

AQUATIC CONNECTIVITY

Identifying Barriers to Organisms and Hazards to Communities

Problem Road Culverts

Poorly designed and undersized culverts are barriers to aquatic organisms and hazards to communities during storms. Streams are linear habitats for aquatic and semi-aquatic species such as American eel, herring, stream salamanders, turtles and crayfish. Road crossings can fragment streams into small pieces, preventing organisms from accessing critical habitats.

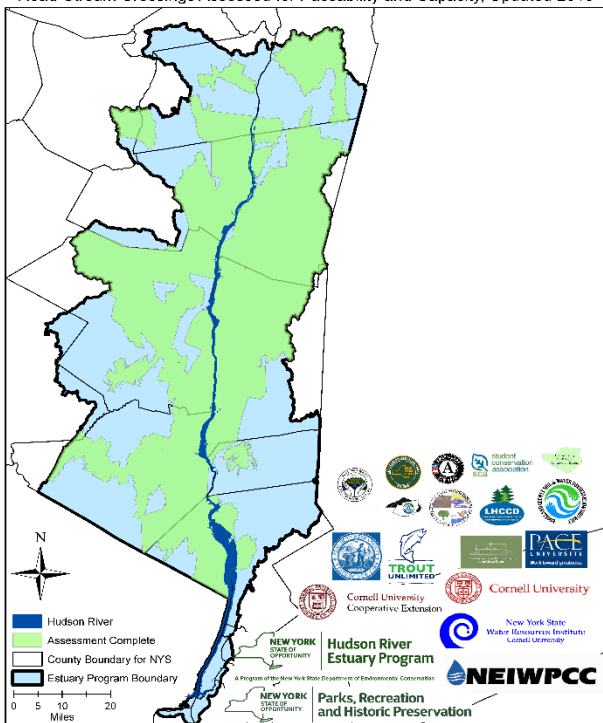
Culverts also may be infrastructure liabilities and flooding hazards for communities. During storms, undersized or improperly installed culverts can become clogged with debris or overwhelmed, leading to road flooding, stream bank erosion, or even washout of the whole road.



Culverts such as this these can constrict the natural flow of the stream, have a perched outlet that only strong swimmers can jump and contain no natural streambed. Many culverts and dams fragment

Municipalities can receive help prioritizing culverts that could be upgraded, benefitting aquatic organisms and communities' bottom lines.

Hudson River Estuary Program Culvert Prioritization Project
Road-Stream Crossings Assessed for Passability and Capacity, Updated 2019



Studies have found that about two-thirds of crossings are not fully passable to aquatic organisms. The NYSDEC Hudson River Estuary Program, other NYSDEC branches, Soil and Water Conservation Districts, and interested county and local partners are working to reconnect tributaries within the Estuary watershed by surveying and prioritizing impassable and undersized culverts. Road crossings with unnatural stream bottoms, a perched outlet where a culvert adds an unnatural step to the stream, or other conditions are often barriers to organisms that need to go up and down streams.

Cornell University hydrologists model each crossing for the maximum storm interval (return period) the crossing could pass without spilling over the road. Undersized culverts are more likely to flood the road and washout during large storms. Emergency replacement of failed culverts costs more money and disrupts essential services such as hospital access during flood events. **This project connects interested communities with funding sources to replace impassable, undersized culverts with fully passable, properly sized culverts.**

Empowering Communities

After the assessment work, communities have data on each crossing's passability and capacity scoring information. This data is also available on the Cornell WRI [Aquatic Connectivity Map](#) and the [North Atlantic Aquatic Connectivity Collaborative database](#). Estuary Program staff are available for technical assistance and presentations to help communities use the information. Culvert assessments have been conducted in approximately 54.4% of the Hudson River Estuary Program boundary with the help of many partners.



Scenic Hudson Land Trust received a grant to improve the aquatic organism passability and reduce the flooding hazard of this vital piece of infrastructure.

To help communities reconnect their streams and proactively remove flooding hazards, Estuary Program grants can fund these planning and mitigation steps.

- 1.) **Assess Culverts and Bridges** for aquatic organism passability and storm capacity by partner organizations or Estuary Program staff.
- 2.) **Prioritize Problem Culverts** within a management plan. After the crossings have been assessed and modeled, municipalities can rank crossings by passability, capacity and local needs. This document can be added to a Natural Resource Inventory or Hazard Mitigation Plan.
- 3.) **Design Replacements** through conceptual or shovel-ready engineering plans. This process also addresses relevant permits required for a construction mitigation project.
- 4.) **Fix Problem Culverts** by upgrading infrastructure to be fully passable to organisms and reduce flooding hazards.

Removing harmful and unnecessary stream barriers will benefit our resident and migratory fish, as well as all the other organisms that use our streams. New York has seen a dramatic increase in the amount of rain falling during large storms, and climate change projections suggest that will continue. Planning for fully passable crossings for organisms also means planning for structures capable of handling more frequent and intense storm events. This project gives communities a clear understanding of where problem stream barriers are and provides funding to fix them.

CONTACT INFORMATION

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Partners have assessed over 10,000 crossings

- 20% of these are substantial barriers to aquatic organisms
- 71% of crossings are undersized
- Problems are more pronounced for locally owned roads