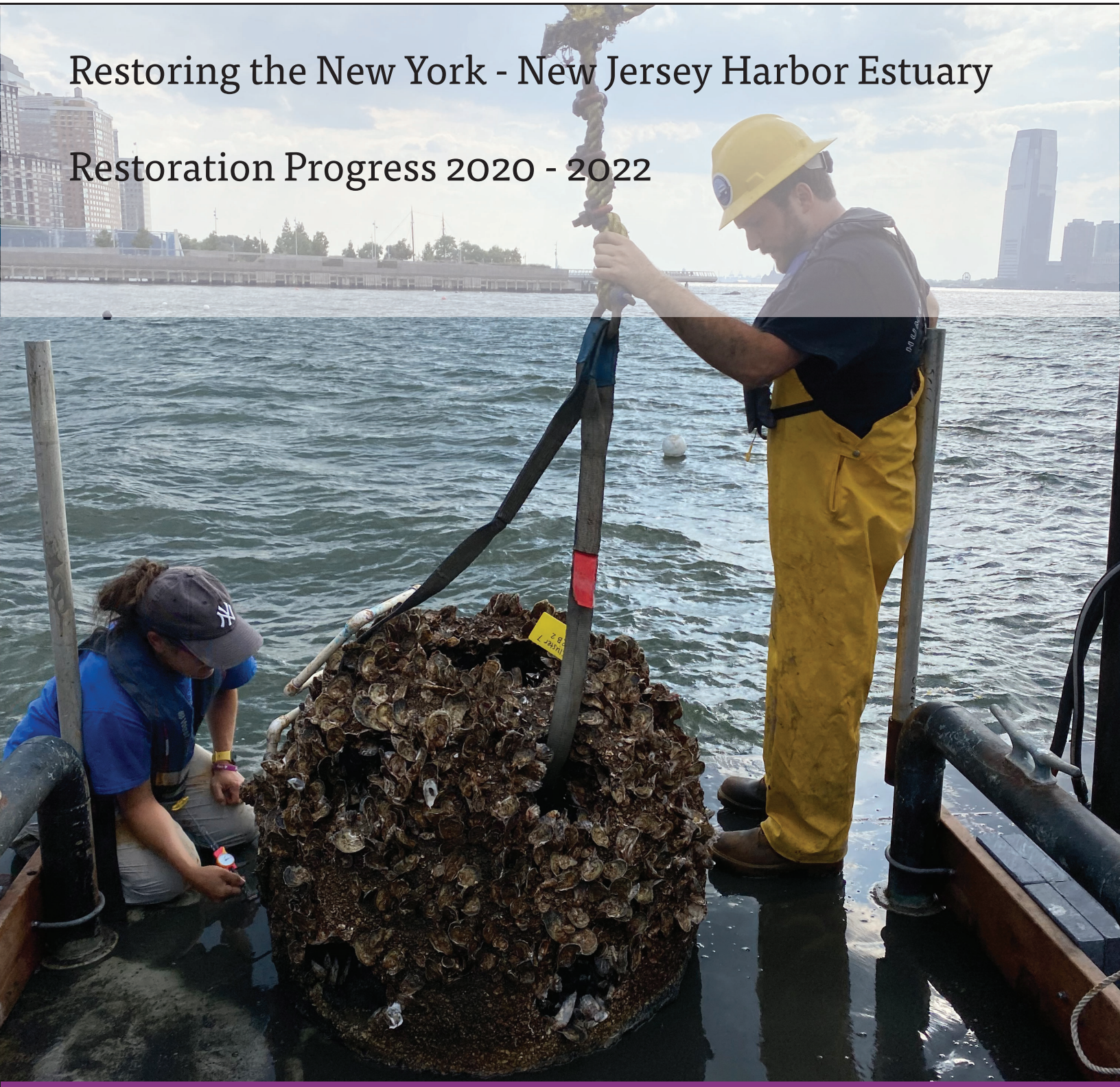
NEW YORK / NEW JERSEY HARBOR & ESTUARY PROGRAM

Restoring the New York - New Jersey Harbor Estuary

Restoration Progress 2020 - 2022



HUDSON RIVER FOUNDATION

NY/NJ HARBOR & ESTUARY PROGRAM

Overview and Summary

Restoration of the Hudson Raritan Estuary continues to progress, despite the global pandemic that halted most activities including construction, and funding, for much of the three-year period (2020 – 2022) that this restoration report covers. Over the past three years HEP's partners have completed over 36 restoration projects culminating in 28 million dollars of investment in enhancing the habitats of our region. The Target Ecosystem Characteristics (TECs) that have shown the most positive change from the previous restoration report are Oyster Reefs, due to a growth in both the community of practice and investment, and Sediment Contamination, due to the progress towards cleaning up the Gowanus Superfund site.

