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Aquatic Representative Species of the North Atlantic:

Preliminary Set of Species Selected, Considered, and Associated Habitats

**Background:** The Northeast Region of the U.S. Fish and Wildlife Service has designated an initial set of representative species in the North Atlantic LCC region as a tool for strategically conserving habitat at landscape scales. A representative species is one that, because of its habitat use, ecosystem function, or management response, typifies lifecycle or habitat requirements for a larger group of species. The Northeast Region sponsored a project with the University of Massachusetts Amherst that considered 22 candidate fish or mussel species to serve as representative species. These candidates had been designated as species of conservation and management concern by the Northeast Fisheries program of the Service. At a 2011 workshop of experts on southern New England species, 13 representative species were selected (including 4 species not on the original candidate list: blacknose dace, rainbow smelt, slimy sculpin, and spring salamander). At a similar 2011 workshop in the mid-Atlantic, experts did not select any aquatic representative species based on concerns about the limited number of candidate species and that North Atlantic LCC boundaries did not include complete watersheds. The experts provided several recommendations for improving the list of aquatic representative species, including expanding the list of candidate species to include all species in relevant state wildlife action plans.

**Explanation of Table:** The table below lists each representative species selected, the other candidate species considered, and the habitats with which they are associated. Numerous other species that share these habitats, but which were not specifically considered by the project or listed in the table, are also expected to be represented. The specific aquatic habitat types are from the *Northeast Aquatic Habitat Classification System* (2008) sponsored by the Northeast Association of Fish and Wildlife Agencies and directed by The Nature Conservancy. The general habitat description summarizes the types of specific habitat types found within the group. In some cases, habitat groups distinguish between breeding habitat for a species (B) and nonbreeding habitat (NB).

| **#** | **General Habitat Description** | **Representative Species** | **Species Represented (of those considered)** | **Specific Aquatic Habitat Types** |
| --- | --- | --- | --- | --- |
| 1 | Cold streams (low buffered) | Brook Trout (B)Slimy SculpinBlacknose DaceSpring Salamander |  | 1\_1\_1\_1 : Headwater/Creek; Low Gradient; Low Buffered, Acidic; Cold 1\_2\_1\_1 : Headwater/Creek; Low‐Moderate Gradient; Low Buffered, Acidic; Cold 1\_3\_1\_1 : Headwater/Creek; Moderate‐High Gradient; Low Buffered, Acidic; Cold 1\_4\_1\_1 : Headwater/Creek; High Gradient; Low Buffered, Acidic; Cold 2\_1\_1\_1 : Small River; Low Gradient; Low Buffered, Acidic; Cold 2\_2\_1\_1 : Small River; Low‐Moderate Gradient; Low Buffered, Acidic; Cold 2\_3\_1\_1 : Small River; Moderate‐High Gradient; Low Buffered, Acidic; Cold 2\_4\_1\_1 : Small River; High Gradient; Low Buffered, Acidic; Cold Lentic ‐ size: Temporary pondsLentic ‐ water chemistry: Acidic |
| 2 | Warm to cool streams | None selected |  | 1\_1\_1\_2 : Headwater/Creek; Low Gradient; Low Buffered, Acidic; Transitional Cool 1\_1\_1\_3 : Headwater/Creek; Low Gradient; Low Buffered, Acidic; Warm 1\_1\_2\_2 : Headwater/Creek; Low Gradient; Moderately Buffered, Neutral; Transitional Cool 1\_1\_2\_3 : Headwater/Creek; Low Gradient; Moderately Buffered, Neutral; Warm 1\_1\_3\_1 : Headwater/Creek; Low Gradient; Highly Buffered, Calcareous; Cold 1\_1\_3\_2 : Headwater/Creek; Low Gradient; Highly Buffered, Calcareous; Transitional Cool 1\_1\_3\_3 : Headwater/Creek; Low Gradient; Highly Buffered, Calcareous; Warm 1\_2\_1\_2 : Headwater/Creek; Low-Moderate Gradient; Low Buffered, Acidic; Transitional Cool 1\_2\_1\_3 : Headwater/Creek; Low-Moderate Gradient; Low Buffered, Acidic; Warm 