OPPORTUNITIES TO ADVANCE WETLANDS MIGRATION PATHWAY PROTECTION

A Report to the New York-New Jersey Harbor & Estuary Program

Blair Environmental Consulting
December 2018

CONTENTS

EXECUTIVE SUMMARY

The NY-NJ Harbor & Estuary Program (HEP) commissioned an assessment of regional knowledge, activities, needs, and opportunities related to the protection of pathways for tidal wetlands to advance inland as sea level rises. These pathways are a cornerstone of tidal wetlands conservation and resilience, and necessary to maintain the ecosystem, economic, and community resilience services these wetlands provide (Tabak et al., 2016; Calvin et al., 2018).

This report summarizes findings from interviews with 22 coastal researchers, environmental conservation leaders, and public agency officials who have been involved in coastal resilience at the municipal, county, state, and federal levels in the HEP region. The interviewees broadly recognized the importance of protecting and managing low elevation adjacent lands as pathways for wetland migration, with 94% (21) of respondents indicating this issue is of high or medium importance in their arena of work, most of them (72% or 13) ranking it highly important.

Most people interviewed said more information, data, and/or tools would help them engage in wetland pathway protection. The most frequently cited need was for maps of projected wetland pathways (45%, 10 people). Nearly a third of interviewees (32% or 7) said that information and outreach materials on this topic would help them engage in pathway protection, enabling them to understand the topic better and to be able to convey information to a variety of audiences within and outside their organizations. Other needs were identified, including a list of priority projects; communication tools; technical guidance; access to pertinent research; information about policy, regulation and planning avenues; and funding for protection, restoration and maintenance of pathway lands. There was universal desire among those interviewed to learn more about pathway protection, primarily through regional workshop(s), webinars, and white papers and synopses.

These findings, along with other conversations and studies, suggest/indicate that pathway protection is an important emerging resilience and conservation opportunity in the HEP region with the potential for far-reaching benefits for the NY-NJ Estuary region's human and natural communities. The HEP program, working with its many partners, could accelerate and broaden the protection of tidal wetland migration pathways. Twelve recommendations are made to the HEP program:

1. Work with New York and New Jersey to encourage the states to set joint goals for advancing pathway protection.

2. Convene a regional workshop on wetland pathway protection.

3. Develop guidance materials and a policy brief about wetland pathway protection in the NY-NJ HEP region.

4. Explore opportunities to incorporate pathway protection into state and local emergency management planning, especially through FEMA-based Community Rating System programs at the local and county level.

5. Explore opportunities to permit pathway protection as an alternate form of mitigation.

6. Assess the state of knowledge and build consensus on best regional practices for management of existing lands and wetland pathways to promote successful migration.

7. Explore the potential to engage with communities and other stakeholders on wetland pathway protection.

8. Evaluate state of knowledge about the economics of marsh pathway protection.

9. Evaluate best ways to frame and communicate about pathway protection.

10. Make timely connections to foster inclusion of pathway protection objectives in other organizations' forth-coming plans.

11. Assess other specific policy and regulatory avenues to foster pathway protection.

12. Raise awareness of the benefits, status, and conservation needs of tidal wetlands and other coastal habitats.

INTRODUCTION

A primary goal of the New York – New Jersey Harbor & Estuary Program (HEP) is to protect and restore vital habitat, ecological function, and biodiversity that provide society with renewed and increased benefits. Among other objectives, HEP's Action Agenda 2017-2022 seeks to advance understanding and incorporation of climate change impacts in habitat management and restoration (NY-NJ HEP, 2018). A key element of this will be to foster the resilience of the region's tidal wetlands and associated coastal habitats.

Tidal wetlands are a keystone element of the ecology of the New York – New Jersey Harbor and its estuaries. These wetlands provide habitat for a rich array of species and biological communities, help regulate water quality and chemistry, and serve other important functions. In many places, the area's salt, brackish, and freshwater tidal wetlands have been overwhelmed by human activities, however thousands of acres remain. Accelerated sea level rise is a significant challenge for these tidal wetlands which must keep up through sediment accretion or move upslope and landward to remain resilient and persist in our landscape. The protection of pathways for tidal wetlands to gradually move upslope as sea level rises is a necessary component of strategies to promote coastal wetland resiliency.

The study included interviews of a cross-section of researchers, environmental conservation leaders, and pubic agency officials at the municipal, county, state, and federal levels in the HEP region about wetland migration pathway protection. Through 14 interviews with 22 people, the study explored current activities to advance pathway protection, perceptions of the issue's importance and priority, needs related to addressing the issue, suggestions for HEP, and intent to work on this topic in the future.

STUDY APPROACH

The NY-NJ HEP identified potential interviewees who were broadly representative of county, New York City (NYC), state and federal agencies and non-profit environmental organizations who had partnered with the NY-NJ HEP. HEP made initial interview requests to these individuals and invited them to include others from their organization if appropriate. Fourteen interviews were conducted with 23 people who represented two federal agencies, one state, one county, NYC, two non-profit organizations, and one university. Some of the interviewees were affiliated with or volunteered for non-profit institutes or organizations in addition to their primary jobs. Interviewees were told their responses would be anonymous. Blair Environmental Consulting set up and conducted the interviews in August 2018, compiled and summarized the results, and prepared this report. Interview questions appear in Appendix 1.

INTERVIEW FINDINGS

KNOWLEDGE OF PATHWAY PROTECTION

The interviewees were selected for their work on, interest in and knowledge of projects, programs, and issues related to natural and community resilience. Not surprisingly, 59% (13) said they "understand a good deal about the topic" and 36% (8) said they "are somewhat aware of the topic." One person first learned about pathway protection during the interview process.

Interviewees who said they "understand a good deal about the topic" ranged from those who felt they had a good working knowledge of the subject to those who were regional experts in some aspect of wetland migration pathway protection. Among the "somewhat aware" were a few who said they were just starting to think about land use to increase resiliency, while others were working on projects and programs that they considered to be somewhat overlapping and complementary to pathway protection, such as planning for flood reduction and conserving open space.

