

North Atlantic Aquatic Connectivity Collaborative

Assessing road-stream crossings to improve river and stream continuity across the North Atlantic U.S.



Photo: Erika Edgley, The Nature Conservancy

Improving Aquatic Connectivity and Increasing Flood Resilience

Road-stream crossings, which include culverts and bridges, are an essential element of our transportation networks, allowing roads to pass over rivers and streams. Undersized or poorly designed crossings fragment streams, contribute to erosion, exacerbate flooding, and prevent fish and other organisms from accessing the habitat they need to survive and reproduce. The good news is that thoughtfully-designed and well-placed stream crossing replacements can increase habitat connectivity for fish and wildlife while also enhancing resiliency of roads to flooding.

To best utilize limited restoration resources, it is necessary to assess opportunities and prioritize action. To address this need, the University of Massachusetts Amherst (UMass), The Nature Conservancy, and other experts from thirteen states, with support from the North Atlantic Landscape Conservation Cooperative, have formed the North Atlantic Aquatic Connectivity Collaborative (NAACC). The NAACC is developing common protocols for assessing stream crossings, in order to identify high priority bridge and culverts for upgrade and replacement. The work of the NAACC will support planning and decision-making by providing information about where restoration projects are likely to bring the greatest improvements in aquatic connectivity. By bringing together a range of partners – conservation organizations, local citizens, and state and federal natural resource and transportation agencies – the network will facilitate the exchange of information as well as collaboration on efforts to improve aquatic connectivity.

The Challenges

For aquatic organisms:

- There are millions of stream crossings across the NALCC region. In New York alone, there are an estimated 1.2 million crossings.
- The majority of stream crossings limit the movement of fish and wildlife. In Maine, nearly 60% of surveyed crossings are complete or partial barriers,
- Fragmentation of streams due to crossings has a range of negative consequences for river and stream ecosystem. As the climate changes, many organisms depend upon access to cooler upstream habitat to survive and reproduce.

For people:

- The North Atlantic region is experiencing more frequent extreme rain events, and the trend is expected to continue. Much of our transportation infrastructure is not designed to withstand these storms, which results in costly flood damage and potentially dangerous conditions. For example, an estimated 1,000 culverts in the state of Vermont sustained damage from Tropical Storm Irene.
- A recent UMass study found that stream crossings that are more severe barriers to fish and wildlife are also the most vulnerable to failure during large storms.



This undersized culvert is “perched” above the stream, making it a complete barrier to the movement of aquatic organisms.

Photo: The Nature Conservancy



This stream crossing is large enough to handle flood flows, the depth and speed of the water within the culvert match the natural conditions upstream and downstream, and the natural bottom creates suitable conditions for stream dwelling organisms to move.

Photo: Scott Jackson, UMass

The NAACC project will:

- Assemble a network of practitioners working to enhancing aquatic connectivity.
- Develop a standard road-stream crossing field survey protocol for use in the North Atlantic region that reconciles different approaches for crossing assessments and scoring systems.
- Launch an online stream crossing assessment training program.
- Create an online database and map interface that provide a system for storing, scoring, and making available data from stream crossing assessments throughout the region.
- Support state coordinators, volunteers, and technicians in conducting crossing assessments in targeted areas throughout the region, as part of the U.S. Fish & Wildlife Service Hurricane Sandy recovery and mitigation effort.
- Identify opportunities to improve aquatic connectivity by prioritizing crossings for assessment and upgrade based on their potential ecological benefit.
- Build on existing work, such as The Nature Conservancy's Northeast Aquatic Connectivity Project: <http://rcngrants.org/content/northeast-aquatic-connectivity>.



Photo: Erika Edgley, The Nature Conservancy

Working Together

Funding for the North Atlantic Aquatic Connectivity Collaborative project is provided by the North Atlantic Landscape Conservation Cooperative and the U.S. Department of Interior Hurricane Sandy Mitigation funds. Numerous partners from conservation organizations, federal and state agencies, and academia are contributing data and providing advice and expertise.

The NAACC Project Area



The Brook Trout is a cold-water fish species dependent upon access to small, cool headwater tributaries. Stream crossings that allow aquatic organisms to move ensure access to critical coldwater habitat.

Photo: Ben Letcher, USGS



The Wood Turtle is a semi-aquatic animal that travels along rivers and streams and is vulnerable to road mortality. Well-designed crossings allow these and other semi-aquatic wildlife to move safely along stream corridors.

Photo: Michael Jones, UMass

What we can accomplish:

- Reconnect streams and rivers to support healthier populations of fish and wildlife in a changing climate.
- Proactively identify and help prioritize sites for stream crossing upgrades and replacements to bolster the flood resilience of transportation infrastructure.
- Facilitate communication and information sharing among North Atlantic partners working to improve stream crossings.



For more information:

To learn more about the NAACC and how you can get involved in the work group, contact Jessica Levine at jlevine@tnc.org.