

Wetlands Mitigation Banking in NYC: Challenges and Opportunities

Natural Areas
Conservancy



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The Natural Areas Conservancy champions urban natural areas in New York City and across the nation through innovative research, partnerships, and advocacy. We increase the health and resilience of urban forests and wetlands, catalyze connections between people and nature, and strengthen the environmental workforce.

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Table of Contents

04 **Executive Summary**

Constraints & Solutions

06 **Introduction**

Overview of Wetlands
Mitigation in New York City

11 **Mitigation Process
Challenges and Barriers**

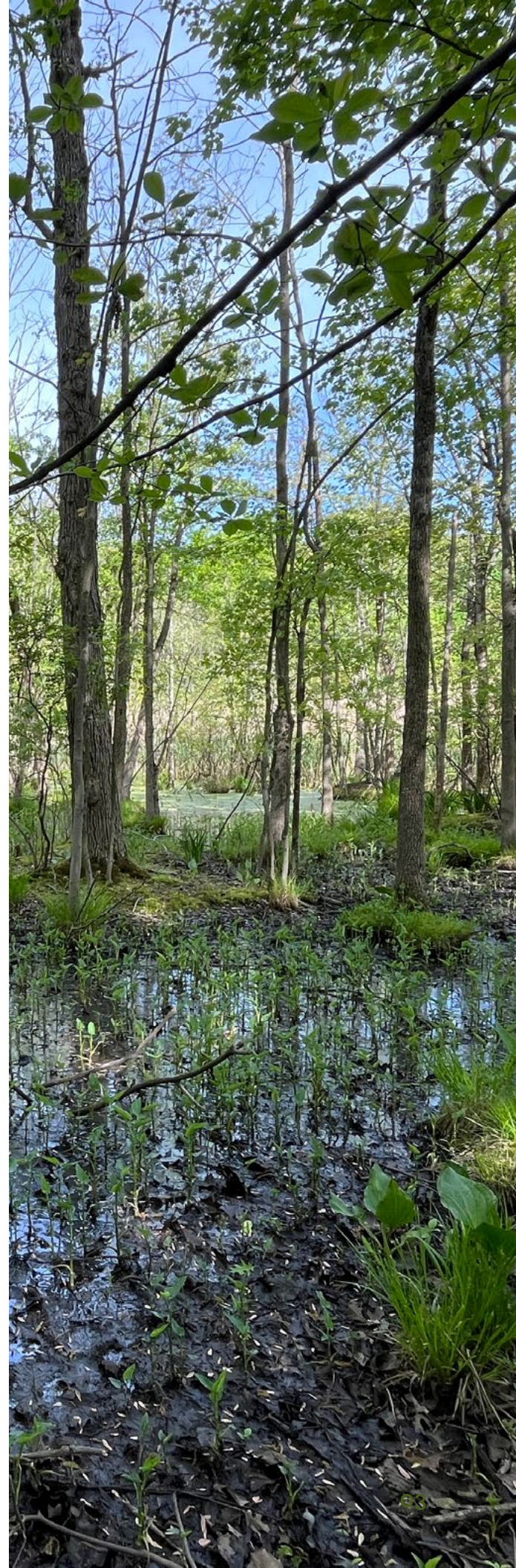
Lack of Physical Space
Funding and Resource
Constraints
Staffing Constraints

17 **Opportunities to
Improve New York City's
Approach to Mitigation**

Ensuring Interagency
Efficiency
Exploring Multiple Bank
Instrument Structures
Rethinking Mitigation Credits
Leveraging the Political
Process

23 **Conclusion**

24 **Glossary**



Executive Summary

In New York City, tidal wetlands are a critical part of coastal resiliency and provide numerous ecological and social benefits. State and federal wetlands mitigation regulations require that development resulting in wetland impacts offset those losses through wetland creation, restoration, and enhancement – with a goal of no-net wetland loss.

To date, wetlands mitigation has occurred in New York City predominantly on an ad-hoc basis. While the results have been largely successful, we recommend investing in a more proactive approach due to the finite locations for future mitigation. New York City has limited physical space for wetlands mitigation, while the need for mitigation has only grown due to the increased number and scale of renewable energy development, coastal development, and resiliency projects. In addition to dwindling physical space, mitigation outcomes can be negatively impacted by high costs, insufficient staffing, and a complex policy landscape. As a result of these challenges, and the compounding effects of climate

change, New York City is at risk of not meeting federal, state, and local no-net loss goals for coastal wetlands.