1\_2\_2\_3 : Headwater/Creek; Low-Moderate Gradient; Moderately Buffered, Neutral; Warm 1\_2\_3\_1 : Headwater/Creek; Low-Moderate Gradient; Highly Buffered, Calcareous; Cold 1\_2\_3\_2 : Headwater/Creek; Low-Moderate Gradient; Highly Buffered, Calcareous; Transitional Cool 1\_2\_3\_3 : Headwater/Creek; Low-Moderate Gradient; Highly Buffered, Calcareous; Warm 1\_3\_1\_2 : Headwater/Creek; Moderate-High Gradient; Low Buffered, Acidic; Transitional Cool 1\_3\_1\_3 : Headwater/Creek; Moderate-High Gradient; Low Buffered, Acidic; Warm 1\_3\_3\_1 : Headwater/Creek; Moderate-High Gradient; Highly Buffered, Calcareous; Cold 1\_3\_3\_2 : Headwater/Creek; Moderate-High Gradient; Highly Buffered, Calcareous; Transitional Cool 1\_3\_3\_3 : Headwater/Creek; Moderate-High Gradient; Highly Buffered, Calcareous; Warm 1\_4\_2\_2 : Headwater/Creek; High Gradient; Moderately Buffered, Neutral; Transitional Cool 1\_4\_2\_3 : Headwater/Creek; High Gradient; Moderately Buffered, Neutral; Warm 1\_4\_3\_2 : Headwater/Creek; High Gradient; Highly Buffered, Calcareous; Transitional Cool 1\_4\_3\_3 : Headwater/Creek; High Gradient; Highly Buffered, Calcareous; Warm 2\_1\_1\_2 : Small River; Low Gradient; Low Buffered, Acidic; Transitional Cool 2\_2\_3\_1 : Small River; Low-Moderate Gradient; Highly Buffered, Calcareous; Cold 2\_3\_1\_2 : Small River; Moderate-High Gradient; Low Buffered, Acidic; Transitional Cool 2\_3\_1\_3 : Small River; Moderate-High Gradient; Low Buffered, Acidic; Warm 2\_3\_3\_1 : Small River; Moderate-High Gradient; Highly Buffered, Calcareous; Cold 2\_3\_3\_2 : Small River; Moderate-High Gradient; Highly Buffered, Calcareous; Transitional Cool 2\_3\_3\_3 : Small River; Moderate-High Gradient; Highly Buffered, Calcareous; Warm 2\_4\_1\_3 : Small River; High Gradient; Low Buffered, Acidic; Warm 2\_4\_2\_3 : Small River; High Gradient; Moderately Buffered, Neutral; Warm 2\_4\_3\_3 : Small River; High Gradient; Highly Buffered, Calcareous; Warm 3\_4\_0\_2 : Medium River; High Gradient; Assume Moderately Buffered;Transitional Cool 3\_4\_0\_3 : Medium River; High Gradient; Assume Moderately Buffered;WarmNone  |
| 3 | Cold streams and rivers (moderately buffered) | Brook Trout (NB)Atlantic Salmon (B)Rainbow Smelt |  | 1\_1\_2\_1 : Headwater/Creek; Low Gradient; Moderately Buffered, Neutral; Cold 1\_2\_2\_1 : Headwater/Creek; Low-Moderate Gradient; Moderately Buffered, Neutral; Cold 1\_3\_2\_1 : Headwater/Creek; Moderate-High Gradient; Moderately Buffered, Neutral; Cold 1\_4\_2\_1 : Headwater/Creek; High Gradient; Moderately Buffered, Neutral; Cold 2\_1\_2\_1 : Small River; Low Gradient; Moderately Buffered, Neutral; Cold 2\_2\_2\_1 : Small River; Low-Moderate Gradient; Moderately Buffered, Neutral; Cold 2\_3\_2\_1 : Small River; Moderate-High Gradient; Moderately Buffered, Neutral; Cold 2\_4\_2\_1 : Small River; High Gradient; Moderately Buffered, Neutral; Cold 3\_1\_0\_1 : Medium River; Low Gradient; Assume Moderately Buffered;Cold 3\_2\_0\_1 : Medium River; Low-Moderate Gradient; Assume Moderately Buffered;Cold 3\_3\_0\_1 : Medium River; Moderate-High Gradient; Assume Moderately Buffered;Cold 3\_4\_0\_1 : Medium River; High Gradient; Assume Moderately Buffered;Cold 4\_3\_0\_2 : Large/Great River; Moderate-High Gradient; Assume Moderately Buffered;Transitional Cool4\_4\_0\_2 : Large/Great River; High Gradient; Assume Moderately Buffered;Transitional Cool |
| 4 | Warm to cool streams and rivers (moderately buffered) | None selected | James River SpineymusselHickory Shad (B) | 1\_2\_2\_2 : Headwater/Creek; Low-Moderate Gradient; Moderately Buffered, Neutral; Transitional Cool 1\_3\_2\_2 : Headwater/Creek; Moderate-High Gradient; Moderately Buffered, Neutral; Transitional Cool1\_3\_2\_3 : Headwater/Creek; Moderate-High Gradient; Moderately Buffered, Neutral; Warm 2\_3\_2\_3 : Small River; Moderate-High Gradient; Moderately Buffered, Neutral; Warm2\_1\_2\_2 : Small River; Low Gradient; Moderately Buffered, Neutral; Transitional Cool 2\_1\_2\_3 : Small River; Low Gradient; Moderately Buffered, Neutral; Warm 2\_2\_2\_2 : Small River; Low-Moderate Gradient; Moderately Buffered, Neutral; Transitional Cool 2\_2\_2\_3 : Small River; Low-Moderate Gradient; Moderately Buffered, Neutral; Warm 2\_3\_2\_2 : Small River; Moderate-High Gradient; Moderately Buffered, Neutral; Transitional Cool 3\_3\_0\_2 : Medium River; Moderate-High Gradient; Assume Moderately Buffered;Transitional Cool 3\_3\_0\_3 : Medium River; Moderate-High Gradient; Assume Moderately Buffered;Warm4\_3\_0\_3 : Large/Great River; Moderate-High Gradient; Assume Moderately Buffered;WarmLentic - substrate: Organic materialLentic - substrate: Silt |
