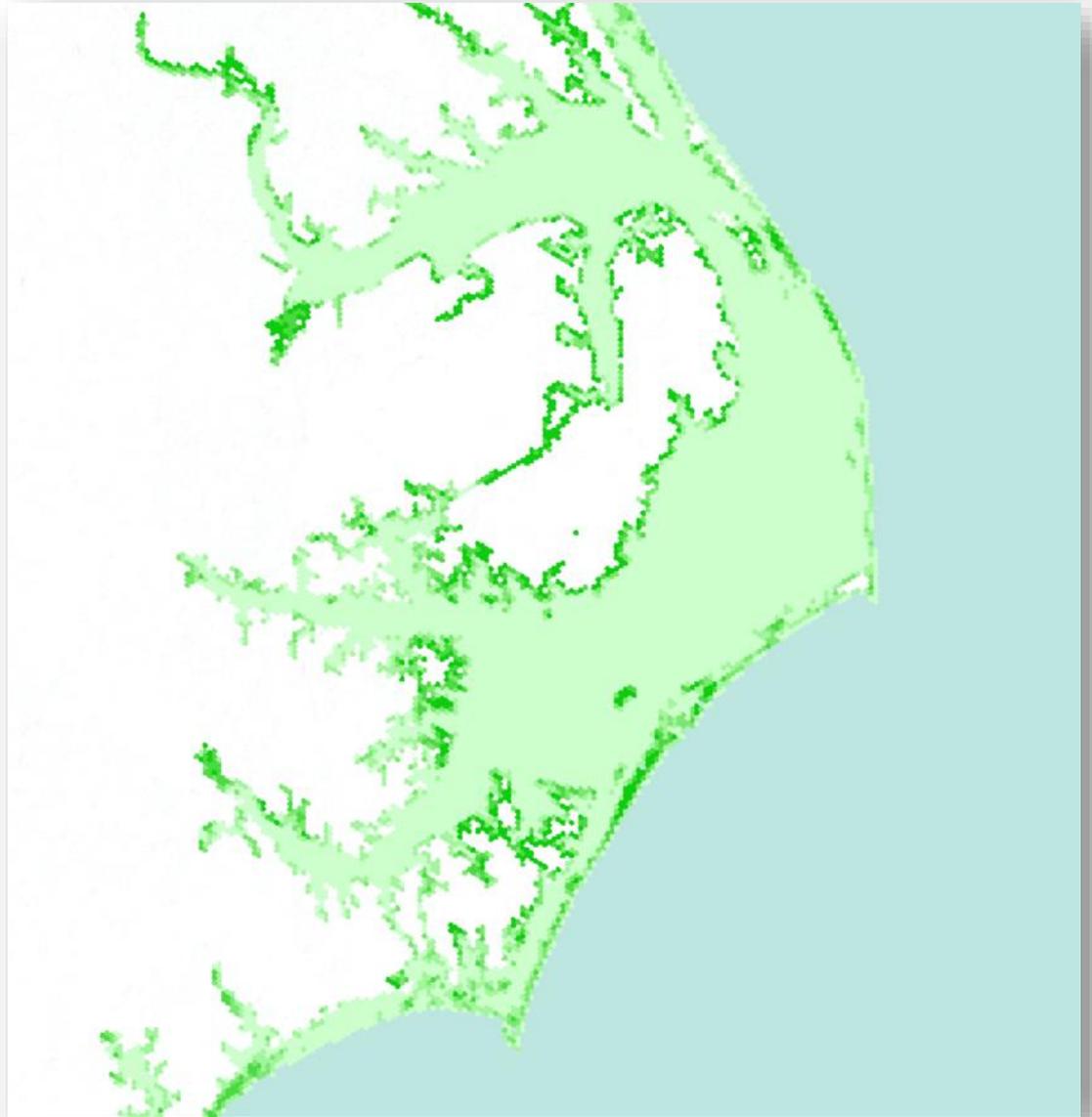
Diadromous Assessment

SE Fish Habitat Conservation Mapping

[Estuarine Assessment](#)

