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Restoring NY-NJ Estuary Will Create Breathtaking Views And More Bipartisan Infrastructure Law Funding

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I have a vivid memory as a child while living in Brooklyn, New York in the 1970's. I am in the car with my family and we're driving along the Belt Parkway when suddenly the vehicle fills up with a familiar stench that tells me we have reached Jamaica Bay.

I hold my breath and look out the window. I see a mountain of raw garbage – a dump 100-foot-high – with tiny bull dozers plowing through it. Hungry seagulls circle the top while contaminated soil falls into the bay.

Today, the dump and pungent smell are gone, but not the negative effects it has had on the bay. The estuary is slowly improving with work being performed by my agency, the U.S. Army Corps of Engineers, New York District.

The Army Corps with partnering agencies is using funds from the Bipartisan Infrastructure Law to revitalize marsh islands in the bay. It is part of a larger project to restore the degrading estuary in New York and New Jersey.

This project fulfills some of the goals of the law that was implemented this past spring by the U.S. Congress and signed into law by President Biden. The Army Corps received funding that will be applied to over 500 projects throughout the United States.

“The Army will work with community partners to leverage these historic civil works funds for investments that strengthen national supply chains through our commercial navigation mission, help communities impacted by climate change to increase their resiliency, advance environmental justice, and invest in communities that have too often been left behind,” said **The Honorable Michael L. Connor, Assistant Secretary of the Army for Civil Works**.

The Army Corps’ New York District will be applying these funds to a number of projects, including the Hudson Raritan Estuary New York and New Jersey Ecosystem Restoration Project.

The Hudson Raritan Estuary is located within the boundaries of the Port District of New York and New Jersey and is situated within a 25-mile radius of the Statue of Liberty National Monument.

An estuary is a partially enclosed, coastal water body where freshwater from rivers and streams mix with salt water from the ocean. Estuaries can include a variety of habitats including salt marshes, mangrove or maritime forests, mud flats, tidal streams, rocky intertidal shores, reefs, and barrier beaches.

The Hudson Raritan Estuary is a complex ecological system located within a highly urbanized region of 20 million people that includes the New York Harbor, rivers, wetlands, coastlines, and open waters.

Over the years, industrialization has degraded the estuary and 1,000 miles of its natural shorelines have been replaced with piers, docks, and bulkheads, destroying naturally sloped shorelines that transitions from shallow to deep water that are needed by fish and sea life to thrive.

Restoring the estuary is important because the ecosystem provides habitat for birds, fish, shellfish, and other wildlife, maintains water quality by filtering out contaminated sediments, provides recreational opportunities, boosts the region’s economy, and acts as a buffer from flooding for coastal communities during destructive and powerful storms.

One study done by Lloyd's of London showed marshes play a critical role in reducing damage to infrastructure from coastal storms. The study showed that during 2012's Hurricane Sandy marshes prevented \$625 million in direct flood damages across twelve states. In New Jersey, coastal marshes reduced property damages by more than 20 percent.

Lisa Baron, project manager, New York District, U.S. Army Corps of Engineers said, "The plan for the overall HRE Program is to restore a mosaic of 621 acres of habitat at 20 individual projects sites. These projects will restore estuarine and freshwater wetlands, shorelines, fish passage, oyster reefs, shallow water habitat, coastal forests and Jamaica Bay marsh islands while providing maximum ecological and societal benefits to the region." Baron has been involved in various types of environmental restoration initiatives and projects for more than 30 years, including managing the HRE Project for the last 15 years.

The BIL funds will help to kick start five of these restoration sites that include four projects over the next few years including Stony Creek Marsh Island Restoration Project, Jamaica Bay, New York, Flushing Creek Restoration Project, New York, Bronx Zoo & Dam and Stone Mill Dam Restoration Project, New York, and the Oyster Restoration at Naval Weapons Station Earle Project, New Jersey.

Stony Creek Marsh Island Restoration Project, Jamaica Bay, New York

Jamaica Bay is located in portions of the Boroughs of Brooklyn and Queens in New York City and is part of the Jamaica Bay Park and Wildlife Refuge, the country's first national urban park and one of the Gateway National Recreation Areas that is visited by millions of people each year.

The bay covers 26 square miles and opens to the Atlantic Ocean. The land surrounding the bay is heavily developed and includes John F. Kennedy International Airport, the Belt Parkway, and several landfills, including the ones I saw as a child – the Fountain Avenue and Pennsylvania Avenue landfills.

