Long Island Sound Ecologically Significant Areas

LIS Blue Plan

Webinar Speakers:

Nathan Frohling

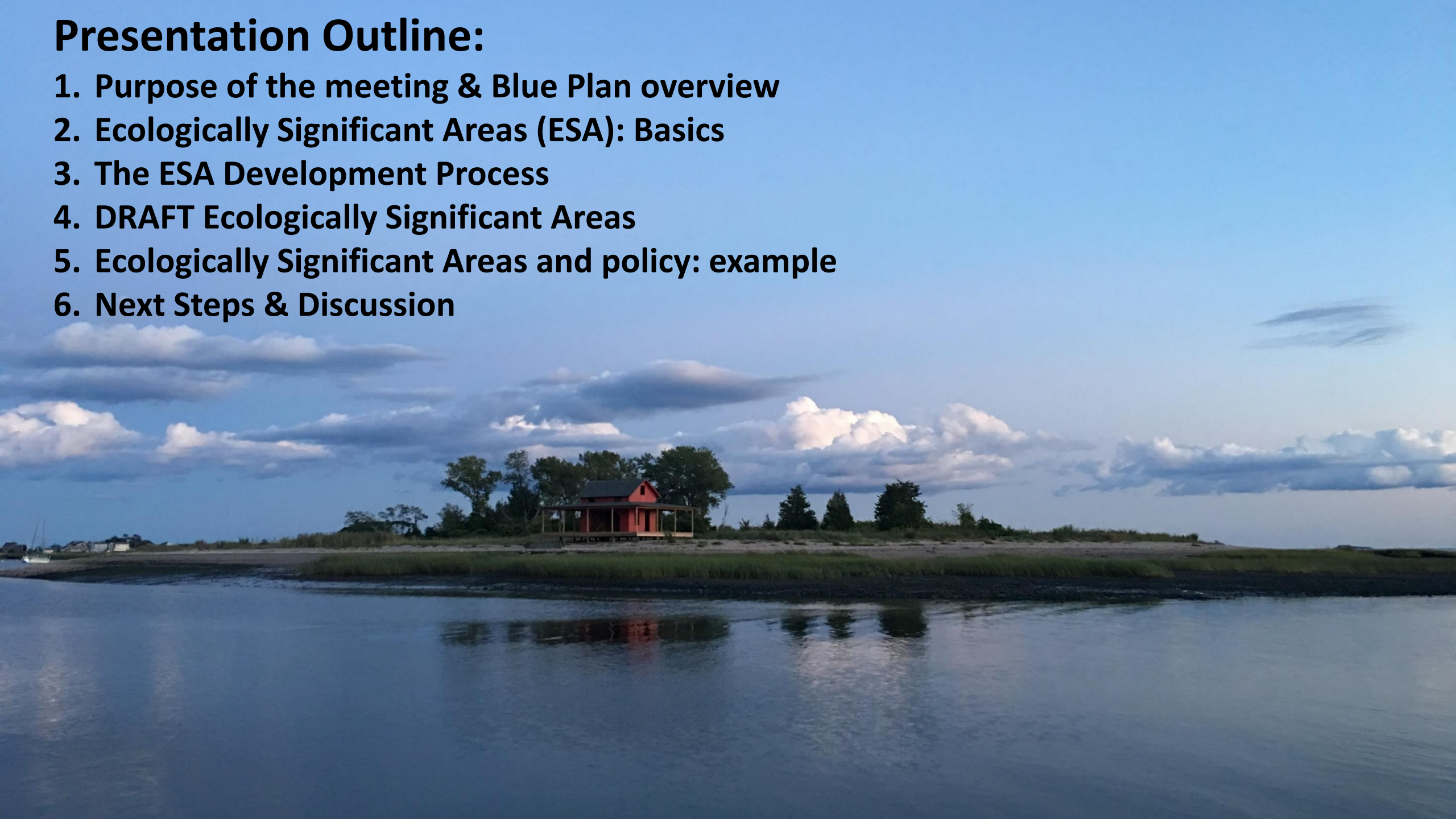
Director of Coastal and Marine Initiatives, The Nature Conservancy of CT
Blue Plan Advisory Committee member
Chair, Ecological Characterization Work Team

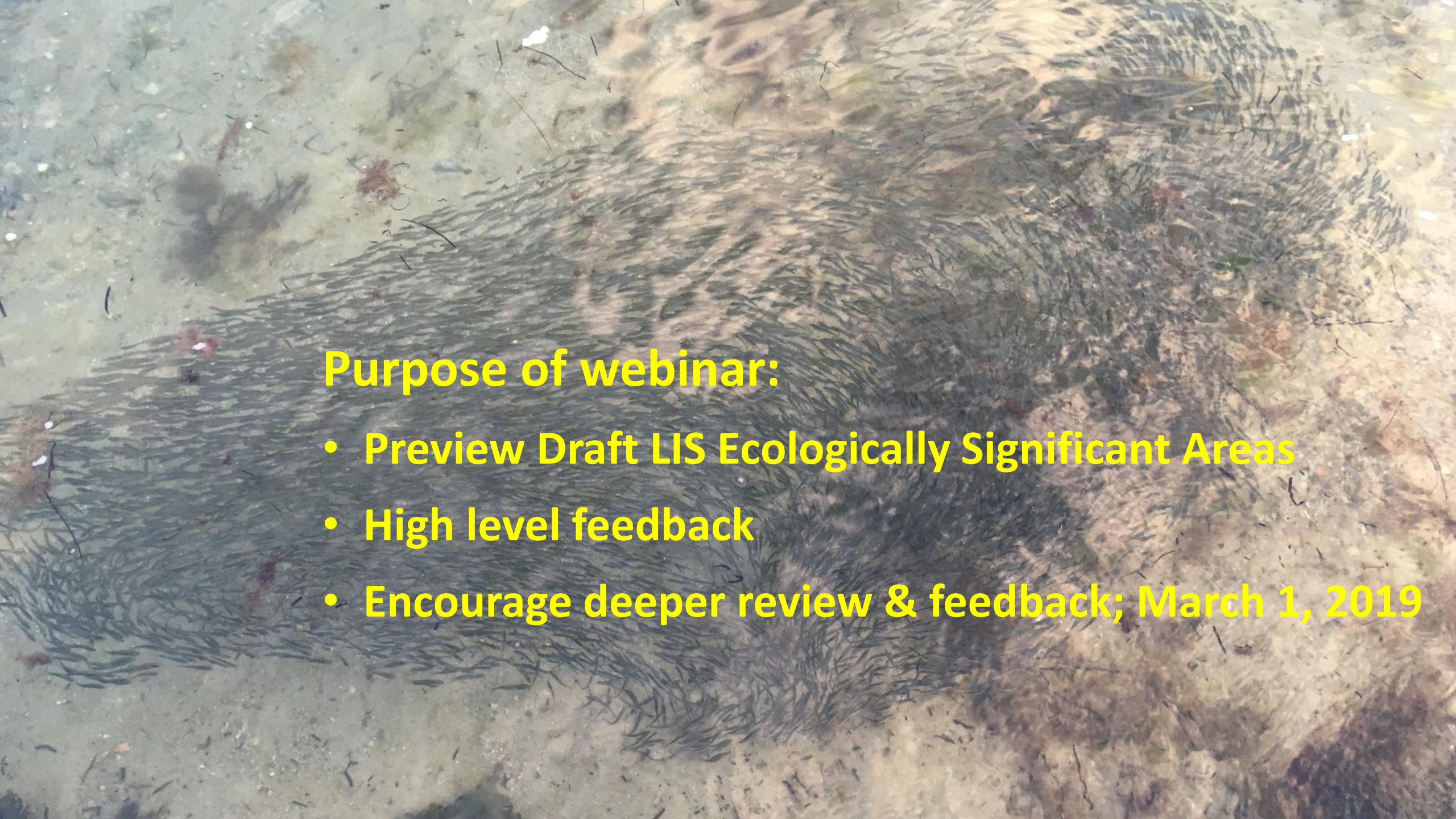
Emily Shumchenia, PhD.

E & C Enviroscape
Ecological Consultant to the Blue Plan Ecological Characterization process

Presentation Outline:

1. Purpose of the meeting & Blue Plan overview
2. Ecologically Significant Areas (ESA): Basics
3. The ESA Development Process
4. DRAFT Ecologically Significant Areas
5. Ecologically Significant Areas and policy: example
6. Next Steps & Discussion





Purpose of webinar:

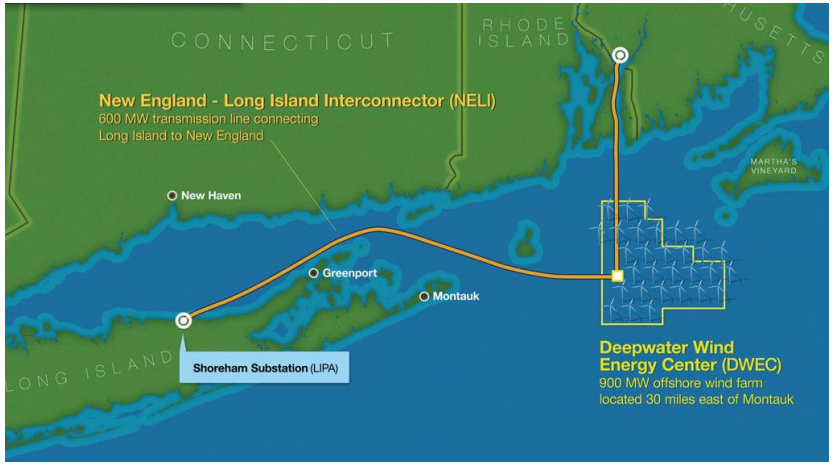
- Preview Draft LIS Ecologically Significant Areas
- High level feedback
- Encourage deeper review & feedback; March 1, 2019

LIS Blue Plan: Why do we need it?

Increasing demands pose potential conflicts with human uses & marine life

Insufficient mechanisms for managing use of the Sound *as a whole*

Individual proposals and permit applications set the future course



What is the Blue Plan?

- 2015 legislation: Develop Blue Plan to guide new uses & "*manage Sound as a whole*"
- Produce an Inventory of Human Uses and Natural Resources
- Develop policies about *where* new things go – marine spatial planning - maps
- Policies guide and direct how State permits and decision-making is to be carried out

Organization

- Led by CT DEEP
- Guided by 16 member Advisory Committee
- Coordinated with NY as much as possible

Principal Goals:

- Identify and protect places of ecological significance
- Identify and protect place of traditional human use
- Reduce potential conflicts

Boundaries:

- Planning: MHWL
- Policy: Seaward of 10’ depth contour

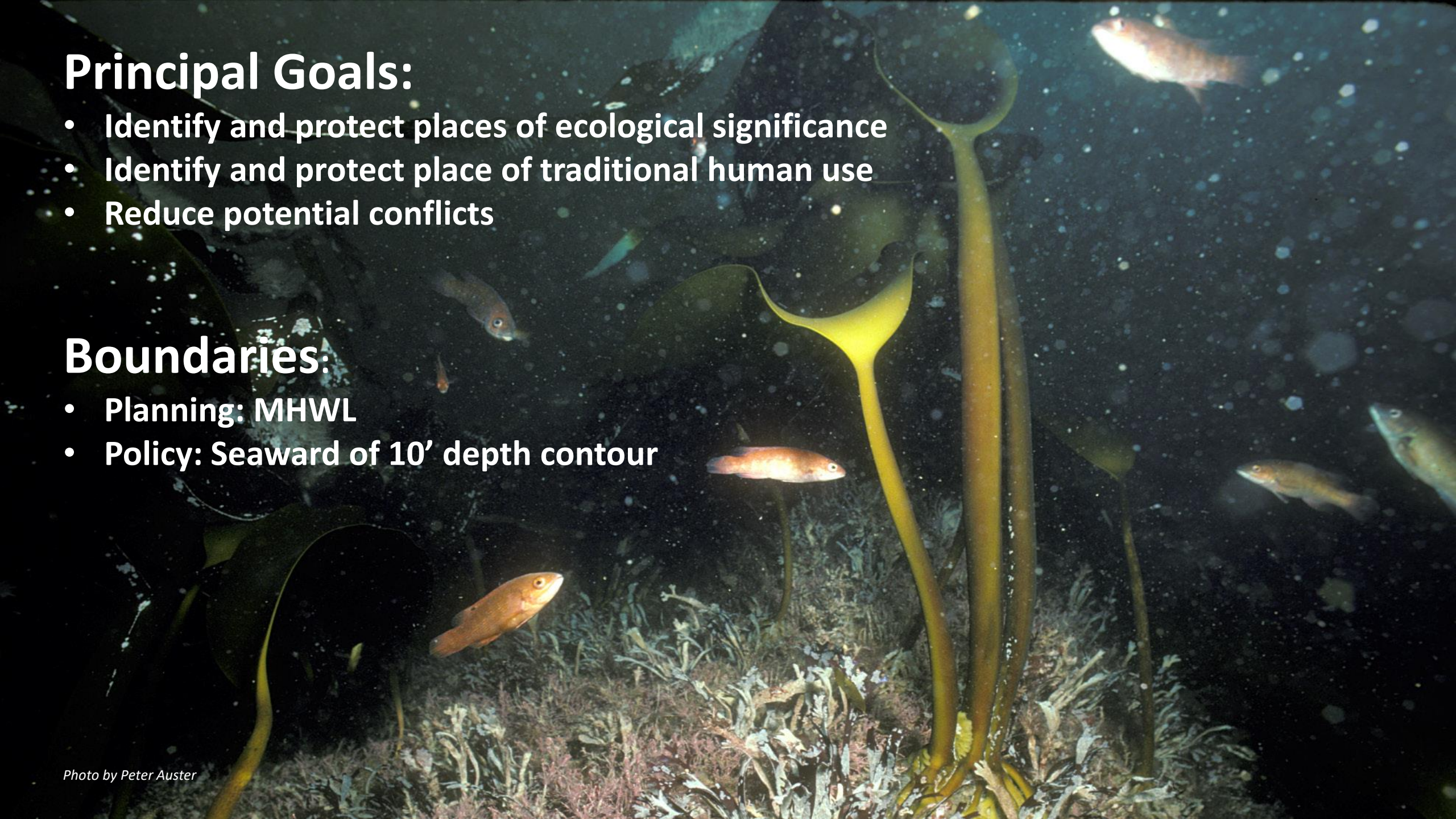
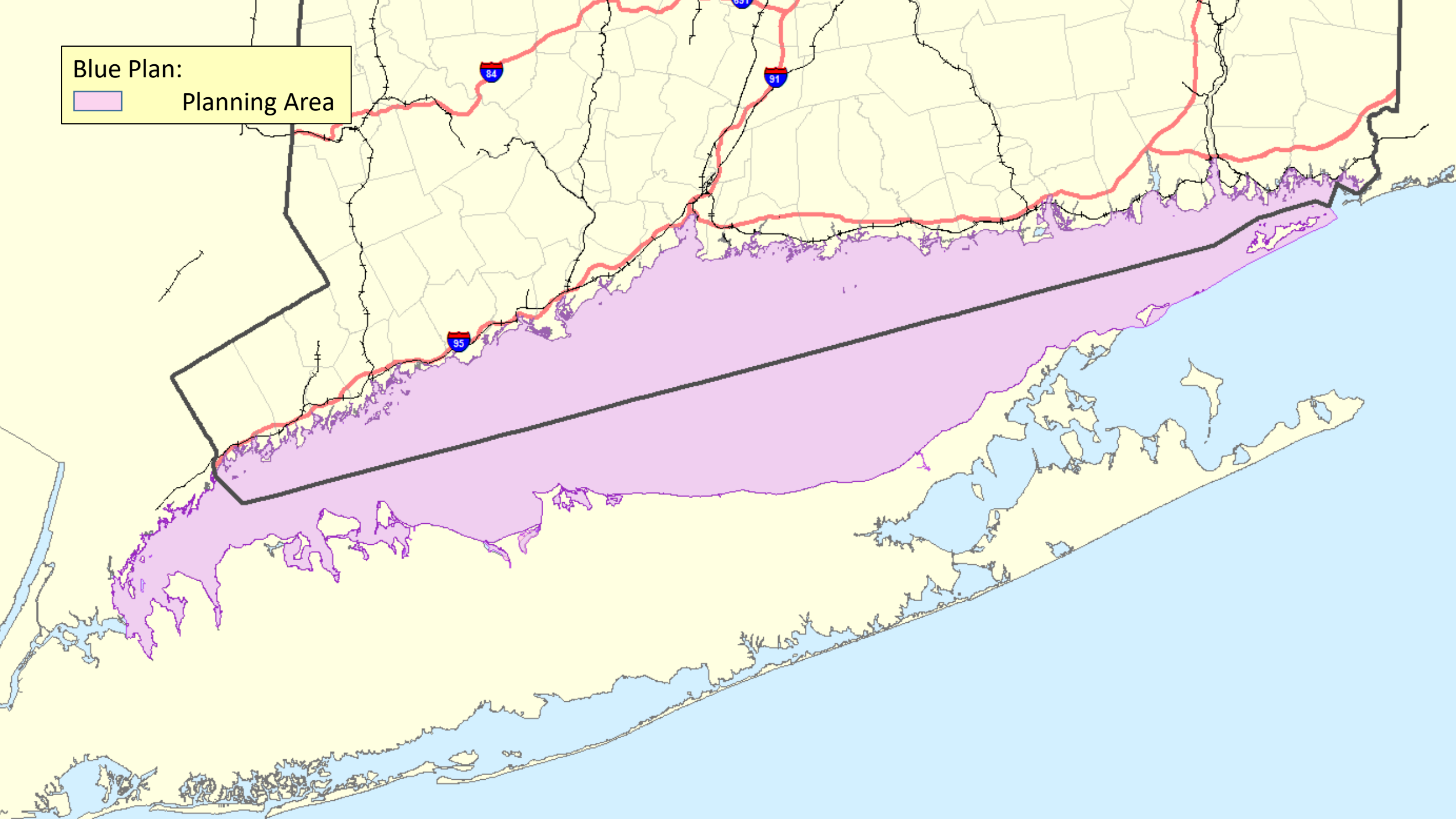
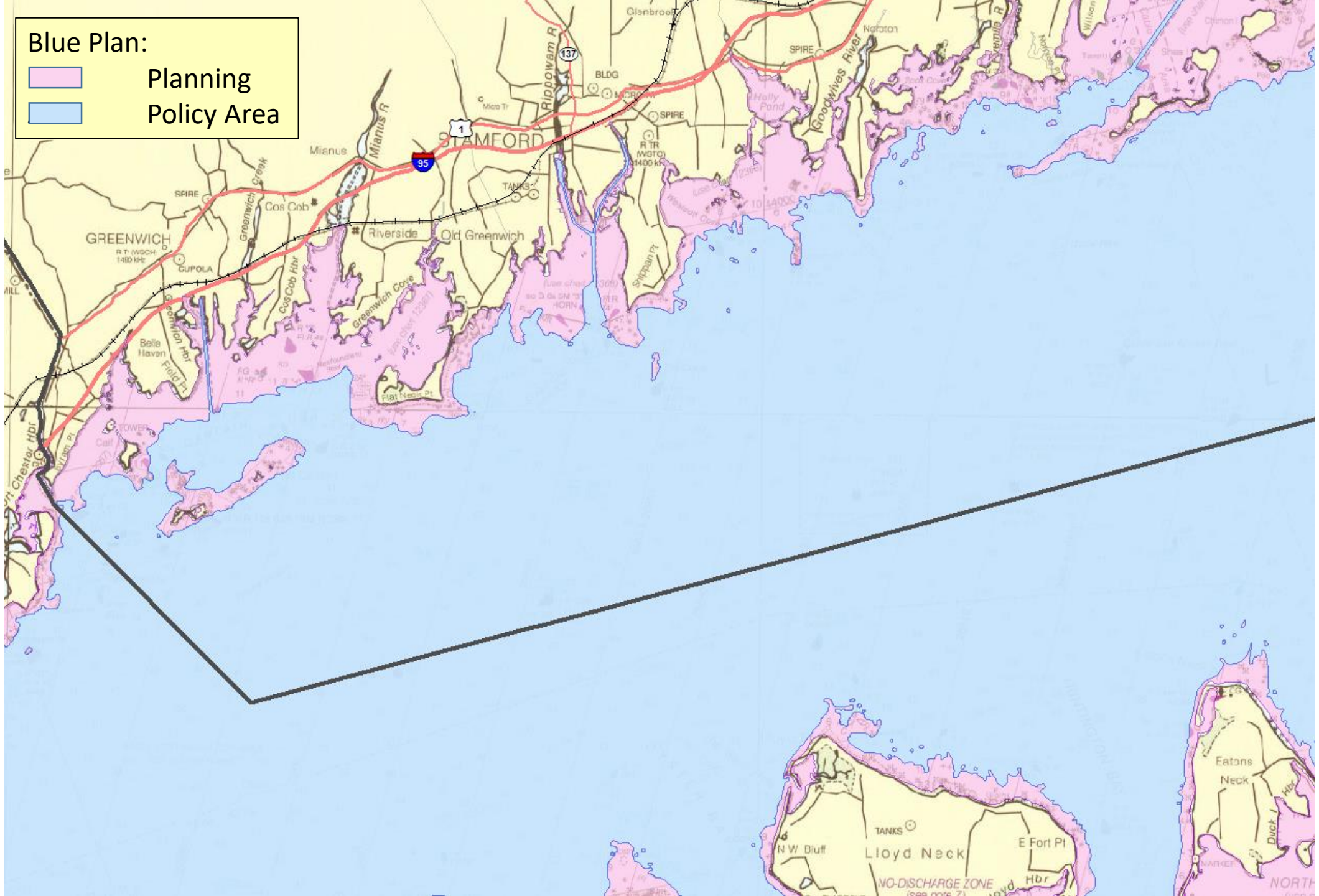
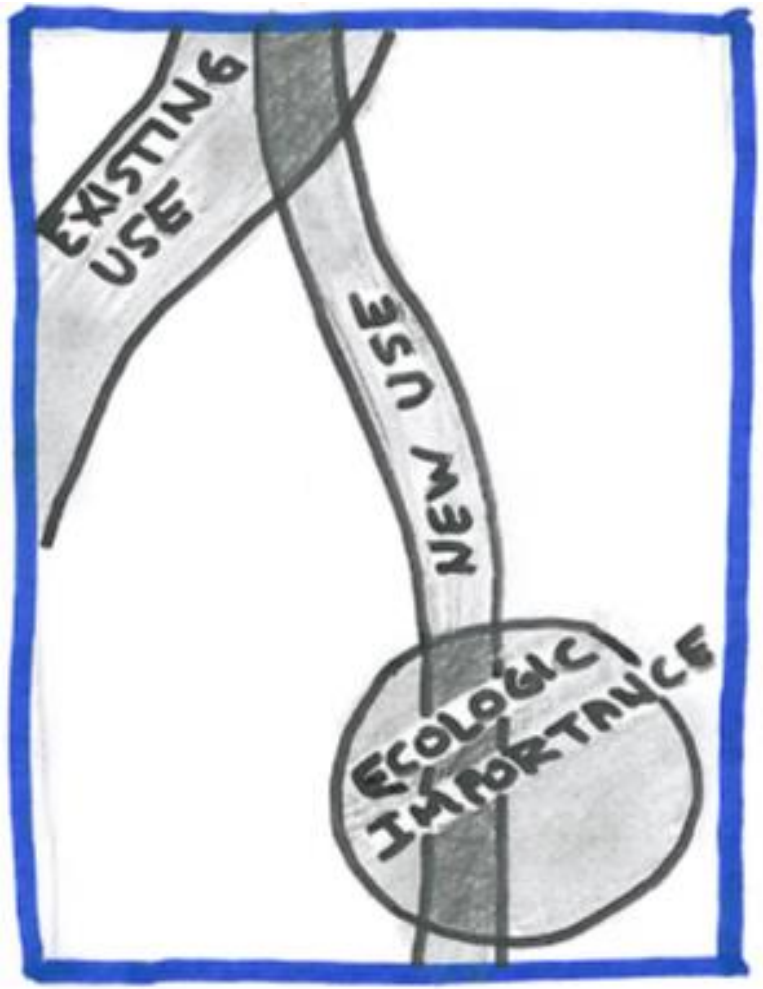