PERCEIVED IMPORTANCE OF PATHWAY PROTECTION

Nearly all the interviewees (20 people, 91%) considered the protection of pathways for wetland migration to be important. A subset of those 20 (17) were asked to rank the importance of this topic relative to their other work; 76% (13) said it was in the top third of things they work on and 24% (4) said it is in the middle third. One of the remaining two interviewees worked in an organization not yet sure of the appropriate balance between retreat and armoring/elevation. The last interviewee was not involved in work related to pathway protection.

Interviewees considered wetland migration corridor protection to be an important environmental objective for two main reasons. First, it was perceived to be an important component of any wetland protection strategy and the logical next step, given uncertainty that many wetlands will be able to increase in elevation at the projected accelerating rates of sea-level rise. Others expressed concerns about misplaced public investments associated with restoration and remedial projects ("we're making wetlands that are going to be underwater in 50 years") and barrier projects ("instead of thinking where we're going to build the wall, we should be investing in how economic redevelopment can help move people to safe ground and release vulnerable lands to parkland where we can have healthy coastal vegetation.")

PATHWAY PROTECTION ACTIVITIES AND CONSTRAINTS

Pathway Protection Activities

Interviewees had already undertaken a variety of activities related to protection of pathways for wetland advancement as sea-level rises, as summarized in Table 1 and described in more detail below.

Table 1: Pathway Protection Activities by Interviewees (# interviewees who mentioned)
Education about tidal wetlands (3)
Identification of pathways for tidal wetland advancement (3)
Tidal wetland vulnerability assessment (1)
Land acquisition of properties that will be inundated (2)
Documentation of coastal mitigation sites protected under remedial plans (1)
Management of restoration sites and uplands for wetland advancement (3)
Incentivization of wetland pathway protection in floodplains (1)
Community resilience planning and support to foster more areas for wetland advancement (1)
Science and monitoring related to marsh resilience and advancement (7)

Pathway Identification: One interviewee had been directly undertaking modeling migration of saltwater wetlands for New Jersey as part of New Jersey Adapt (http://www.njadapt.org/, an online tool which, among other things, identifies areas where salt marsh wetland migration is impeded and unimpeded. Two other interviewees were partnering on a New York State Energy

Research and Development Agency (NYSERDA) Sea Level Affecting Marsh Migration (SLAMM) study using dynamic marsh modeling to evaluate a set of management strategies in NYC and had used SLAMM to assess conditions and vulnerability of 25 wetlands in NYC.

Land Acquisition: Several interviewees had played a role in coastal land acquisition. Two had specifically prioritized lands for acquisition to protect future marsh pathways. Others, while not specifically targeting wetland migration pathways, had been involved in conservation of floodplain lands in dozens of projects, and suspected their work had overlapped significantly with marsh pathway protection.

Documenting Lands Protected Under Past Mitigation Projects: One person had been searching old records to document sites that were preserved over the last 25 years through deed restrictions associated with mitigation projects authorized by the U.S. Army Corps of Engineers (ACOE) or the U.S. Environmental Protection Agency (EPA) as part of enforcement settlements or Superfund remediations. Sites had been documented using a centroid point on a Google Maps base map, since polygons of parcel boundaries are harder to determine. Although it wasn't clear how many of these deed restrictions include lands that will be pathways, many of the projects occurred in coastal areas and could be within projected pathways. These deed restrictions could be incorporated into pathway protection planning, assuming location can be verified, and the deed restrictions are not successfully challenged in court. Unlike conservation easements, deed restrictions can be removed by local judges.

Restoration and Land Management: Two interviewees had factored protection of marsh migration pathways into the design of new habitat restoration projects, although in urban settings they noted there was usually not much space to build in room for migration. Five interviewees routinely designed wetland restoration projects to persist longer under accelerated sea-level rise by locating them a little higher in the tidal range to adjust for projected conditions. Two interviewees had the opportunity to work on restoration design and management of Blue Acres Program buyout lands, piloting vegetation management approaches so restoration areas designed to embrace rather than resist movement of wetland species with sea-level rise. A few interviewees stressed the importance of broadening the concept of wetland pathway protection to include all coastal vegetation, from intertidal mudflats to coastal scrub shrubland and maritime forest, not just high and low intertidal marsh.

Planning and Policy: One interviewee developed a county Community Rating System (CRS) user group to help communities with the process to become eligible and certified as CRS communities by the Federal Emergency Management Agency (FEMA), resulting in homeowner savings and benefits. To be eligible, communities must accrue points for flood reduction measures, including acquisitions of vulnerable lands, some of which may be wetland migration pathways. This interviewee identified the potential for linking CRS designation with wetland pathway protection.

Since Sandy, another interviewee's organization had been actively working with communities to use natural areas to support healthy and resilient communities using "nature-based solutions." Although this organization did not have a "marsh room to move" strategy, some staff did focus on ability of marshes to move inland, either on current open space or by helping people moving out of harm's way and returning those lands to nature.

One group (2 interviewees) had recently updated its protected area management plan to include an objective to identify marsh vulnerabilities and explore land acquisition needs for marsh migration.

Science and Monitoring: Several interviewees had been involved in scientific research to study and monitor questions related to marsh resilience and migration. A few were looking at accretion rates on separate projects to explore questions such as whether oyster castles in the intertidal zone affect sediment accretion, how vegetation communities will respond to sea-level rise, and whether there will be enough sediment accretion to enable wetlands to keep up with sea-level rise. One person had been working with a team to collect LiDAR (Light Detection and Ranging) to create high resolution elevation data. Two people were studying the zone where upper marsh transitioned to uplands. A few interviewees had noted evidence of marsh migration into uplands, and though they were not yet monitoring this phenomenon, they had noted variable vegetation dynamics that raised questions about best management practices, including invasive species management.