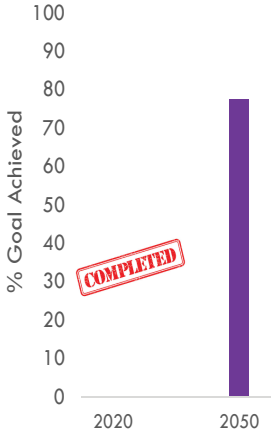
In 2009, the New York/New Jersey Harbor & Estuary Program's (HEP) Restoration Work Group adopted the US Army Corps of Engineers Comprehensive Restoration Plan (CRP) for the Hudson-Raritan Estuary (HRE) as a shared blueprint to protect extant habitats and restore, enhance and create new habitats. Since the final CRP was finalized in 2016, we have been tracking progress towards our shared goals: 12 TECs that together define the structure, function and biological diversity of a restored estuary south of the Mario Cuomo (Tappan Zee) Bridge. This report highlights the progress towards goals (for both 2020 and 2050) since the last Restoration Report.

Five of the TECs have still not met their 2020 goals. All but two of these are progressing adequately, albeit slowly. But for the Wetland and Enclosed and Confined Waters TEC, we are not likely to hit these targets anytime soon, more details herein. The remaining seven TECs have met their 2020 goals and are progressing towards their 2050 goals. Our most successful TEC continues to be Coastal Forests, which is well poised to hit its 2050 goal long before the deadline. However, some of the 2050 goals outlined in the CRP are very ambitious and it is unlikely we will fulfill those goals on time. To ensure that the HRE-CRP goals remain relevant for the next decade and beyond, HEP's Restoration Work Group will reevaluate the goals defined in 2016. For some TECs, we have achieved the 2020 goal to implement one or more pilot projects, but, as a community of practice we are not at the point where the more aspirational 2050 goals seem reasonable (e.g., making all shorelines of the estuary accessible). As development continues and seas rise, we are limited by available lands; this impacts our ability to reach certain goals and highlights the need for acquisition for conservation. In some cases, we are limited by our own understanding of what the wildlife of our estuary needs, and we need the trust and flexibility, and partnerships with scientists to pilot projects. Finally, the 2050 goals may need to be revised to reflect the current priorities of the many public and private stakeholders in the restoration community.

Our timing for this effort will align with HEP's preparation of a new Action Agenda in 2025. As our Action Agenda represents consensus of all HEP's partners towards a path to accomplishing restoration goals, it will help set priorities for the HEP collaborative, including how best to access federal, state and private funding that will always be a key factor in determining what progress the RWG can make. Perhaps most importantly, HEP aims to better engage communities to ensure more valuable and sustainable projects.

Cover Photo: Courtesy of Hudson River Park

Coastal and Maritime Forests



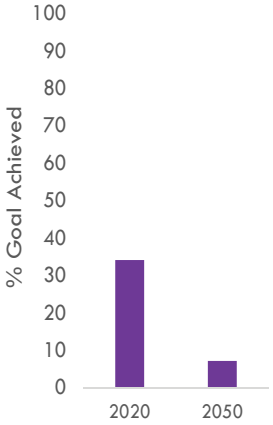
2020 Goal: establish one new maritime forest of at least 50 acres and restore at least 200 additional acres among several coastal forest/upland habitat types.
2050 Goal: 500 acres of maritime forest community among at least three sites and 500 additional acres of restored coastal forest/upland habitat.

The region's progress toward restoring Coastal and Maritime Forests is one of our most successful efforts. All of the progress over the last three years has been due to the NYC Department of Parks who have restored seven forests totaling 37 acres. Reasons for success in this TEC include fewer regulatory constraints in upland areas, the ability for agencies like NYC Parks to use in-house staff to do the restoration, and often dealing with only one landowner. The 2050 goal has two parts: 1. restored coastal forest and upland habitat, and 2. maritime forest in particular. Only the maritime forest requirement is not yet satisfied and given the current pace of restoration, this goal is well within reach.

One of the most significant restorations of the past three years was the 10 acres of maritime forest restored at Marine Park, Brooklyn, NY. This included planting of 700 shrubs, 3,300 small container trees, 500 large container trees, 25 large caliper trees, and 3 acres of herbaceous seeding. The project also included maintenance on the large restored adjacent maritime forest, removing invasive woody plants encroaching in this important coastal habitat.

Photo: Marine Park, NYC Parks Department

Wetlands



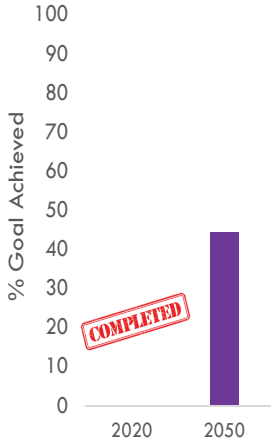
2020 Goal: create/restore a total of 1,000 acres of freshwater and coastal wetlands.
2050 Goal: continue creating an average of 125 acres per year for a total system gain of 5,000 acres.

