

Nevius Street Dam Removal Project

A Raritan River Restoration Initiative

The New Jersey Department of Environmental Protection's Office of Natural Resource Restoration (NJDEP ONRR), in conjunction with Kinder Morgan, Inc. and the Duke Farms Foundation, are implementing the removal of the Nevius Street Dam, located at Raritan River Mile (RM) 27.0, to allow anadromous and catadromous fish species to freely migrate upstream and downstream of the dam site. This project, guided by the technical groundwork developed by National Oceanic and Atmospheric Administration (NOAA) Restoration Center, fulfills objectives outlined in the 2006 Open Rivers Initiative (ORI) and the goals set forth by the Sustainable Raritan River Initiative.



The Nevius Street Dam was constructed in circa 1901 by James Buchanan (Buck) Duke, the tobacco and hydropower industrialist, for aesthetic and recreational purposes as part of his development of Duke Farms, a 2,740-acre property in Hillsborough Township, New Jersey. The dam was comprised of mortared stone block over a concrete core and had a stair-step design on its downstream side. A water intake structure installed in the early 1960s on the north end of the dam was used to supply water to the Duke Farms lake system.

The Raritan River and its sub order tributaries combine to form the largest interior watershed to support migratory fish in New Jersey. These river segments are suitable spawning and nursery habitat for American shad (*Alosa sapidissima*), hickory shad (*Alosa mediocris*), alewife (*Alosa pseudoharengus*), and blueback herring (*Alosa aestivalis*), which formerly populated the river in such numbers that they supported a commercial seine-haul fishery in the 19th century.

The shallow water depths and pebbly river bed substrates characteristic of the Raritan River and tributary stream beds in the vicinity of the Nevius Street Dam make this stretch of river an ideal spawning and juvenile growth habitat for shad and river (alewife and blueback) herring.



Dams physically prevent spawning runs of migratory anadromous fish (species that spend their adult life stages in the ocean and return to fresh water to spawn), which has contributed to a steep decline of their populations along the Atlantic coast. Dams also limit dispersal of resident freshwater fish species, cause crowding just downstream of the dam structure, and produce notable differences in biodiversity between upstream and downstream locations. Additionally, dams alter riverine habitats by producing lake-like conditions upstream of the structures, which can favor undesirable

species, cause siltation of spawning and feeding habitats, and trigger deleterious effects on water quality, such as when thick, filamentous algal mats blanket acres of stagnant water upriver of the dams in the summer months.

Removal of the Nevius Street Dam will eliminate the most significant barrier to anadromous fish passage along three miles of the main stem of the Raritan River between RM 27.0 and RM 29.9 (up to the Headgates Dam), restoring access to historically significant spawning grounds for American shad and other migratory fish. Dam removals have direct physical benefits; for example, the natural river process of transporting and depositing gravels, sand, nutrients, and woody debris is restored, enabling rivers to provide the diversity of habitats necessary for species to survive and thrive.



This dam removal will also benefit resident aquatic insects and birds, including the bald eagle (*Haliaeetus leucocephalus*), the great blue heron (*Ardea Herodias*), a New Jersey species of Special Concern, the great egret (*Ardea alba*), a NJDEP species of Regional Priority, and the belted kingfishers (*Megaceryle alcyon*). Juvenile fish are an important food source for the aforementioned wading birds, which also utilize the river corridor for nesting. The presence of the Nevius Street Dam has reduced the foraging habitat

available for wading birds by submerging the river shoreline up to the steep embankments and the dam has decreased natural river channel heterogeneity in the impounded areas of fish passage.

Lastly, but certainly as compelling as the aforementioned ecological benefits, is that low head dams like the Nevius Street Dam are “drowning machines,” presenting deadly safety hazards to fisherman and other recreational users of the river. Drowning victims become inextricably trapped in a submerged hydraulic jump and reverse roller that occurs just downstream from the dam. Hundreds of the people have been killed at low head dams across the United States, including individuals who have drowned at dams on the Raritan River.



In summary, dam removals are one of the most successful and proven methods of restoring rivers and there are significant ecological (in addition to commercial and recreational) benefits for the removal of the Nevius Street Dam. The Nevius Street Dam removal project is considered to be regional significance because of its long-term, watershed-wide benefits, and this specific project has long been of interest to a diversity of parties, including federal, state, local, and private partners.

For more information on restoring fish passage on the Raritan River, please visit:

www.habitat.noaa.gov/ourwork/fishpassage.html and www.raritan.rutgers.edu/

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