

## **DRAFT UNDER CONSIDERATION BY EBM WORK GROUP AND NORTHEAST RPB**

### **Components of Important Ecological Areas – 11/5/15**

The *Framework for Ocean Planning in the Northeast US* (adopted by the NE RPB in January 2014) suggests that defining important ecological areas (IEAs) is the first step to identifying those areas. Similarly, at its September 30, 2015 meeting, the Ecosystem Based Management Work Group (EBM WG) recommended the RPB define important ecological areas as a series of ecological components, using existing definitions from National Ocean Policy documents and similar efforts elsewhere.

In the Final Recommendations of the National Ocean Policy Task Force, important ecological areas are described as including “areas of high productivity and biological diversity; areas and key species that are critical to ecosystem function and resiliency; areas of spawning, breeding, and feeding; areas of rare or functionally vulnerable marine resources; and migratory corridors.” Below is a list of the six components identified in this definition of IEAs. This list is being suggested as a starting point for defining and characterizing IEAs in support of Ocean Planning in the Northeast. It includes examples of data that are available in the short term to characterize these areas and it includes longer-term data and science needs for each IEA component. Several other organizations or projects have also identified important biological or ecological areas; the overlap of those designations with the National Ocean Policy Task Force components is indicated in parentheses next to each component. The designations considered are:

- National Marine Sanctuary nomination criteria for national significance (“NMS”)
- Essential Fish Habitat definition (“EFH”)
- Oceana Important Ecological Areas (“Oceana”)
- A Biological Valuation Map for of the Belgian Part of the North Sea (“Belgian”)
- UN-CBD Ecologically and Biologically Significant Area criteria (“EBSA”)
- Ecologically and Biologically Significant Areas, Canada Department of Fisheries and Oceans (“DFO”)

“Naturalness” is an additional component of IEAs not considered in the National Ocean Policy Task Force definition, but is present in Belgian, EBSA and DFO definitions. “Naturalness” refers to the *relative* naturalness of an area (i.e., not necessarily pristine), the presence/dominance of native species, and an absence or low level of human-induced disturbance, degradation, or introduced/cultured species.

After defining IEAs and understanding the existing data and information resources available to map IEA components, the RPB, informed by the EBM WG, will consider how to incorporate them into the Northeast Ocean Plan. This includes consideration of how individual IEA components relate to and support other sections of the Draft Plan and understanding and applying lessons learned from other similar efforts.

**Component 1: Areas of high productivity (NMS, Oceana, EBSA)**

Spatial data available	Long-term needs
<ul style="list-style-type: none"> <li>• Primary productivity (1998-2007, satellite) <ul style="list-style-type: none"> <li>○ Rate of photosynthesis</li> <li>○ Chlorophyll a, winter, spring, summer, fall</li> </ul> </li> <li>• Zooplankton abundance (2003 – 2007) <ul style="list-style-type: none"> <li>○ <i>Calanus finmarchicus</i>, Euphausiids, Gammarid amphipods, Mysid shrimp (all fall season)</li> </ul> </li> <li>• Proxies: frontal boundaries, upwelling zones, canyons, seamounts, areas of high seafloor slope</li> </ul>	<ul style="list-style-type: none"> <li>• Incorporate biotic and abiotic information into an index of high potential productivity across multiple taxa</li> <li>• High productivity areas from benthos, SAV, and macroalgae (biotic)</li> <li>• Explore using abundance as a surrogate for productivity of biotic elements that may be difficult to quantify</li> </ul>

**Component 2: Areas of high biodiversity (NMS, Oceana, Belgian, EBSA, DFO)**

Spatial data available	Long-term needs
<ul style="list-style-type: none"> <li>• MDAT Shannon diversity index products (Marine mammals, sea turtles, birds, fish)</li> <li>• MDAT Multi-Taxa Synthetic Product – All Species Richness (includes marine mammals, sea turtles, birds, fish)</li> <li>• Proxy: seafloor heterogeneity or topographic complexity</li> <li>• Proxy: fronts and convergence zones</li> <li>• Observations of cold-water coral habitats</li> </ul>	<p>A more complete assessment of biodiversity that incorporates additional taxa including corals, large-bodied fishes (e.g. sharks), macroalgae, SAV, benthic infauna and epifauna.</p>