| 5 | Warm to cool small rivers | American Eel (NB) |  | 2\_1\_1\_3 : Small River; Low Gradient; Low Buffered, Acidic; Warm 2\_1\_3\_1 : Small River; Low Gradient; Highly Buffered, Calcareous; Cold 2\_1\_3\_2 : Small River; Low Gradient; Highly Buffered, Calcareous; Transitional Cool 2\_1\_3\_3 : Small River; Low Gradient; Highly Buffered, Calcareous; Warm 2\_2\_1\_2 : Small River; Low-Moderate Gradient; Low Buffered, Acidic; Transitional Cool 2\_2\_1\_3 : Small River; Low-Moderate Gradient; Low Buffered, Acidic; Warm 2\_2\_3\_2 : Small River; Low-Moderate Gradient; Highly Buffered, Calcareous; Transitional Cool 2\_2\_3\_3 : Small River; Low-Moderate Gradient; Highly Buffered, Calcareous; Warm 4\_4\_0\_3 : Large/Great River; High Gradient; Assume Moderately Buffered;Warm |
| 6 | Medium to large rivers | American ShadShortnose SturgeonDwarf wedgemussel | Striped BassAtlantic SturgeonBlueback Herring Maryland Darter | 3\_1\_0\_2 : Medium River; Low Gradient; Assume Moderately Buffered;Transitional Cool 3\_1\_0\_3 : Medium River; Low Gradient; Assume Moderately Buffered;Warm 3\_2\_0\_2 : Medium River; Low-Moderate Gradient; Assume Moderately Buffered;Transitional Cool 3\_2\_0\_3 : Medium River; Low-Moderate Gradient; Assume Moderately Buffered;Warm 4\_1\_0\_2 : Large/Great River; Low Gradient; Assume Moderately Buffered;Transitional Cool 4\_1\_0\_3 : Large/Great River; Low Gradient; Assume Moderately Buffered;Warm 4\_2\_0\_2 : Large/Great River; Low-Moderate Gradient; Assume Moderately Buffered;Transitional Cool 4\_2\_0\_3 : Large/Great River; Low-Moderate Gradient; Assume Moderately Buffered;Warm Estuarine - stratification/circulation: Freshwaterotic - substrate: BoulderLotic - substrate: CobbleLotic - substrate: GravelLotic - substrate: PebbleLotic - substrate: SandLotic - substrate: Silt |
| 7 | Estuaries | None Selected | Spiny DogfishScupWinter FlounderTautogWeakfishSummer Flounder MenhadenAmerican Eel (B) Atlantic Sturgeon (NB)Hickory Shad (NB) | Estuarine - geology: Bar-BuiltEstuarine - geology: FjordLentic - water chemistry: CalcareousMarine: Open oceanEstuarine - geology: Coastal plainEstuarine - stratification/circulation: Salt wedgeEstuarine - stratification/circulation: Slightly stratifiedEstuarine - stratification/circulation: Vertically mixedEstuarine - substrate: BedrockEstuarine - substrate: BoulderEstuarine - substrate: CobbleEstuarine - substrate: GravelEstuarine - substrate: MacrophytesEstuarine - substrate: PebbleEstuarine - substrate: SandEstuarine - substrate: SiltEstuarine - zone: SubtidalEstuarine - geology: DeltaicEstuarine - substrate: Organic materialEstuarine - zone: IntertidalLotic - substrate: Organic materialMarine: CoastalMarine: Mid/South AtlanticMarine: North Atlantic |
| 8 | Large lakes | Lake Trout  | Lake SturgeonAtlantic Salmon, landlocked (NB)Brook Trout (NB) | Lentic - size: Large lakesLentic - stratification/circulation: DimicticLentic - stratification/circulation: HolomicticLentic - stratification/circulation: MonomicticLentic - substrate: BoulderLentic - substrate: CobbleLentic - substrate: GravelLentic - substrate: PebbleLentic - substrate: SandLentic - temperature: Cold waterLentic - trophic status: OligotrophicLentic - water chemistry: IntermediateLentic - zone: LimneticLentic - zone: Littoral |
| 9 | Ponds to medium lakes | Alewife |  | Lentic - size: Permanent ponds and lakesLentic - size: Small-medium lakesLentic - substrate: MacrophytesLentic - temperature: Cool waterLentic - temperature: Warm waterLentic - trophic status: Mesotrophic |