



Region 4 Strategic Habitat Areas

Nov. 15, 2017

Marine Fisheries Commission Meeting

*Department of Environmental Quality
Division of Marine Fisheries*



Coastal Habitat Protection Plan



North Carolina Coastal Habitat Protection Plan

Source Document

2016

NC Department of Environmental Quality

Enhancing coastal fisheries through habitat protection and restoration

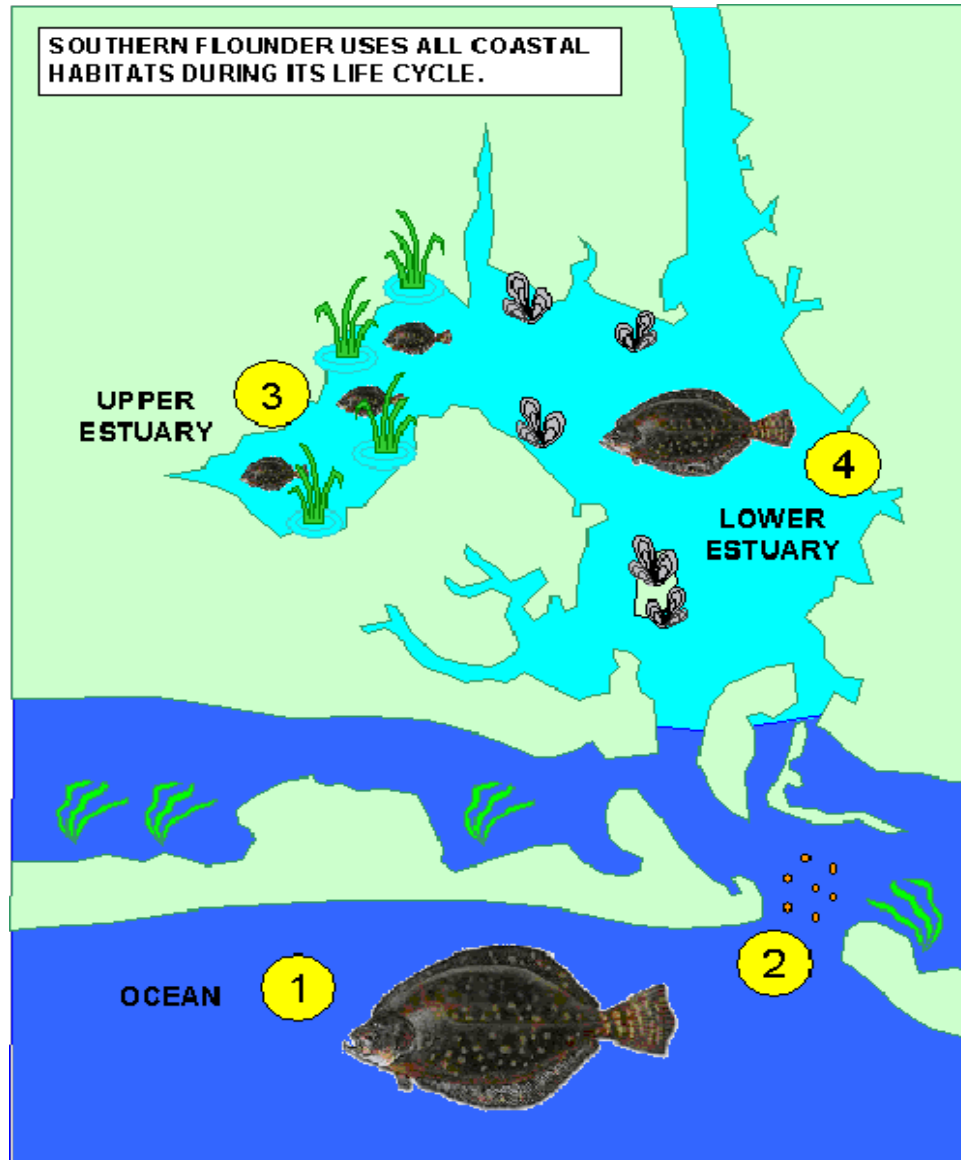


- Mandated by the 1997 Fisheries Reform Act
- Recognizes habitat and water quality issues play critical roles in sustainable fisheries
- **Goal 2 – Identify and delineate strategic habitat areas**

Department of Environmental Quality



An Ecosystem Approach



What are Strategic Habitat Areas?