During the development of this report, Natural Areas Conservancy (NAC) staff interviewed over a dozen practitioners whose work intersects with the wetlands mitigation process, including professionals in the private, nonprofit, and public sectors. These individuals are key players in advancing mitigation in New York City. Their roles range from mitigation bank managers, regulators, restoration practitioners, and project managers for infrastructure projects. This report distills and synthesizes the feedback we received during the stakeholder interview process, and breaks down the challenges and barriers to the existing mitigation process, while highlighting recommendations for improvements that would help New York City better protect its wetland ecosystems.

Some of the challenges and barriers identified are outlined in the next page.

Mariner's
Marsh Park,
Staten
Island



Constraints



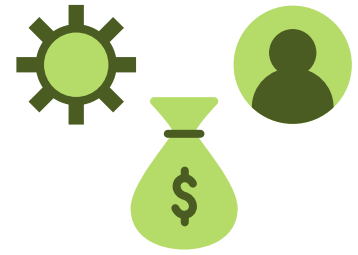
Physical Constraints:

- A lack of space in NYC to mitigate
- The need to remediate for prior contamination



Regulatory and Policy Constraints:

- Interagency coordination challenges
- Problems with the reliance on institutional knowledge and staff turnover
- Regulatory constraints that don't suit NYC's urban environment
- Larger challenges with citywide resiliency planning and lack of a holistic vision for NYC's wetlands and watersheds



Resource Constraints:

- Underestimating the true cost of mitigation projects
- Agency staffing and resource limitations

Solutions



- Ensuring interagency efficiency
- Recognizing NYC as a distinct regulatory region
- Approving a new mitigation banking instrument structure
- Rethinking what creditable mitigation actions are for NYC
- Using updated climate forecasting and wetlands mapping to inform policy
- Envisioning more holistic waterfront planning and wetlands mitigation, with regulations to match
- Increase political pressure to draw attention to this issue

Introduction

There are 6,200 acres of wetlands in New York City, 3,500 acres of which include tidal wetlands that provide innumerable social and ecological benefits: they help protect the city against storms and flooding, clean our water, lower summer temperatures, and provide critical carbon storage. Wetlands also support diverse and endangered wildlife and provide New Yorkers with unique experiences in nature, which can reduce stress and improve fitness and mental health. Since the arrival of European colonists, however, New York City has lost over 90% of its historic wetlands. Despite federal protections and no-net loss policies, we are currently losing several acres of wetlands each year to sea level rise and other factors. By the 2050s, predicted sea-level rise will drown many of New York City's remaining tidal wetlands.

Superstorm Sandy both highlighted the importance of wetlands to coastal resiliency and the vulnerability to our aging infrastructure. New York City continues to increase efforts to reduce climate risks, particularly along the coastline, meaning more resiliency projects that could have unforeseen impacts. Wetlands mitigation is needed to offset these impacts to our wetlands and waterways. Currently, there is no long-term plan that identifies the anticipated need and prioritized opportunities for wetland mitigation. Historically, mitigation projects have been developed on a makeshift basis, often in an ad-hoc in-lieu-fee (ILF) model. Given current challenges, long-term planning and alignment is needed to ensure sustainable, resilient, functional wetland creation and enhancement projects.

Additionally, practitioners across various sectors have identified process barriers that make wetlands mitigation in New York City more challenging than in other regions of New York State and the country. While developing this report, NAC staff spoke with many of these stakeholders across various sectors to better understand the challenges, opportunities, and potential changes that could make the wetlands mitigation process more effective in the long-run, including the potential value of mitigation banking.

