

FISH PASSAGE SURVEY

While habitat fragmentation has been studied extensively in upland forests, it is also a significant problem in rivers and streams. Flowing waters are often crossed by many roads and are blocked by large and small dams. Without proper design, construction, and maintenance, dams and culverts can block the movement of fishes and other aquatic organisms. The effects of such fish passage barriers on long distance migratory fish species like Atlantic salmon and alewives are significant. The effects on resident species are less well understood.

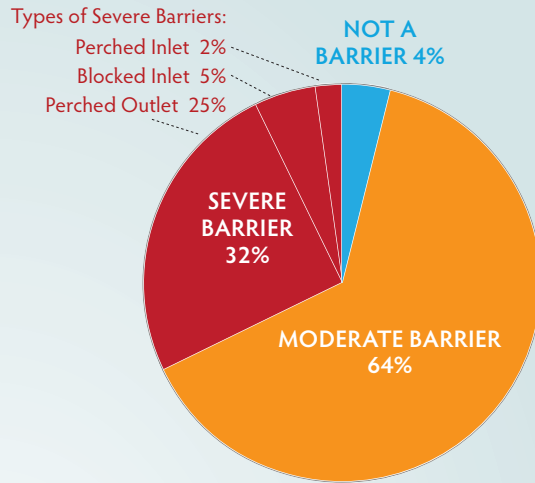
In 2009, CBEP seasonal staff, working with volunteers from Trout Unlimited and personnel from the U.S. Fish and Wildlife Service Gulf of Maine Coastal Program Office, visited over 700 potential fish passage barriers in the Royal River and lower Presumpscot River watersheds. They collected detailed data from over 480 culverts and approximately 30 dams. The survey was the first in the state to be carried out in a region that is largely urban and suburban; previous Maine surveys were focused on more rural landscapes, especially forested watersheds.

About one-third of culverts in the region never permit fish to pass. The majority of culverts are partial barriers to fish movement – blocking access some of the time, or to certain species of fish. Only a handful of crossings never restrict movement of fishes.

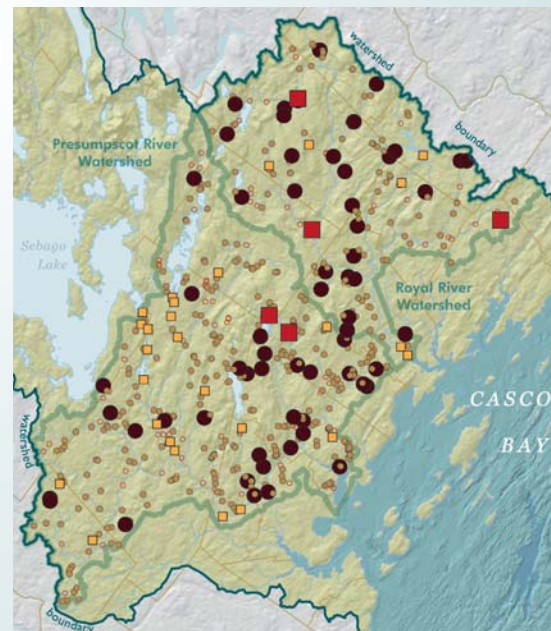
U.S. Fish and Wildlife staff analyzed the data to identify priority restoration opportunities in the study area, both for restoring access of anadromous fishes to stream habitat and for restoring access to lake habitat – which is particularly important to alewives, one of the most abundant anadromous species in the region. The results of those analyses provide CBEP and its partners with a “to do” list for fish passage restoration.

CBEP staff have also developed a tool – based in part on methods pioneered by the Piscataqua Region Estuaries Partnership under their Climate Ready Estuaries project – that provides a rough estimate of the relative flood risk at each culvert. Using the geometric data about each culvert collected during the field survey, along with the geographic information derived from GIS analysis, CBEP compared culvert flow capacity with expected storm flows.

Analysis of the results showed significant overlap between culverts that block fish migration and culverts that may pose higher than average flood risk. That insight has led to conversations with local communities, the Maine Department of Transportation, and the Cumberland County Emergency Management Agency to identify sites where culvert replacement would simultaneously serve environmental, infrastructure and public safety goals.



Results of 2009 field survey. Most culverts are fish passage barriers. A quarter of all culverts are impassable to fish because their outlet is perched significantly above the elevation of the stream. Since most of Maine’s anadromous fishes don’t jump, these culverts effectively block upstream movement of many anadromous fishes.



Priority Fish Passage Restoration Areas

Dams		Culverts	
	Priority		Priority
	Other		Other
	Unsurveyed crossing (2009)		