- Subset of the coastal ecosystem
- Best of the best
- Relatively unaltered
- Maintains biodiversity and ecological functions
- Network of habitat connections



What are Strategic Habitat Areas?



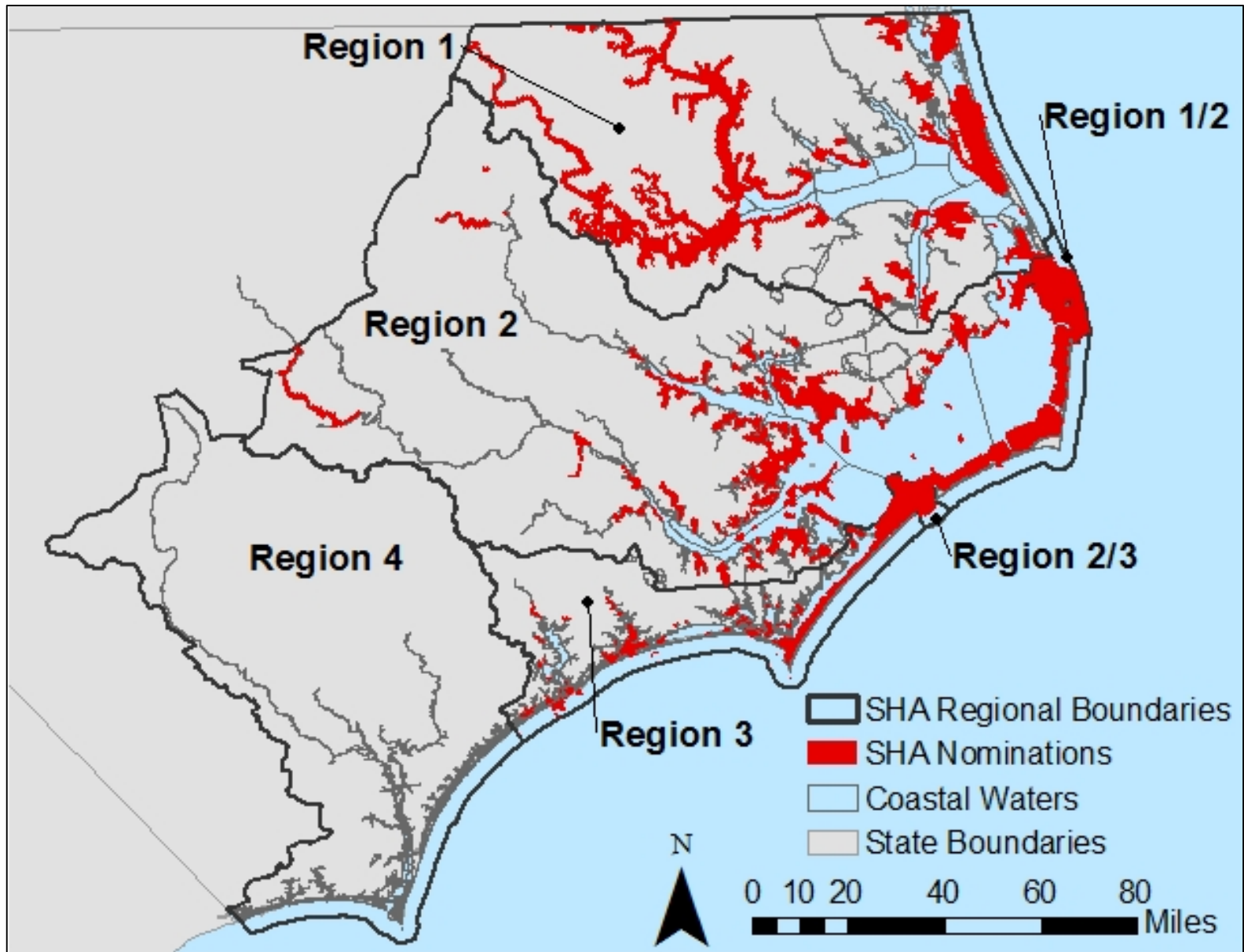
Defined in rule as:

“Locations of individual fish habitats or systems of habitats that provide exceptional habitat functions or that are particularly at risk due to imminent threats, vulnerability or rarity.”