Little on-the-ground progress was made in 2020-2022 towards the Wetland TEC. Most construction was stopped in early 2020 due to Covid and many partner organizations are still catching up on restoration projects that were delayed in all stages from design through construction. Wetland restoration progress is slow and though projects continue to be implemented, they are not occurring at the rate that the TEC goals aspire to. Reasons for this include: highly complex projects that often involve contaminated and even hazardous land fill; long design timeframes due to permitting and approval processes, high construction costs and escalation costs due to long design and procurement timeframes; limited space availability for land owners to conduct restoration on their own property; and lost opportunities, conflicting interests, and complex ownership issues preventing restoration on private or unprotected land.

NYC Parks restored one degraded wetland over the last three years, Seagirt Wetlands in eastern Queens bordering Nassau County. Debris was removed and native high-marsh and scrub shrub species were planted to enhance habitat value. NYC parks also completed several more projects during this time frame that were mitigation for intertidal or sub-tidal shallow water filling for infrastructure and transportation projects. Additionally, several more wetland restoration projects made critical steps in their design phases, the largest of which include Liberty State Park in Jersey City and Spring Creek in Brooklyn and Queens.

Photo: Before and after wetland restoration at Seagirt, NYC Parks Department

Habitat for Waterbirds

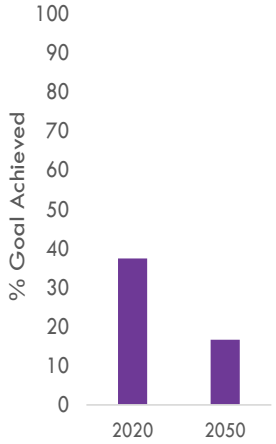


2020 Goal: enhance at least one island without an existing waterbird population in Hudson Raritan Estuary regions containing islands and create or enhance at least one foraging habitat.
2050 Goal: all suitable islands provide roosting and nesting sites and have nearby foraging habitat.

No new island breeding habitats were restored over the last three years for long-legged wading birds such as great egret, glossy ibis, green heron, and black-crowned night-heron (collectively referred to as Harbor Herons). However, the recently restored freshwater West Pond in Queens is a key foraging spot for these species. Harbor Herons are still found on eight of the 16 islands in the Harbor Estuary used by waterbirds since the 1980s. More research is needed to determine what makes desirable breeding habitat in the Harbor for these species.

One important island restoration measure being explored is predatory mammal removal. Wading birds are known to abandon island rookeries in response to the arrival of mesopredators such as raccoons. In the Harbor, we have preliminary evidence that the arrival of raccoons on a rookery island rapidly leads to rookery abandonment. Active and continued removal of raccoons from harbor islands is being explored and may help to restore at least four island rookeries in Jamaica Bay.

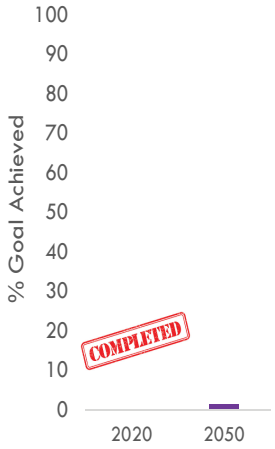
Enclosed and Confined Waters



2020 Goal: improve the water quality of eight enclosed waterways.
2050 Goal: improve the water quality of all enclosed waterways.

No new progress has been made to the Enclosed and Confined Waterways TEC over the last three years. However, slow progress is to be expected as significant improvements in water bodies often require large waste or stormwater infrastructure remediations. Examples include construction of CSO holding tanks, separation of storm and sanitary sewers, increasing flushing or removing barriers to tidal flow, or a concerted green infrastructure effort in the sewershed. With the adoption of Long-Term Control Plan's in New York and New Jersey, and the availability of federal and state funding from the Bipartisan Infrastructure Law and other sources, we can anticipate greater progress in the future. In particular, the NYCDEP is engaged in planning of such improvements for the confined waterbodies of Flushing Creek in Queens and Gowanus Canal in Brooklyn.