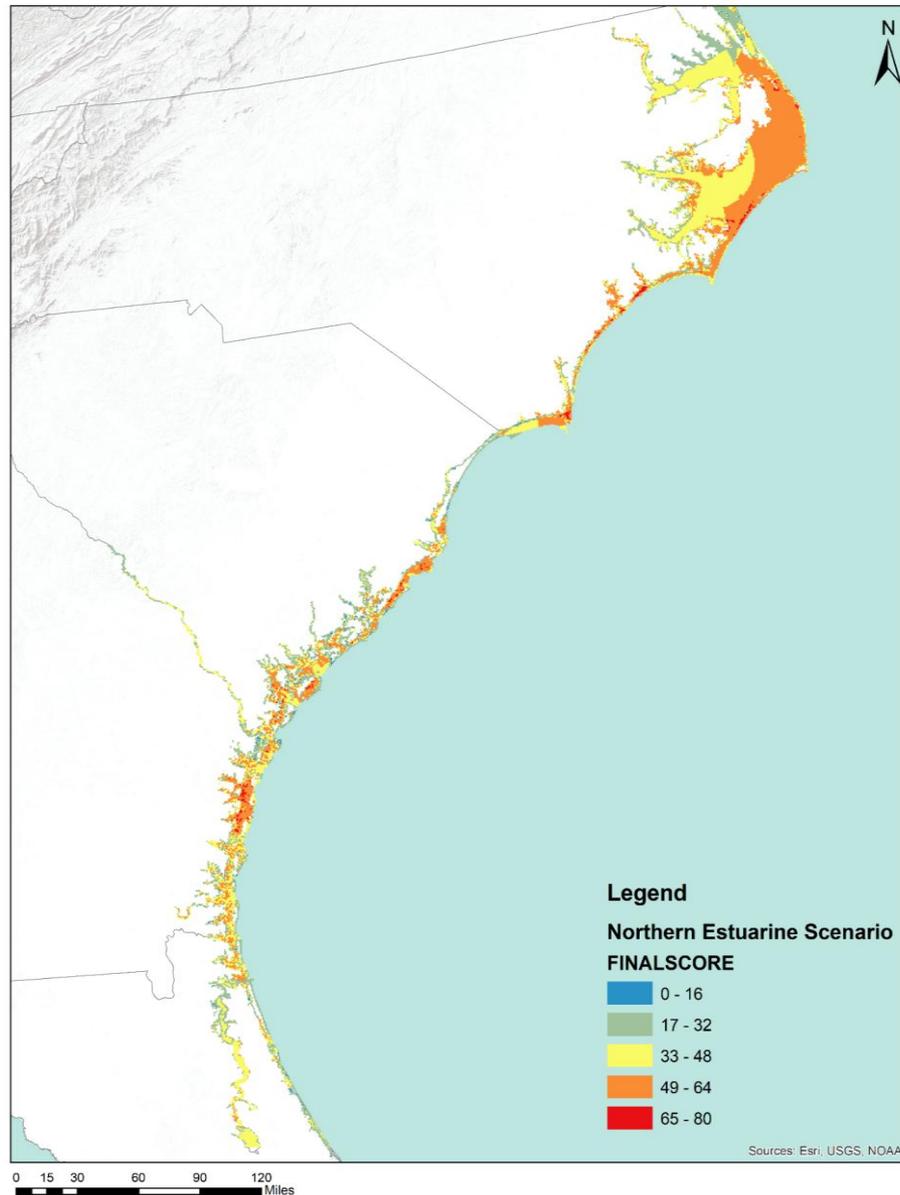| Variable	Measurement	Metric
Seagrass and oyster reef habitat	% of polygon covered by seagrass or oyster reef	10 points if the polygon ranks in the top 25% for coverage
Wetland habitat	% of polygon covered by wetlands	10 points if the polygon ranks in the top 25% for coverage
Estuarine-marsh-water edge	Length of estuarine-marsh-water edge in the polygon	10 points if the polygon ranks in the top 25% for length
Proximity to protected habitat	Distance to inlet (an HAPC in the south Atlantic)	10 points if the polygon is within 1/2 km of an inlet
Proximity to development	Distance from marinas and ports	10 points for the 25% of polygons farthest from marinas and ports
Water quality	Total # of NPDS permit sites in the inlet	10 points for the 25% of polygons with the least number of NPDS sites/inlet
Hardened shoreline	Length of hardened shoreline within the polygon	10 points for the 25% of polygons with the least amount of hardened shoreline
Habitat Fragmentation	Linear ft. of causeway (causeway defined as having marsh on at least 1 side) within a polygon	10 points if the polygon has 0 ft. of causeways