One interviewee had worked on a project that included a social science component, where a researcher had interviewed people at demonstration sites about their visual preferences for different vegetation and land management approaches.

Support of Resilience Planning with Communities: Several people were engaged in outreach and training on climate resilience, talking with communities and decision makers about what happens as sea-level rises. Some have tailored their terminology and approach to the audience, recognizing, for example, that agency resource managers often are thinking about habitat benefits, while communities may see tidal wetlands as a critical part of their resilience infrastructure and focus less on habitat values.

Constraints in Advancing Pathway Protection

Although interviewees were not asked directly what hampers their ability to advance pathway protection in the HEP area, their comments that revealed that many were grappling with important constraints. In addition, interviewees frequently commented on challenges they have had in focusing on pathway protection. These are summarized in Table 2.

Table 2: Challenges in Advancing Pathway Protection Activities Noted by Interviewees
Unfamiliarity with which lands are important as potential pathways
Challenges in connecting scientific findings to policy and practice
Limited staff and competing organizational priorities
Insufficient capital budget and/or grant sources for projects
Lack of coordination on land acquisition strategies
Lack of guidance on managing lands for coastal habitat advancement
Uncertainty about when and how successfully marshes will advance upslope
Lack of public awareness of wetland pathway protection
Uncertainty about economic benefits

NEED FOR INFORMATION OR TOOLS

Most people interviewed said it would be helpful to have more information and/or tools to help them engage in wetland pathway protection, including locations of projected pathways; a list of priority projects; information materials and communication strategies; technical guidance;

research; policy, regulation and planning avenues; and funding for protection, restoration and maintenance of pathway lands.

Locations of Projected Pathways

Access to Existing Information: The most commonly cited need (45%, 10 people) was for information about locations of future wetland advancement corridors. This information should be accessible in different formats (GIS layers, maps) to meet a range of needs and preferences of the users.

A few interviewees allowed that it has been challenging to keep track of existing data sources, SLAMM studies and all the other tools available to project inundation, flooding and risk, such as the New Jersey Flood Mapper, NOAA's Digital Coast tools, and a variety of sea-level rise and resiliency toolkits. It was daunting to remember where to find them, when to use which tool, and how to access the products and results. They saw the need for a guide to and/or training on existing tools and data for this region.

The HEP region has had major studies of wetland migration conducted along its New York City, New Jersey, and Hudson River coastlines that model land cover change from uplands to wetlands in time steps for different scenarios of projected sea-level rise. These studies were summarized in Calvin et al., 2018. All used a version of the SLAMM (Sea Level Affecting Marsh Migration) model developed by Warren-Pinnacle which factors in elevation, slope, tide range, accretion rates, and erosion rates. These studies varied in resolution (some were at a coarser scale than others) and how far into the future the model was run (2050 or 2100), and they have been evolving as new model features and better land cover, accretion, and erosion data become available.

Some interviewees stated they have proficiency with GIS (or access to staff who do) and prefer GIS layers that can be manipulated and exported as files that work in different environments, such as Google Earth. Others did not have GIS capability and preferred maps in a pdf or similar format, recognizing that the generation of these maps will require decisions be made about which sea-level rise and marsh sediment accretion scenarios to use, which may vary depending on the intended user and audience's needs and preferences. One interviewee stated that the horizon for local master plans is usually 20 years, so information about what 20 years from now is likely to look like would be most useful. Others saw opportunity and real value in having widespread topographic mapping coupled with sea-level rise forecasting and current land use that would allow them to target land preservation for future wetlands.

Need for Continued Improvement in Models and Data: A few of the interviewees were involved in mapping and modeling, and they saw a need to improve mapping after taking a first cut at modeling; to do so they were trying to get better marsh sediment accretion rates. A few interviewees had compared the SLAMM model to other models, such as the Marsh Equilibrium Model, SLOSH (Sea, Lake and Overland Surges from Hurricanes) and other models; they saw the need for continued exploration to improve confidence in model results. These models also rely on a SET (Surface Elevation Table) network to get accurate long-term marsh sediment accretion rates and several interviewees mentioned the need to expand the geographic coverage of these networks to increase accuracy of local and regional projections, which may, in turn affect conservation priorities. One interviewee did not believe the SLAMM data are sufficiently localized. Others felt there is sufficient information to act.

Priority Projects List

A few interviewees recommended developing a map and list of priority projects for wetland pathway protection; these would include both high priority acquisitions and low-hanging fruit - areas that are in public ownership, in need of restoration, and/or good for public use.

Information Materials and Communication Strategies

Informational materials: Many of the interviewees (32% or 7) expressed a need for informational materials specific to this issue in the HEP area, and suggested fact sheets, white papers, slide presentations, and other formats geared to different audiences. Some envisioned using these to improve their own working knowledge, so they can be better prepared to discuss this issue with other agencies, partners and coastal stakeholders, and in one case, to help generate funding to address some of gaps. Others sought informational materials they could share with colleagues and distill into messages for senior staff and elected officials. Several wanted information materials intended for use in outreach to community leaders and organizations, land trusts and property owners. Three interviewees expressed interest having these include regionally-specific information about the general benefits of pathway protection to make the case to protect these areas, including why these areas are and will be important. One person had a specific interest in economic development arguments factoring in future conditions.

One interviewee noted that people are very visual and suggested there's a need to develop the means to connect with people visually. He recommended using the internet and social media to reach young people and others with different video lengths, for instance one minute for social media and 10-15 minutes for YouTube.

Demonstration Sites and Signage: One interviewee stated that visually appealing shoreline and wetland restoration demonstration projects, some of which are scattered throughout national and city parks in the area, are important to show people different vegetation zones, illustrate different treatments, and foster interaction with restoration sites. A key part of this was perceived to be the attractive, illustrative signs placed at the sites.

Technical Guidance

How to Restore and Maintain Pathways: A few interviewees emphasized the critical need for guidance on the management of lands after they've been bought out using FEMA other funds. These lands are being managed by municipalities, counties, or states. FEMA funding is only available for removal of buildings and there is a dearth of guidance about what to do with the lands post-acquisition. They sought guidance on restoration, stabilization, and proactive management to buffer nearby lands from storms, hold storm surge, and flood waters, and develop productive habitat.