15A NCAC 03I.0101(4)(h)



Strategic Habitat Areas, Regions 1-3





Region 4



Two Phase Process

- 1) Site selection software - MARXAN
- 2) Modifications based on other information

Successful applications

Marine Reserve Design

Great Barrier Reef, Australia (Lewis et al. 2003)

Channel Islands, California (Airame et al. 2003)

Essential Fish Habitat Determination

Northeast and Mid- Atlantic (Cook and Auster 2004)

Integrated Terrestrial / Aquatic Ecoregional Assessments

Puget Sound Region, Washington State (Ferdana et al. 2005)

South Atlantic Region (DeBlieu et al. 2005)

Strategic vs. Non-strategic

	Low	Moderate
High	SELECTED Exceptional Protect	SELECTED At Risk Restore/Enhance
Low	NOT SELECTED Status Quo Rely on existing protections	

Ecological Value = level of service provided by a habitat to fish (e.g., marsh that is a nursery area)

Alteration = Disturbance by human activity (e.g., marina)

Region 4 Advisory Committee



Name	Affiliation
Troy Alphin	University of North Carolina - Wilmington
Nora Deamer	North Carolina Division of Water Resources
Jeremy Humphrey	North Carolina Division of Marine Fisheries
Jessie Jarvis	University of North Carolina - Wilmington
Mike Mallin	University of North Carolina - Wilmington
Robb Mairs	North Carolina Division of Water Resources
Kyle Rachels	North Carolina Wildlife Resources Commission
Fritz Rohde	National Marine Fisheries Service
Fred Scharf	University of North Carolina - Wilmington
Hope Sutton	North Carolina Division of Coastal Management
Dawn York	Cape Fear River Partnership

Strategic Habitat Area Selection Process



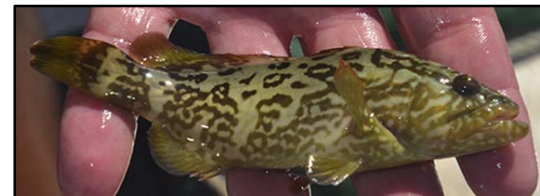
1. Identify priority fisheries
2. Determine habitats that are important to priority fisheries for various life history stages (Natural Resource Targets)
3. Determine how much of each habitat should be included in the strategic habitat area network (Representation Level)
4. Determine level of alterations present
5. Use computer program (Marxan) to pick best locations for strategic habitat areas
6. Expert modification by advisory committee and division staff



Region 4 Priority Fisheries



Shellfish/ Crustacean	Blue Crab
	Shrimp
	Oysters
	Clams
	Bay Scallop
Estuarine finfish	Spot
	Kingfishes
	Southern Flounder
	Spotted Seatrout
	Red Drum
Anadromous fish	Striped Bass
	Sturgeon
Reef fish and coastal pelagics	Grouper, Gag
	Black Sea Bass
	Sheepshead
	King mackerel
	Spanish mackerel



Strategic Habitat Area Selection Process



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Wetland Edge



Shell Bottom



Low-Elevation Uplands



Streams



Hard Bottom

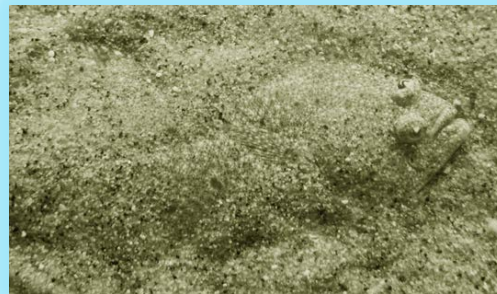


Habitats
(Natural Resource Targets)