Photo by Peter Auster

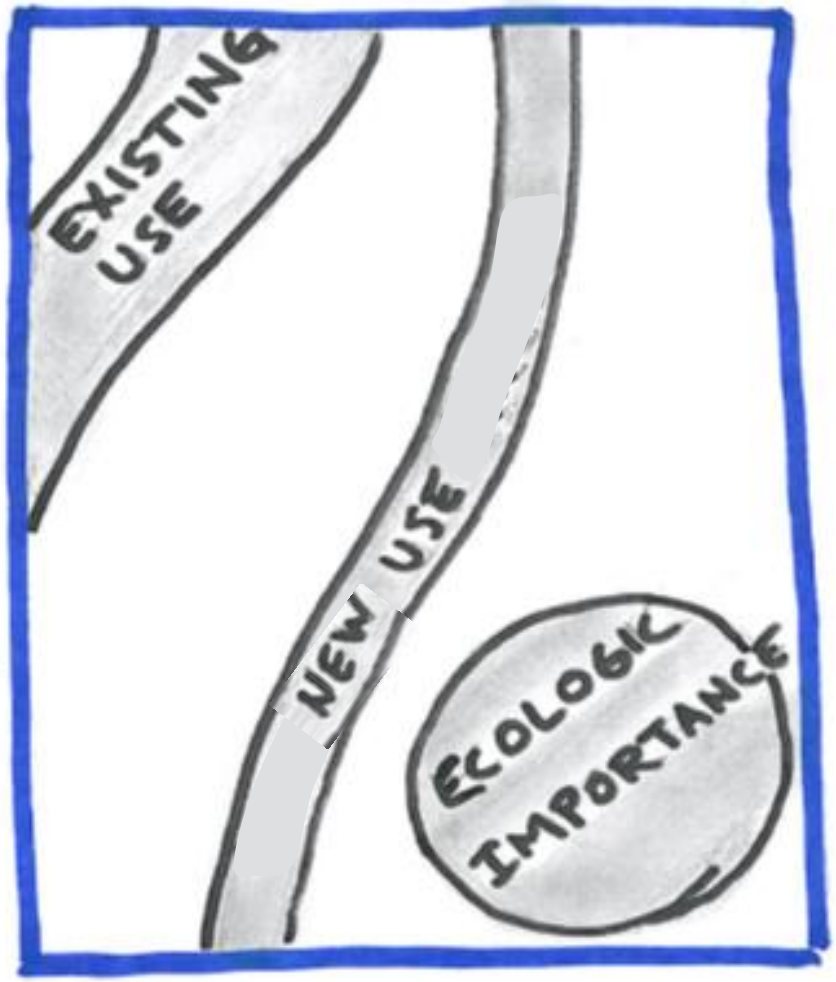

Blue Plan:
Planning Area
84
91
95


Blue Plan:
Planning
Policy Area
STAMFORD
GREENWICH
Riverside
Old Greenwich
Cos Cob
Mianus
Mianus R
Rippowam R
Goodwives River
Glenbrook
Noroton
SPIRE
BLDG
TANKS
CUPOLA
Belle Haven
Greenwich Cove
Greenwich Hbr
Cos Cob Hbr
Field Pt
Flat Neck Pt
Shippan Pt
Port Chester Hbr
Lloyd Neck
N W Bluff
E Fort Pt
Hbr
NO-DISCHARGE ZONE
Eatons Neck
Duck I
95
1
137

How will Blue Plan work? Combination of Significant Areas and Policy:



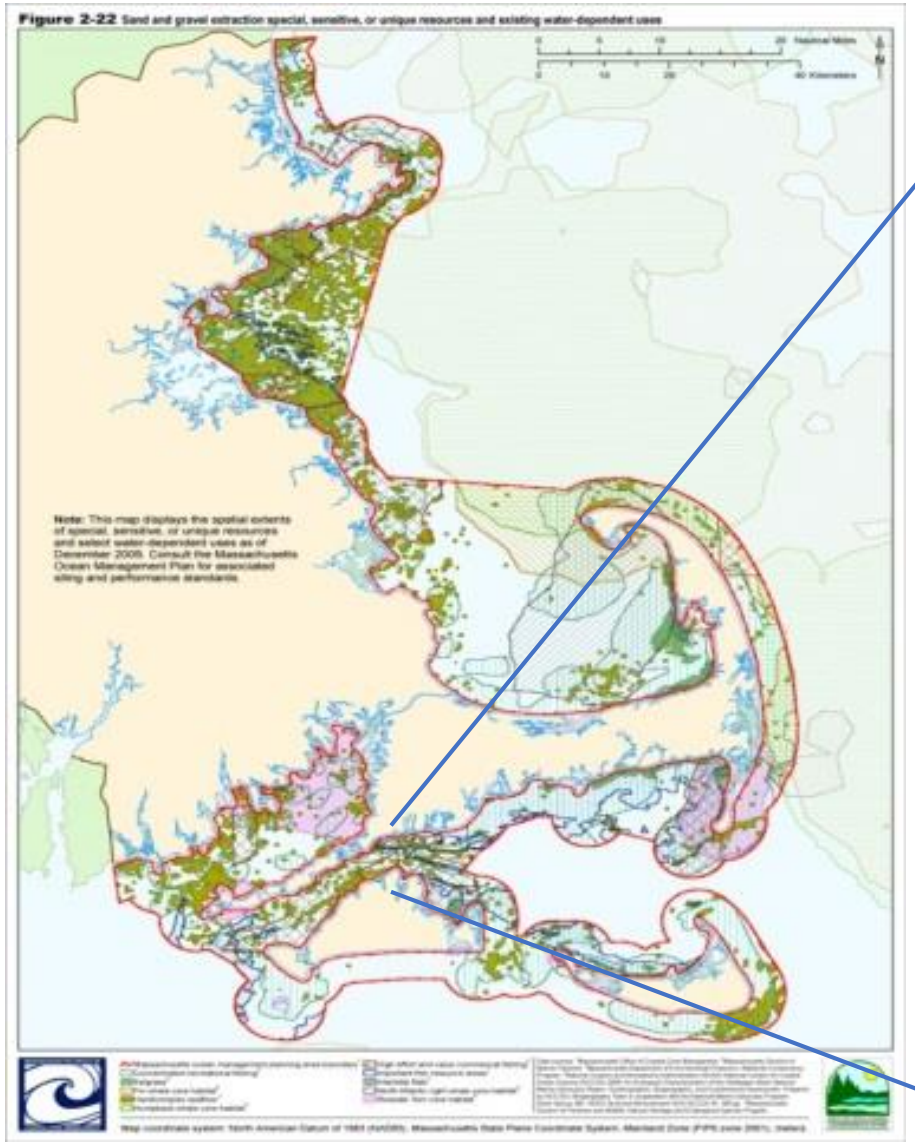
New use **coincident** with identified special areas



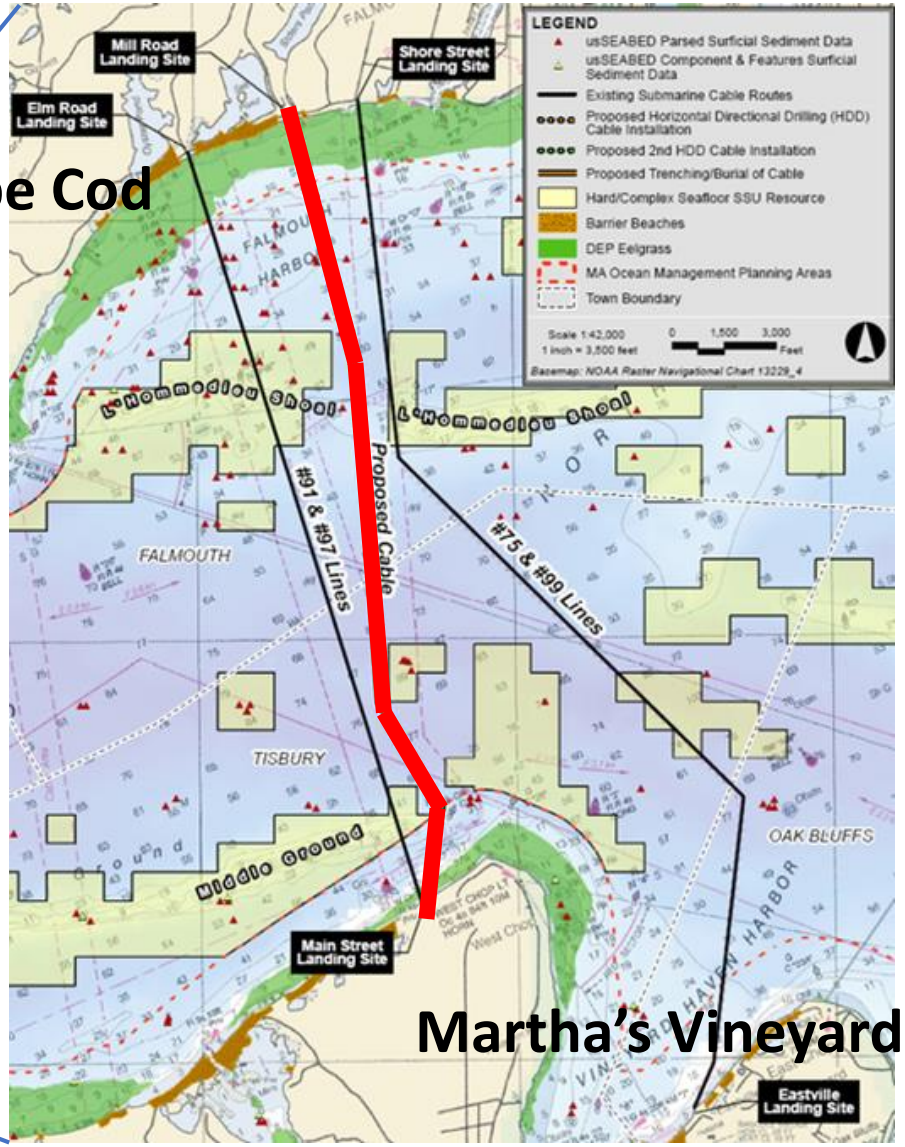
New use **avoids** identified special areas

Example: Massachusetts Ocean Plan

Proposed hybrid fiber optic & electric power cable (Comcast & NSTAR Electric Co.)



Cape Cod



Martha's Vineyard

Blue Plan Process

Step One

Gather Data of Natural Resources and Human Uses

Inventory of Long Island Sound

Step Two

Use Inventory to Find Important Areas in LIS.

Step Three

Form Policies and Standards to Protect Important Areas in LIS.

Blue Plan

Ecologically Significant Areas:

- Spatial
- Required by legislation
- Connected to the Policy
- Unprecedented for LIS

Ecologically Significant Areas:

- Location of ecological priorities vs. ecosystem description
- What we know vs. what we seek to know
- Overall LIS ecosystem remains important
- Criteria definitions prevail over maps

Ecologically Significant Areas & Policy:

General: New activities … shall maintain, preserve, or enhance the values of an ESA

Locating new activities within an ESA: Performance standards

Example (Draft):

ESA: Hard bottom and complex sea floor

Standard: No alteration that would significantly adversely impact ecological characteristics and function.

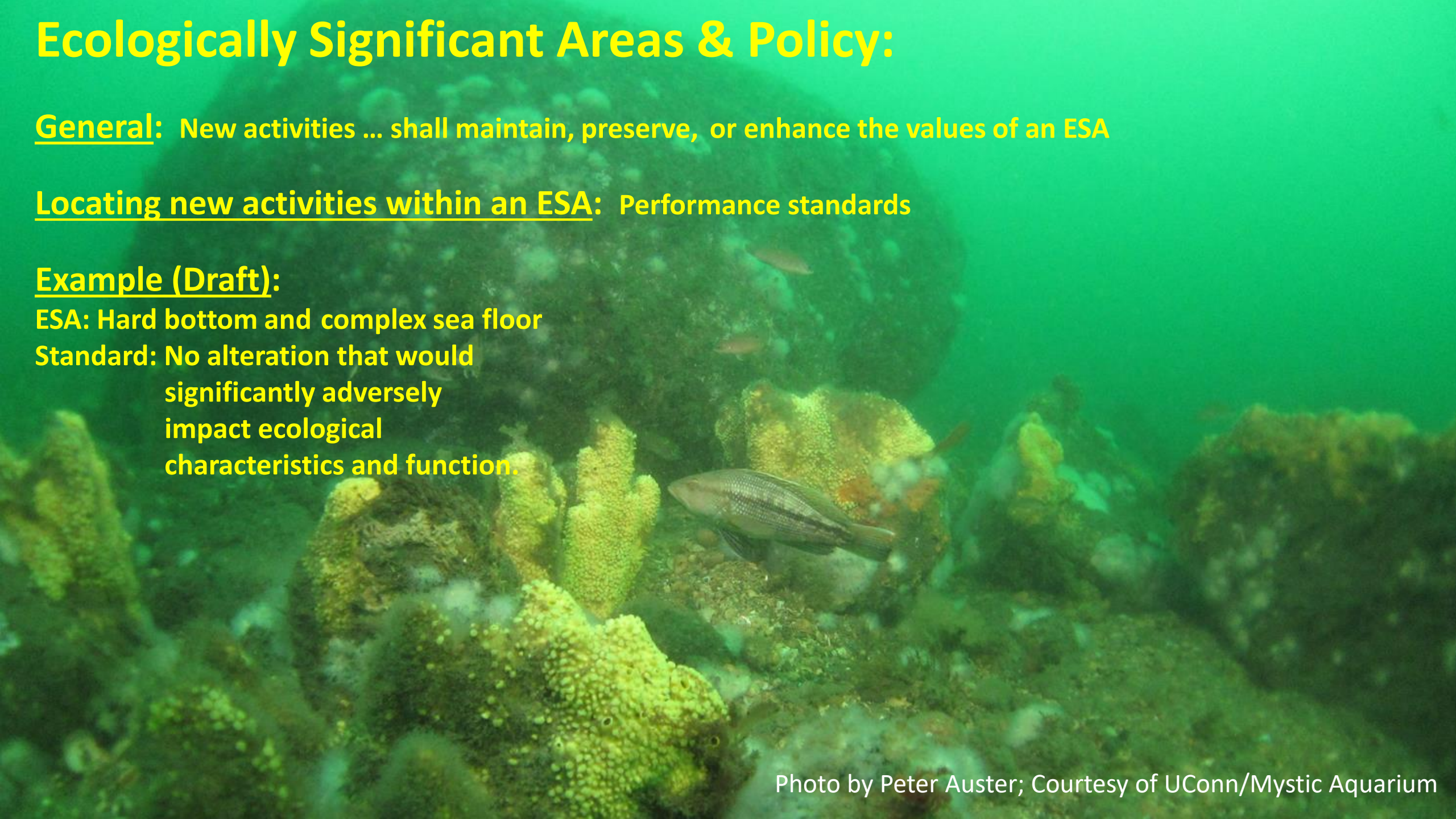


Photo by Peter Auster; Courtesy of UConn/Mystic Aquarium

Ecologically Significant Areas Process

- Inventory
- Ecological Experts Group and Consultant
- ESA Criteria
- Data analysis, development, synthesis and much more!