Oyster Reefs



2020 Goal: 20 acres of reef habitat across several sites.
2050 Goal: 2,000 acres of established oyster reef habitat.

In terms of acres restored, more progress has been made on the Oyster TEC since 2019 than in all the previous decade combined. There are several reasons for this: 1. Restoration techniques including the use of shell gabions and reef balls, have been refined, and capacity to restore has been building, thanks in large part to expanded partnerships and the growth of the non-profit Billion Oyster Project; 2. Our region has recently seen an influx of funding from New York and New Jersey to support oyster restoration for habitat and water quality benefits. Existing restoration projects at the Tappan Zee in Westchester, Soundview in the Bronx, and US Naval Station Earle on the Raritan Bayshore, have continued and expanded due to consistent stewardship efforts and collaborative partnerships. Additionally, the Hudson River Park Trust has created several new subtidal projects involving oysters, notably the Tribeca Enhancement Project, a three-acre restoration of shell-filled gabions, reef balls and 11 million larval oysters.

While we have satisfied the 2020 goal, meeting the 2050 TEC goal assumes exponential growth in our ability to restore oysters. The lofty goal was established considering both habitat suitability modeling and that 2000 acres is only fraction the area historically covered by oyster reefs in our estuary. Reaching the 2050 goal will require continued development of partnerships to refine restoration techniques and implement much larger restoration projects as well as the accompanying financial commitments

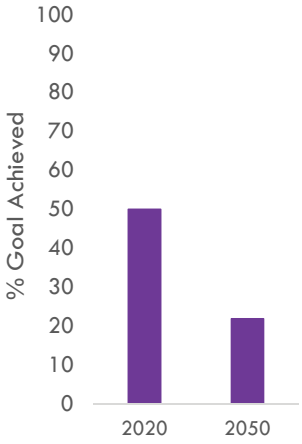
Photo: courtesy of Hudson River Park

Habitat for Fish, Crab and Lobsters

2020 Goal: create a set of two functionally-related habitats in each region.
2050 Goal: complete four sets of at least two related habitats in each HRE region.

The purpose of this TEC is to drive restoration projects that enhance habitat by improving multiple ecosystems in a single project location. Progress has been made on this TEC in the past three years, however, the projects were located in HRE regions that already had previous projects. Therefore, our progress on the 2020 goal remained the same while our 2050 goal improved from the last progress report. In order to reach our goals, projects will need to be implemented in the regions that do not yet have projects of this type: the Upper Bay, Jamaica Bay, Arthur Kill/Kill van Kull, and Lower Raritan River.

One recent creative restoration and education project in the Hudson River Estuarine Sanctuary is the Pier 26 Tide Deck. This demonstration-sized project combines, salt marsh plantings, rocky intertidal pools, and subtidal oyster restorations.



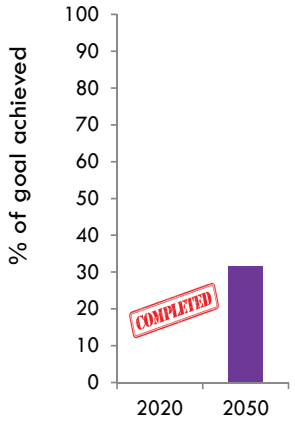
Beneficial Use of Dredge Material

HEP's Restoration Work Group has discussed the opportunities to beneficial use dredged materials for ecological restoration. Often, sediments are dredged from the Harbor to clear channels for boats and port operations. These sediments are usually placed offshore in the NY Bight, but suitable and clean dredged material can be used in habitat restoration projects. For example, from 2006 to 2012, the USACE and partners restored five Jamaica Bay marsh islands with dredged sand. The USACE and Port Athority have studied the feasibility of deepening the channels further in order to allow larger ships to access the port in Newark Bay. Our workgroup believes such a project could create opportunities for productive use of the resulting clean rock and sand to accomplish CRP goals. The Wetlands TEC could benefit from the placing or spraying of clean sand in thin-layer placement projects, to raise elevations in order to protect against sea-level rise. Additionally, larger rock pieces could be used to create shallow subtidal reefs to replace some soft organic sediments that have settled in our shallow waters. Such restoration projects could create habitat for fish and other aquatic life.

Photo: courtesy of Hudson River Park

Tributary Connections

2020 Goal: restore connectivity or habitat within one tributary reach per year.
2050 Goal: continue rate of restoring and reconnecting areas.



No new tributary connections projects have been completed in the past three years. In addition to the global pandemic, probable causes for this include the physical complexity of barrier removals require a slow design and permitting phase, lack of funding, and frequent issues with dam ownership. However, several are in planning stages, including dam removals and fish ladders in the upper Raritan Estuary that are being undertaken with natural resources damages funding, and two dams on the Bronx River in the design phase with NYC Parks and USACE. Our region's effective partnerships and concerted efforts towards this TEC are paying off and despite the recent lack of progress, the 2050 goal is reasonable.