Wetlands



Soft Bottom



SAV

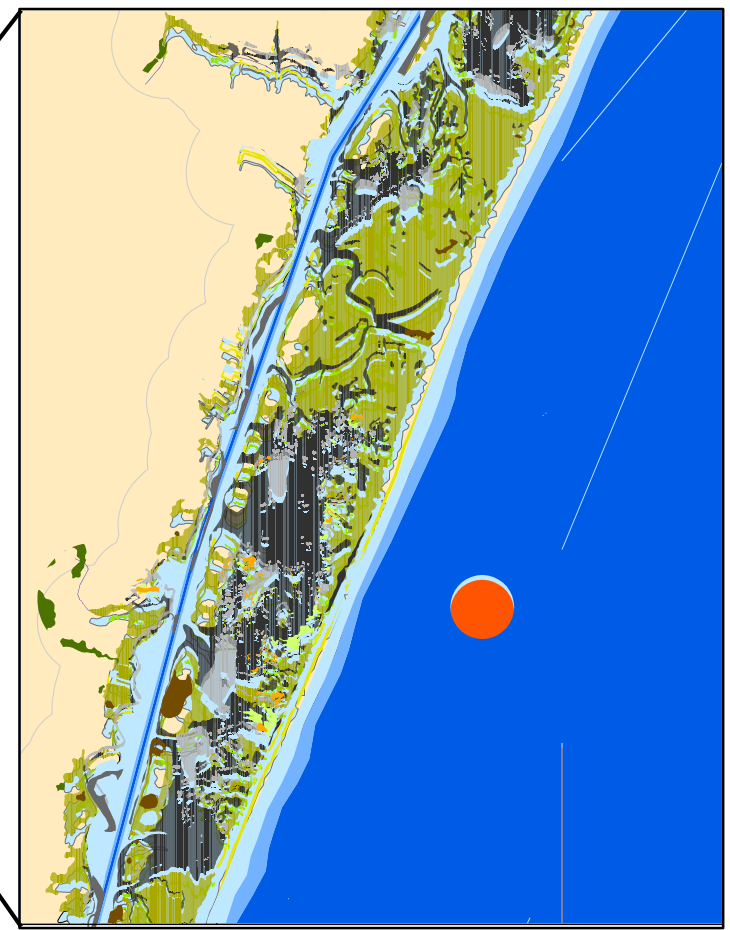


Region 4 Habitats

(Natural Resource Targets)



Region 4	Intertidal shell bottom	Soft bottom (>6ft)	Emergent Wetland
Focus Area	Subtidal shell bottom	Soft bottom (ND)	Forested Wetland
Natural Resource Targets	SAV & shell bottom	Creeks & rivers	Shrub & Scrub
Hard bottom	Soft bottom (0-3ft)	Streams	Upland
High Salinity SAV	Soft bottom (3-6ft)	Wetland edge	



Strategic Habitat Area Selection Process



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Natural Resource Target Representation Level

Selected based on functional importance, rarity, sensitivity, vulnerability or historical loss of habitat.

Higher Representation Level	Lower Representation Level
Submerged Aquatic Vegetation	Soft bottom
Shell bottom	Wetlands
Wetland edge	Low-elevation upland
Hard bottom	Streams



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Development



Shellfish Closures



Agriculture



Marinas



Culverts



Alteration Factors

Trawling



Ditching and Draining

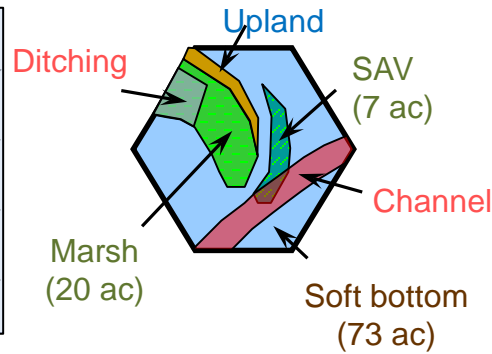
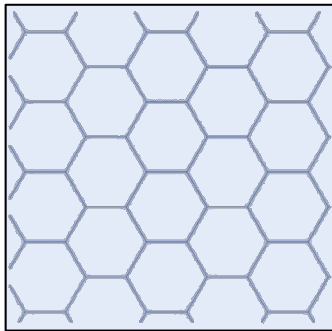