- 329 pages, 27 chapters
- Ecological and Human Use characterization of the Sound

Ecological Experts Group (EEG):

Peter Auster: UConn/Mystic Aquarium
Penny Howell: CT DEEP Marine Fisheries
Maxine Montello: Riverhead Foundation
Emily Shumchenia: Lead Consultant
Chris Elphick: UConn
Giancarlo Cicchetti: EPA
Tessa Getchis: CT Sea Grant
Kevin O'Brien: CT DEEP
Melissa Albino-Hegeman: NY DEC
Christian Conroy: UConn
Nick Napoli: Consultant
Nathan Frohling: Blue Plan AC

Four day-long workshops plus . . .

ESA Criteria:

- **Criteria definitions are controlling; maps best current guidance**
- **Major focus of EEG work**
- **Consistent w other marine plans**

ESA Criteria:

(1) Areas w rare, sensitive, or vulnerable species, communities or habitats

- Hard bottom and complex sea floor
- Areas of submerged aquatic vegetation
- Endangered, threatened, species of concern or candidate species listed under state or federal ESA, and their habitats
- Areas of cold water corals
- Coastal Wetland

Peter Auster

ESA Criteria:

(2) Areas of high natural productivity, biological persistence, diversity and abundance, including areas important for supporting or exhibiting such features relative to …

- Cetaceans, Pinnipeds, Sea turtles and other reptiles
- Birds
- Fish
- Mobile invertebrates
- Sessile-mollusk-dominated communities
- Managed shellfish beds
- Soft-bottom benthic communities

Ecologically Significant Areas – criteria > definitions > data > maps

Reminders:

- Definitions are “controlling” (most important to get these right)
- Each criterion has a siting and performance standard in the Blue Plan

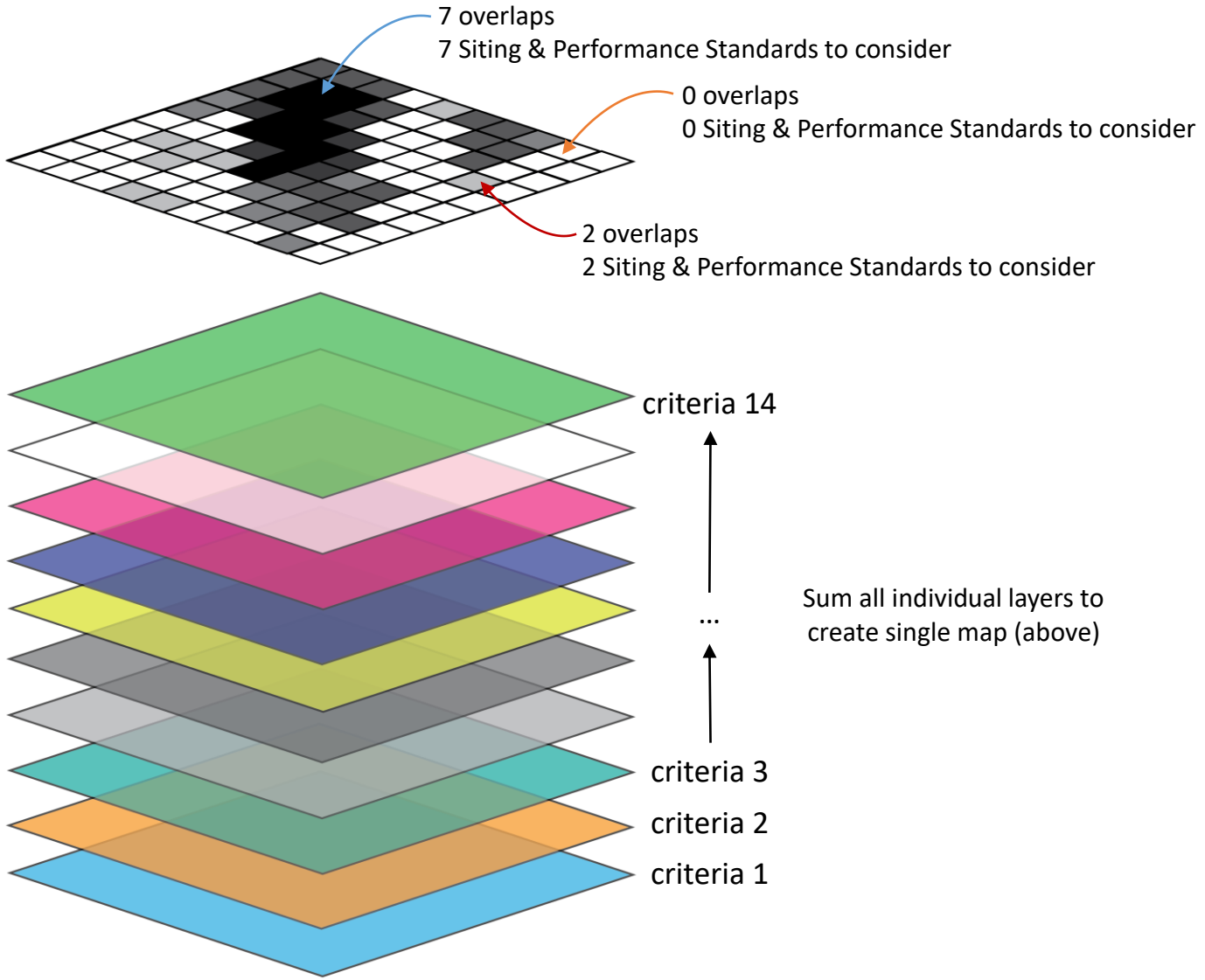
Considerations:

- Leverage existing data in Inventory especially from CT DEEP, NYDEC, LISS, academic research
- Data were not equally available or of equal “quality” or coverage for each criterion
- There are many criteria (14 total!)

How to make this both a good representation of ecologically significant areas in Long Island Sound AND practical tool that can be used by LIS stakeholders?

Ecologically Significant Areas – criteria > definitions > data > maps

- Common grid
- Each criterion associated with a single presence/absence layer that represents an Ecologically Significant Area for that criterion
- For layers that required a threshold, generally applied a “top quintile” approach
- A map depicting the overlap of all ESA criteria represents “the minimum number of ESAs present”
- The overlay map also represents the number of siting or performance standards that should be consulted in any place



First Criteria: Rare, sensitive, or vulnerable species, communities, habitats

Hard bottom and complex seafloor

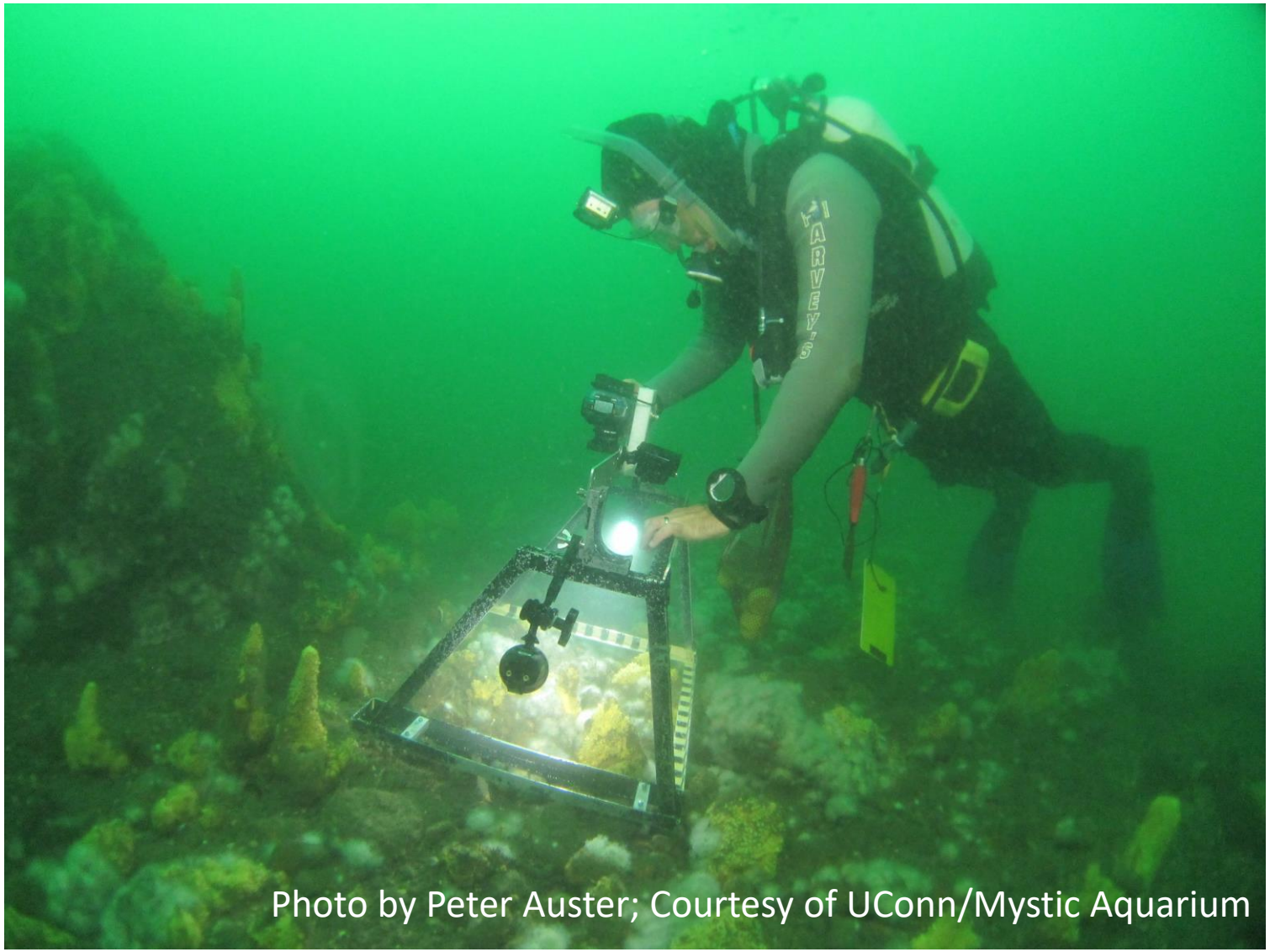
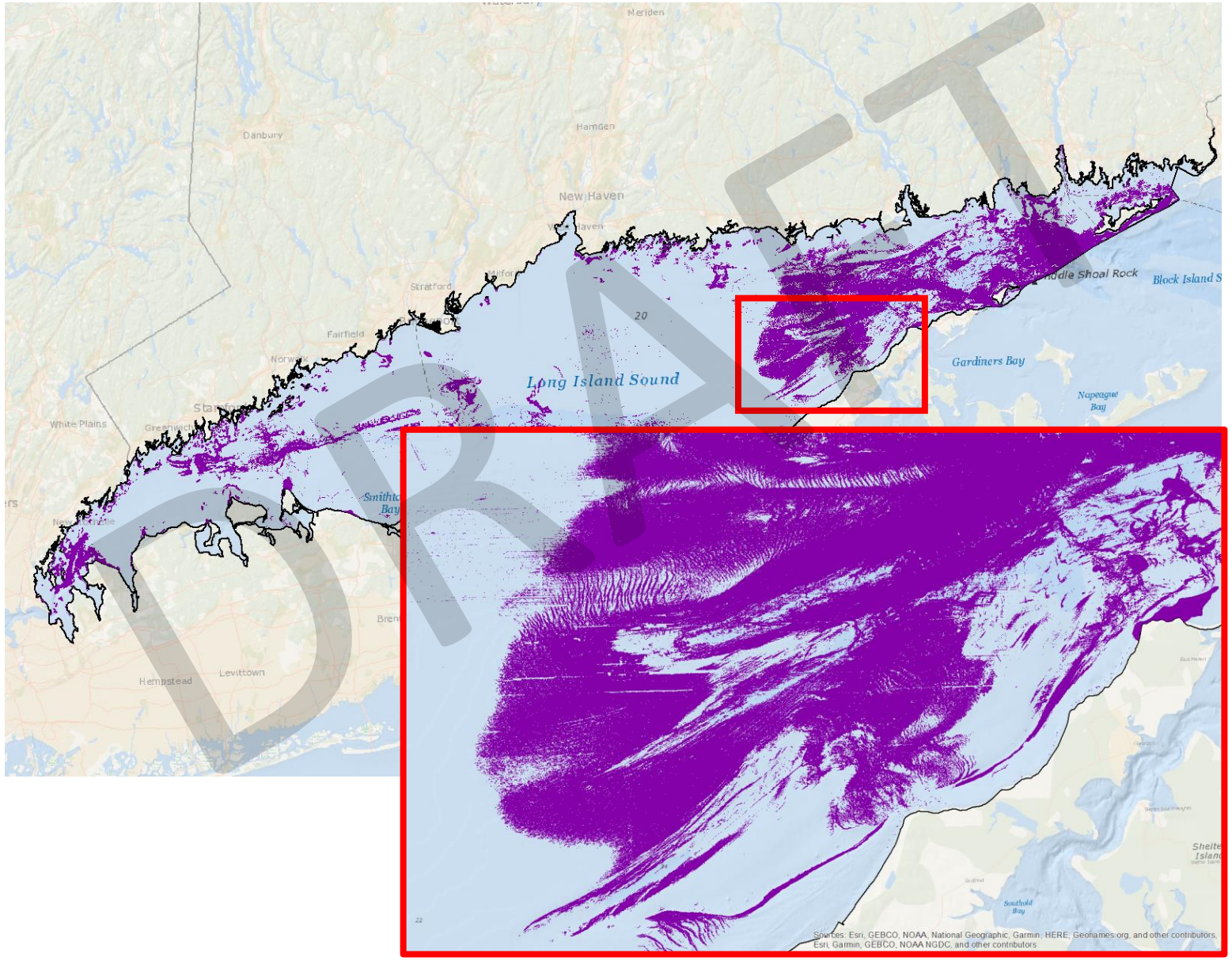


Photo by Peter Auster; Courtesy of UConn/Mystic Aquarium

First Criteria: Rare, sensitive, or vulnerable species, communities, habitats

Hard bottom and complex seafloor

- Hard bottom
  - USGS Long Island Sound Surficial Sediment map
  - Long Island Sound Ecological Assessment hard bottom map
  - Long Island Sound Mapping and Research Collaborative hard bottom points
- Complex seafloor
  - TOP QUINTILE Terrain Ruggedness Index (TRI), new 8-meter bathymetry composite (NOAA multibeam, Long Island Sound Seafloor Mapping)
- Wrecks and obstructions from NOAA AWOIS



Rare, sensitive, or vulnerable species, communities, habitats

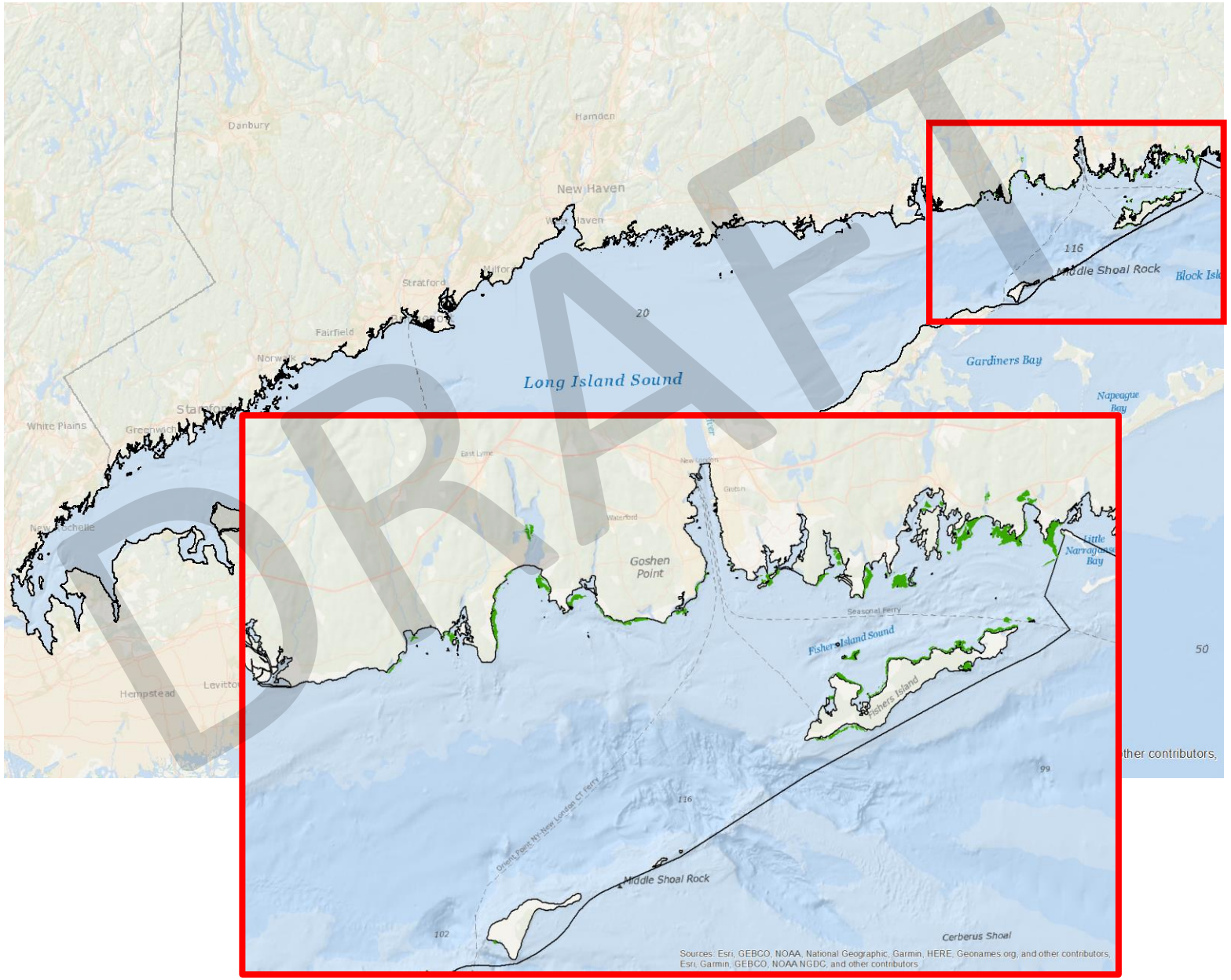
Areas of submerged aquatic vegetation

Rare, sensitive, or vulnerable species, communities, habitats

Areas of submerged aquatic vegetation

Areas where submerged aquatic vegetation, e.g., eelgrass (Zostera marina), etc., are present or have been found to be present.