Inside the bay there is a marsh island complex. In the last century, these once vibrant islands have been rapidly disappearing resulting in extensive habitat loss. Over 2,000 acres

of marsh islands have been lost since 1924, and 85% of the wetlands have been lost in the region.

In general, historic wetland loss in the region is due to human development that's included the filling in of marshes and open water areas, hardening of shorelines, input of raw and treated sewage, sewer overflows, and landfill leachate, or water containing contaminants seeping from landfills.

The disappearing marshes pose a threat to wildlife and coastal communities. It has been estimated that the marsh islands if left alone would vanish completely by 2025.

Fortunately, due to work the Army Corps has performed over the years, this will not happen. The Army Corps, along with partnering agencies, has restored approximately 180-acres of marsh in Jamaica Bay through a number of successful restoration projects.

According to **Baron**, "Restoring these marsh islands provides significant benefits to the region and combats many of the reasons for their loss. The restored marsh islands keep the sediment within the Jamaica Bay system; wetland vegetation stabilizes the island; the islands reduce waves and erosion of surrounding shorelines and adjacent islands; the wetlands improve water quality within the bay; and the marsh islands that we construct will continue to build the ecological resilience of the bay to respond to increasing sea level rise."

Now with BIL funds, the Army Corps in collaboration with the New York City Department of Environmental Protection will be restoring another marsh island that sits in the heart of the bay— Stony Creek Marsh Island.

Sixty-two acres of the island will be restored. To perform this work, approximately 150,000 cubic yards of sand will be beneficially used from the dredging of the Jamaica Bay Federal Navigation Channel or Ambrose Channel and placed on the island. The material will be graded and contoured to appropriate elevations suitable for a marsh and then planted with native vegetation.

When completed, the island will have 26 acres of low marsh, 22.5 acres of high marsh, 3.5 acres of scrub-shrub wetland, 8.7 acres of shallow marine habitat, and 1.4 acres of tidal channels or narrow inlets.

This will create a healthy marsh for one of the most biodiverse regions in the Northeastern United States. Jamaica Bay provides critical spawning and nursery habitat for more than 80 migratory and estuarine fish species, as well as terrapins and four species of endangered or threatened turtles.

In addition, 300 bird species – or 20 percent of the Nation’s birds – call the bay their home and visit it every year as a stopover point along the Atlantic Flyway migration route to their breeding grounds. These birds include the federally listed threatened piping plover and endangered rosette tern.

Flushing Creek Restoration Project, New York

While birds are making their Atlantic Flyway migration, they will also stop at Flushing Creek, located in the Borough of Queens, in New York City.

The Flushing Creek site is comprised of approximately 19 acres of shoreline and is surrounded by a highly urbanized area including houses, transportation systems, businesses, and industry.

In the last century, the creek’s marsh habitat has degraded due to human development that’s included stream channel straightening, filling of wetland areas, and headwater reconfiguration of the creek. This was a result of the region’s preparation for the World’s Fair that took place in Queens in 1939 and 1964.

These activities led to a creek with low ecological value suffering from habitat loss, bank erosion, dominance of invasive plant species, low benthic and fish abundance and diversity, and poor water quality.

Now with BIL funding, the Army Corps in collaboration with the New York City Department of Environmental Protection will restore a large portion of the creek.

Approximately 19 acres of habitat will be restored. The work will include removing invasive plant species, such as common reed grass, and excavating, placing, and re-grading soil to restore wetlands and upland forests. In addition, select areas of intertidal mudflats – a nuisance source of hydrogen sulfide gas – will be converted to low marsh.

When completed, wetlands will be restored including 9.8 acres of low marsh, 2.5 acres of high marsh, and 1.8 acres of scrub-shrub wetlands in the transitional areas between the wetlands, and 3.9 acres of upland maritime forest.

The restored habitat along Flushing Creek will be characterized as a more diverse, functioning community that will contribute to shore stabilization and flood control.

Not only will the public be safer, but residents will also have improved access to green space and a revitalized waterfront for recreational and educational experiences.

They will be able to see the hundreds of migratory birds that use the area as a stopover location during migration along the Atlantic Flyway.

These birds include waterfowl, such as the mallard, canvasback, lesser saup, and wood duck and wading birds, including the cattle egret, snowy egret, and the great egret.

This project also includes providing a habitat for migratory fish, where they can nurse, feed, spawn, and find refuge from predators.

Bronx Zoo & Dam and Stone Mill Dam Restoration Project, New York

Speaking of restoring migratory fish habitats, this project advances one of the primary goals of the HRE Project – to improve tributary and habitat connectivity.

North of Flushing Creek, is the Borough of the Bronx, in New York City and the location of the Bronx Zoo & Dam and Stone Mill Dam.