Bulkheads

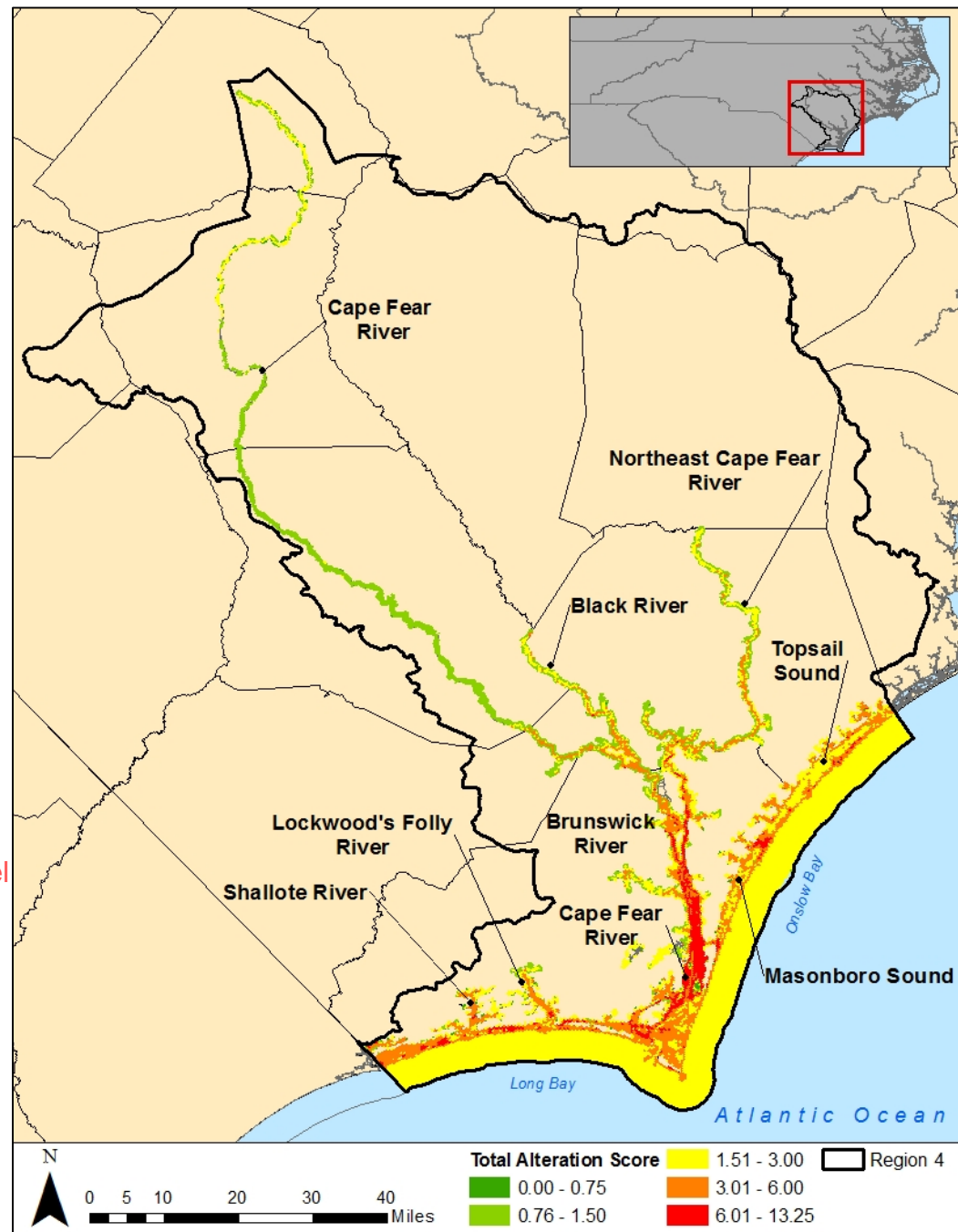




Total Alteration Scores



Severity x Extent x Habitat Portion



Strategic Habitat Area Selection Process



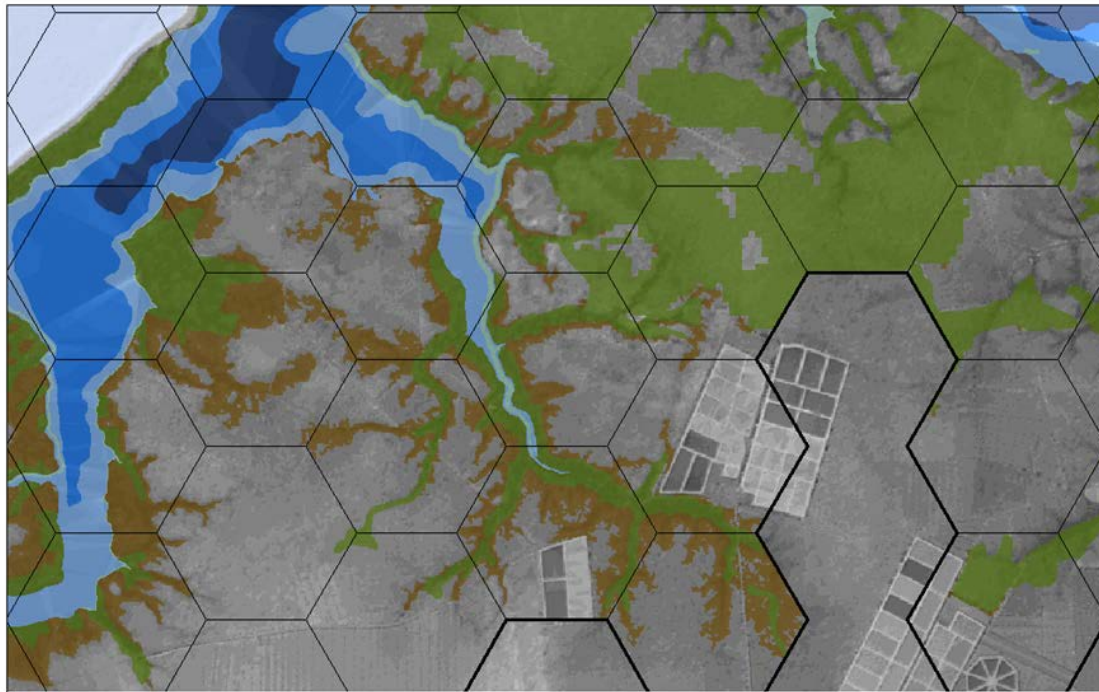
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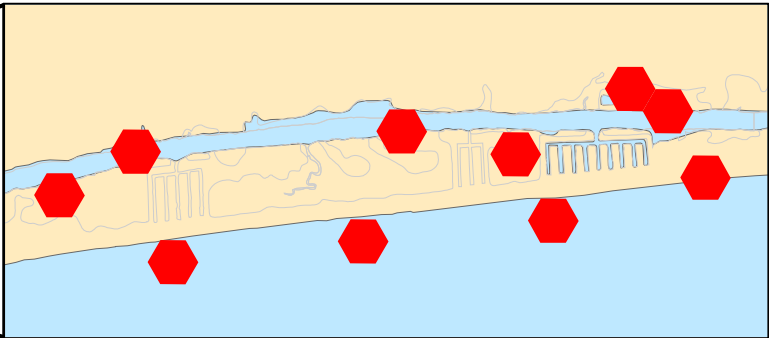
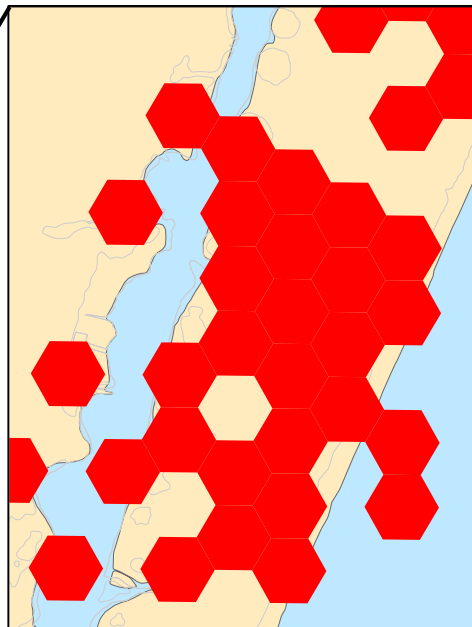
Computer Selection Program – Marxan



- Maps of habitats (Natural Resource Targets)
- Alteration layer
- Overlay hexagon grid
- Run Marxan to get draft results



Region 4 Marxan Output



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6. **Expert modification by advisory committee and division staff**



Criteria for Expert Modification

- Habitats present
- Alteration scores
- Selection frequency
- Fish data
- Ecological designations
- Water quality status
- Connectivity