Opportunities and Challenges from the Bipartisan Infrastructure Law

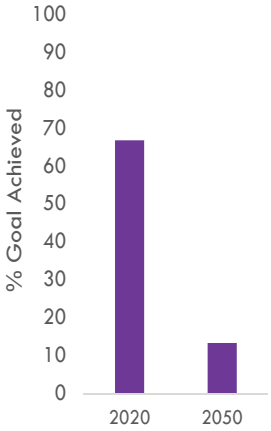
The Bipartisan Infrastructure Law and other recent legislation have provided unprecedented opportunities for funding to advance many of our TECs, notably Tributary Connections. Our dense, urban environment has been highly developed over centuries, with some of the oldest, aging infrastructure in the country. For example, there are thousands of culverts in the estuary watershed, many of which are blocking critical habitat pathways for fish, while also causing erosion and flooding problems for property owners, local government, and transportation agencies. Such concerns could be addressed by BIL funding including existing grants from NOAA, USFWS, EPA, FEMA, and DOT.

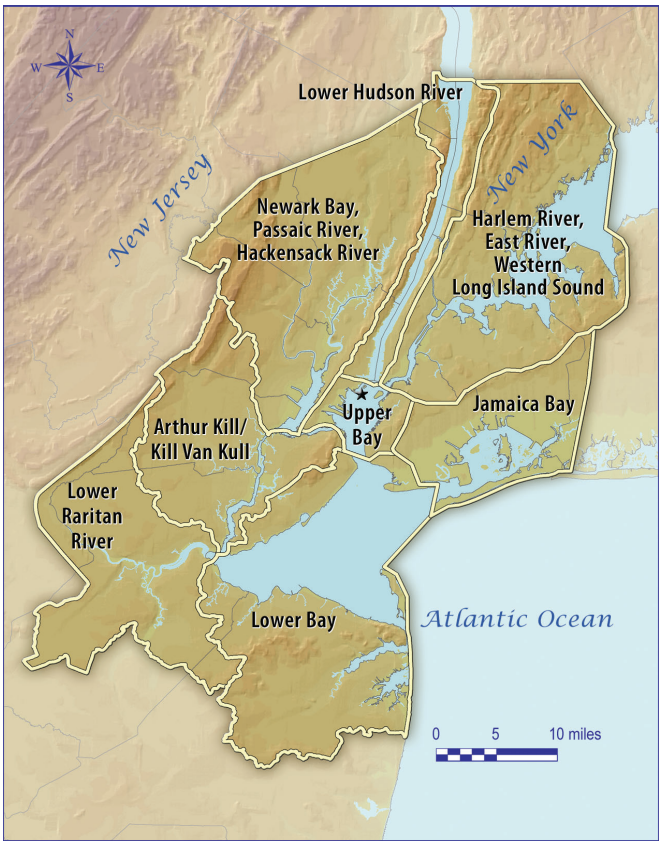
However, the delivery of these benefits to the HRE is challenged by traditional grant formulas that have made it historically difficult for projects in our region to receive federal funding since the project costs are often high and the typical metrics that agencies are looking for, such as miles of stream or acres of habitat restored, are difficult to attain given our highly developed environment. This has the unintended result of restricting funding in densely populated areas like New York and New Jersey. Most importantly, these formulas lead to inequities in environmental funding distribution away from underserved and disadvantaged communities. To help ensure that these national efforts met the need of our urban estuary, the Tributaries Connectivity Subcommittee shared these concerns to relevant agencies as well as a federal interagency task force convened by USFWS to help coordinate fish passage issues.

Eelgrass Beds

2020 Goal: create one bed in at least three HRE regions.
2050 Goal: three established beds in each suitable HRE region.

Though eelgrass is largely extirpated in the Harbor Estuary, it has been set as a target ecosystem in the CRP with a reasonable goal: create pilot projects. For the first time since the adoption of the CRP in 2009, we have made some progress with the Eelgrass Beds TEC. A pilot eelgrass planting has been installed and monitored in Sunset Park, Brooklyn, New York. The project is tiny; managed by volunteers and unfunded, yet for every year of monitoring eelgrass remains, growing doggedly, through often zero-visibility waters. The leader of this effort, Bart Chezar, has also reintroduced Sargassum, another native but extirpated submerged aquatic vegetation species. We need eelgrass pilot projects in two additional Hudson Raritan Estuary regions to satisfy our 2020 goal.





MAP: The Eight Planning Regions of the Hudson Raritan Estuary

Shorelines and Shallows

2020 Goal: develop new shorelines sites in two HRE regions.
2050 Goal: restore available shoreline habitat in three HRE regions

Three new shoreline projects have been created in the past three years and the 2020 TEC goal is now satisfied as projects have been implemented in two different regions. The project that helped us reach the goal is the West Pond Living Shoreline located in Jamaica Bay. A living shoreline was created from bags of recycled shell, coir logs, recycled trees, and other shoreline enhancements. An additional living shoreline was created at Sherman Creek in the Bronx that included shoreline oyster castles and fringe wetland plantings. The locations and baseline metric of "available shoreline habitat" for the 2050 Shorelines and Shallows goal has not been calculated but achieving this goal will be ambitious.