6,200

acres of wetlands
in New York City

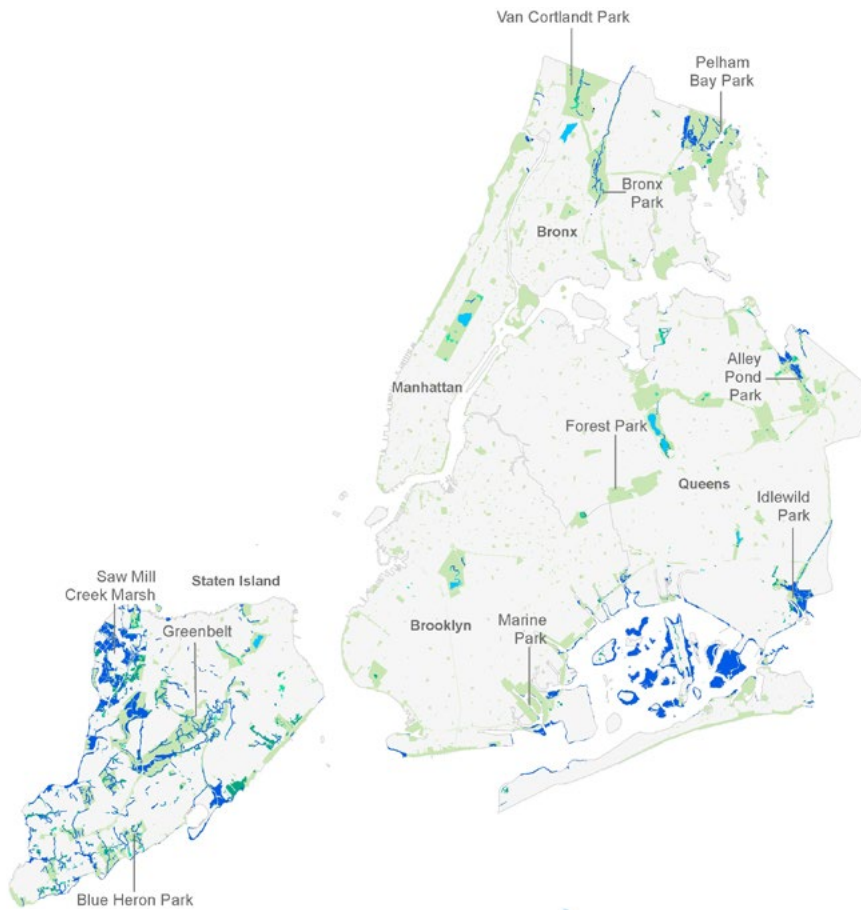
3,500

acres of tidal wetlands
in New York City

90%

Of historic wetlands
lost in NYC since the
arrival of European
colonists

NYC's Streams and Wetlands



- Streams
- Freshwater wetlands
- Lakes and ponds
- Tidal wetlands

Historical Streams and Wetlands



- Historical wetlands and streams

Overview of Wetlands Mitigation in New York City

The complex nature and historic industrial use of much of New York City's waterfront has drastically altered the shoreline and condition of historic wetlands across the five boroughs, and has also left much of the city susceptible to the impacts of climate change and extreme weather events.

New York City wetlands are in decline due to land use history, sea level rise, and regulatory and financial challenges to restoration, management and mitigation. As the city seeks to fortify its 520 miles of shoreline and embark on large-scale resiliency planning efforts, these waterfront projects will trigger wetlands mitigation requirements, and there will be an urgent need to provide space for mitigation and ecological uplift of the city's salt marshes and tidal wetlands.

The regulatory landscape for wetlands mitigation in New York City is governed by national, state and local regulations. For the purposes of this report, mitigation banking will be referred to generally, however there are various methods of mitigation, each with their own functional approaches and regulations, and all of which are solutions to the broader challenge of mitigation and preventing no-net loss of these ecosystems. In other parts of the country and New York State, wetlands mitigation is often completed via the federal government's preferred method of mitigation banking, with ILF banks as the second preferred method, followed

by onsite mitigation or restoration, and offsite as the least preferred method. In most jurisdictions, compensatory mitigation bank sites are privately managed with credits for sale that correspond to habitat area. These banks collect funds from permittees that have impacted habitat at other locations in the service area of the bank.

In New York City, mitigation has typically been satisfied through offsite mitigation due to the lack of available banks and site constraints. New York City's first mitigation bank began design in 2013 and was considered a pilot. In the absence of a bank, the New York State Department of Environmental Conservation (NYS DEC) prefers the removal of historical fill to restore or create wetlands where they existed pre-development as the main strategy to address mitigation. As the New York City Department of Parks and Recreation (NYC Parks) has restored wetlands since the 1990s through a combination of grants and city capital, mitigation has often occurred on an ad-hoc basis by increasing the size of NYC Parks' voluntary restoration projects to include mitigation. Pre-Superstorm Sandy, the scale and frequency of mitigation needs was lower, and NYC Parks could address the city's mitigation needs in the course of their ongoing work. But now, with increased mitigation needs, the competition for space on New York City's waterfront to address both resiliency and necessary mitigation is compounded.

Saw Mill
Creek,
Staten
Island

New York City is unique in that its sole mitigation bank, the Saw Mill Creek Wetland Mitigation Bank (through the Mitigation and Restoration Strategies for Habitat and Ecological Sustainability, or MARSHEs program) on Staten Island, is managed by the New York City Economic Development Corporation (NYC EDC), a public benefit corporation that serves as the economic development organization for the City of New York. The Saw Mill Mitigation Bank has had many benefits

including guaranteeing successful mitigation for many projects in New York City across a subset of wetland types, supporting long-term stewardship, and removing barriers to meeting mitigation obligations by making it easier for those who need to do mitigation to purchase credits. The bank has limitations, including only serving a portion of New York City's geography that is used primarily for private entities. There also has been a decline in credits available for purchase.



