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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 Sculpin  Blacknose Dace  Spring 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 ponds  Lentic ‐ 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 Cool  4\_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 Spineymussel  Hickory 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 Cool  1\_3\_2\_3 : Headwater/Creek; Moderate-High Gradient; Moderately Buffered, Neutral; Warm  2\_3\_2\_3 : Small River; Moderate-High Gradient; Moderately Buffered, Neutral; Warm  2\_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;Warm  4\_3\_0\_3 : Large/Great River; Moderate-High Gradient; Assume Moderately Buffered;Warm  Lentic - substrate: Organic material  Lentic - 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 Shad  Shortnose Sturgeon  Dwarf wedgemussel | Striped Bass  Atlantic Sturgeon  Blueback 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: Boulder  Lotic - substrate: Cobble  Lotic - substrate: Gravel  Lotic - substrate: Pebble  Lotic - substrate: Sand  Lotic - substrate: Silt |
| 7 | Estuaries | None Selected | Spiny Dogfish  Scup  Winter Flounder  Tautog  Weakfish  Summer Flounder  Menhaden  American Eel (B)  Atlantic Sturgeon (NB)  Hickory Shad (NB) | Estuarine - geology: Bar-Built  Estuarine - geology: Fjord  Lentic - water chemistry: Calcareous  Marine: Open ocean  Estuarine - geology: Coastal plain  Estuarine - stratification/circulation: Salt wedge  Estuarine - stratification/circulation: Slightly stratified  Estuarine - stratification/circulation: Vertically mixed  Estuarine - substrate: Bedrock  Estuarine - substrate: Boulder  Estuarine - substrate: Cobble  Estuarine - substrate: Gravel  Estuarine - substrate: Macrophytes  Estuarine - substrate: Pebble  Estuarine - substrate: Sand  Estuarine - substrate: Silt  Estuarine - zone: Subtidal  Estuarine - geology: Deltaic  Estuarine - substrate: Organic material  Estuarine - zone: Intertidal  Lotic - substrate: Organic material  Marine: Coastal  Marine: Mid/South Atlantic  Marine: North Atlantic |
| 8 | Large lakes | Lake Trout | Lake Sturgeon  Atlantic Salmon, landlocked (NB)  Brook Trout (NB) | Lentic - size: Large lakes  Lentic - stratification/circulation: Dimictic  Lentic - stratification/circulation: Holomictic  Lentic - stratification/circulation: Monomictic  Lentic - substrate: Boulder  Lentic - substrate: Cobble  Lentic - substrate: Gravel  Lentic - substrate: Pebble  Lentic - substrate: Sand  Lentic - temperature: Cold water  Lentic - trophic status: Oligotrophic  Lentic - water chemistry: Intermediate  Lentic - zone: Limnetic  Lentic - zone: Littoral |
| 9 | Ponds to medium lakes | Alewife |  | Lentic - size: Permanent ponds and lakes  Lentic - size: Small-medium lakes  Lentic - substrate: Macrophytes  Lentic - temperature: Cool water  Lentic - temperature: Warm water  Lentic - trophic status: Mesotrophic |