"Tier 1 2017 mapping of *Zostera marina* in Long Island Sound and change analysis", Bradley and Paton 2018.



Rare, sensitive, or vulnerable species, communities, habitats

Endangered, threatened, species of concern, or candidate species listed under state or federal Endangered Species Act, and their habitats

Roseate tern Photo: USFWS

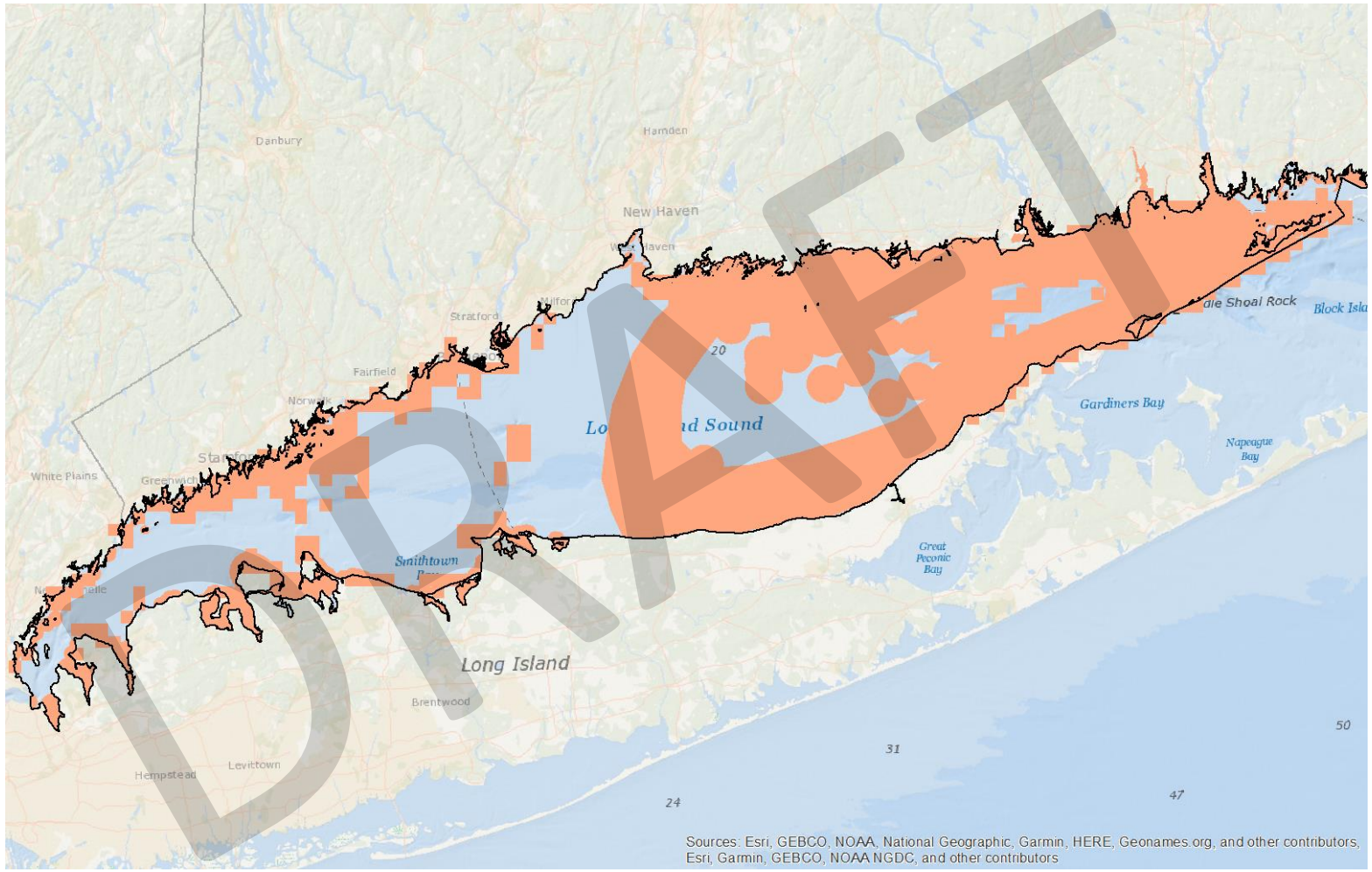
Atlantic sturgeon Photo: NOAA Fisheries

Rare, sensitive, or vulnerable species, communities, habitats

Endangered, threatened, species of concern, or candidate species listed under state or federal Endangered Species Act, and their habitats

Definition recognizes that detailed spatial data depicting the distribution and abundance for these marine species in Long Island Sound are potentially unavailable

- Federal – Critical Habitats
- CT – Natural Diversity Database, Estuarine Critical Habitats
- NY – Rare plants and animals, Significant Natural Communities, Significant Coastal Fish and Wildlife Habitats
- Roseate tern summer occurrence
- Atlantic sturgeon high use areas, migratory corridors, gear restriction areas (all from CT DEEP Marine Fisheries)



Rare, sensitive, or vulnerable species, communities, habitats

Areas of cold water corals

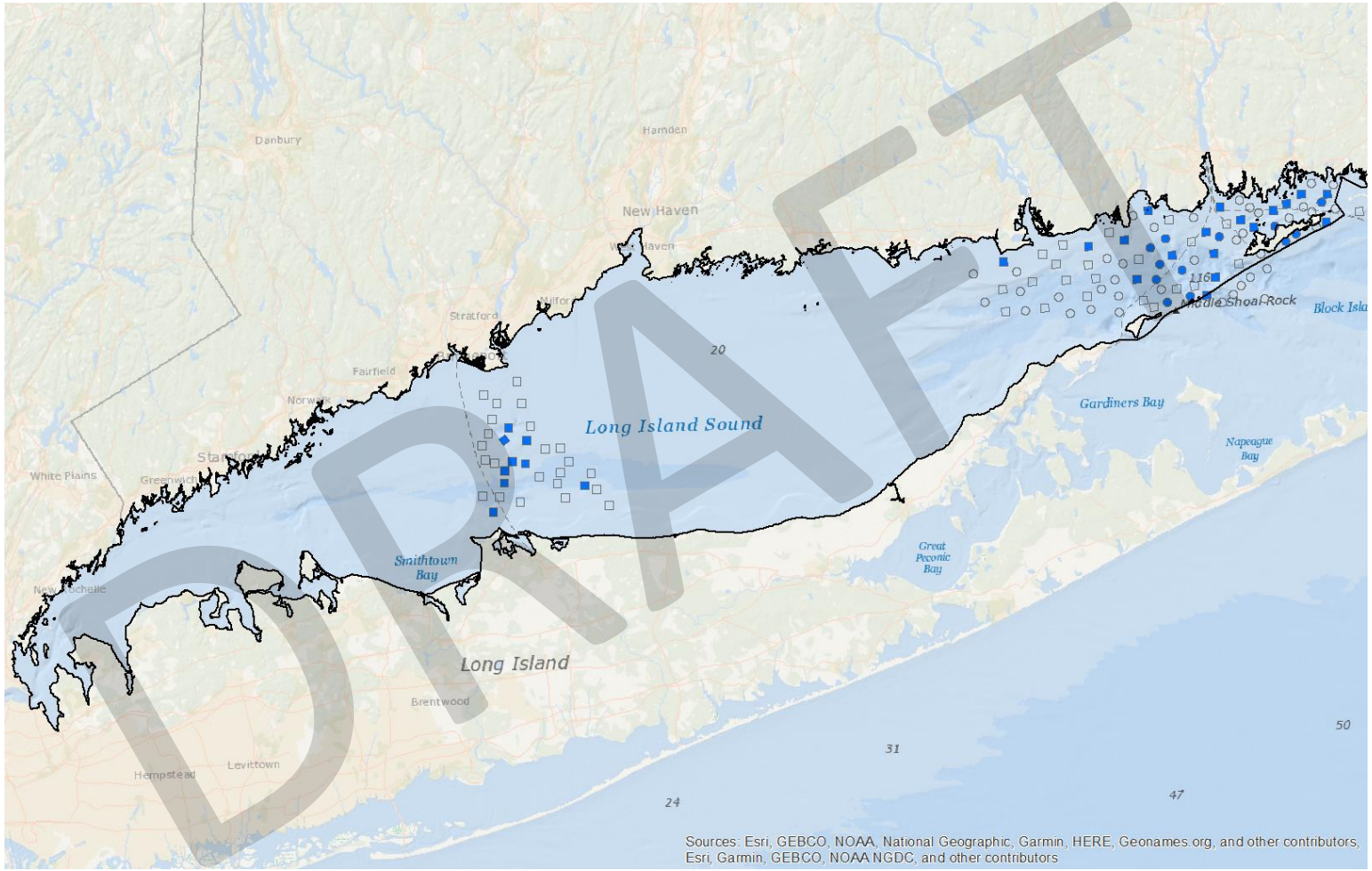
Photos by Peter Auster; Courtesy of UConn/Mystic Aquarium

Rare, sensitive, or vulnerable species, communities, habitats

Areas of cold water corals

Areas where cold-water corals have been observed or where habitat suitability or other scientific models predict they occur.

Long Island Sound Mapping and Research Collaborative Phase I and II cold water corals observations



Rare, sensitive, or vulnerable species, communities, habitats

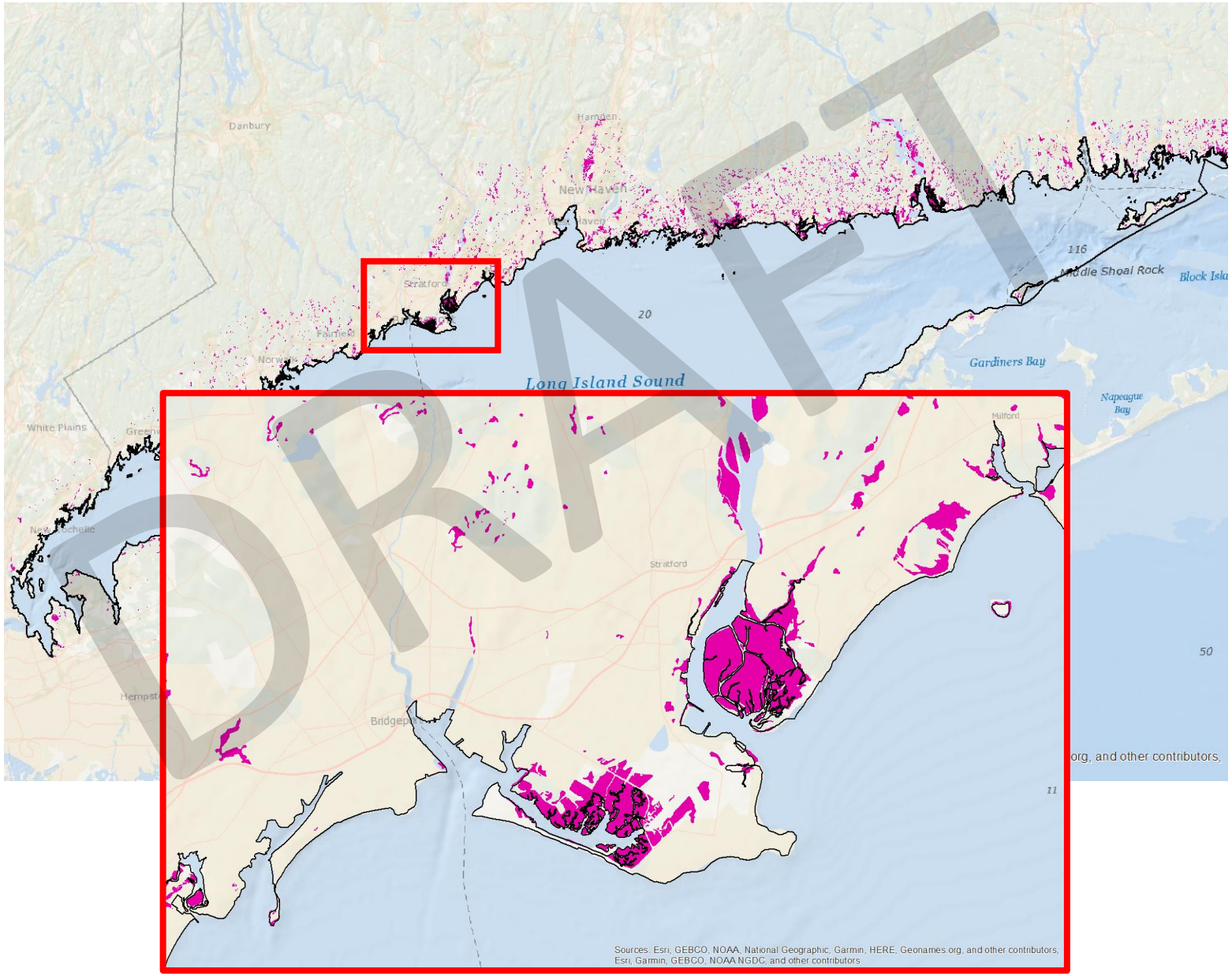
Coastal wetlands

Rare, sensitive, or vulnerable species, communities, habitats

Coastal wetlands

Definition recognizes that coastal wetlands are likely outside of the Blue Plan policy area (i.e., landward of the 10-foot contour)

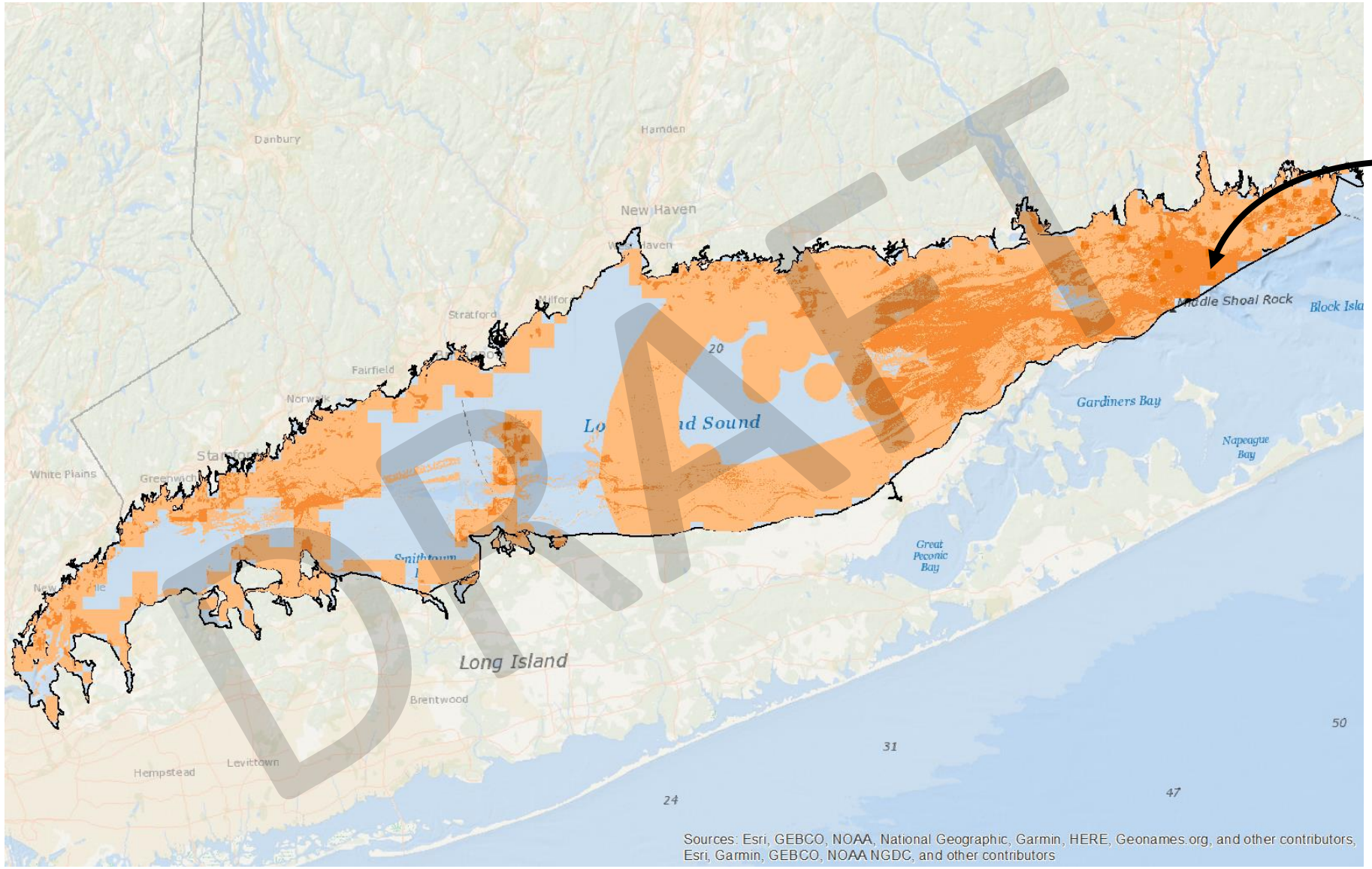
Long Island Sound Study coastal wetlands data



First Criteria: Roll-up

Minimum number of rare, sensitive, or vulnerable species communities, habitats

5 total criteria; 4 max overlap



Overlaps here:

1. Hard bottom and complex seafloor
2. Endangered, threatened, species of concern or candidate species
3. Cold water corals

Second Criteria: Areas of high natural productivity, etc.

Cetaceans

Humpback whale Photo: NPS

Second Criteria: Areas of high natural productivity, etc.