Technical Guidance and Model Ordinances: One person recommended technical guidance for regulators where regulators have the teeth to protect wetland migration corridors. At the local level, model ordinances related to coastal habitats and pathway protection would be helpful. Some county regulators have authority while for others there is a question of the rational nexus of using county authority for this purpose.

Guidance for Municipalities for Informing Prospective Buyers of Foreclosed Properties: One person suggested that municipalities need guidance on how to inform people who are considering purchases from banks of foreclosed properties due to storm damage and commented that there may need to be changes to state law to increase transparency and full disclosure, although this may beyond the scope of the HEP program to pursue.

Research

Communications Science: Two interviewees recommended that pathway protection efforts would benefit from more social science around communications and the framing of these topics in conversations with local communities. What's needed is a better understanding of how to talk about this issue in a way that will successfully engage decision-makers in considering this issue.

Economics of Marsh Migration: A few interviewees stated the need for regionally relevant information about the economic tradeoffs of protecting marsh migration corridors versus other risk reduction and resilience strategies.

Sediment Accretion Rates in Tidal Wetlands: Interviewees recognized the need to increase the number of locations in the network of sites where local sediment accretion rates can be monitored long-term. NOAA-approved surface elevation table protocols are used to understand within-marsh, regional between-marsh, and inter-annual variations; this information has the potential to affect wetland resilience and migration conservation priorities in a significant way.

Patterns of Marsh Migration: Interviewees noted important knowledge gaps about how and when marshes will migrate, and which restoration and management approaches are more successful and beneficial. There are conflicting research results to date about how marshes will migrate inland – as native communities or ones dominated by the invasive tall reed *Phragmites australis*.

Policy, Regulation and Planning Approaches

Some interviewees expressed the need to explore approaches for promoting conservation of pathways for wetlands in the policy, regulatory, and planning realms. They wondered what incentives might exist for private landowners to promote conservation of pathways; whether there are opportunities to use existing rules and regulations to effect pathway protection, for instance through Section 401 of Clean Water Act and state coastal management programs; what policies might be applied or created to foster protection; and what planning vehicles might be used to broaden and institutionalize pathway protection, such as county master plans, Coastal Zone Program local waterfront revitalization programs, or organizational strategic plans. One commented that restoring spaces for wetland function should be included in county hazard mitigation plans and will then be eligible for FEMA funding.

One interviewee suggested HEP provide a forum for discussion of the potential for development of a system of programmatic permitting. These would apply to situations where several projects are permitted together instead of being issued individual wetland permits, enabling the implementing agencies to proceed with long-term projects with assurance that all components are permitted or permittable.

Funding for Protection, Restoration and Maintenance of Acquired Lands

Several interviewees identified the need for funding for many aspects of marsh pathway protection, including land acquisition, restoration and management of vacated uplands, science to answer key questions, and funding to local organizations to help advance protection through education, outreach, conservation, and stewardship.

INTEREST IN LEARNING MORE

There was universal desire among those interviewed to learn more about pathway protection, and they expressed a range of preferences for content, duration, learning mode, and training format. Three formats for learning came up most frequently: regional workshop(s), webinars, and white papers and synopses.

Regional Workshop

Most interviewees were interested in attending a regional workshop on the state of knowledge about pathway protection in the region, including who's doing what, what's working and what's not, what funding sources have been used, and how communities are reacting to pathway protection efforts. Such a workshop would be an opportunity to build foundations for further collaboration across a range of management and science perspectives, including emergency managers. One interviewee commented on the importance of sharing information about what others are trying, as well as learning about both success and failures. She considered it especially important to think and learn about socio-economic factors. Another would also like to know more about public's perception about marsh movement into uplands and the economic impacts of retreat.

People expressed interest in a one-, two- or three-day workshop. Several commented on what they liked about the format of recent regional conferences, including interactions with people from other states and water-bodies; cross-pollination between scientists, managers, planners, regulators, emergency managers, and relevant business interests; well-facilitated meetings; time for questions and discussions; and work group sessions at longer meetings. Some respondents suggested recent workshops as models, including HEP's 2015 "Two States, One Bay" workshop and the 2018 "Exploring Thin Layer Sediment Placement for Wetland Restoration in the Mid-Atlantic" hosted by the mid-Atlantic National Estuarine Research Reserves and NOAA.

Webinars

About half the interviewees expressed interest in attending webinars to learn about pathway protection and/or to share information, particularly if it's not possible to attend in-person meetings and/or to keep information flowing between meetings. One person suggested a webinar series about different aspects of pathway protection, such as regulatory considerations, technical aspects, and habitat impacts.

White Papers and Synopses

About a quarter of those interviewed indicated a desire to receive written material in the form of white papers and short reports, in part because they can be passed on to others and mined for briefings. Brevity is desired.

OPPORTUNITIES FOR HEP TO ADVANCE PATHWAY PROTECTION

Several opportunities for HEP to advance pathway protection were identified in the preceding "needs for information and tools" and "interest in learning" sections. In addition, we asked interviewees directly to identify ways that HEP could advance pathway protection.

Provide Leadership and Forums

Several of those interviewed recognize the HEP a strong bi-state forum with the breadth to reach the wide variety of groups who may be willing to engage in wetlands pathway protection efforts. "HEP is good. It forces people to sit at the same table to discuss regional issues." The HEP Citizen Advisory Committee members include many non-governmental organizations in the region, some who have been active on this issue and others who may choose to become active. The Restoration Work Group includes a variety of private entities and public agencies at the federal, state, and county level; it is a valued forum for collaboration and information sharing.

