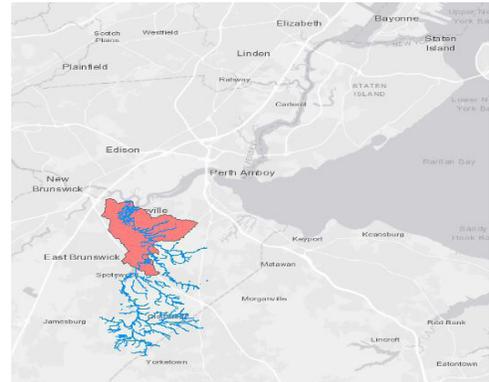


Aquatic Connectivity Through Climate-Ready Infrastructure

South River Subwatershed

This assessment found four priority restoration projects in the South River subwatershed that will address either aquatic connectivity, hydrologic capacity, and/or crossing condition. The aquatic connectivity for the South River watershed is very good overall. The proximity to the lower Raritan River makes this subwatershed very important for fish that migrate from the ocean to freshwater streams at different parts of their life cycle. The assessment identified many road-stream crossings in this watershed that are problematic from a hydrologic perspective. The culvert capacity model predicts that nearly all of the crossings that are not on the main stem of the lower South River are undersized. Luckily, most of these culverts are not directly in residential neighborhoods and the surrounding open space may provide a buffer to the flooding in this area.

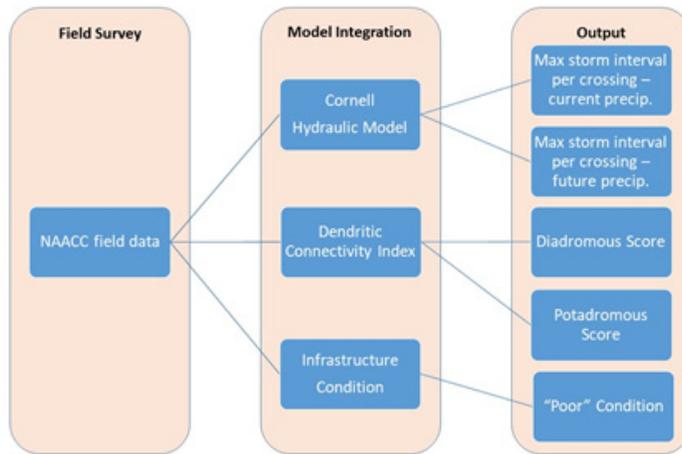


Background

Aquatic connectivity is a key restoration goal for the New York – New Jersey Harbor & Estuary Program (HEP) and its partners because this connectivity is crucial for improving healthy ecosystems and managing severe storms and flooding caused by climate change. Recommendations for barrier removal were made based on the following assessments: the North Atlantic Aquatic Connectivity Collaborative (NAACC), dendritic connectivity, a culvert capacity model developed by Cornell University, and infrastructure condition. These results are being shared with stakeholders to advance planning and capital projects that will replace problematic road-stream crossings with climate-ready, connectivity-friendly versions.

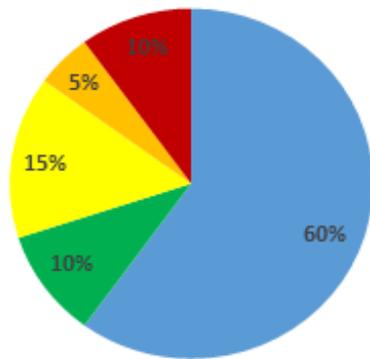


This assessment was made possible by funding from the EPA Coastal Watershed Grant administered by Restore America's Estuaries, and in partnership with the Rutgers Sustainable Raritan River Initiative.



This diagram shows the evaluation process. First field measurements are taken to estimate how well fish can pass through the culverts and bridges. Then that data is plugged into the Cornell Model to estimate the size of the rain event the crossing can accommodate (as measured by the current projections of the 1 to 500-year storm events). Individual culverts were prioritized for passage for estuarine (diadromous) and freshwater (potadromous) species using a dendritic connectivity index. Finally, crossings were prioritized that were in poor condition (falling apart).

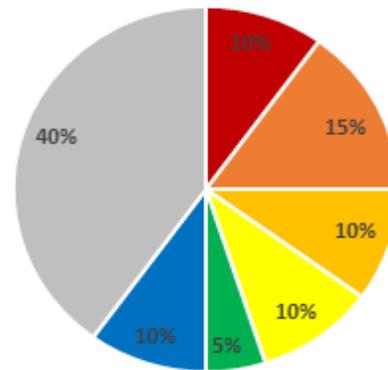
Aquatic Connectivity Results



■ Insignificant Barrier ■ Minor Barrier ■ Moderate Barrier
 ■ Significant Barrier ■ Severe Barrier

There are no barriers to fish passage on the mainstem of the South River in this subwatershed. Those that are moderate to severe barriers on the tributaries are largely so because they are so small in diameter that some fish species will avoid using them. Many of the crossings in this subwatershed are on railroads and there are two “ghost” crossings, structures that are no longer in use.