**Component 3: Habitats areas and distribution of species critical to ecosystem function and resilience (NMS, Oceana, Belgian, EBSA)**

Spatial data available	Long-term needs
<ul style="list-style-type: none"> <li>• Distribution and abundance of keystone species, foundational species, and ecosystem engineers in existing MDAT products (e.g., Atlantic herring, wolffish)</li> <li>• Eelgrass beds</li> <li>• Habitat suitability for cold water corals</li> <li>• Wetlands</li> <li>• Complex seafloor habitats</li> <li>• Shellfish beds</li> </ul>	<ul style="list-style-type: none"> <li>• More complete understanding of distribution and abundance of keystone species, foundational species, and ecosystem engineers in the Northeast region</li> <li>• Distribution of bivalve-dominated communities</li> <li>• Distribution of kelp beds</li> <li>• Areas of strong benthic-pelagic coupling</li> <li>• Areas where benthic-pelagic coupling co-occurs with high productivity</li> </ul>

**Component 4: Areas of functionally vulnerable marine resources (*Oceana, Belgian, EBSA*)**

Spatial data available	Long-term needs
<ul style="list-style-type: none"> <li>Habitat suitability for cold water corals</li> <li>Distribution and abundance of species with low fecundity, slow growth, longevity in existing MDAT products</li> </ul>	<ul style="list-style-type: none"> <li>Integrate MDAT products grouped by sensitivity/vulnerability to various impacts (planned)</li> <li>Climate change linkage – identification and mapping of species vulnerable to warming waters, acidification</li> </ul>

**Component 5: Areas of spawning, breeding, feeding, and migratory routes (*NMS, EFH, Oceana, Belgian, EBSA, DFO*)**

Spatial data available	Long-term needs
<ul style="list-style-type: none"> <li>Essential fish habitat (EFH)</li> <li>MDAT EFH fish group abundance, biomass hotspots, core areas</li> <li>Designated ESA critical habitats (North Atlantic right whale, Atlantic salmon, Piping plover, Green-, Hawksbill-, leatherback and loggerhead sea turtles)</li> <li><a href="#">CetSound Biologically Important Areas</a> (North Atlantic right whale, Fin whale, Sei whale, Minke whale, Humpback whale, Harbor porpoise)</li> <li>EFH for Atlantic Highly Migratory Species (e.g., sharks, tuna, billfish)</li> </ul>	<ul style="list-style-type: none"> <li>Integrate breeding, nesting and feeding areas for avian species</li> <li>Integration of rolling closure and spawning area closure regulations for fish</li> <li>High density scallop areas (known to be more fecund than low density)</li> <li>Seal haul-outs</li> <li>Integrate ongoing work by MDAT to identify temporal components to core areas for marine mammals, birds, and fish (i.e., could highlight migratory routes)</li> <li>Integrate existing work on avian migratory routes from tagging/tracking studies</li> <li>Integrate existing work on fish migratory routes from tagging/tracking work for sharks and striped bass, other species</li> </ul>

**Component 6: Areas of rare marine resources (*Belgian, EBSA, DFO*)**

Spatial data available	Long-term needs
<ul style="list-style-type: none"> <li>MDAT products grouped by ESA-listed species (marine mammals, sea turtles, birds, fish)</li> <li>Habitat Areas of Particular Concern (e.g., Atlantic cod, Atlantic salmon) [HAPC for cod may be more applicable under Component 5]</li> </ul>	<ul style="list-style-type: none"> <li>Define ecologically rare, beyond ESA or other authorities</li> <li>Species encountered x% of the time or that occur in less than x% of the region</li> <li>Habitats that occur in less than x% of the region</li> </ul>