One interviewee stated he would like HEP to work with New York and New Jersey to encourage the states to set joint goals having to do with wetland resilience and pathway protection. These conversations should include a full range of relevant agency and programmatic perspectives, including environmental protection, coastal zone management, emergency management, and others. Interviewees suggested that HEP play a role in elevating the profile of these joint goals, and to look at shared initiatives, for instance land acquisitions in a common watershed. They also suggested HEP explore the nexus of state land acquisition programs (e.g., the New Jersey Green and Blue Acres Programs) and wetland pathway protection needs to see how these can be leveraged. Lastly, they suggested HEP also encourage states to factor in wetland resilience and pathway protection in updates to strategic documents such as open space plans and Coastal Zone Management Act Section 309 assessments.

Many interviewees suggested HEP consult further with specific organizations on pathway protection to understand the obstacles, constraints, and opportunities associated with their programs. Organizations included a wide range of federal (ACOE, NOAA Office of Response and Restoration, EPA, National Fish and Wildlife Foundation, US Fish and Wildlife Service), state (coastal management programs, emergency management offices, environmental protection agencies, sea grant programs, parks and recreation), county (planning, emergency management, extension), city, and private (land trusts, citizens groups, conservation organizations), including some non-traditional partners.

Another interviewee commented that HEP has a better line of communication with state agencies than small towns do and suggested HEP use this advantage to advocate for the needs of communities who are willing and ready to work on enhancing wetland resilience, but need state support, such as funding for outreach and project implementation.

Explore the Potential for Novel Funding Mechanisms

One interviewee suggested HEP focus on creation of a mitigation fund fed by a fee system in lieu of mitigation, especially in areas that lack opportunities for mitigation. Such a fund would create the opportunity for "out-of-kind" mitigation solutions that might be acceptable to state and federal regulatory agencies for use in protecting wetland pathways and achieving a mitigation projects with greater longevity and resilience. A similar suggestion was to explore providing incentives to commercial private mitigation bank developers to protect wetland pathway lands.

Help Funding Sources Identify Low-Hanging Fruit

Some interviewees suggested HEP could help funding sources identify good locations for wetland pathway protection by providing maps and identifying priorities and feasible projects. One person noted that it had been helpful when HEP helped identify communities that could be easily served by a $100k state grant to address combined sewer overflows.

Leverage Other Projects

Interviewees were asked to suggest existing projects that HEP might seek to leverage to include pathway protection. Suggestions included the following:

- The NY/NJ Baykeeper living shoreline project on Naval Weapons Station Earle which used oyster “castles” to stabilize shoreline at the mouth of Ware Creek.
- A planning effort being led by NJ DEP - New Jersey Fostering Regional Adaptation through Municipal Economic Scenarios (FRAMES) in Monmouth County that is focused on the Shrewsbury and Navesink River basins to address vulnerabilities to severe weather and repetitive flooding.
- The City of New Brunswick’s draft land conservation plan which extends from the Raritan to the mouth of Lawrence Brook, and includes some lands already under conservation easement.
- The update of the NYC Local Waterfront Revitalization Program.
- The ACOE high-frequency risk reduction project in the Far Rockaways.
- The USFWS’s Saltmarsh Habitat & Avian Research Program (SHARP).

POTENTIAL LOCATIONS FOR HEP ENGAGEMENT ON WETLAND PATHWAY PROTECTION

Interviewees were asked to identify locations where HEP may wish to explore the potential to engage with communities and other stakeholders on wetland pathway protection. Many are in communities that have been heavily impacted by large storms, particularly Irene and Sandy. In some, buyout programs have resulted in retreat in vulnerable neighborhoods and a return of lands to a more natural condition. Based on suggestions from interviewees and additional research, three communities were highlighted: two in the Lower Raritan watershed (Woodbridge and Sayreville, NJ) and Keyport, NJ on Raritan Bay. Staten Island, Jamaica Bay and the Hackensack Meadowlands were also suggested. These sites are described in Appendix 2. They are preliminary recommendations, subject to further investigation of issues, consultation with municipal, county, and state officials, and coordination with other organizations already working with these communities.

COLLABORATION

All interviewees identified collaboration as an essential component for advancing wetland pathway protection, and the need to tap the broad expertise and participation of many partners. One remarked that many organizations have been engaged in overlapping work and there is a need to make scarce dollars go further. While HEP can foster collaboration, the interviewees recognized that several other programs and organizations, large and small, have roles to play in both promoting collaboration and advancing pathway protection. They suggested that

collaboration needs to happen across multiple scales and within and between many settings: regulatory, scientific, environmental management, resilience, emergency response.

RECOMMENDATIONS

NY-NJ HEP is in a unique position to expand knowledge and awareness, coordination, and action on wetland pathway protection. The following recommendations are based on the interviews and the author's experience and general knowledge, and they derive in part from excellent recommendations previously put forward by the Regional Plan Association and Scenic Hudson.

1. **Work with New York and New Jersey to encourage the states to set joint goals for advancing pathway protection**.
   Engage with both states to explore a full range of relevant agency and programmatic perspectives, including environmental regulation, land acquisition, coastal zone management, emergency management, and others in a bi-state forum. Encourage states to factor in wetland resilience and pathway protection in state level databases and updates to strategic documents such as open space plans, local waterfront revitalization programs, and Coastal Zone Management Act Section 309 assessments.

2. **Convene a regional workshop on wetland pathway protection**.
   To elevate the state of knowledge about pathway protection in the region, organize a major regional workshop to highlight what pathway protection entails, where pathways are located, why pathways are important to both natural and human communities, who is doing what, successful approaches (or not), funding sources, and community responses to pathway protection efforts.

3. **Develop guidance materials and a policy brief about wetland pathway protection in the NY-NJ HEP region.**
   Pathway protection has emerged as an important conservation and resilience priority, but it is not yet widely recognized, practiced and/or institutionalized. A short guide, possibly in more than one format, will provide tools, common terminology, a rationale, and examples that help people know and protect the pathways, and create a foundation for building knowledge and engagement. A white paper on policy and planning needs related to pathway protection would provide a basis for agency briefings to elevate awareness and engagement on this issue.

