Region Conservation Opportunity Areas Version 1. 0

Aquatic Core Networks

Products at a Glance

What are they?

Aquatic core networks are intact, well-connected stream reaches, lakes, and ponds in the Northeast region that if protected as part of stream networks and watersheds, will continue to support a broad diversity of aquatic species and the ecosystems on which they depend.

The core areas include especially intact, resilient examples of each major aquatic ecological system across the region, along with habitat for priority aquatic species. The core network information offers guidance for conserving aquatic biodiversity and ecological function into the future by providing tools to help identify, prioritize, protect, and effectively manage the full range of aquatic systems in the region along with representative and priority fish and wildlife species.

How are they intended to be used?

Aquatic cores can be viewed as among the most intact and resilient examples of each stream lake and pond ecological system of the aquascape, based on both ecosystem and aquatic species information in each watershed (Hydrologic Unit Code 6) across the entire Northeast region and across the region as a whole.

The core areas and their buffers represent places to start for protection and management of a range of aquatic systems that are relatively intact. These priority areas and their buffers should be used in conjunction with the additional data layers, including Freshwater Resilience watersheds, anadromous species occurrence information, and other foundational data, to identify additional areas and networks of high ecological value.

The data are also intended to complement priority areas identified in the RCOA RSGCN Habitats analysis, as well as state, local, and other fine-filter information that can capture priority areas for rare and threatened species, and species rich areas not captured through this coarse-filter core area approach.

The information can also be used in conjunction with Terrestrial Core Areas to identify areas that are important for terrestrial conservation and as buffers for aquatic cores. Finally, the aquatic cores can be used in conjunction with aquatic connectivity restoration priorities to identify areas where restoring connectivity will add value to areas that are already intact.

How were they identified?

The aquatic core network is based on a set of regional analyses that assess the physical and biological value of aquatic systems and species across the Northeast region. The core area network integrates five components:

1. The most integral locations of each of 21 stream habitat classes and 12 lake/pond habitat classes in HUC 6 watersheds across the Northeast. Ecological systems were mapped by The Nature Conservancy working with the Northeast state fish and wildlife agencies and the North Atlantic LCC through the Regional Conservation Needs program. The integrity of these systems was assessed using the *Index of Ecological Integrity* developed by the University of Massachusetts Amherst with support from the North Atlantic LCC.
2. Lotic core areas representing the highest probability of occurrence for Eastern brook trout (representative species for cold headwater streams) not captured by lotic ecosystem cores.
3. Lentic cores representing the highest landscape capability for common loon (representative species for intact lakes and ponds) not captured by lentic ecosystem core.
4. Known stream reaches with existing occurrences for Atlantic and shortnose sturgeon and salter brook trout, along with top 5% of watersheds for alewife, American shad, and blueback herring, from Trout Unlimited and priority rearing habitat for Atlantic salmon in the Gulf of Maine from U.S. Fish and Wildlife Service watershed as cores where not already captured.
5. Aquatic core area buffers based on areas in the upstream watershed most likely to influence the core area(s).

These core areas and buffers are intended to be overlain with additional analyses including Freshwater Resilience Highest and High watersheds developed by The Nature Conservancy and a version of regionally scaled, unstratified ecosystem-based core areas selected from the Index of Ecological Integrity to complement and compare to ecosystem core areas.

What are known limitations of aquatic core networks?

- The classification and mapping of aquatic ecological systems is known to be imperfect, which consequently affects the mapped values for ecosystem integrity and species habitat. While the ecosystem mapping is anticipated to correctly reflect broad patterns of ecosystem occurrence, errors in classification and placement do occur, as with any regional GIS data. In addition, errors in mapping and alignment of hydrography, development, roads, traffic rates, and a number of other data layers can affect the model results.
- It is not possible to map all factors affecting ecological integrity and species habitat across the Northeast, and the omission of such factors can be anticipated to pose some limitations in the results. Examples are listed below.

- ○ The aquatic core network does not currently account for flow impairment as this information is only available at the medium resolution (1:100k) hydrography.
  - ○ The aquatic core network does not include information on non-indigenous aquatic species, or instream habitat quality because the available data are too coarse (HUC 8 watersheds) for the region.
  - ○ Core areas do not account for instream habitat quality because there are no consistent data across region; partners can incorporate local or state data if available.
- ● The core area network approach by design does not explicitly identify the most important areas for rare aquatic species; however some additional areas are covered with the Regional Species of Greatest Conservation Need (RSGCN) component and should be used as a complementary dataset.