In most other regions, mitigation banks are generally privately held and managed.

The ILF model employed in regions outside of New York City involves a nonprofit or public agency collecting and pooling funds from multiple permittees in order to gather the resources needed to build and maintain the mitigation sites. This model has not yet been implemented in New York City, but efforts have been underway to explore approval for an ILF mitigation model to proceed, particularly on land owned and managed by NYC Parks.

Mariner's
Marsh Park,
Staten
Island



As outlined under Section 404 Program of the Clean Water Act, mitigation banks are wetlands, streams, or other aquatic resource sites that have been enhanced, restored, established, or, in more limited circumstances, preserved for the purpose of providing compensatory mitigation credits when existing wetland habitat is unavoidably impacted by development and fill activities.

Functionally, this has meant that many private and nonprofit landholders have offered up pre-approved space for wetlands mitigation banking, allowing for the transfer of liability and the responsibility of long-term protection of wetland mitigation sites to the bank operator. Mitigation banks generally offer a set amount of wetland habitat and acreage that has been restored prior to a project's impact, allowing permittees to purchase commensurate credits from the restored bank site that translates to the amount of impacted wetland habitat. This model also allows multiple permittees to purchase into the bank, which can be useful in regions or watersheds that have many smaller sized wetland impacts taking place due to development and infrastructure projects, such as New York City.

Mitigation Process Challenges and Barriers

Broadly speaking, mitigation is an imperfect tool for achieving the goal of no-net wetland loss. For one, the no-net loss framework assumes that wetlands are only being lost due to development and face no threats from climate change. Additionally, the unique context and history of New York City's waterfront and urban environment have yielded a number of challenges and barriers to the mitigation process. Many of the challenges identified emerged in multiple conversations with practitioners, offering a sense of the pain points in the mitigation process, and also consensus around specific areas that could be improved to benefit the state of New York City's tidal wetlands. Generally, challenges are due to barriers to interagency coordination, narrow definitions of what types of projects count as mitigation, high capital costs, and pre-existing contamination at potential mitigation sites.

The historic flooding during 2012's Superstorm Sandy spurred a new era of waterfront and resiliency planning to address the clear threat of sea level rise and increasingly powerful storms on coastal communities throughout the five boroughs. Additionally, New York City's

coastal waterfront is increasingly being identified as space for renewable energy projects to be sited.

As these large-scale resiliency and renewable energy plans move forward, it has become clear that the impacts to waterfront habitat will require more space for mitigation than New York City can currently support. One practitioner interviewed likened the process to rearranging the deck chairs on the Titanic.

While the urgency and scale of the challenge is well understood, what is now needed is the ability for city agencies to coordinate efforts and effectively plan for the scale and restoration that this moment requires. Despite the tremendous need to plan for large-scale changes to our waterfront and tidal wetlands, a number of challenges exist in the current mitigation landscape that practitioners feel are holding the city back from ensuring a successful strategy for maximizing coastal protection to New Yorkers and our fragile wetland ecosystems.

Ferry
Point Park
Greenway,
Bronx





Coastal
damage
caused by
Hurricane
Sandy

Lack of Physical Space

There is a sense that city agencies are often competing for land to be used for mitigation or for other uses, such as siting utilities or other infrastructure. Additionally, the NYS DEC has an in-the-vicinity requirement that compels mitigation to take place as close to the site of impact as possible, or in the watershed. These challenges will increase as the significant and ongoing need for wetlands mitigation for various resiliency and infrastructure projects continues. NYC Parks might be able to overcome space challenges via an ILF model on their own land portfolio. The NYC EDC has also been working to establish a citywide umbrella mitigation bank, although approval of this bank has not yet been granted by federal regulators.

Under current policies, New York State strongly prefers wetland creation through the removal of historical fill to be the primary approach for wetland mitigation – truly creating new acres of wetland. As such, certain activities such as sediment placement in existing wetlands and marshes is generally not counted as a mitigation action to regulators; however sediment placement is an increasingly necessary activity to protect existing wetlands from drowning. Various stakeholders identified a need for the regulatory agencies that approve mitigation activities to shift to a more flexible model and understanding

of which actions and approaches may ultimately yield solutions for preservation of New York City’s existing tidal wetlands and marshes (many of which are threatened by sea level rise), especially in light of the fact that there is limited space for mitigation under the current approach.

Among practitioners, there is also a concern that if it continues to be a challenge to find mitigation sites, small, undersized projects might take place instead. This approach would make it harder for the city to track and monitor success than at larger sites, and the city would continue to run the risk of losing small amounts of wetlands citywide, which is explicitly counter to the goals of no-net loss of wetlands.