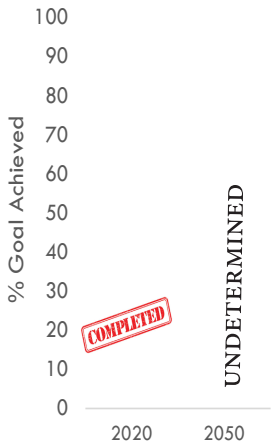
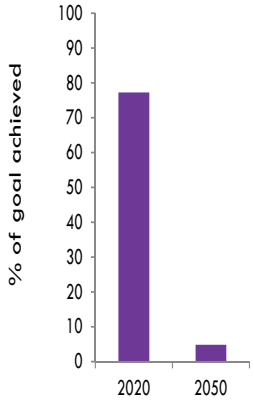


Photo: Sherman Creek, Ben Hider

Sediment Contamination

2020 Goal: isolate or remove at least 25 acres of contaminated sediment.
2050 Goal: isolate or remove at least 25 acres of contaminated sediment every two years.

The dredging and removal of contaminated sediment has progressed in earnest over the past three years from the federal Superfund site in the Gowanus Canal, Brooklyn. Over 35,000 cubic yards of sediment were removed in the completed first phase (of three) for this project. We have still not satisfied the CRP's 2020 goal, but the remainder of the Gowanus project should do so. Many other federal superfund sites in our region are also progressing towards their cleanup stage including Berry's Creek and the Lower Passaic River in New Jersey, and Newtown Creek in Queens.

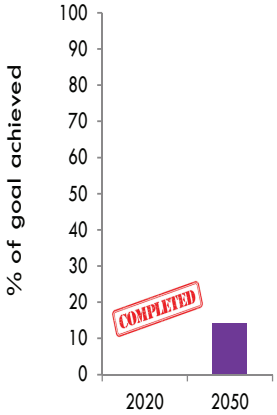


Acquisition

2020 Goal: acquire 1000 acres of habitat for protection.
2050 Goal: continue to acquire at a rate of 200 acres per year (6,000 acres) for a total of 7,000 acres.

All of the acquisition progress over the past three years in our region has been due to the continuing buyouts of flood-prone or damaged properties through the NJDEP Blue Acres program. This program increases the resilience of the towns in coastal NJ by allowing homeowners to move to safer neighborhoods, and at the same time adds to the much-depleted coastal habitat needed by wildlife. Blue Acres are poised to become an even more effective tool in the coming years as they are now looking proactively for opportunities to buyout homes that are threatened with rising sea level and increased precipitation.

While home buyouts are helpful, we cannot rely on those alone to reach our 2050 goal as most properties in our urban watersheds are not large in size. Acquisition will increasingly become important to protect wetland migration pathways as well as rare habitats to maintain biodiversity and endangered species. While the Port Authority's existing Hudson Raritan Program remains unfunded, new acquisition funding may become available through New York State's Environmental Bond Act.



Public Access

2020 Goal: create one access and upgrade one existing access per year.
2050 Goal: all waters of the HRE are accessible.

Public Access projects continued to advance despite the pandemic. The 2020 goal was well satisfied, but the 2050 goal is broadly ambitious and we have a long way to go before all the shoreline is accessible. The newly created waterfront spaces of the past three years increased the accessible waterfront by nearly 5 linear miles. This accomplishment is led by the creation of public access at three new piers on the west side of Manhattan, the new Shirley Chisolm State Park on Jamaica Bay in Queens, and a few other small new access points around the estuary. Shirley Chisolm is a new 400-acre park situated on top of historic landfills, providing both ecological habitat as well as waterfront views and trails for public use.