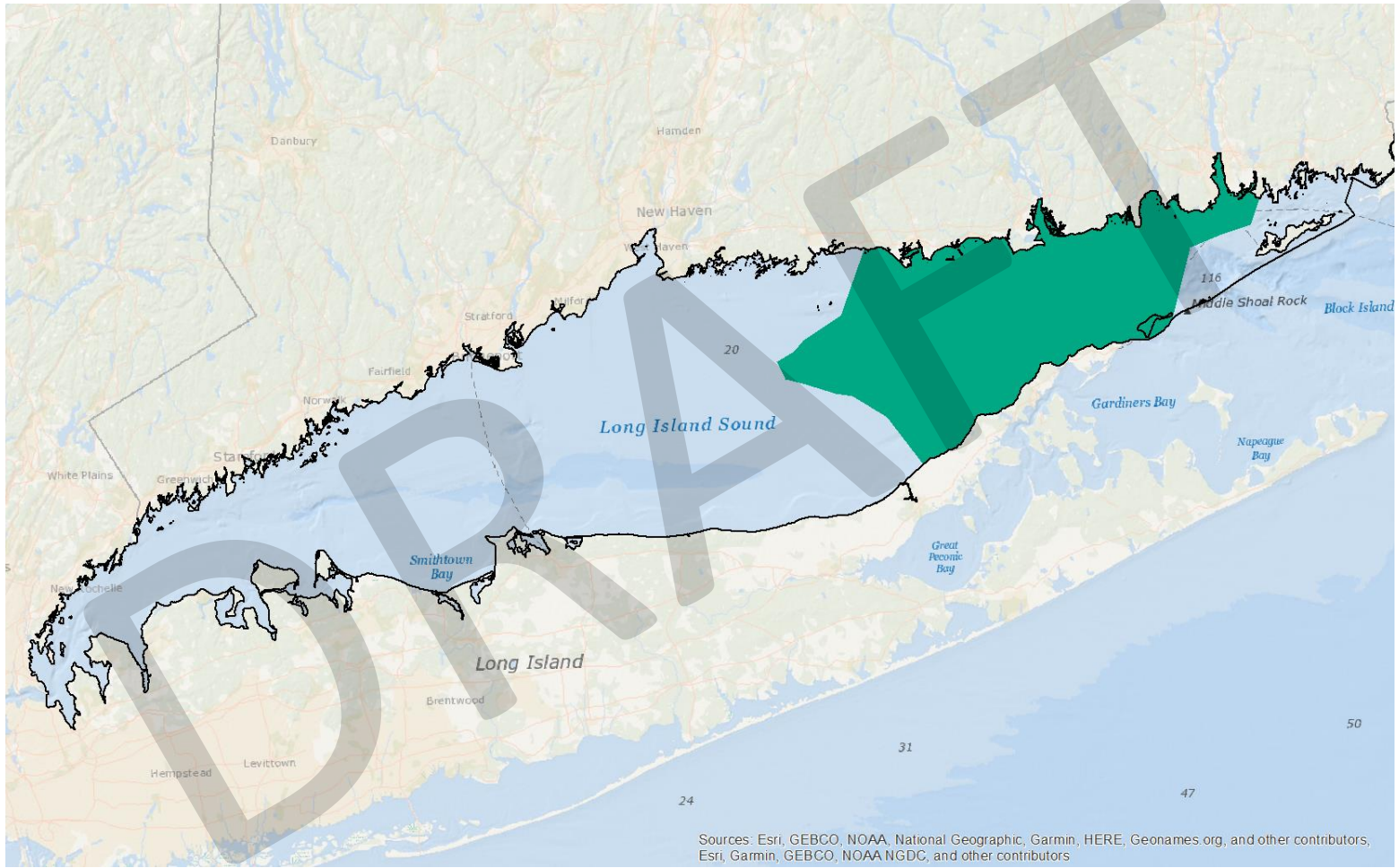
Cetaceans

Areas where cetaceans occur in higher concentrations and/or particular significant areas as noted in the general description (above) that support cetaceans (e.g. particular feeding areas, nursery grounds).

Modeled average density of cetacean species (predicted animals per 100 square kilometers) by the Duke University Marine Geospatial Ecology Lab and Marine-life Data and Analysis Team.

11 species or species guilds with predictions in LIS

<u>AREAS WITH AVERAGE ANNUAL PREDICTED ABUNDANCE OF 5 OR MORE ANIMALS</u>



Areas of high natural productivity, etc.

Pinnipeds

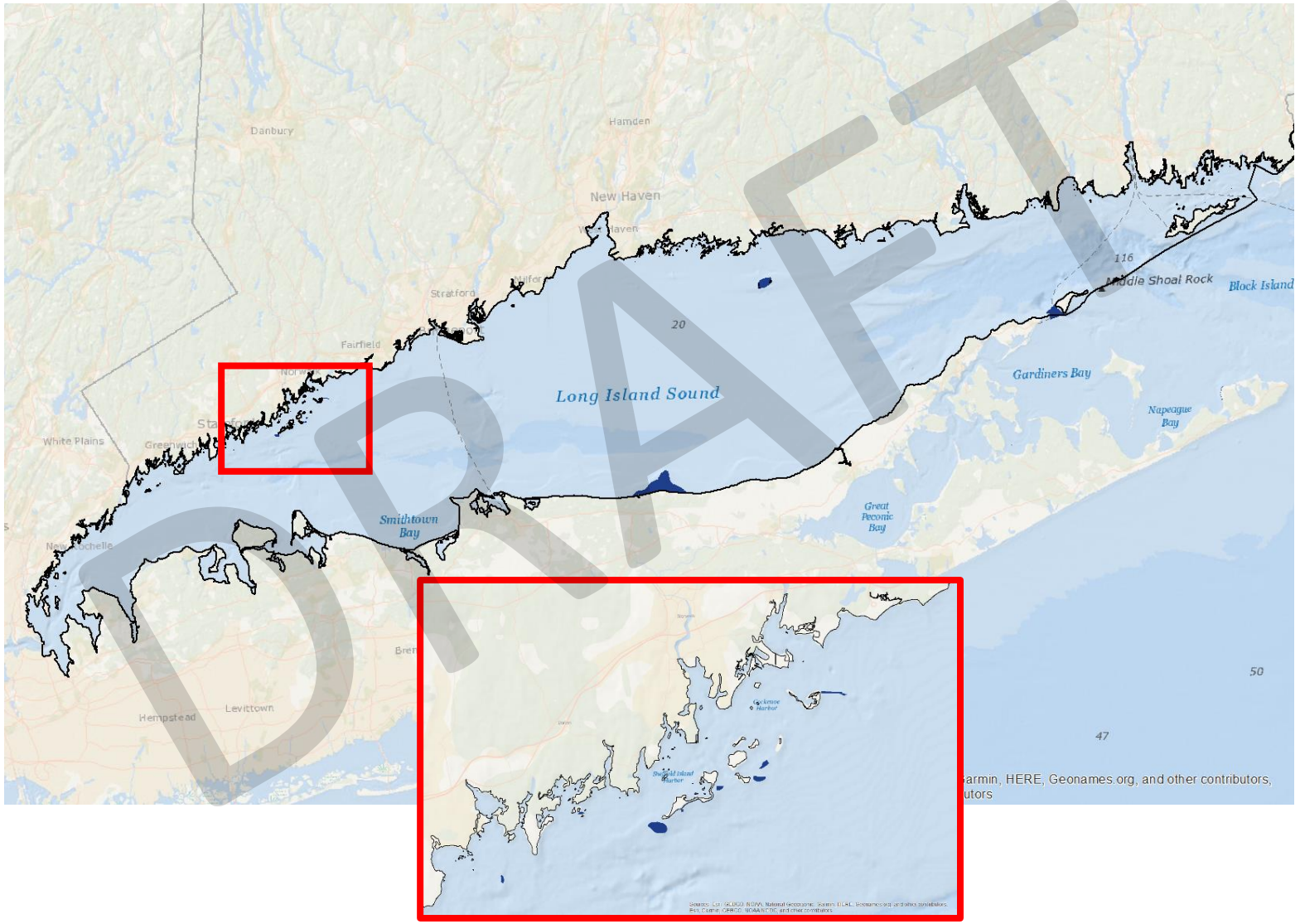
Seals in Long Island Sound Photo: LISS

Areas of high natural productivity, etc.

Pinnipeds

Areas where pinnipeds occur in higher concentrations and/or particular significant areas as noted in the general description (above) that support pinnipeds (e.g. particular haul-out locations, feeding areas).

Seal concentration areas (Environmental Sensitivity Index data plus expert input) representing 2015-2017 conditions



Areas of high natural productivity, etc.

Sea turtles and other reptiles

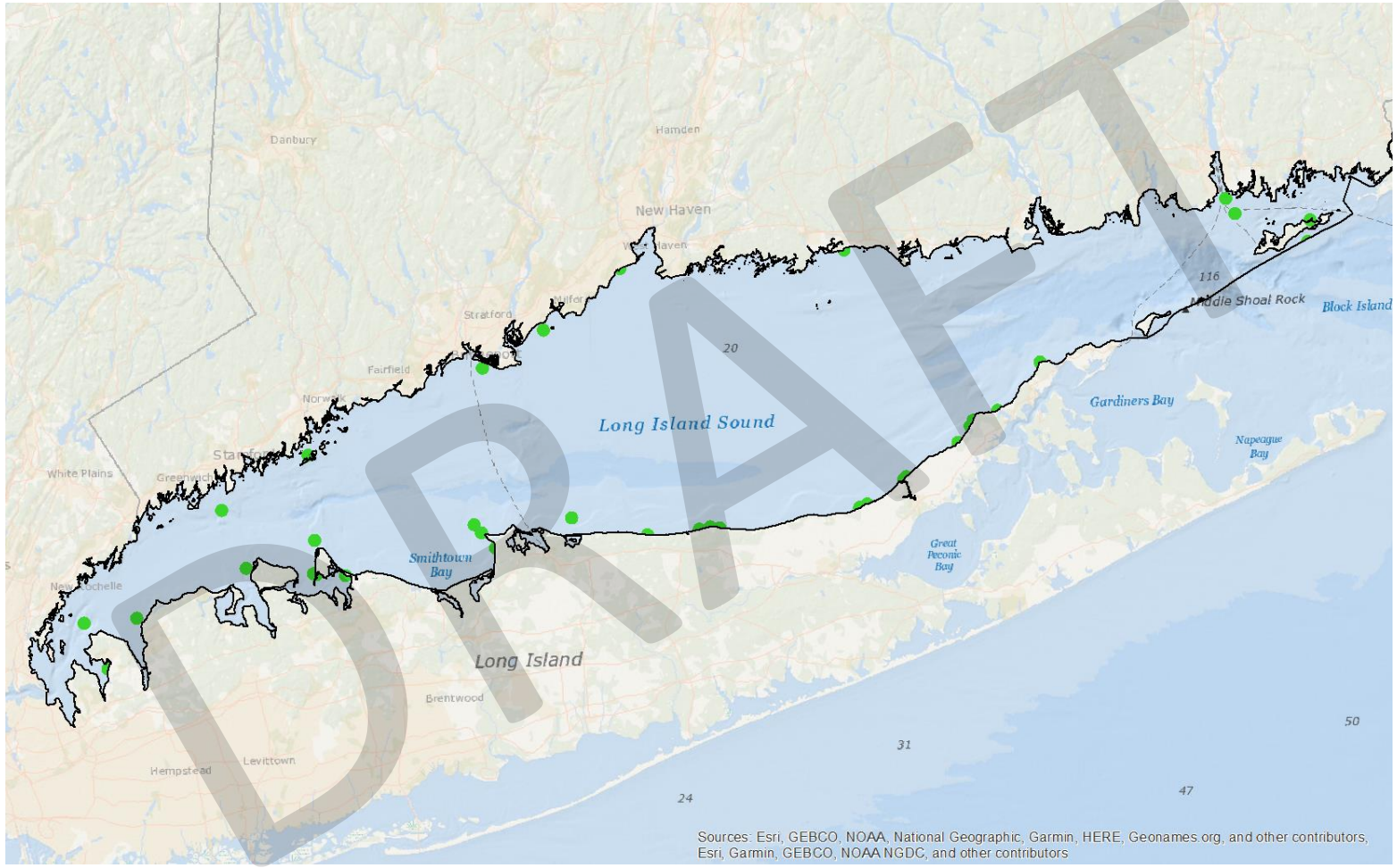
Diamondback terrapins Photo: Courtesy of the Bruce Museam

Areas of high natural productivity, etc.

Sea turtles and other reptiles

Areas where sea turtles and other reptiles occur in higher concentrations and/or particular significant areas as noted in the general description (above) that support sea turtles and other reptiles (e.g. particular feeding areas, nesting grounds, hibernation areas).

Live strandings and in-water observations (Mystic Aq & Riverhead Found), and 2018 coastal Connecticut mortality events



Areas of high natural productivity, etc.

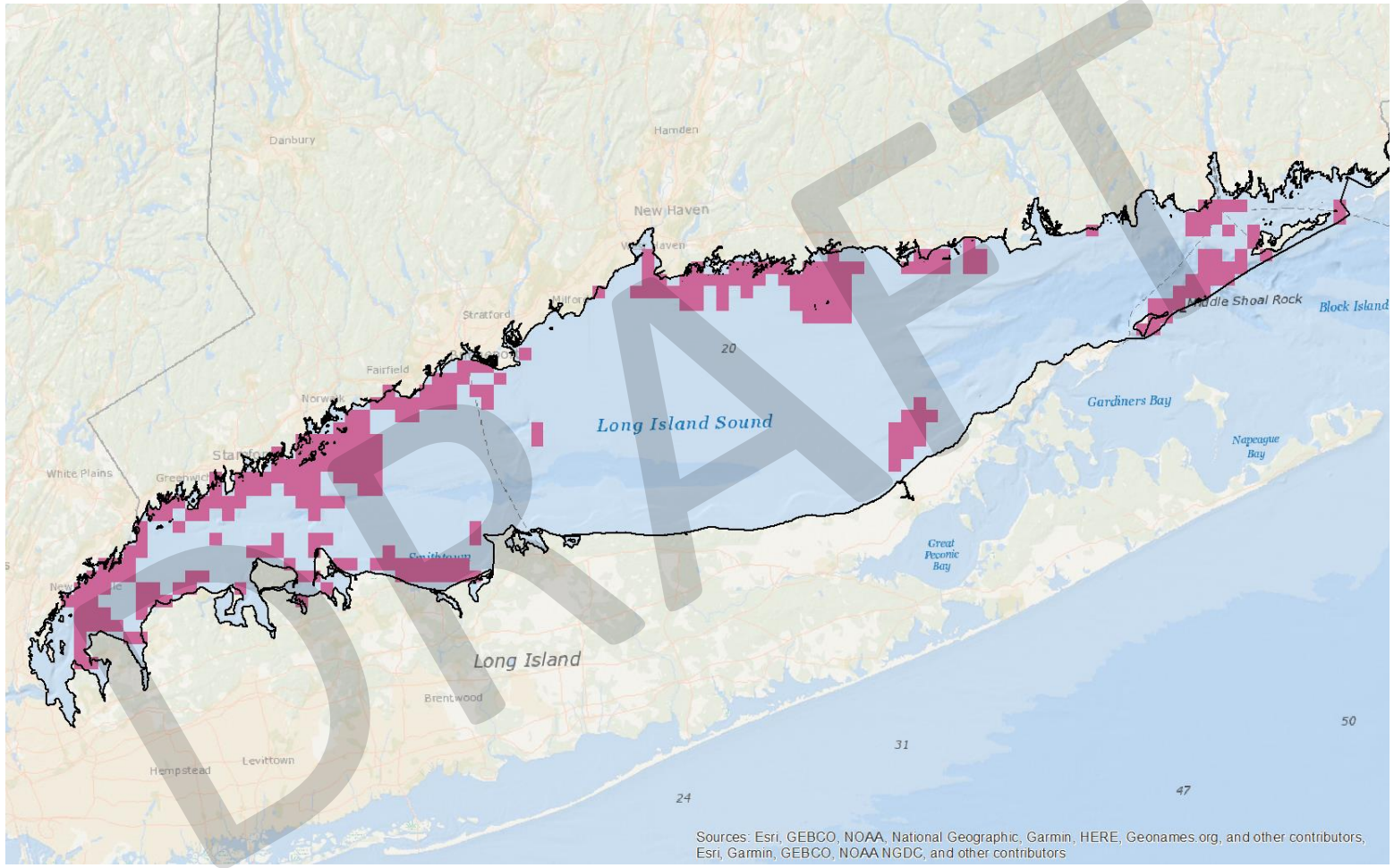
Birds

Areas of high natural productivity, etc.

Birds

Areas where birds are abundant or diverse including feeding areas; areas of high bird productivity including nesting areas.

Occurrence predicted for winter (23 spp.) and summer (7 spp.) from eBird data and environmental covariates – Steen and Elphick (UConn)



Areas of high natural productivity, etc.

Fish

Four-bearded rockling in western LIS Photo: © Robert Bachand

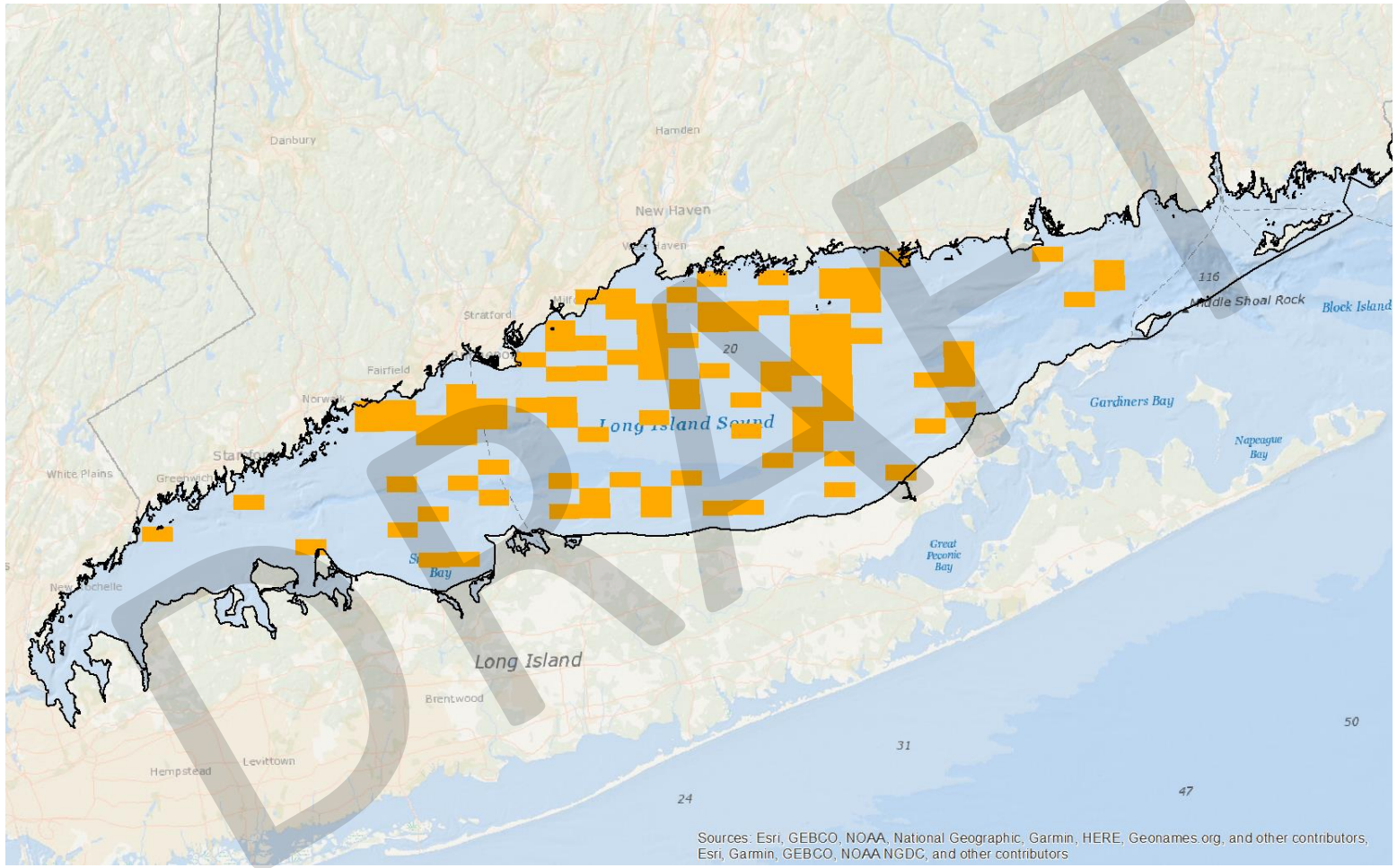
Areas of high natural productivity, etc.