Various respondents interviewed for this project identified the need for mitigation to be done at-scale in New York City, ideally with numerous bank locations distributed citywide. Ultimately, practitioners believe it is critical to continue to keep mitigation within the city, however there is concern that given the dwindling supply of available mitigation sites and the increasing demand, there is a risk of mitigation shifting to sites outside of New York City.

Randall's
Island
waterfront



Funding and Resource Constraints

Like many capital projects in New York City, the cost of mitigation is very high relative to other regions in the United States. Additionally, the process of receiving environmental permits for waterfront development involves a complex set of requirements that must be fulfilled in a certain timeframe to ensure compliance with wetland regulations. These requirements include mitigation plans, construction documents, and clear timelines for construction; however these milestones are often challenging to fulfill for many city agencies. Additionally, for many wetland sites that could otherwise be considered for mitigation projects, legacy contamination issues stemming from our city's long history of industrial waterfront use prevents these locations from being used for mitigation due to the high up-front costs of remediation, which are not included as creditable mitigation activities.

A particular challenge for many projects is the fact that the extent of wetlands impact is often not fully understood until a waterfront project's design is near final. Significant changes in project impacts can have the effect of shifting the goalposts on the mitigation required to offset development.

For example, it takes two to three years to design a wetland mitigation project, so identifying a significant mitigation need during final design and permitting can add years to the timeline for construction, as well as increased project budgets.

A barrier identified to implementing an ILF model in New York City specifically is that there is not currently upfront funding available to initiate mitigation in this way. Without a mechanism from the city to pool funding (i.e. to compel agencies to submit to a collective fund), the ability to initiate an ILF model is currently limited. Stakeholders feel that this model could be approved by NYS DEC, but that without designated funding set aside in advance of when mitigation is needed, there will be a limited ability to initiate such a process.

Compounding these challenges, there is also a requirement that projects meet compliance requirements and adaptive management for five years after the completion of a mitigation project. Federal guidance also requires the project be stewarded following mitigation to protect the investment. Staffing and resources are often insufficient for both the agency doing the monitoring, adaptive management, and long-term stewardship, as well as the regulators verifying compliance. This has added a layer of uncertainty around the success of mitigation projects.



Tidal wetland mitigation in progress at Idlewild Park, Queens

Staffing Constraints

Practitioners cited additional challenges regarding staffing constraints at all levels of the mitigation process. On the regulatory side, there is a sense that there are too few staff to review and process applications, leading to lengthy review times, high turnover, and a loss of institutional knowledge. Project managers highlighted the challenge of being able to build meaningful relationships with colleagues on the regulatory side of the process, as many key junior staff-level positions experience high levels of turnover, and longtime regulatory professionals reach retirement. Subsequently, many newer staff brought on to help with permitting and regulatory compliance often lack direct experience with restoration and mitigation and a depth of longstanding knowledge about state and federal guidelines that impact wetlands and mitigation, leading to differing interpretations of key regulations. Additionally, due to the lengthy nature of the permitting process for wetlands mitigation, when staff leave their roles mid-process,

practitioners often feel they are rebuilding relationships from scratch midway through what is already a complex process.

On the restoration side, city agencies responsible for the ongoing maintenance and monitoring of wetlands have experienced inconsistent levels of funding for the positions required to best ensure the long-term success of mitigation efforts and overall wetland ecosystem health. With the five-year window of post-project monitoring required for mitigation projects and a critical need for long-term stewardship, more consistent funding for maintenance and monitoring staff is needed than what is currently provided by the city budget. Additionally, in order to develop a functional ILF model for the city, agencies will need funding and resources to develop the feasibility and conceptual designs of mitigation sites, allowing them to be ready for implementation when mitigation is ultimately required.

Landing
Lights
section of
Idlewild
Park



Opportunities to Improve New York City's Approach To Mitigation



While there are many challenges to a more proactive approach to mitigation planning and coastal wetlands protection, we offer the following recommendations.

Ensuring Interagency Efficiency

The complex nature of coastal development and wetlands mitigation requires many agency stakeholders, whose input and approval is required to move mitigation projects forward. These agencies cover different jurisdictions and necessarily range from the federal level to the local level. As with many interagency efforts, the interplay of these decisionmakers is a crucial component of the process. But this process is often subject to the capacity and bandwidth of the agencies themselves. This can lead to misalignment and at times varying interpretations of the legislative regulatory requirements.