4. **Explore opportunities to incorporate pathway protection into state and local emergency management planning, especially through FEMA-based Community Rating System programs at the local and county level.**
   Consult with state and federal emergency management staff about adding tidal wetlands pathway protection as an eligible activity under the community rating system, and foster inclusion of this activity under existing and new county hazard mitigation plans.

5. **Explore opportunities to permit pathway protection as an alternate form of mitigation.**
   Convene a conversation with Federal and state regulatory agencies about how best to permit mitigation of unavoidable wetland losses. In most cases, mitigation now consists of in-kind and/or in-place mitigation projects that are subject to future losses with sea-level rise. Explore whether and how pathway protection could be an alternative.

6. **Assess the state of knowledge and build consensus on best regional practices for management of existing lands and wetland pathways to promote successful migration.**
   Address the need for practitioners to conduct science-based management, learn from one another, and identify salient research questions and information needs. Seek to fill important knowledge gaps about how and when marshes will migrate, and which restoration and management approaches are more successful and beneficial. Develop consensus on best practices and create guidance on regional methodologies based on the state of knowledge.

7. **Explore the potential to engage with communities and other stakeholders on wetland pathway protection.**
   Assess community needs, best approaches for engagement, and HEP capacity to work with communities to support wetland pathway protection and community resilience. Consider developing a community of practice of those who engage with communities on resilience planning.

8. **Evaluate state of knowledge about the economics of marsh pathway protection.**
   There is a demand for regionally relevant information about the economic tradeoffs of protecting marsh migration corridors versus other risk reduction and resilience strategies.

9. **Evaluate best ways to frame and communicate about pathway protection.**
   Different audiences are motivated by different language and framing of issues. Foster social science research on how best to frame this topic with different audiences so that it is most likely to most resonate.

10. **Make timely connections to foster inclusion of pathway protection objectives in other organizations' forth-coming plans.**
    Several state, regional, and local plans are in preparation and there is an opportunity to provide information and encourage inclusion of pathway protection objectives and strategies in these documents.

11. **Assess other specific policy and regulatory avenues to foster pathway protection.**
    Draft or identify sample language, white papers, and other means to reach policy-makers, decision-makers, and regulators. Focus on opportunities to strengthen municipal ordinances to protect tidal wetlands and other coastal habitats. Review forthcoming Georgetown Law paper on this subject.

12. **Raise awareness of the benefits, status, and conservation needs of tidal wetlands and other coastal habitats.**
    More than ever, there's a need to build awareness of this emerging issue and the benefits, status, and conservation needs of vital coastal habitats. This foundational understanding is essential to the success of the rest of the recommendations.

REFERENCES

Calvin, E., R. Freudenberg, and S. McCoy. 2018. The New Shoreline: Integrating Community and Ecological Resilience around Tidal Wetlands. Regional Plan Association. A Report of the Fourth Regional Plan, 40pp.

National Park Service. 2014. Record of Decision for Gateway National Recreation Area General Management Plan and Environmental Impact Statement. Accessed 9-25-18 at: https://home.nps.gov/gate/learn/management/upload/GATE_GMP_ROD_JUNE2014.pdf

New York City Department of Environmental Protection. 2007. Jamaica Bay Watershed Protection Plan. Original plan and updates accessed on 9-25-18 at: http://www.nyc.gov/html/dep/html/dep_projects/jamaica_bay.shtml

Pirani, R; Stinnette, I; Da Silva, R; Lerman-Sinkoff, S; Lodge, J; Giudicelli, A; and Boicourt, K., 2018. NY–NJ Harbor & Estuary Program Action Agenda 2017-2022, Hudson River Foundation. New York, NY.

Roberts, D., D. Bloch, and W. White. 2014. Borough of Keyport Strategic Recovery Planning Report. Accessed 9-25-18 at: http://keyportonline.com/filestorage/4031/5682/6351/Strategic_Recovery_Planning_Reportv2_-FINAL-_4-17-14.pdf

Sanderson E., W. Solecki, J. Waldman, and A. Parris, Eds. 2016. Prospects for Resilience: Insights from New York City's Jamaica Bay. Island Press, Washington, D.C.

Schwartz, J. 2018. Surrendering to Rising Seas. Scientific American, August 1, 2018. https://www.scientificamerican.com/article/surrendering-to-rising-seas/?previewid=B4AC698F-FEC3-4DA1-B970AA1D792D0A65

Tabak, N., M. Laba, S. Spector. 2016. Simulating the Effects of Sea Level Rise on the Resilience and Migration of Tidal Wetlands along the Hudson River. PLoS ONE 11(4): e0152437. https://doi.org/10.1371/journal.pone.0152437

APPENDIX 1: INTERVIEW QUESTIONS

Q1. What is your professional title? Would you please describe your current position? How long have you held it? Have you worked for this program in other capacities?

*Q2. Do you and/or your staff work on topics relating to aspects of climate change, including tidal wetland protection? If so, what are these?

Q3. Do you or your staff work on topics relating to the identification and/or protection of pathways for wetland migration as sea-level rises? If so, what are these?

Q4: What is your level of understanding about wetland migration pathway corridors? Would you say you: 1) know little or nothing about them, 2) are somewhat aware they play a role in wetlands resilience to climate change, or 3) understand a good deal about the role corridors play in wetlands resilience to climate change.

Q5: Do you perceive protection of these corridors to be an important issue in your arena of work? Why or why not? How important is this issue relative to your other work: bottom, middle, top?

Q6: Would more information or tools help you engage in wetland pathway protection? If so, what?

Q7: Would you like to learn more about other work on wetland migration and how to protect pathways for this migration? If so, how?

Q8: Are there opportunities for the HEP and/or others to support work on wetland pathway protection? If so, what? With whom?

Q9: Are there locations and/or communities that are receptive to planning for and acting on wetland pathway protection? If so, who are some key contacts?

Q10: Are there any existing projects that could be leveraged to also address wetland pathway protection?