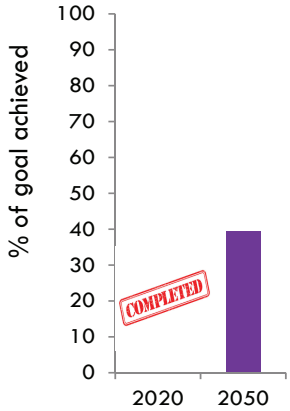


PHOTO: Shirley Chisolm State Park, Camile Winter

Hudson Raritan Estuary Ecosystem Restoration Project

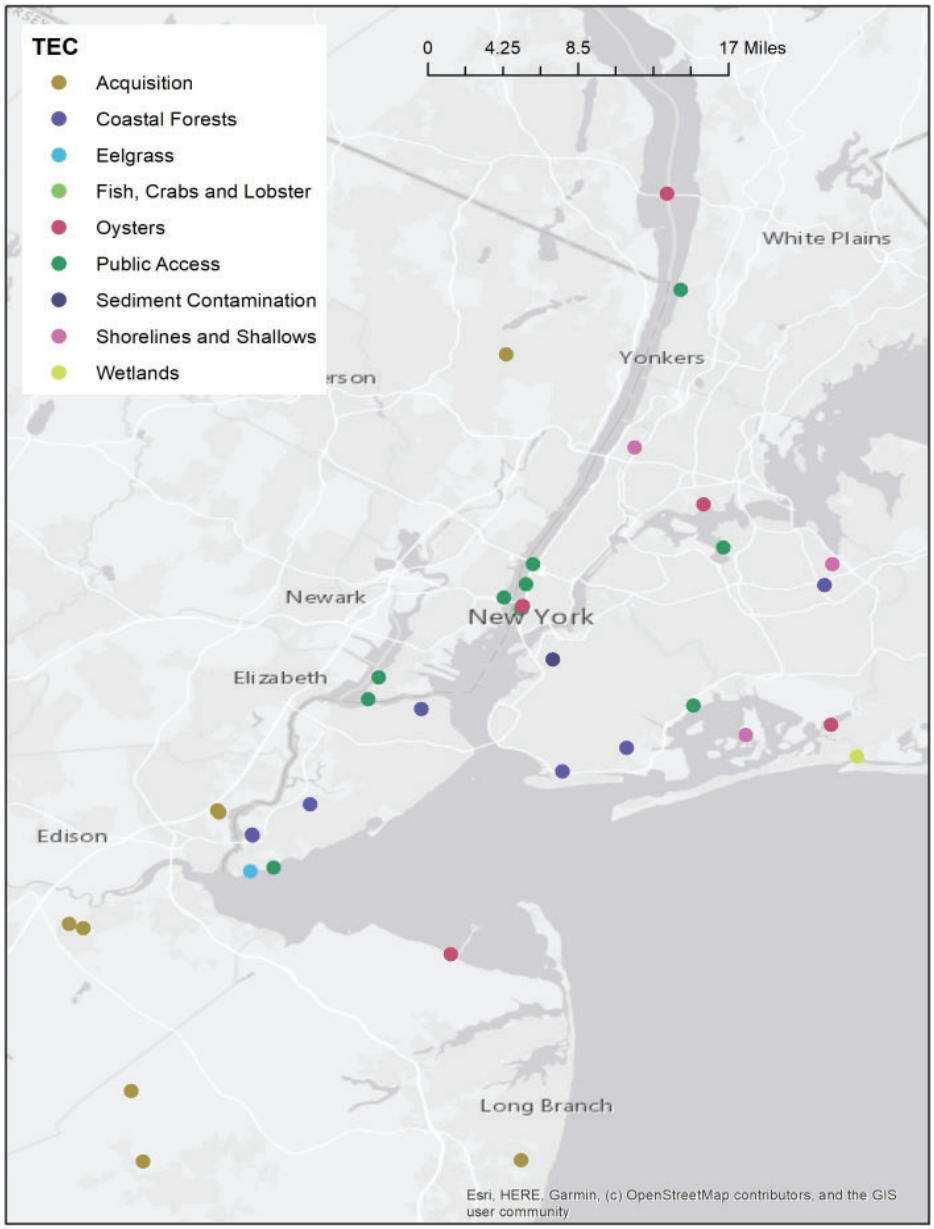
The New York District of the USACE, and numerous study sponsors, completed the HRE Final Integrated Feasibility Report and Environmental Assessment in April 2020. The Chief's Report was signed in May 2020 and recommended 20 individual ecosystem restoration projects throughout the NY/NJ Harbor. These projects were authorized for construction in December 2020 in the Water Resource Development Act (WRDA) for a total of $421,435,000, with a fully funded cost estimate of $624,772,000 (FY2022 price levels). The Recommended Plan includes restoration at these 20 project locations that will restore a mosaic of 621 acres of nationally significant habitat that will reduce long-term and large-scale degradation in the Hudson Raritan Estuary.