At the city level, mitigation needs are defined during the permitting process. The need to design and seek approval for mitigation can add two to three years to a project timeline, and result in a significant increase in project costs. Projects that will require mitigation should set aside a portion of the project budget for the mitigation itself. Starting with an assumption that a project will trigger mitigation and budgeting upfront, at least partially, would help mitigation projects start faster, and would help avoid last minute requests for funding to move the mitigation

forward. While it can be challenging to fully assess the scope of a mitigation project's budget upfront, setting aside a portion of a project's budget is viewed as a key strategy to help ensure the process moves more efficiently with regulators. Additionally, holding pre-application meetings with regulators to discuss mitigation needs earlier in the project has been suggested as an effective way to ensure the process can proceed more quickly.

One stakeholder interviewed for this project acknowledged that restoration project designers don't always strive to put themselves in the perspective of regulators whose approval is necessary for mitigation projects to move forward. One opportunity proposed was the potential for the New York City Department of Environmental Protection (NYC DEP) Bureau of Coastal Resilience (BCR) to convene stakeholders involved in the coastal wetland mitigation process as relates to coastal protection and risk reduction projects.

**NYC
Parks staff
conducting
freshwater
wetland
assessment**

At the regulatory level, clearer lines of communication across the various regulatory layers will help streamline the mitigation process and leave less room for interpretation, as complex restoration projects are submitted for approval. Many stakeholders identified limited staffing for the various regulatory agencies involved in the mitigation process as a key challenge. In New York City, the coordination with NYS DEC is one of the most crucial to move mitigation efforts forward. There is a sense that NYS DEC would be better

able to align its mission of environmental conservation and protection by receiving more funding to adequately staff their regulatory program, and to recognize the importance of maintaining and protecting existing wetlands as an important mitigation approach. Additionally, more formal guidance on tidal wetland mitigation (as there is for freshwater wetlands) for New York State would help ensure that the agency is maximizing its work to protect and restore wetlands to meet the spirit of the Clean Water Act.



Exploring Multiple Bank Instrument Structures

NYC Parks
staff in
Idlewild
Park



After the success of the Saw Mill Mitigation Bank, there is consensus that additional banks would improve the mitigation process in New York City. One current proposal for consideration is the creation and approval of New York City's first umbrella mitigation bank, which would allow credits to be created and sold across the five boroughs and may be used by city agencies.

Additional consideration should be given to establishing an at-scale mitigation framework that would involve multiple banks distributed citywide.

Because space is at a premium, and mitigation often needs to happen at a smaller scale to match the size of the impact, having a bank (or series of banks) would allow projects to be consolidated, and thus be more cost efficient and impactful from a restoration standpoint.

A more nuanced understanding of mitigation – as it pertains to New York City's extensive shoreline, waterfront development, and endangered salt marshes – would help ensure that this densely urban area is resilient to climate change, contains an expanse of vital wetland habitat, and keeps investment in wetland protection within the city. While New York City has used an ad-hoc ILF model in prior mitigation projects, a more formal ILF model might be effectively utilized by NYC Parks as an approach to benefit city projects that require mitigation. The benefits of such a program could be multi-pronged:

- NYC Parks would have the ability to access financial resources to restore wetland habitat across its portfolio.
- Public access to these spaces could be increased as a result of the restoration.
- Other city agencies would have the ability to meet mitigation requirements within the five boroughs for some resiliency projects of all scales that are taking place across the city.

Rethinking Mitigation Credits

Many practitioners agree that a more flexible approach to what can be considered as mitigation for projects is needed, as the space to remove historical fill and create wetlands is dwindling. Created wetlands take decades to achieve the ecosystem functions of existing wetlands, thus protecting existing wetlands is critical for both resiliency and helping to meet no-net loss goals. Multiple solutions have been identified as potential alternative actions for mitigation, including sediment placement, debris removal, marsh migration, and acquisition.

Sediment placement has been identified as an example of a beneficial restoration and enhancement activity that could provide ecological uplift to wetlands through

mimicking natural sediment transport processes. Debris removal is also a major concern in many of New York City's coastal wetlands. One of the legacies of the city's long history of coastal development and maritime industry is that many of our coastal habitats have also suffered from long standing neglect and illegal dumping. The removal of this maritime debris and sediment placement would benefit coastal wetland habitats, but NYS DEC has not typically considered these acceptable mitigation activities, though they have been used in specific instances, such as restoration of the Jamaica Bay Marsh Islands through sediment placement or debris removal in Great Kills.

Construction debris for removal in Idlewild Park



Coastal wetland acquisition and creating or restoring space for marsh migration have also not counted as an approved mitigation activity with NYS DEC, leaving some of the remaining coastal wetland habitats that are not currently owned by the city vulnerable to continued development. For many advocates and practitioners, accepting wetlands acquisition as a mitigation activity would help provide additional space for preservation of what are increasingly rare habitats in the five boroughs.