Post-Modification Strategic Habitat Areas

- 43 discrete areas selected
- 21 percent (74,451 acres) of total focus area



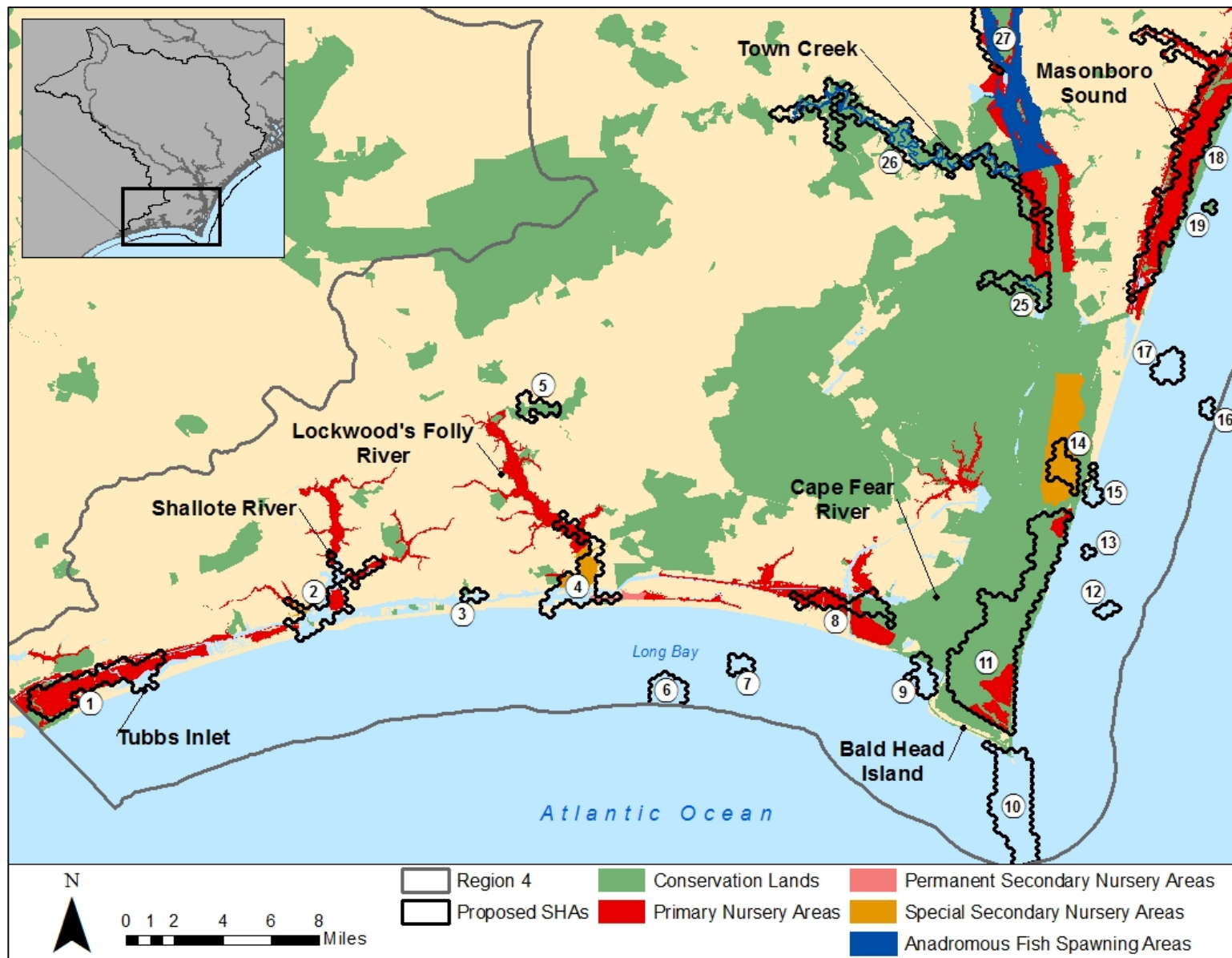
Region 4 – Strategic Habitat Area Nominations

75 percent (55,717 acres) of selected areas have some level of protection

- Conservation lands
- Primary Nursery Areas
- Anadromous Fish Spawning Areas



Region 4 Draft Strategic Habitat Areas and Corroborating Information Brunswick County and lower Cape Fear River



Draft Strategic Habitat Areas and Corroborating Information

Tidal waters in New Hanover and Pender counties and portions of the Cape Fear River