Fish

Areas of high weighted fish persistence and high fish abundance and concentration.

Weighted persistence (Long Island Sound Ecological Assessment, 1984-2009 spring and fall)

Abundance (CT DEEP Long Island Sound Trawl Survey, 2004-2015 spring and fall)



Areas of high natural productivity, etc.

Mobile invertebrates

American lobster Photo: © Robert DeGoursey

Areas of high natural productivity, etc.

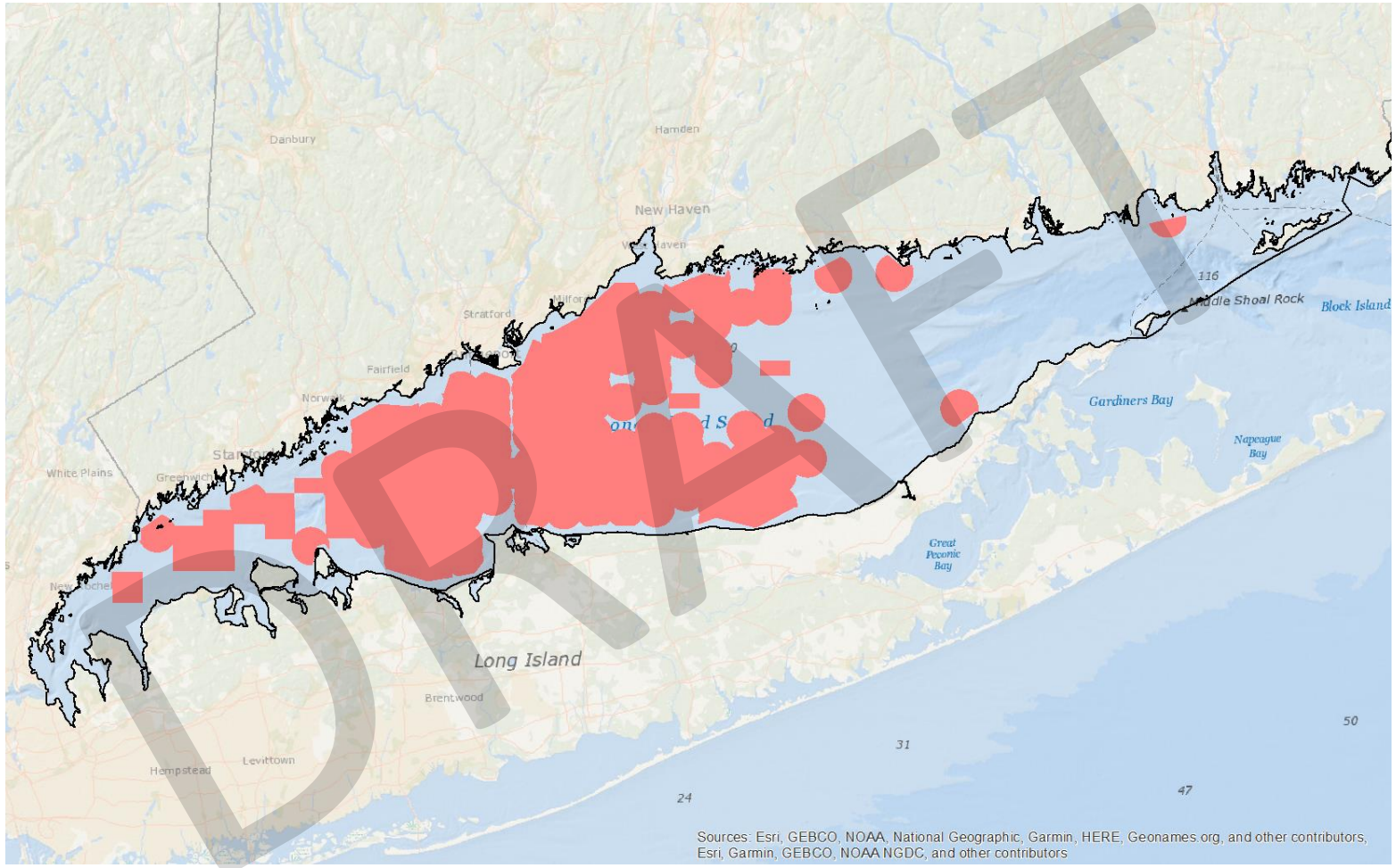
Mobile invertebrates

Areas of high mobile invertebrate (e.g., lobster, other crustaceans, squid) abundance and concentration

Horseshoe crab CT spawning beaches, offshore hotspots, offshore high use areas (CT DEEP)

American lobster, Horseshoe crab, Longfin squid abundance (CT DEEP Long Island Sound Trawl Survey, 2004-2015 spring and fall)

American lobster projected thermal refuge areas (CT DEEP and Stevens Institute)



Areas of high natural productivity, etc.

Sessile-mollusk-dominated communities

Blue mussels Photo: Courtesy of Politico

Areas of high natural productivity, etc.

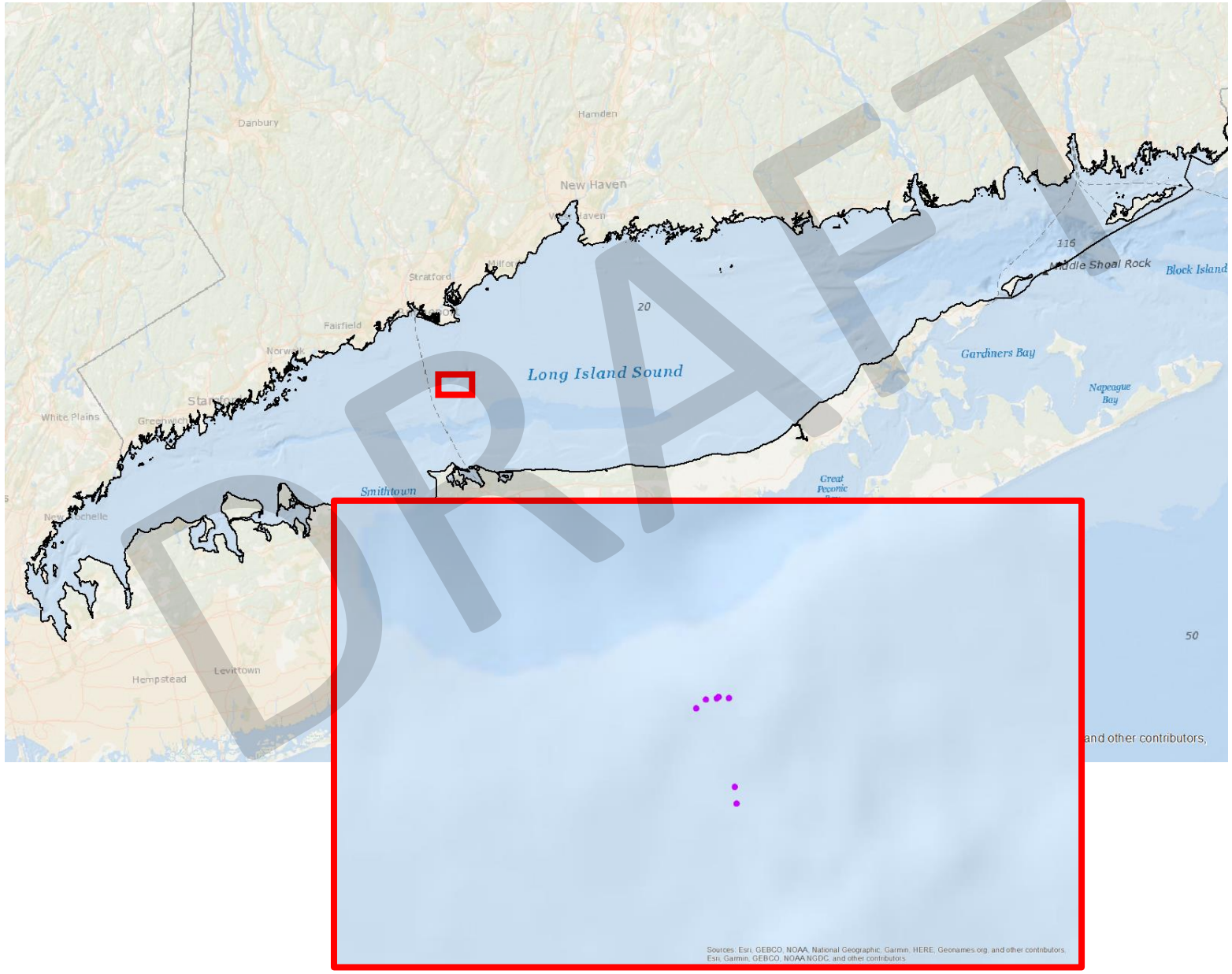
Sessile-mollusk-dominated communities

Areas where wild, natural sessile-mollusk-dominated communities occur.

Blue mussel aggregations

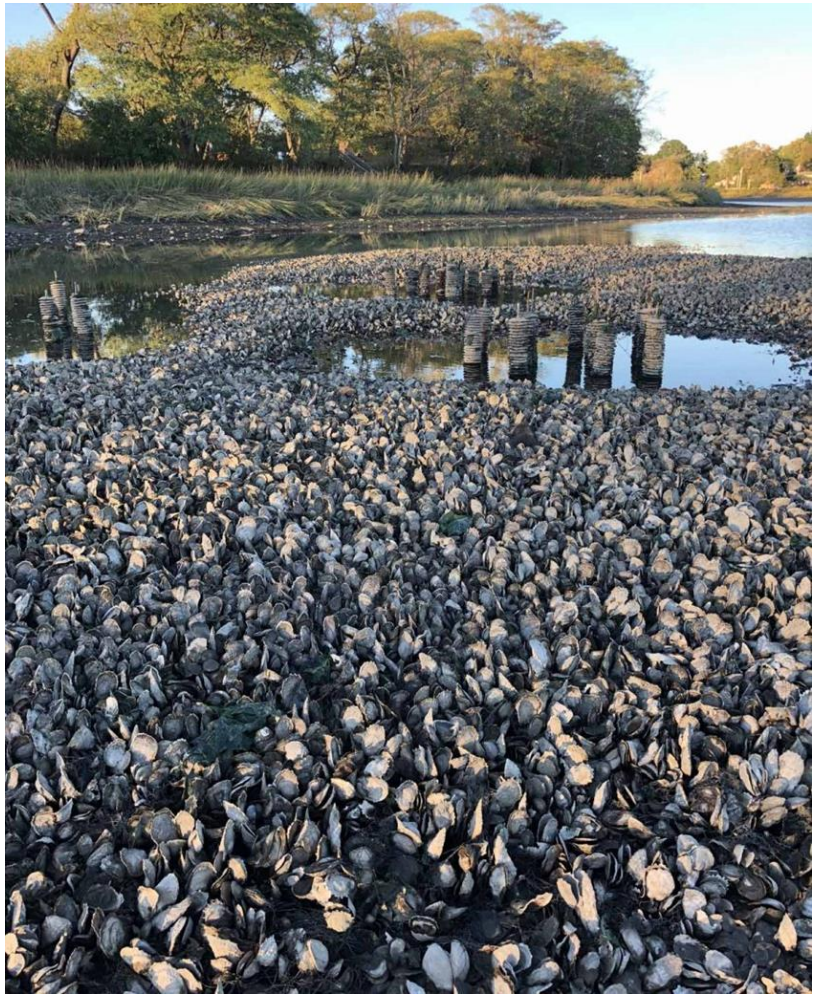
Slipper shell aggregations

(Long Island Sound Mapping and Research Collaborative)



Areas of high natural productivity, etc.

Managed shellfish beds



An oyster reef grows in tidal waters in Fairfield
Photo courtesy of Connecticut Sea Grant-UConn

Areas of high natural productivity, etc.

Managed shellfish beds

Locations of commercial and recreational shellfishing harvest areas, including shellfish restoration activities and areas closed to shellfishing.

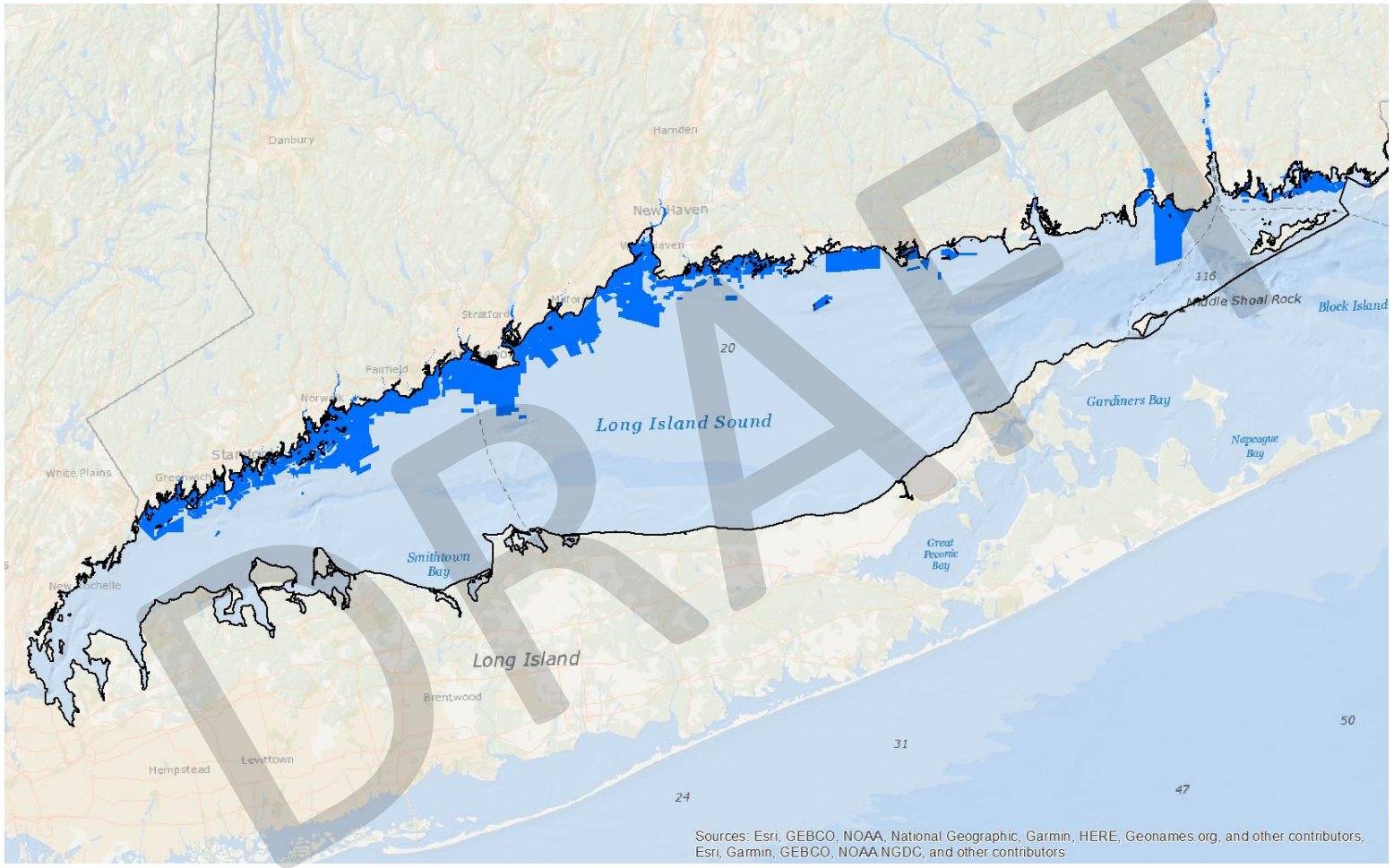
Oyster seed beds

CT recreational beds

CT state-managed beds

CT town-managed beds

(CT Bureau of Aquaculture)



Areas of high natural productivity, etc.

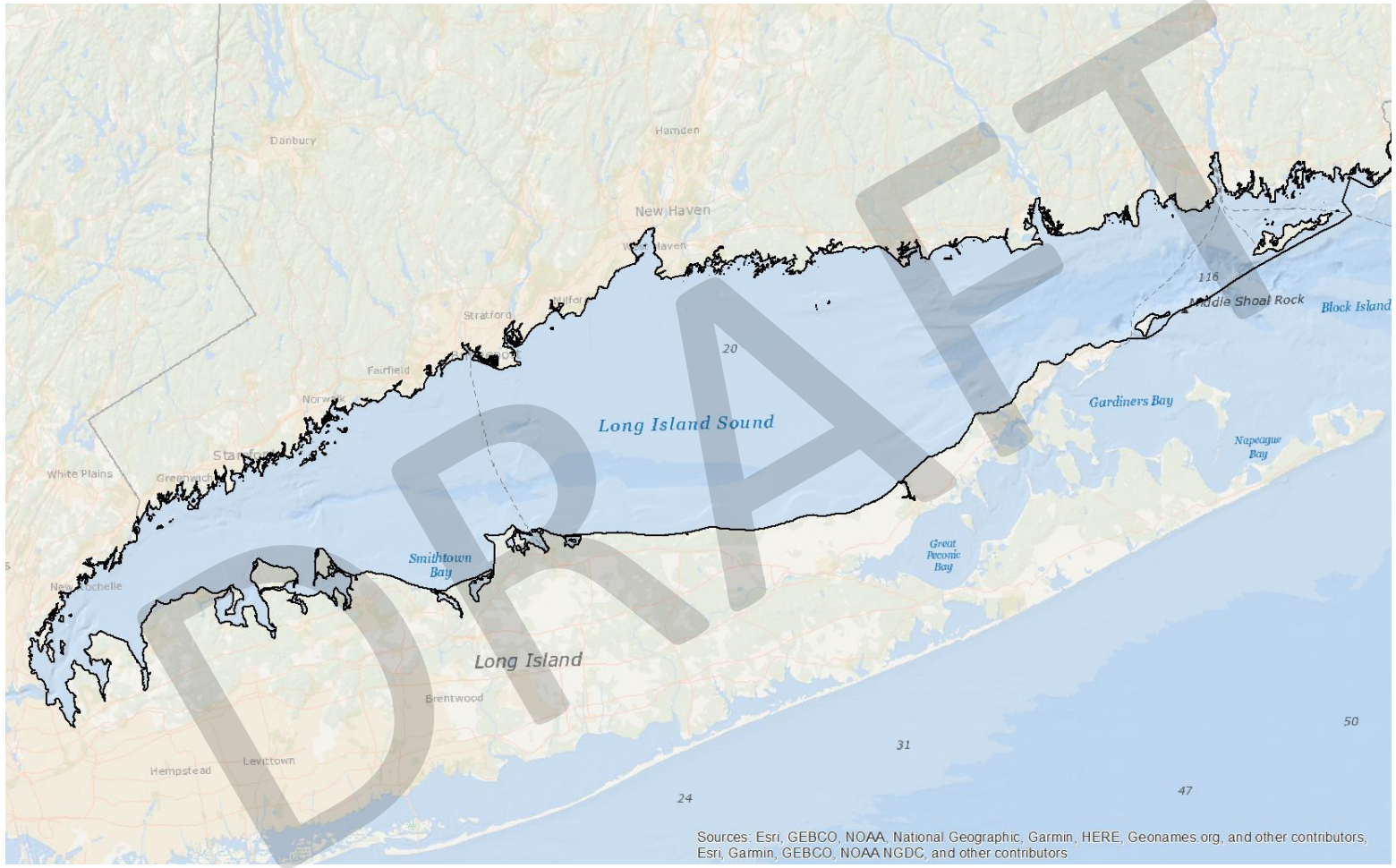
Soft-bottom benthic communities

Photo: © Robert DeGoursey

Areas of high natural productivity, etc.