There is a consensus that managed retreat of coastal properties should be counted as an approved mitigation activity.

Post-Superstorm Sandy, many of the waterfront communities most impacted by storm surge flooding have reckoned with how and whether to rebuild properties that were inundated during the storm.

As the increasing threat of sea-level rise comes into clearer view, there is a need for regulators to align new approaches to mitigation with the forecasted impacts to coastal wetlands and surrounding areas from climate change and sea-level rise. Existing mapping exercises that demonstrate the anticipated changes to wetlands as a result of climate change should guide regulators' decision-making around creditable mitigation activities. Practitioners interviewed for this report articulated a fear that the regulatory approval process is lagging behind the rapid changes to ecosystems and habitat loss taking place as a result of climate change, and relayed that regulators may need to rethink their permitting strategies to reflect the urgency of the moment.

Legislators at the state and local level have proposed legislation around managed retreat, and in 2023 it was named as a priority for the city in the *PlaNYC: Getting Sustainability Done* report. While the topic is a sensitive one, there is the potential for carefully considered coastal retreat to create opportunities for coastal wetland restoration through the lens of mitigation.



Leveraging the Political Process

Nonprofit and private sector practitioners interviewed for this report acknowledged that this particular moment offers an opportunity for the political process to help draw attention to the need for a more holistic vision for New York City's waterfront and wetlands, and the regulatory and process changes that might require. The 2025 New York City mayoral election, for instance, offers an opportunity for candidates to engage with the issue of wetlands mitigation as a signature component of the city's large-scale resiliency planning and environmental policy in the next administration, and beyond. It is known that wetland mitigation will be required for the various resiliency

projects taking place citywide, which will involve new fill placed in our waterways. The mitigation process needs to take into account opportunities for natural and nature-based features to serve as mitigation, and for funding to be allocated to advance umbrella wetland banks or ILF programs that can assure that mitigation will be effective at creating and enhancing wetlands within New York City. These actions are urgently needed as we continue to lose wetlands, and offer the city's aspiring decision-makers the chance to make bold decisions that would place New York City as a global leader, at the forefront of making a more ecologically resilient city in this era of climate change.

Mariner's
Marsh Park,
Staten
Island



Conclusion

New York City is on the precipice of significant change with regards to its wetlands and its waterfronts. While there is an understanding that there will be necessary changes to the city's waterfronts in order to meet resiliency goals to best protect the coastal communities of the five boroughs, deep questions remain about the viability of coastal wetlands mitigation under the current set of approaches. While there is not one quick or easy answer to how to streamline the process, there are a number of tactical approaches and possible solutions that we encourage the city and regulatory community to pursue in service of best protecting New Yorkers and their vital wetlands. New York City is often on the vanguard of climate solutions that can help set the pace for the rest of the country, and we encourage our decision-makers and regulatory partners to pursue creative solutions that will help ensure that wetlands mitigation in New York City can continue to meet the goals of no-net loss while maximizing the ecological uplift of our coastal wetland ecosystems.

Jamaica
Bay Wildlife
Refuge,
Queens



Glossary

404 Program

A program established by Section 404 of the Clean Water Act regulating the discharge of dredge and fill material into waters of the United States that is implemented primarily by the U.S. Army Corps of Engineers (USACE), or authorized states and the Environmental Protection Agency (EPA).

Bank Site

A wetland restored, established, enhanced, or preserved that is part of a mitigation bank.

Compensatory Mitigation

Within the 404 Program, Regulation 33 CFR Part 332, this refers to the restoration, establishment (creation), enhancement, or preservation of wetlands, streams, or other aquatic resources for the purpose of offsetting unavoidable adverse impacts.

Credits

A unit of measure representing the accrual or attainment of aquatic functions or services at a compensatory mitigation site.

Degraded

Reduced in quality, for example loss of ecosystem structure, composition, or function as a result of chronic human impact.

Dredging

Digging or excavation of sediment within a channel or wetland (removal, stockpiling, or reuse of sediment typically follow).

Freshwater Wetlands

An area exhibiting standing water or saturated soil permanently or seasonally, encompassing a wide range of habitats and vegetation types, including open water, herbaceous plants, shrubs, and trees.

Filling

The placement of material (often originating from construction) into freshwater wetlands, tidal wetlands, streams, or ponds to raise the elevation and create solid land, often leading to habitat degradation or destruction.

Impact

In this report, impact refers to the adverse effects of a discharge of dredge or fill material into an aquatic resource.

In-Kind

Compensatory mitigation that provides a resource of a similar structural and functional type to the impacted resource.