Q11: Do you have an interest in working more on or advancing pathway protection? If so, on what?

Q12: Do you perceive a need for greater collaboration among organizations working on this topic in the NY-NJ HEP area? If so, how?

Q13: Any other thoughts or suggestions?

*Note: Q2 was removed after the first three interviews as it was unnecessarily broad for this project.

APPENDIX 2: POTENTIAL LOCATIONS FOR HEP ENGAGEMENT ON WETLAND PATHWAY PROTECTION

Interviewees identified several locations where HEP may wish to explore the potential to engage with communities and other stakeholders on wetland pathway protection. Many are in communities that have been heavily impacted by large storms, particularly Irene and Sandy. In some, buyout programs have resulted in retreat in vulnerable neighborhoods and a return of lands to a more natural condition. Based on suggestions from interviewees and additional research, three communities are highlighted below: two in the Lower Raritan watershed (Woodbridge and Sayreville, NJ) and Keyport, NJ on Raritan Bay. Staten Island, Jamaica Bay and the Hackensack Meadowlands were also suggested and are described briefly below.

NOTE: These are preliminary recommendations, subject to further investigation of issues, consultation with municipal, county, and state officials, and coordination with other organizations already working with these communities.

Lower Raritan Watershed

The Lower Raritan Watershed is part of the larger Raritan Basin and is comprised of six groups of sub-watersheds. Historic contamination, combined sewer overflows, non-point source pollution and habitat fragmentation are long-standing issues in the watershed. One sub-watershed, the Lower Raritan below the outlet of Lawrence Brook, includes significant tidal wetlands and several communities that were especially hard-hit by the surge and flooding from recent large storms that affected Sayreville, Woodbridge, South River, and Perth Amboy, poignantly highlighting the need to increase the climate resilience of human communities and the natural communities on which they depend. Recent neighborhood buyouts in Woodbridge and Sayreville (and possibly Perth Amboy and South River) resulted in the acquisition of hundreds of vulnerable residences that were razed and returned to open space for public access and restoration. At least some of these buyouts may have occurred in corridors essential to wetland pathway protection.

Several interviewees suggested exploring specific needs and opportunities related to wetland migration pathway protection in these localities as a logical extension of the buyout activities and resilience dialogues that are already underway. The interviewees identified a variety of planning, stewardship, scientific, and education and outreach activities of the municipalities and counties, state and federal partners, universities, non-profits, and others, many of whom are working collaboratively and in partnerships. These include a recent NOAA training about green infrastructure for coastal resilience hosted by the Lower Raritan Watershed Partnership (LRWP), as well as mapping, monitoring, scientific, stewardship and arts activities focused on the Raritan River and its watershed by the LRWP, Rutgers University (including its Sustainable Raritan Initiative), and other academic institutions, including floodplain designs developed for buyout lands by water resources and wildlife extension professionals. Interviewees suggested that future HEP activities be linked to Middlesex County's countywide master planning process begun in 2018, state and local planning processes for emergency response, and floodplain management activities that help qualify communities for discounted flood insurance rates under FEMA's National Flood Insurance Community Rating System.

Key Contacts and Resources

Municipal officials in Borough of Sayreville, Township of Woodbridge, City of Perth Amboy, and Borough of South River.

Middlesex County:
Office of Planning, Middlesex County Department of Infrastructure Management: Nick Tufaro, Principal Planner (nick.tufaro@co.middlesex.nj.us).
Office of Parks and Recreation: Rick Lear, Director of Parks and Recreation (Richard.Lear@co.middlesex.nj.us)

New Jersey:
NJ DEP Blue Acres Buyout Program: Fawn McGee, Director (Fawn.McGee@dep.nj.gov).
Website: https://nj.gov/dep/greenacres/blue_flood_ac.html
NJ Office of Emergency Management: Tom Bykowski, OEM Coordinator (tom.bykowski@co.middlesex.nj.us)

NJ Coastal Management Program: Elizabeth Semple, Director (Elizabeth.Semple@dep.nj.gov).
Website: https://www.state.nj.us/dep/cmp/index.html

Lower Raritan Watershed Partnership: Heather Fenyk, President and Founder (hfenyk@gmail.com). Website: http://lowerraritanwatershed.org/ accessed 9-25-18.

Sustainable Raritan River Initiative, Rutgers University: Co-Leads Jeanne Herb (jherb@ejb.rutgers.edu) and Rick Lathrop (lathrop@crssa.rutgers.edu); facilitator Sara Malone (sjmalone@ejb.rutgers.edu). Website: http://raritan.rutgers.edu/the-initiative/
Other Rutgers researchers are conducting or planning wetlands research and monitoring that would be relevant to pathway protection.

Rutgers University. 2009. The Sustainable Raritan River Action Plan. Accessed 9-25-18 at: http://raritan.rutgers.edu/wp-content/uploads/2015/05/SRR-Action-Plan-Dec-2009-rev-May-2015.pdf.

Sayreville case study developed by graduate students and faculty at the Rutgers Edward J. Bloustein School of Planning and Public Policy. Accessed 9-25-18 at: http://www.sayreville.com/documents/PRESENTATION%20FOR%20INTERNET.pdf

Scientific American recently published an article about coastal community retreat that featured what happened in Woodbridge Township and the Blue Acres Program. “Surrendering to Rising Seas.” Accessed 9-25-18 at: https://www.scientificamerican.com/article/surrendering-to-rising-seas/?previewid=B4AC698F-FEC3-4DA1-B970AA1D792D0A65

Keyport NJ

Keyport is a borough in Monmouth County located on Raritan Bay about three miles southeast of Cheesequake State Park. It is largely bounded by water - to the north by Raritan Bay, to the west by tidal Matawan Creek, and to the east by tidal Chingarola Creek, with Luppatatong Creek and its tidal wetlands prominent north-south features within Keyport.

