# Culvert Replacement

NEW YORK STATE | Department of Environmental Conservation | Hudson River Estuary Program

## Reconnecting Hudson Valley Streams and Reducing Flood Hazards

**Identifying and replacing culverts and other road-stream crossings that are barriers to fish and aquatic organisms can reconnect and improve stream habitat and reduce flood risk.**

## Stream Barriers and Flood Hazards

Streams are habitat for aquatic and semi-aquatic organisms, such as American eels, herring, stream salamanders, turtles, and crayfish. Culverts that are undersized or misaligned with the stream can result in unnatural stream bottoms and a raised or perched outlet. Such crossings are barriers that prevent aquatic organisms from accessing critical upstream habitat. They reduce **aquatic connectivity**, or the amount of continuous habitat available, fragmenting streams into small segments. Studies have found that about two-thirds of crossings are not fully passable to aquatic organisms.

**Undersized crossings may also be flooding hazards.** Many culverts are too small for the flow produced by current storm events. 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 road.

**The DEC Hudson River Estuary Program helps municipalities identify culverts and other road-stream crossings that are barriers to aquatic organisms or pose a flood risk, and prioritize and plan for their replacement**.

*Culverts such as this one can constrict the natural flow of the stream, and the raised or perched outlet prevents aquatic organisms from reaching upstream habitat.*

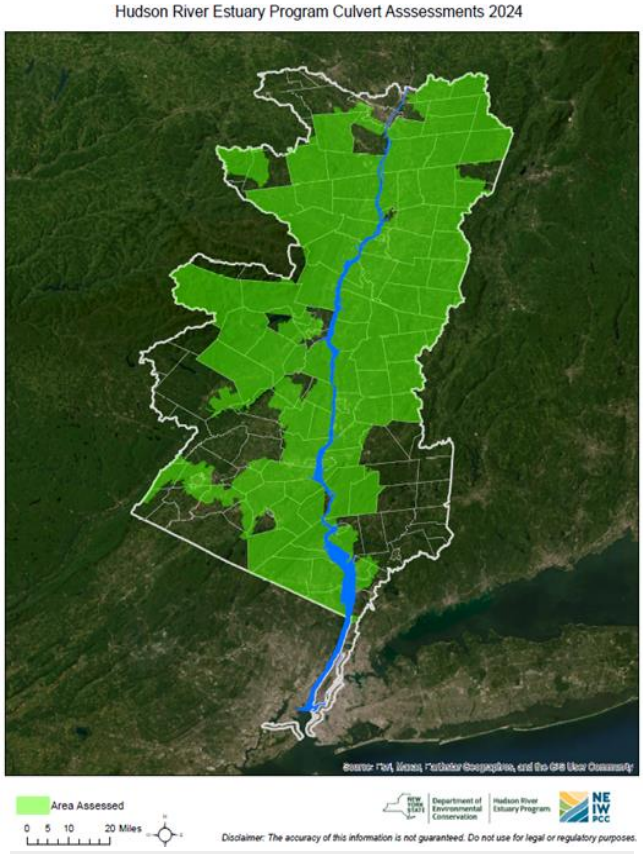
## Hudson Estuary Culvert Project

The Hudson River Estuary Program, other DEC programs, county soil and water conservation districts, and local and regional watershed partners are working to reconnect tributaries in the Hudson River estuary watershed by surveying and prioritizing impassable and undersized culverts. Culvert assessments have been conducted in 75% of the Hudson River estuary watershed with the help of many partners.

**There are over 13,000 road-stream crossings assessed in the estuary watershed.**

- 35% of assessed crossings present a barrier to aquatic organism passage.
- Problems are more pronounced for locally owned roads.

Cornell University hydrologists model each crossing for the maximum storm interval (return period) the crossing can pass without flooding. Undersized culverts are more likely to flood the road and wash out during large storms. Flood events disrupt essential services, such as hospital access. Emergency replacement of failed culverts costs more money than planned replacements.




*Areas with completed culvert assessments in the Hudson River estuary watershed.*

## Assistance for Communities and Partners

**The Hudson River Estuary Program helps municipalities and non-profit partners assess, prioritize, and plan for the replacement of culverts, benefitting aquatic organisms and reducing long-term costs for communities.** Culvert assessment is the first step and provides communities with each crossing's organism passability score and maximum storm capacity. The data is also available on the North Atlantic Aquatic Connectivity Collaborative database. Hudson River Estuary Program staff can provide technical assistance and presentations to help communities use the information.

**Hudson River Estuary Program grants can fund planning and mitigation steps to help communities reconnect their streams and proactively remove flooding hazards.**

## Culvert Planning and Replacement Process

**Assess Culverts and Bridges**
- Determine aquatic organism passability and structure condition with partner organizations or Hudson River Estuary Program staff.

**Prioritize Problem Culverts**
- After the crossings have been assessed and modeled, municipalities can rank crossings by passability, capacity, and local needs in a management plan.

**Design Replacements**
- Prepare conceptual or shovel-ready engineering plans. This process should also address relevant permits required for a constuction mitigation project.

**Fix Problem Culverts**
- Upgrade infrastructure to be fully passable to organisms and reduce flooding hazards.

## Funding Assistance

Funding for municipal road-stream crossing management plans, crossing design, and construction implementation is available through the Hudson River Estuary Grants Program's Local Stewardship Planning and Tributary Restoration and Resiliency opportunities.

**Funded since 2015:**
- 44 Municipal Road-Stream Crossing Management Plans
- 51 Culvert Replacement Design Plans
- 12 Replacement Construction Implementation Projects

Removing harmful and unnecessary stream barriers will benefit resident and migratory fish, as well as all the other organisms that use streams. Fully passable crossings for organisms are also capable of handling more frequent and intense storm events. This project helps communities identify problem stream barriers and provides funding opportunities to fix them.

*Natural flowing stream with replacement structure spanning full streambed.*

**CONTACT INFORMATION**

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