These two dams are located close to each other along the Bronx River, that flows through highly urban communities that include roadways, parking lots, the Bronx River Parkway, the Metro North Harlem commuter rail line, the Bronx Zoo, and the New York Botanical Garden.

Over the years, the Bronx River's complex ecosystem has degraded, losing more than 99 percent of its freshwater wetlands. This has been due to industrialization, channel modification, filling of wetlands, runoff of contaminated sediments from roadways, and the construction of these two dams that have created barriers to fish movement upstream to reach egg-laying sites, threatening the survival of their populations.

Now with BIL funding, the Army Corps in collaboration with the New York City Parks and Recreation, will be providing fish access and connection to key spawning and nursery habitats upstream.

The work will focus on removing or modifying fish passage barriers – which may include installing fish ladders and opening up or removing the dams at both locations to allow fish access to and from an additional seven miles of upstream habitat.

Jamie Ong, environmental protection project manager, New York City Parks and Recreation used a metaphor to describe this work to a group of teenagers who visited the project this summer through the Columbia Teachers College Global Citizens Program.

She said, “I likened our options for fish passage to the doors of a subway car, which sometimes open only on one side, like a technical fishway, and asked them to imagine a car with no walls or doors, which would be comparable to dam removal.”

Providing a habitat for migratory fish is important socially, economically, and ecologically. Migratory fish, such as river herring, are a source of food for birds such as the blue heron and osprey and commercial fish, such as striped bass, cod and haddock, whose populations have been declining.

Ong added, “The teens were surprised to learn about the diverse animal species we are monitoring as part of this project, including the American eel and the great egret. Coincidentally, a great egret flew overhead while I was talking with them. These and many other fish and wildlife species will benefit from better connections between Bronx waterways and rivers upstream.”

In addition, the river and its shoreline will be improved. This will include restoring the bottom of the channel, removing invasive plant species, like knotweed, and replacing it with vegetation that will improve wildlife habitat and stabilize the shoreline to prevent soil from washing into the river.

Oyster Restoration at Naval Weapons Station Earle Project, New Jersey

Besides fish, other aquatic life has been declining over the years in the Hudson Raritan Estuary and this includes oysters.

Up until the late 1800s, the bottom of the estuary was blanketed with oysters. The eastern oyster populated 200,000 acres of the estuary and today it's considered ecologically extinct, primarily caused by water pollution, dredging, poor land management, and overharvesting.

Now with BIL funding, the Army Corps in collaboration with the New Jersey Department of Environmental Protection and the NY/NJ Baykeeper is aiming to bring the oyster back.

The Naval Weapons Station Earle is a secluded Naval location located on the coast of New Jersey, on the Raritan Bay. The plan is to expand a .25-acre oyster reef constructed by the NY/NJ Baykeeper to create a 10-acre oyster reef habitat under the station's 2.9-mile pier that is close to the land and away from naval ship activity.

Stacey MacEwan, project manager, New Jersey Department of Environmental Protection, Office of Natural Resource Restoration said, "Oysters bring a range of benefits to the estuary. Oysters improve water quality through filtration processes, but the reef itself provides a vertical structure that supports a diverse community of fish and invertebrate species, and the reef structure can also help to protect the shoreline from erosion. This type of project can provide large-scale benefits in a relatively small footprint."

Meredith Comi, coastal restoration program director with the NY/NJ Baykeeper agreed, "Knowing that protecting our shorelines is leading to an increase in species diversity is very cool and is even more of a reason to use nature-based features in resilience projects."

Today, when I drive past Jamaica Bay in New York, I am instinctively prepared to be struck by that putrid dump smell and to hold my breath, but instead I am stunned by the change that is occurring in the area.

The landfills were restored and are now a 400-acre, 130-foot-high state park. Instead of seagulls hunting for food, family's picnic on wooden tables and instead of toxic soil leaking into the bay there is a healthy mix of trees, shrubs, and wildflowers growing along the park's walking paths and grounds.

Park visitors also have spectacular panoramic views of the Empire State Building to the northwest, the Verrazano-Narrows Bridge and New York Harbor to the west, and Jamaica Bay to the south.

As restoration work moves forward on the Hudson Raritan Estuary New York and New Jersey Ecosystem Restoration Project, the views of the bay are sure to take the breath away of future generations – in a good way.

Image caption: NY/NJ Baykeeper divers in the Raritan Bay being handed an oyster castle, a concrete block, that will be stacked to make a pyramid to provide habitat structure for the oyster reef and other marine life. Credit: NY/NJ Baykeeper.

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