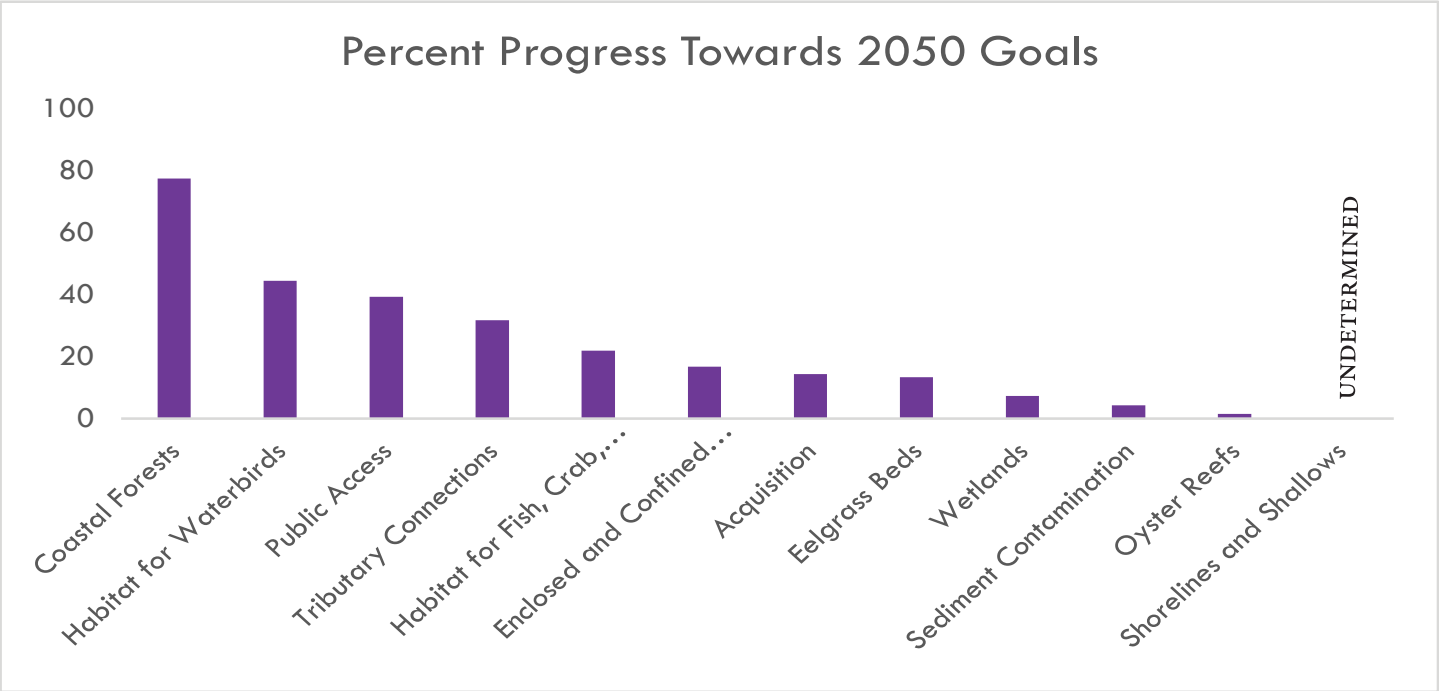
The plan includes:

- Restoration of approximately 381 acres of estuarine wetland habitat (including six miles of tidal channels), 50 acres of freshwater riverine wetland habitat, 27 acres of coastal and maritime forest habitat, 39 acres of shallow water habitat, and 52 acres of oyster habitat;
- Two fishways would be installed and three weirs would be modified to re-introduce or expand fish passage and control flow rate and water volume along the Bronx River;
- A total of 1.6 miles of stream bank and 72 acres of stream bed and channel would be restored; and
- Future spin-off feasibility studies could be carried out under the existing HRE authority.

The 2022 Consolidated Appropriations Act and the Bipartisan Infrastructure Law (BIL) provided funding along with non-federal sponsors for the first 5 sites (4 projects) including: Stony Creek Marsh Island (NYCDEP), Flushing Creek (NYCDEP), Oysters at Naval Weapons Station Earle (NJDEP and NY/NJ Baykeeper), and Bronx Zoo & Dam/Stone Mill Dam (NYC Parks) to initiate the Pre-Construction Engineering and Design phase. In addition, BIL funds were provided to complete the construction of Stony Creek Marsh Island planned for 2025, restoring approximately 62 acres of marsh island habitat within Jamaica Bay. These four projects will provide more than 100 acres of mosaic of habitat advancing the majority of the targets discussed above. Congressional adds are also planned in 2023 to provide funding to initiate the design phase of Fresh Creek restoration in Jamaica Bay. The commitment demonstrated from this Administration, Congressional Representatives and our partners is a promising sign for the future in our efforts to support the HRE CRP's regional goal to "restore a mosaic of habitats that provides society with renewed and increased benefits from the estuary environment."

Map of all Completed Projects 2020-2022





This report is a product of the Restoration Work Group of the NY-NJ Harbor & Estuary Program. Membership includes:

Billion Oyster Project
HEP Science and Technical Advisory Committee
Hudson River Foundation
National Oceanic and Atmospheric Administration
Nature Conservancy
New Jersey Audubon
New Jersey Department of Environmental Protection
New Jersey Sports and Exhibition Authority
New York City Audubon
New York City Department of Environmental Protection
New York City Parks Department
New York-New Jersey Baykeeper
New York State Department of Environmental Conservation
Trust for Public Land
US Army Corps of Engineers
US Environmental Protection Agency
US Fish and Wildlife Service

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