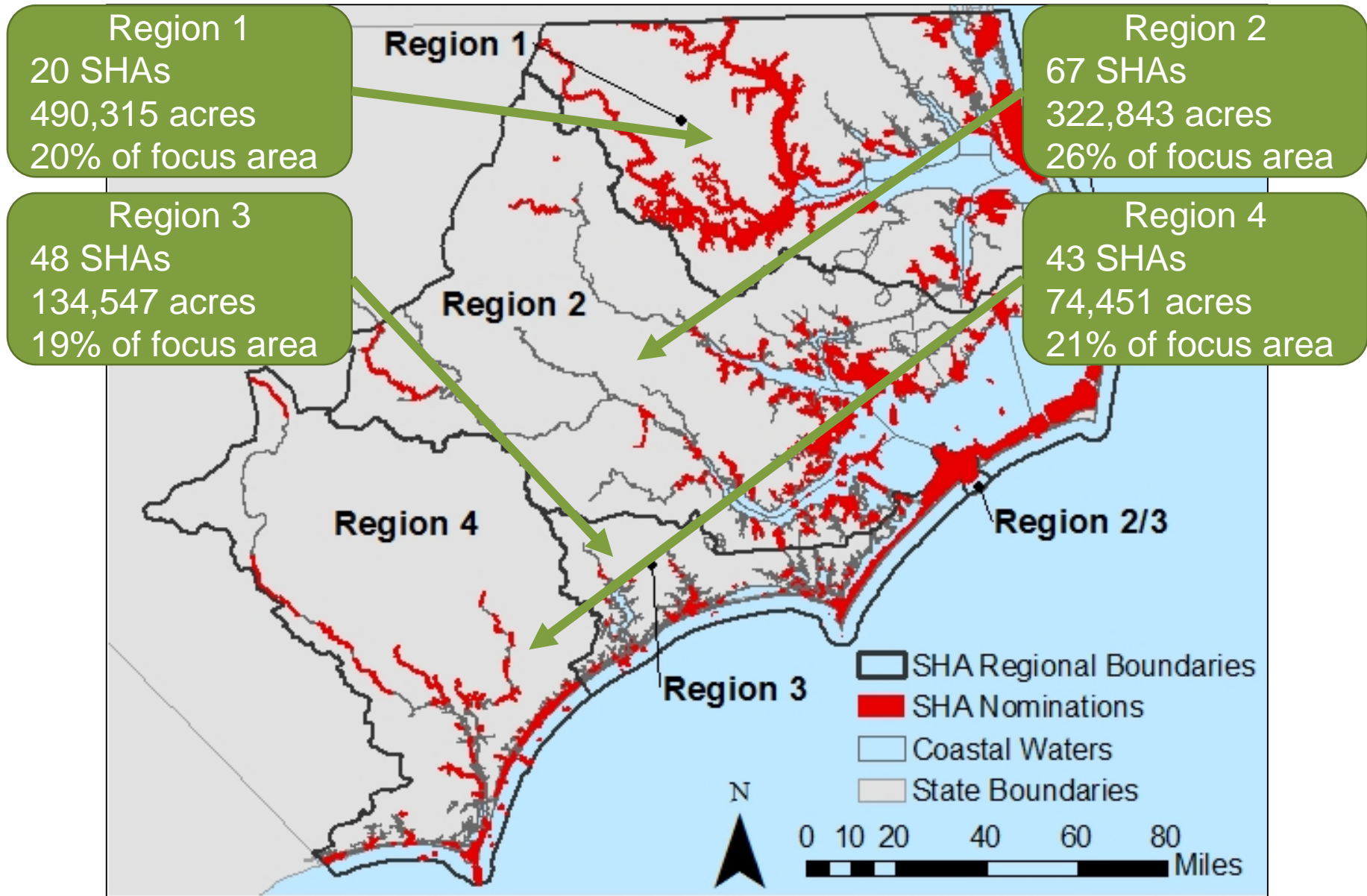


Draft Strategic Habitat Areas and Corroborating Information

Cape Fear River north of Wilmington



Strategic Habitat Area Nominations, Regions 1-4



Potential Conservation Actions

- Use in local land use planning and permit reviews
- Criteria for agriculture cost share projects
- Encourage Best Management Practices near Strategic Habitat Areas
- Pursue restoration projects that would benefit Strategic Habitat Areas
- Recommend some Strategic Habitat Areas for land acquisition

Post-approval



- Begin groundtruthing fish and habitat condition
- Use results to modify selections if needed
- Use results to determine if management actions are needed to protect or enhance

Commission Action

Vote to send draft report out for public comment at Advisory Committees

Department of Environmental Quality



An aerial photograph of a vast, intricate river delta system, likely the Ganges-Brahmaputra delta. The image shows a dense network of channels, distributaries, and oxbow lakes, creating a complex, maze-like pattern of water and land. The water is a deep, dark blue, while the surrounding land is a mix of light and dark brown tones, indicating different soil types and vegetation. The overall scene is captured from a high angle, providing a comprehensive view of the delta's structure. The word "Questions?" is overlaid in the center in a white, elegant serif font.

Questions?