In-Lieu Fee (ILF) Program

A sponsor that collects funds from multiple permittees in order to pool the financial resources necessary to build and maintain compensatory mitigation site(s). The sponsor is a public agency or non-profit organization.

Marsh Migration

The potential for salt marsh habitat to change location (both inland and to higher elevation) over time in response to large-scale processes such as sea-level rise.

Mitigation Bank

A wetland that has been restored, established, enhanced, or preserved for the purpose of offsetting unavoidable negative impacts on aquatic ecosystems as permitted by state and federal regulations. Mitigation banks generate and sell credits, and are governed by a mitigation banking instrument.

Mitigation Banking Instrument

The formal agreement between the bank owners and regulators establishing liability, performance standards, management and monitoring requirements, and the terms of bank credit approval.

Natural and Nature-Based Features (NNBF)

Landscape features that are utilized for flood management, ecosystem benefits, and risk minimization. Examples include dunes, salt marshes, oyster reefs, and beaches.

No-Net Loss

A goal for ensuring that development projects or plans that will have an ecosystem impact are counterbalanced or outweighed by measures taken to minimize, restore, and offset the impact.

Out-of-Kind

Compensatory mitigation that provides a resource of a different structural and functional type than the impacted resource.

Permittee-Responsible Mitigation (PRM)

Compensatory mitigation performed by the permittee or their contractor.

Salt Marsh

A type of vegetated tidal wetland flooded and drained by salt water brought in by the tides.

Sea-Level Rise

With a warming climate, glaciers and other large ice bodies are melting, and seawater is expanding in volume, which is causing ocean surface levels to rise. Global mean sea-levels have risen about 8-9 inches since 1880. By 2050, sea-levels in New York City are projected to rise by 11-21 inches, with upper projections as high as 30 inches.

Service Area

The geographic area in which permitted impacts can be compensated for at a given mitigation bank.

Sponsor

The entity that establishes and operates a bank or ILF program (i.e., mitigation bank or ILF program sponsor).

Stormwater

A product of rain and snow melt, which is transported over impervious surfaces such as rooftops, streets, and sidewalks. Stormwater impacts on New York City stream and freshwater wetland systems include sedimentation, poor water quality, and erosion.

Third-Party Mitigation

Compensatory mitigation performed by a mitigation bank or ILF program.

Tidal Wetlands

A variety of habitats and their adjacent areas that occur where the land meets the sea – including mudflats, salt marshes, and tidally influenced wetlands where streams or rivers drain into an estuary or bay. New York State law protects the area adjacent to these habitats, which is why many recreational beaches are categorized as tidal wetlands.

Umbrella Mitigation Bank (UMB)

A number of mitigation bank sites operated under one mitigation banking instrument that allows for additional bank sites to be added over time, and allows permittees

to purchase credits from a UMB as opposed to one single mitigation bank site.

Watershed

A watershed is the entire surrounding land area from which water may flow into a watercourse.

Wetland Enhancement

The manipulation of the characteristics (physical, biological, or chemical) of an aquatic environment to improve or heighten specific functions in the ecosystem. Enhancements improve specific ecosystem functions, but can result in a loss or degradation of other aquatic ecosystem functions. Enhancements do not increase the amount of wetlands or aquatic resources.

Wetland Establishment (Creation)

Establishment or creation of wetlands involves manipulating existing land or aquatic resources to create an aquatic environment where one was not previously present at upland sites. Establishment results in an increase in the amount of wetlands or aquatic ecosystems and their functions.

Wetland Mitigation

Mitigation involves the restoration, establishment, enhancement, or preservation of wetlands, streams, and other aquatic resources. Wetland restoration can involve either the re-establishment or rehabilitation of existing or historic wetlands, while establishment involves the creation of new wetlands or aquatic resources.

Wetland Preservation

Preservation involves taking action to remove a threat or prevent the decline and degradation of an existing wetland or aquatic environment. Preservation does not result in an increase in the amount of wetlands or aquatic resources.

Wetland Re-establishment

Re-establishment involves the manipulation of a site with the goal of restoring past natural or historic wetland or aquatic resources. Because re-establishment involves rebuilding historic aquatic resources, it results in a gain in the amount of wetlands.

Wetland Rehabilitation

Rehabilitation involves repairing existing wetland or aquatic ecosystem sites back to historic or natural functions by addressing degradation. Rehabilitation does not result in a gain in the amount of wetlands, but does result in a gain in aquatic resource functions.

Wetland Restoration

Restoration involves manipulating sites with the goal of either re-establishing or rehabilitating pre-existing or historic wetlands and aquatic resources.



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