Soft-bottom benthic communities

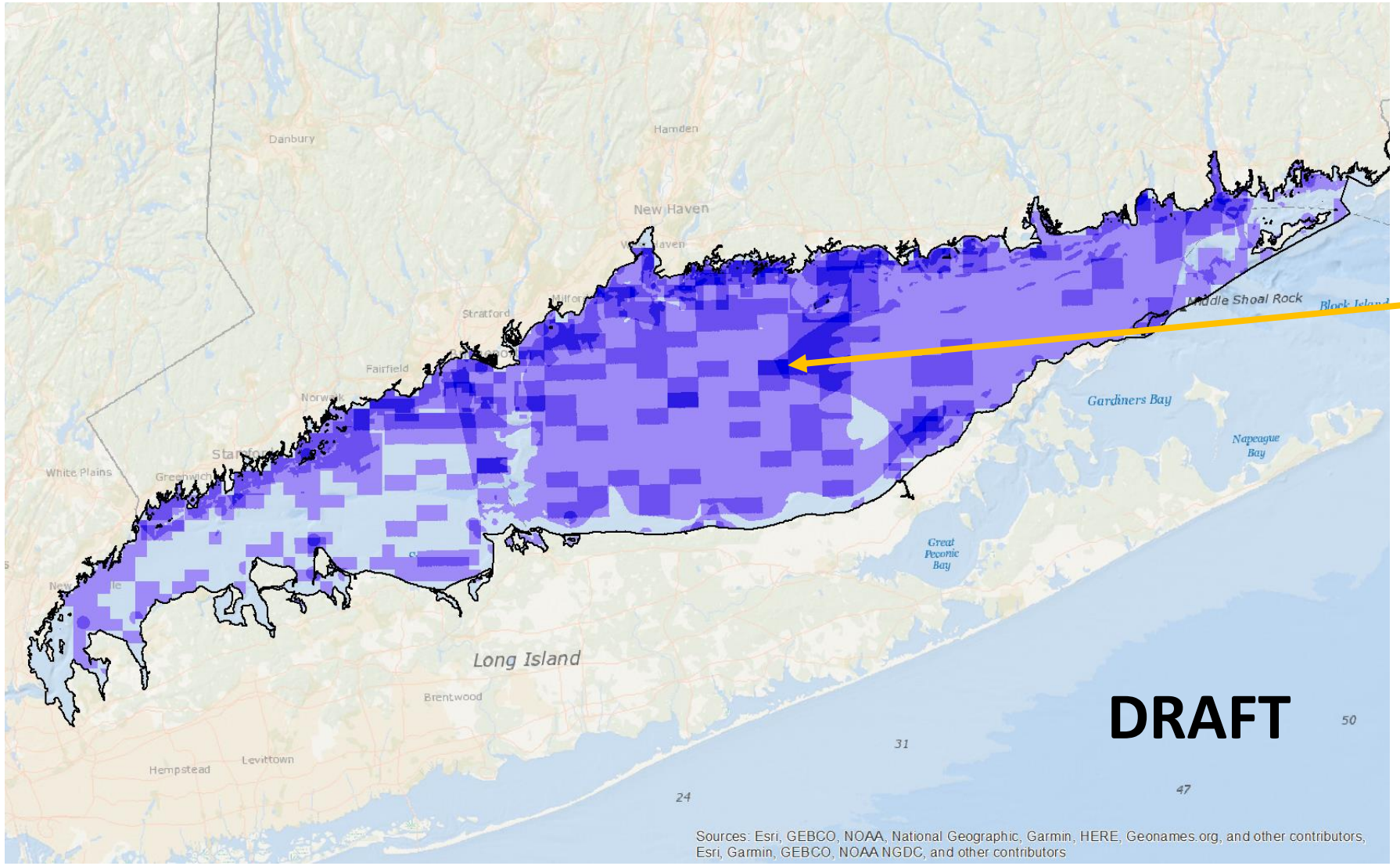
Areas of soft-bottom seafloor communities where natural productivity, biological persistence, diversity, and/or abundance of marine flora and fauna are high, as well as areas of soft-bottom seafloor communities known to support important life history or important ecological functions of mobile species (e.g., migratory stopovers and corridors, feeding areas, and nursery grounds).



Insufficient geospatial data

Second Criteria: Roll-up Areas of high natural productivity, etc.

8 total criteria with data; 4 max overlap

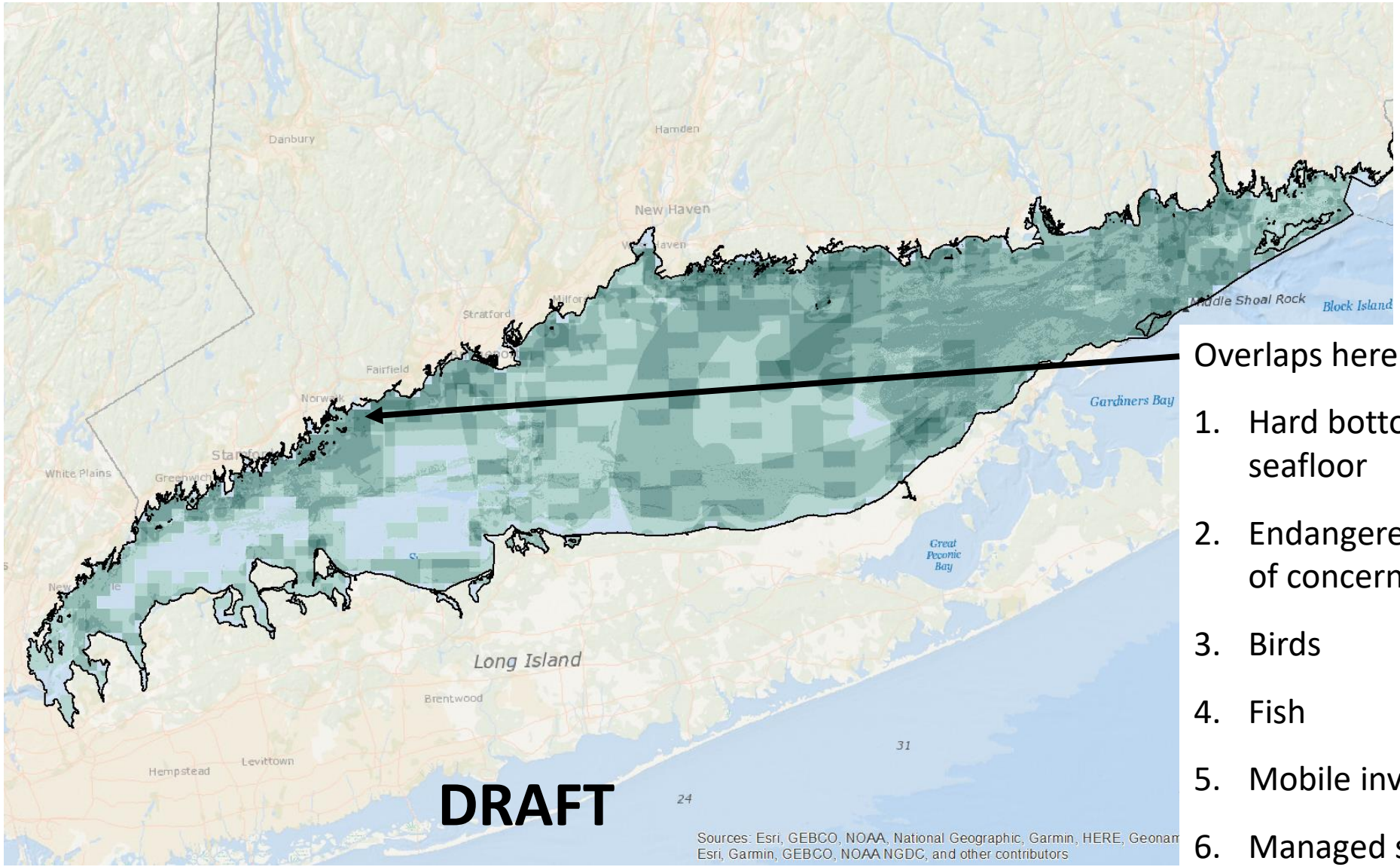


Overlaps here:

1. Cetaceans
2. Fish
3. Mobile invertebrates

Ecologically Significant Areas: All Criteria: Roll-up

13 total criteria with data; 6 max overlap



Overlaps here:

1. Hard bottom and complex seafloor
2. Endangered, threatened, species of concern, or candidate species
3. Birds
4. Fish
5. Mobile invertebrates
6. Managed shellfish beds

Ecologically Significant Areas – Documentation and guidance

- Metadata
- Technical construction tables
- Methods in the Blue Plan
- ESA Data Characterization document

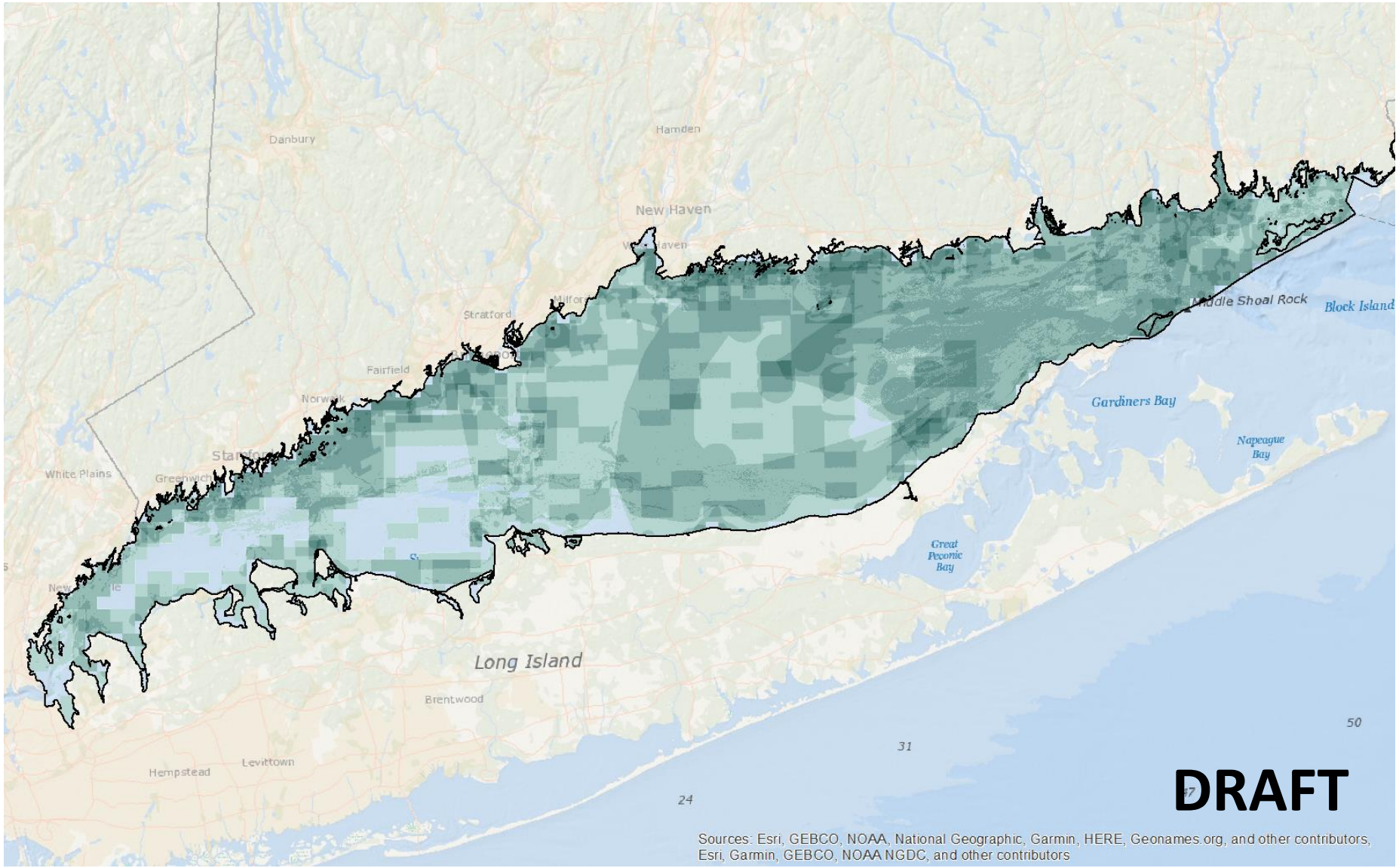
	Each ESA Sub-criterion
ESA Sub-criterion Description	*Definition of the ESA subcriterion*
Data Source	*Names of all input data layers and sources; include resolution if raster*
Data Extent	*Long Island Sound Blue Plan Planning Area (or other extent, will be specific to input data)*
Data Adjustment and Pre-processing	*Were any points/areas removed from the original input data? Other additions, deletions, or transformations should be noted here.*
Data Analysis	*Analysis steps such as buffering, gridding, interpolation, merging, algorithms applied, etc. Include resolution of output(s).*
Data Classification	*Note whether presence/absence, an established classification scheme (include citation), or statistical classification was used*
Selection of ESA	*Describe the subset of the classification (i.e., the exact threshold in the data, if pertinent) that is ESA*

ESA and policy examples

Islander East: Gas Pipeline proposal (2008)

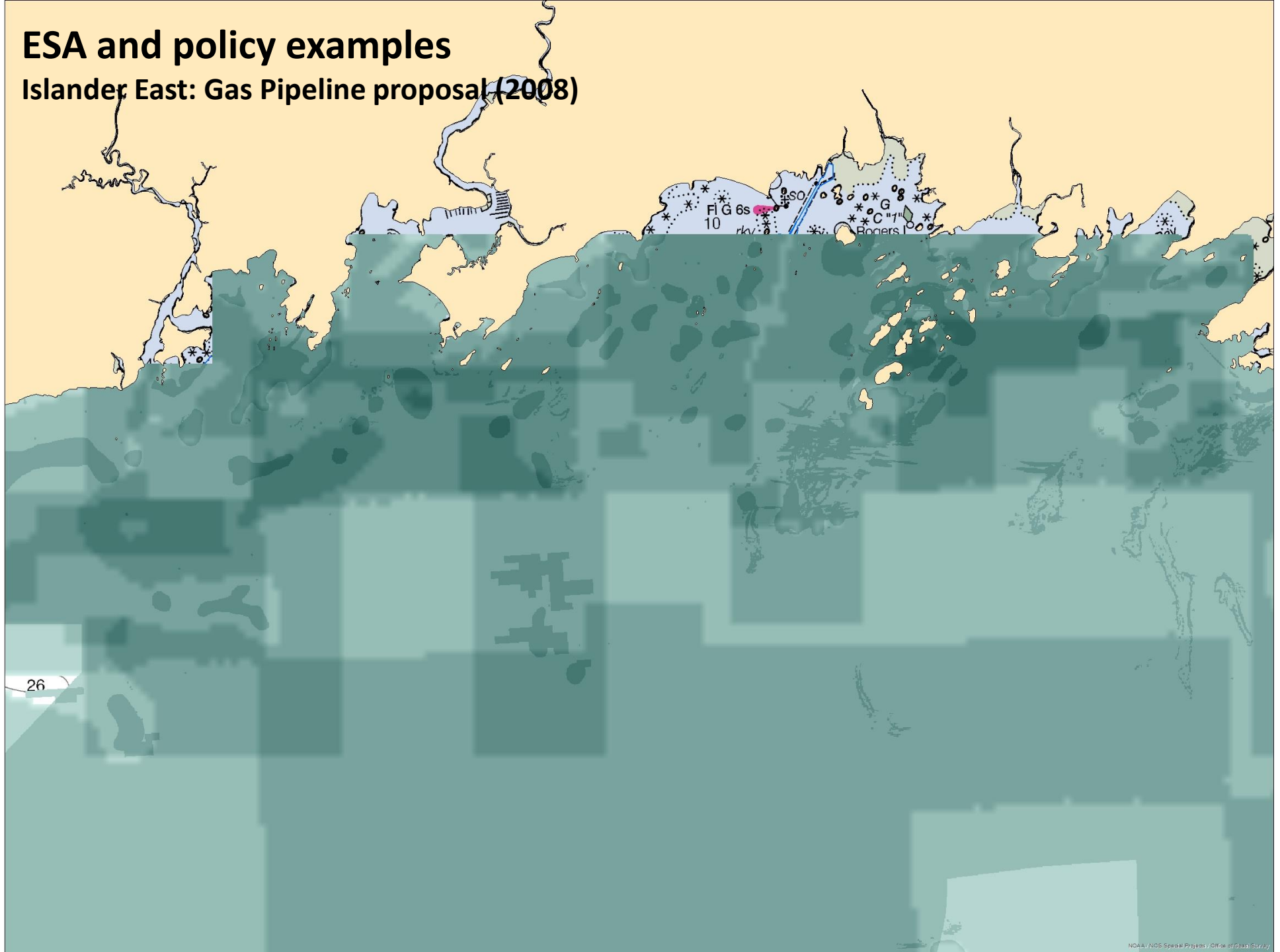
ESA and policy examples

Islander East: Gas Pipeline proposal (2008)