Wetlands

SE Fish Habitat Conservation Mapping

Northern Estuarine Assessment
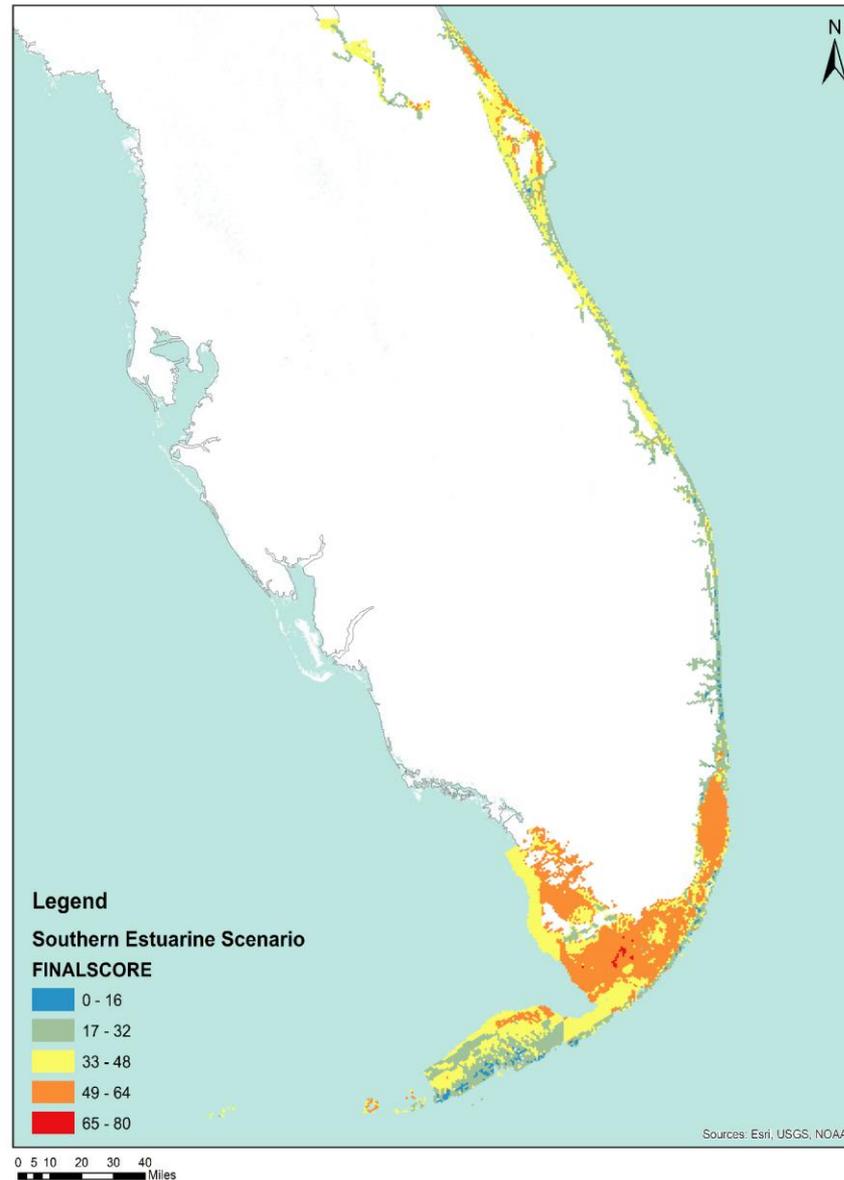

Legend

Northern Estuarine Scenario
FINALSCORE
- 0 - 16
- 17 - 32
- 33 - 48
- 49 - 64
- 65 - 80

Sources: Esri, USGS, NOAA

0 15 30   60   90   120
Miles

Southern Estuarine Assessment

Legend

Southern Estuarine Scenario

FINALSCORE

- 0 - 16
- 17 - 32
- 33 - 48
- 49 - 64
- 65 - 80

Sources: Esri, USGS, NOAA

0 5 10 20 30 40
Miles

Coastal Assessment

- Decided all coral habitat was in need of conservation, regardless of quality
- Due to slow growth and immediate threats to S. FL reefs (bleaching, pollution, disease, burial)
- FWC Unified Reef Map
- Coral reefs and hard bottom HAPCs

SE Fish Habitat Conservation Mapping

Coastal Assessment

Legend

Southern Coastal Scenario Description

Priority Areas

Sources: Esri, USGS, NOAA

0 10 20 40 60 80 Miles

SE Fish Habitat Conservation Mapping

Databasin

SE Fish Habitat Conservation Mapping

[Databasin](#)

SE Fish Habitat Conservation Mapping

Databasin

SE Fish Habitat Conservation Mapping

Next steps

- Finalize the report
- Create maps for each metric
- Announce it
- Start work on northeast assessment
- Improve on southeast assessment

Goal

- Start a conversation on identifying places for protection or restoration.
- Does not contain all metrics (e.g. fishing grounds)
- Urge caution when applying it for protection

Questions?