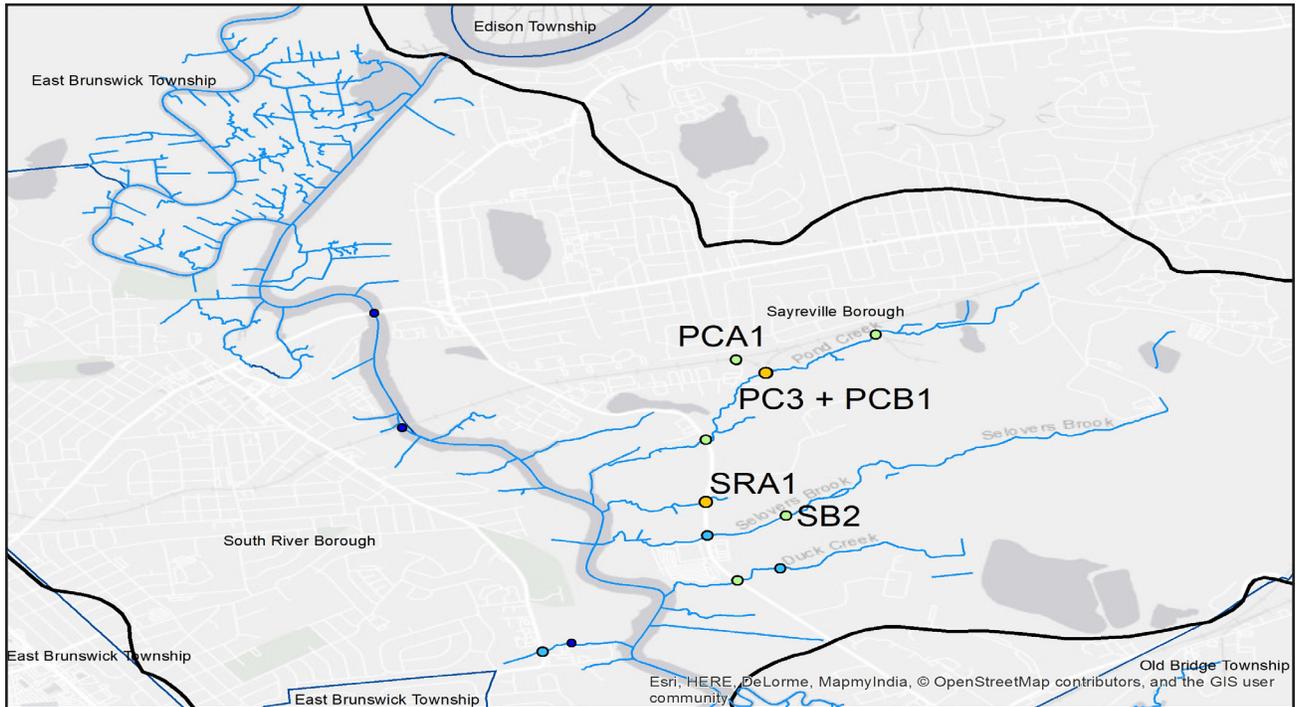
Capacity Model Results



■ 0 ■ 2 ■ 5 ■ 10 ■ 50 ■ 500 ■ blank

This chart shows the maximum storm interval (e.g. 10-year storm event) that the structure can accommodate without flows overtopping the road or causing erosion. This represents current precipitation scenarios, which are expected to increase. The blank crossings in this diagram are mostly crossings that could not be modeled as they are too large and therefore have ample capacity. Any maximum storm interval under 50 is generally considered undersized for a roadway.

Priority Restoration Projects



All recommended projects are located in Sayreville Township, NJ..

1. Pond Creek 3 and Pond Creek B1 (PC3 +PCB1) are two undersized railroad culverts that come from two different small tributaries into the same large scour pool. They are both in poor condition and allow for little to no fish passage due to their small diameter, length and subsequent high water velocity. There is also a historic crossing just downstream that no longer serves a purpose, although it does not hamper flow in the same way.



2. South River tributary A1 (SRA1) is a small culvert on an ephemeral tributary. It would not generally score very high, except at the time of assessment the inlet was completely buried in mud, debris and water, making it a high risk for roadway flooding. This crossing is in need of maintenance. The photo on the right shows the clogged outlet



3. Selovers Brook 2 (SB2) is the most important barrier to remove for anadromous and potadromous fish in this subwatershed. The water at this railroad crossing is deep at both the inlet and outlet, and very shallow inside the culvert, indicating probable erosional issues. Improving this barrier would open up 1.2 miles of upstream aquatic habitat with full downstream access to the ocean.

4. Pond Creek A1 (PCA1) is a ghost crossing structure in the woods that appears to no longer serve a purpose. This crossing could be removed entirely to improve access for fish and reduce flood risk.