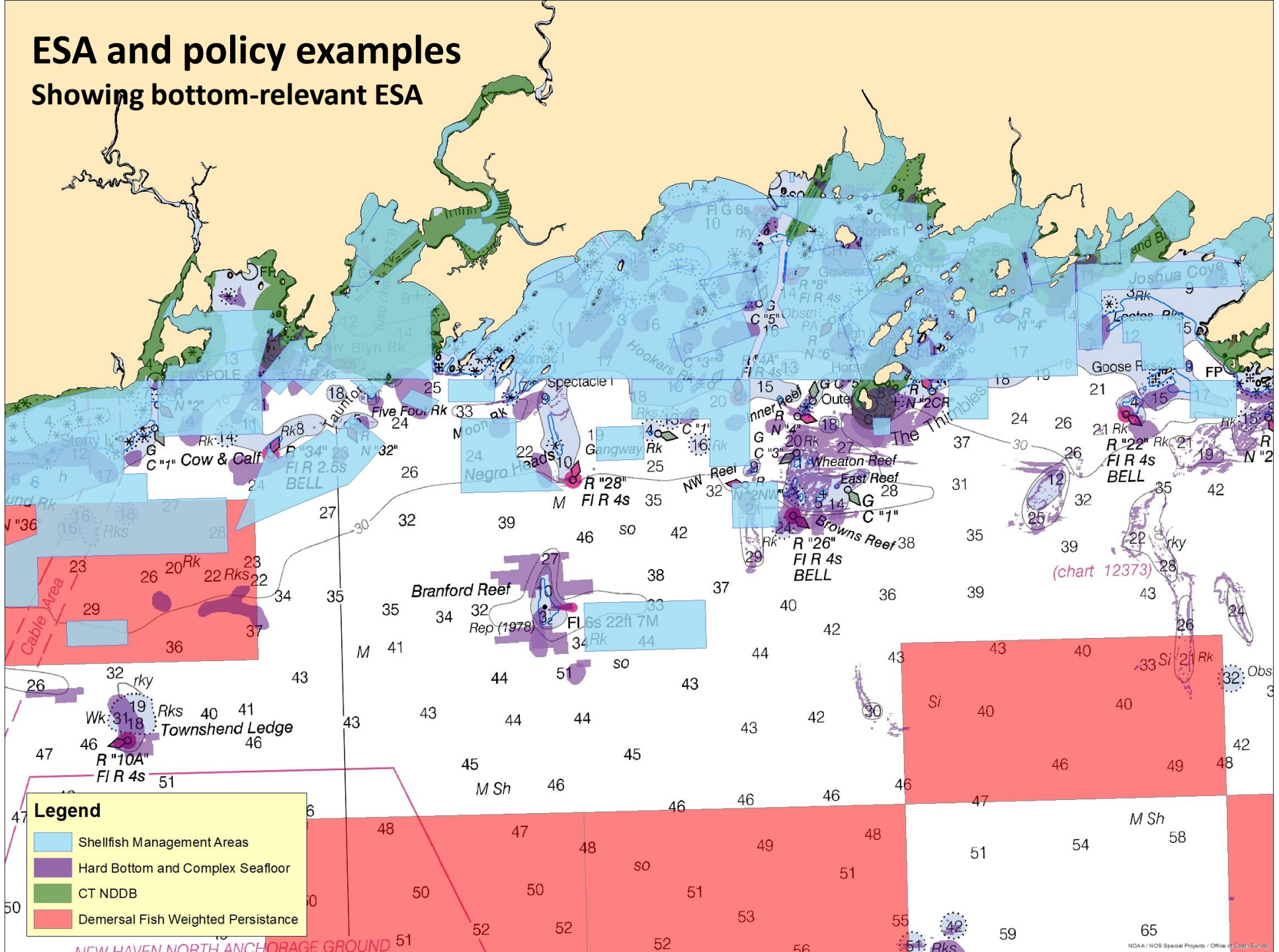
ESA and policy examples

Islander East: Gas Pipeline proposal (2008)



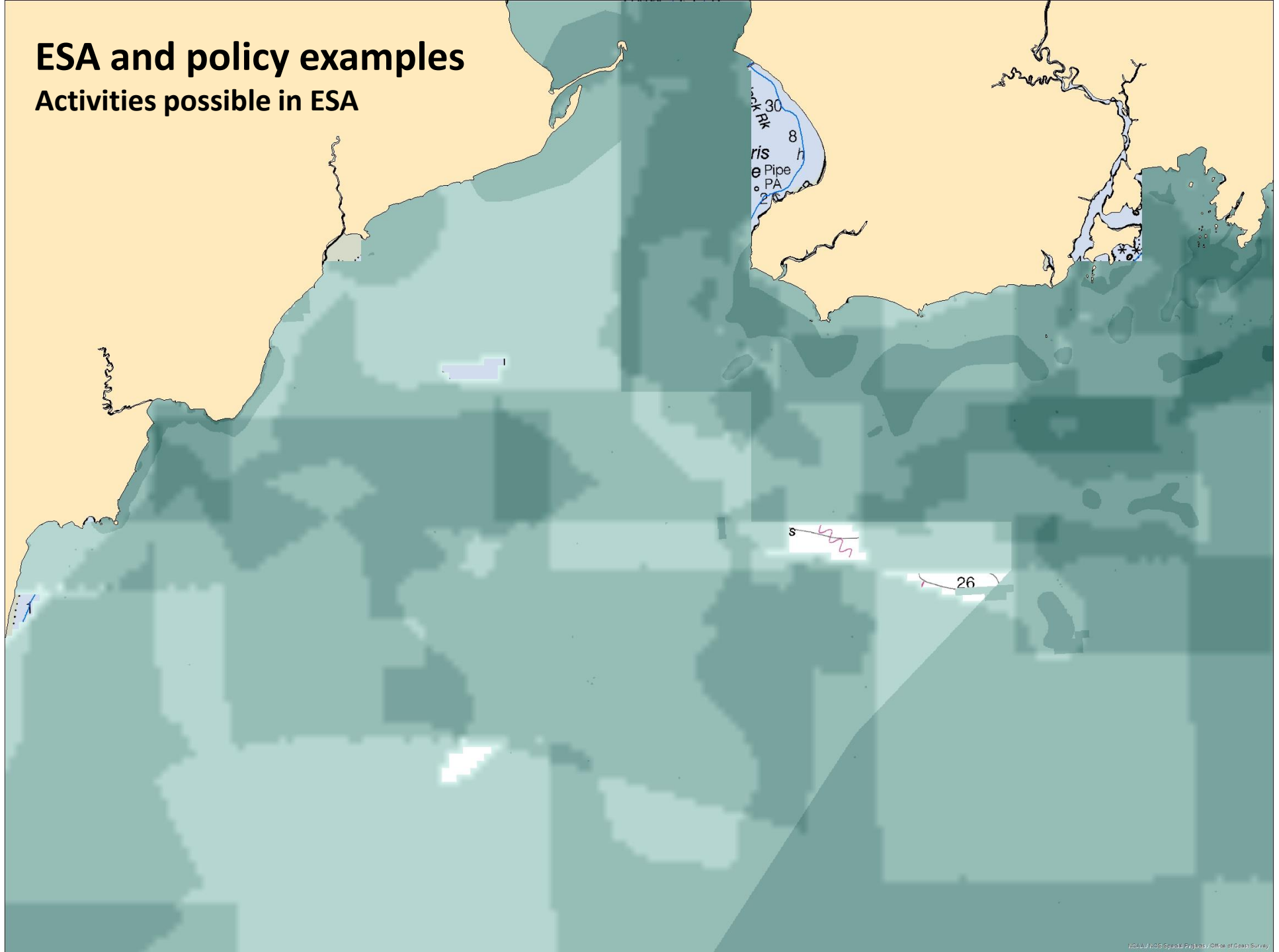
ESA and policy examples

Showing bottom-relevant ESA



ESA and policy examples

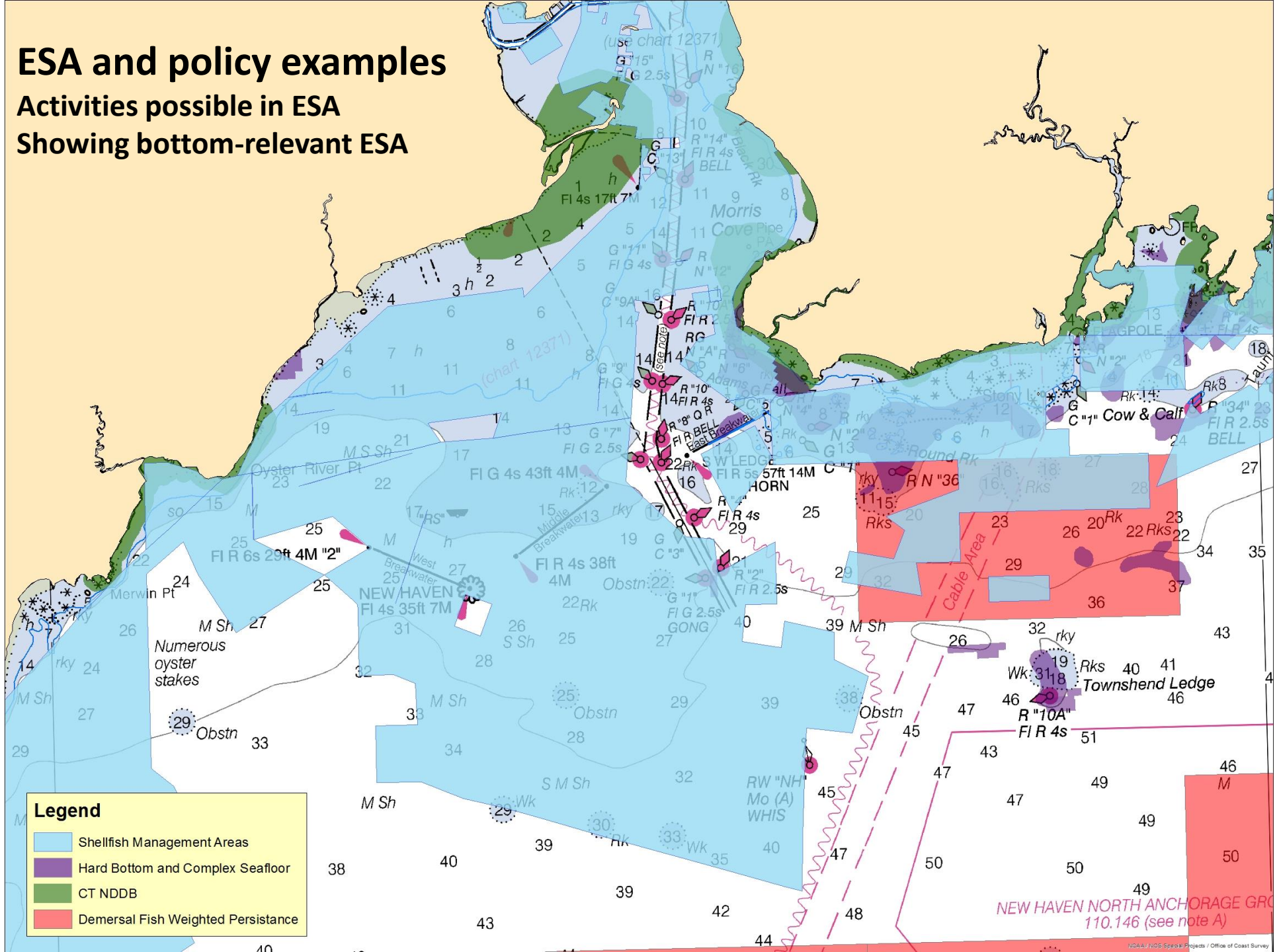
Activities possible in ESA



ESA and policy examples

Activities possible in ESA

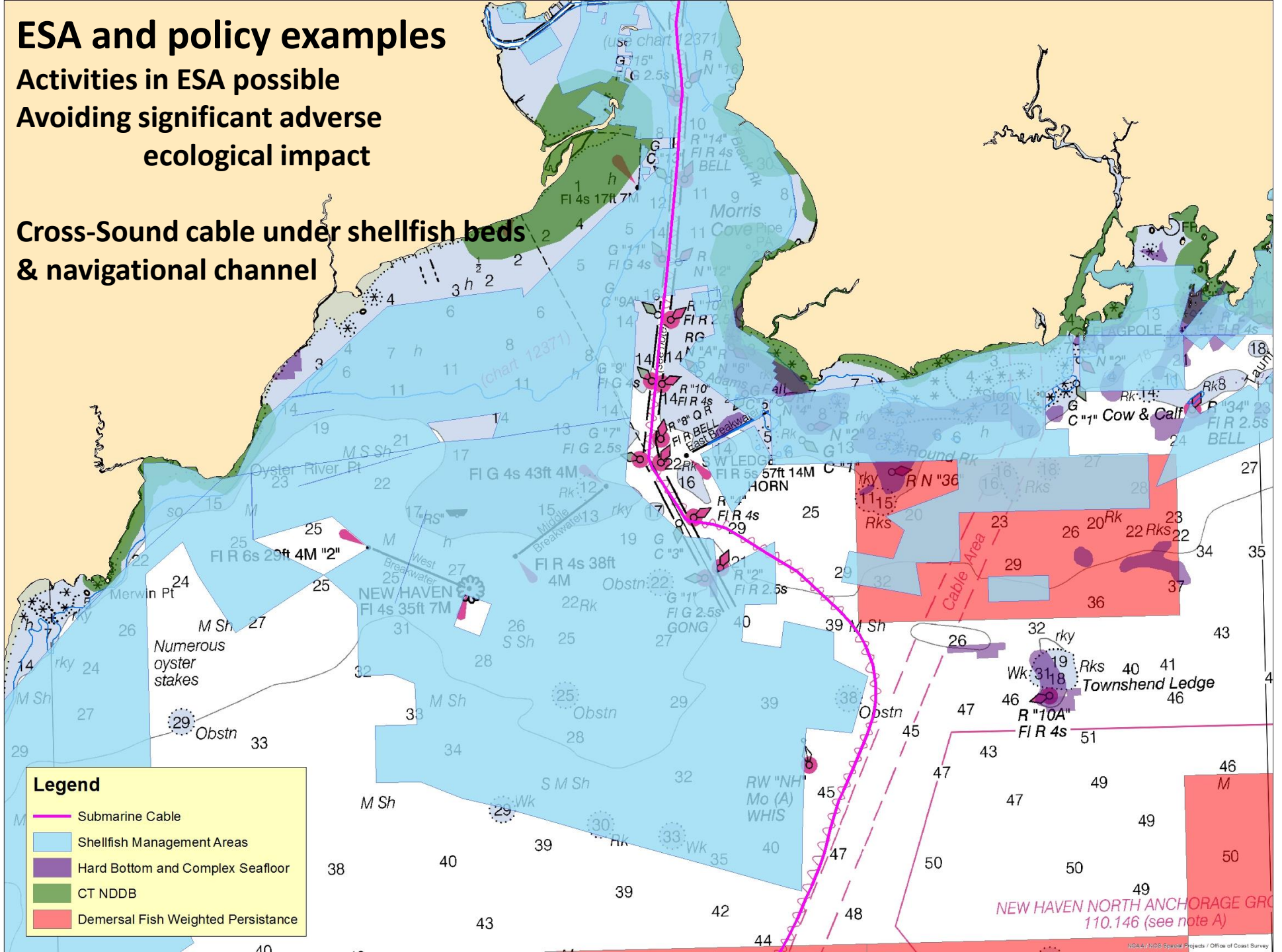
Showing bottom-relevant ESA



ESA and policy examples

Activities in ESA possible
Avoiding significant adverse ecological impact

Cross-Sound cable under shellfish beds & navigational channel



Next Steps & Discussion

We want to hear from you!

DEEP.BluePlanLIS@ct.gov

or

CT DEEP/LWRD Blue Plan Comments

79 Elm Street

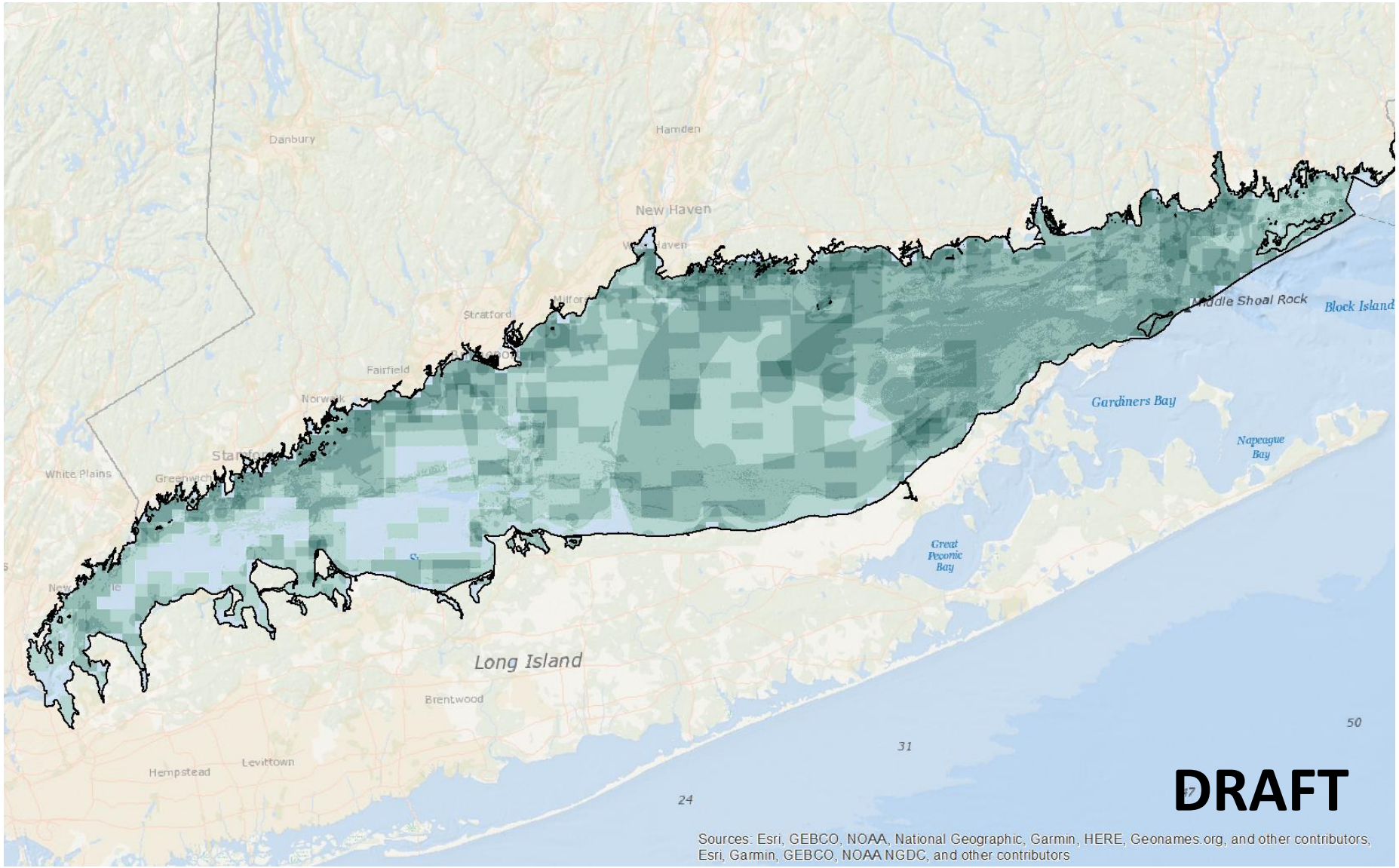
Hartford, CT 06106

Please visit the Blue Plan website at

www.ct.gov/deep/LISBluePlan

Ecologically Significant Areas: Considerations

Vertical location and composition of ESA criteria layers (e.g. birds and fish)



Policy Example slide(s) go here.

Question for Emily/Christian/Me to consider:

In addition to the policy example, is this the place to note the significance of vertical location (e.g. birds) relative to policy implications. Also, the importance of layers that make up ESA relative to policy (e.g. hard bottom may have a higher performance requirement in practice than seafloor complexity even though the two are combined into one ESA layer and have one policy standard).

These points could be noted verbally during the roll-up slides or a visual example pulled out. It may be sufficient to just address the vertical issue (and leave the other "layer" issue out at this point).

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