The Borough of Keyport participated with the Monmouth County Office of Emergency Management in the 2009 Multi-jurisdictional Natural Hazard Mitigation Plan (HMP) and its 2014 update (Roberts et al., 2014). The borough is vulnerable to four storm hazards: tidal surge in the lower lying areas of the Borough and along the three tidal creeks, flooding, wave action, and high winds. These three combined to produce unprecedented damage during Sandy to the waterfront and other low-lying areas in Keyport. The 2014 HMP update listed land use and development trends and pressures, including continued residential development 50 yards from waterfront, 26 condominium units approved along a creek bed, and continued development pressure for approvals for waterfront multi-family units. The report stated that the jurisdiction continues to regulate develop by application and enforcement of CAFRA (NJ Coastal Area Facility Review Act) regulations and floodplain management best practices along Raritan Bay and along our two creeks.

Key Contacts and Resources

Borough officials:
Harry Aumack, Mayor (mayoraumack@keyportonline.com)
Stephen J. Gallo, Borough Administrator (sgallo@keyportonline.com) 732-739-5123

Monmouth County:
Division of Planning: Edward Sampson, Director of Planning (edward.sampson@co.monmouth.nj.us). Website: https://co.monmouth.nj.us/page.aspx?ID=2963
Park System: James Truncer, Director (jjtruncer@monmouthcountyparks.com)
Office of Emergency Management: Michael Oppegaard, OEM Coordinator (moppegaard@mcsonj.org)

Keyport Natural Resources Inventory. Accessed 9-25-18 at: http://keyportonline.com/filestorage/4135/6392/3-02_Keyport_NRI_08-07.pdf

Borough of Keyport Strategic Recovery Planning Report (2014). Accessed 9-25-18 at: http://keyportonline.com/filestorage/4031/5682/6351/Strategic_Recovery_Planning_Reportv2_-FINAL-_4-17-14.pdf

Monmouth County Master Plan (2016). Accessed 9-25-18 at: https://co.monmouth.nj.us/page.aspx?ID=4197

Multi-Jurisdictional Natural Hazard Mitigation Plan, Monmouth County, New Jersey; Revised Draft, 2014 Plan Update. Accessed 9-25-18 at: https://www.mcsonj.org/wp-content/uploads/2015/06/Hazmat%20Mitigation%20Plan%20-%201%20-%20REDACTED.pdf

Staten Island

Three interviewees suggested exploring Staten Island communities that got buyouts and/or have New York City Bluebelt Program projects to preserve lands, improve stormwater retention, and remove contaminants. Three Bluebelt project sites were identified as places where wetland migration could be occurring and there may be potential for additional acquisitions. The Mill Creek project site, located on southern end of Staten Island in South Richmond, which includes a tidally-connected stream. A second site is in Travis, a small community in central Staten

Island facing the Arthur Kill that is preserving land under the Bluebelt Program. A third Bluebelt site is Oakwood Beach on the east shore of Staten Island.

Key Contacts and Resources

NYC Department of Environmental Protection, Department of Design and Construction. Charles Olson, Chief, Bluebelt Section (OlsonC@dep.nyc.gov)

Bluebelt Program: http://www.nyc.gov/html/dep/html/dep_projects/bluebelt.shtml

Jamaica Bay

The challenges to Jamaica Bay's resilience and its historically rich coastal environment have been well documented (Sanderson et al., 2016; New York City Department of Environmental Protection, 2007). Not surprisingly, a few interviewees suggested HEP explore wetland pathway protection opportunities around Jamaica Bay, especially those associated with units of the Gateway National Recreation Area on Jamaica Bay. The National Park Service (NPS) partners on management and restoration of the Area's significant natural resources to improve resiliency and provide a host of other benefits. The record of decision for the NPS Gateway National Recreation Area General Management Plan and Environmental Impact Statement (2014) described the preferred alternative for management of the Jamaica Bay Unit and stated (page 6): "Natural resource protection and restoration efforts in the Jamaica Bay Unit will focus on softening hardened coastal edges, restoring wetland and coastal habitats, and creating additional freshwater wetlands. Increased use will be balanced with additional monitoring and management of wildlife and habitats. NPS will work closely with New York City and other landowners to build the resiliency of coastal habitat and to improve conditions along the entire Rockaway coastline."

Key Contacts and Resources

Gateway National Recreation Area: Jennifer Nersesian, Superintendent (Jennifer_Nersesian@nps.gov); Dave Taft, Jamaica Bay Unit Manager (Dave_Taft@nps.gov)

Science and Resilience Institute at Jamaica Bay: Adam Parris, Executive Director (Adam.Parris56@brooklyn.cuny.edu)

Gateway National Recreation Area General Management Plan. Record of Decision for Gateway National Recreation Area General Management Plan and Environmental Impact Statement. Accessed 9-25-18 at: https://home.nps.gov/gate/learn/management/upload/GATE_GMP_ROD_JUNE2014.pdf

Gateway Research Learning Center (formerly Jamaica Bay Institute): https://www.nps.gov/gate/learn/nature/jamaica-bay-institute-outreach-and-education.htm

Science and Resilience Institute of Jamaica Bay, website: http://www.srijb.org/

Jamaica Bay Watershed Protection Plan. Original plan and updates accessed on 9-25-18 at: http://www.nyc.gov/html/dep/html/dep_projects/jamaica_bay.shtml

Hackensack Meadowlands

The Hackensack Meadowlands were suggested as a possible location to explore wetland pathway protection. Under a recent EPA-funded assessment, the Meadowlands Environmental Research Institute (MERI) collected detailed hydrology and high-resolution elevation data for a collection of discrete wetland sites that are islands in the Meadowlands' expansive matrix of industrial sites, residential areas, and legacy municipal landfills. However, based on this and other studies, Francisco Artigas, Director of the MERI, has concluded the Meadowlands complex has few, if any, opportunities for wetland migration (pers. comm. 9-26-18)

Key Contact

Meadowlands Environmental Research Institute, Rutgers University: Francisco Artigas (Francisco.Artigas@rutgers.edu)