**Bronx River Watershed Climate Resilience Strategy**

**Scope of Work**

**Partners: Westchester County Planning, The Bronx Borough President’s Office, Bronx River Alliance**

**Collaborators: NYC Parks Natural Resources Group, Natural Areas Conservancy,**

**Grant Term: Fall 2019 – Winter 2020 (18 months)**

**Project Background**

Numerous restoration initiatives in Westchester and Bronx Counties have achieved substantial improvement in the landscape along the Bronx River. This progress must be sustained into the future, a task made more complicated by the reality of climate change.

Changing climate will result in significant local effects, such as rain events of increasing intensity and frequency, shifting native and invasive vegetation species’ ranges and the relocation of wildlife, including pests, with the changing habitat. The impacts of climate change will be especially hard on stressed urban ecosystems. The Bronx River hydrograph is incredibly flashy – meaning rainfall causes rapid increases and decreases in volume and velocity – due to the extent of paved surfaces within the watershed and sedimentation is dramatically altering the river channel and its habitat value. Areas of the upper watershed already experience frequent flooding. According to a study by Zahmatkesh et al (2014), which focused on the Bronx River, results showed that downstream parts of urban catchments in particular are more affected by increases in rainfall intensity and consequently more susceptible to rainfall modifications from climate change.

Climate change projections predict more frequent and severe storm events which will exacerbate flashiness and associated scouring, erosion and Combined Sewer Overflow events. Already, hotter, drier summers are affecting base flow in the river during July and August in particular, which limits recreational paddling of freshwater reaches.

Restoration is guided by community planning processes such as:

● The Bronx River Riparian Invasive Plant Management Plan 2012 (RIPMaP) is the result of many years of municipal- and community-led riparian habitat restoration efforts along the Bronx River, which presents an approach to reduce the spread of invasive plants through prioritization of resources, use of best control techniques, and coordination of management activities by the organizations that work along the river.

● The Intermunicipal Watershed Management Plan 2010 (IWMP) developed by the Bronx River Alliance, NYC Parks, and Westchester County Planning, includes priority recommendations for implementation projects to improve water quality; protect and improve aquatic and riparian habitat and riparian and ecosystem services; biodiversity and ecological values; and reduce overall environmental stress to the river system through stormwater BMPs, stream and wetland restoration, invasive plant removal, and riparian reforestation. This plan built on Westchester County’s 2007 Bronx River Watershed Management Plan and the Alliance’s 2005 Eco Plan. Most of the priority projects listed in this plan have been completed.

Restoration of the Bronx River and its environs and the implementation of the Bronx River Greenway are community-driven responses to the meager inheritance of a degraded environment and wildlife habitat, lack of resident access to nature and recreation, and lack of green and open space. These plans, however, were formulated without reference to climate change. It is imperative to take a longer view when restoring the river so that community efforts will be effective today and in the future, as well. A restoration plan that incorporates best practices for environmental resilience in the face of climate change is needed. In addition, an update to the IWMP is needed to identify next phase projects for implementation.

**The project: Bronx River Watershed Climate Resilience Strategy**

The Bronx River Alliance proposes a project that will result in a cooperative, updated intermunicipal watershed plan which includes a Bronx River Watershed Climate Resilience Strategy that will guide restoration work by the collaborating organizations in alignment with expected conditions 20 to 50 years in the future.

The project will:

1) complete a rapid ecological assessment and develop management recommendations for the whole of the Bronx River corridor

2) carry out water quality testing and sediment testing throughout the watershed to determine current areas of increased pollution risk

3) engage partners and the public in a discussion to specify the expected impacts of climate change throughout the Bronx River Watershed

4) update the current Intermunicipal Watershed Management Plan, including targets related to sedimentation, flooding risk, trash, invasive management, public access to the river, ecosystem services

5) formulate recommendations as to the species and techniques most appropriate to mitigate the expected changes

6) specify interventions to adapt to and mitigate the impacts of climate change on the river. Interventions will reflect community priorities and will include a feasibility analysis and cost estimate.

The project will be managed by the Alliance Director of Environmental Stewardship, and will largely be carried out by a consultant (or team of consultants) with the appropriate technical expertise for each phase of the project.

**Outcomes**

* Report on the greatest climate change concerns and opportunities for increasing resiliency. BMP recommendations for technical development of climate mitigation projects
* Addendum to the 2010 Intermunicipal Watershed Plan published including a strategy document of specific recommended projects
* Implementable projects defined at various levels of application, including individual properties, neighborhoods, municipalities, counties, and region

**Work Plan**

Task 1: Project Coordination Meeting, fall 2019, Bronx River Alliance

Convene project partners and collaborators to coordinate the implementation of the project

Task 2: Natural Areas Conservancy Study, fall 2019, NAC

Conduct a rapid ecological assessment in Westchester County and develop management recommendations for the whole of the Bronx River corridor that will align with their forest management framework citywide. This would include research, field data collection, analysis, mapping and forest corridor management plan, with particular focus on invasive plant and pest threats, including those from Emerald Ash Borer.

Task 3: Contract Consultants, winter 2020, Bronx River Alliance

Consultant Scope:

* Compile data available from partner and other organizations about Bronx River and climate change
* Produce report on the greatest climate change concerns and opportunities for increasing resiliency in the Bronx River watershed. BMP recommendations for technical development of climate mitigation projects
* Produce addendum update of Intermunicipal Watershed Management Plan
* Evaluate feasibility of implementable projects from first IWMP that are not completed
* Investigate impact of official agency regulations on potential projects
* Produce recommendations on priority projects based on IWMP and climate resilience

Task 4: Public Engagement, winter/spring 2020, Bronx River Alliance, Westchester County, Bronx Borough President’s office

* Hold two charrettes, one in the Bronx and one in Westchester County to elicit public input on priority environmental and climate related issues in their communities
* Formulate and post an online survey to gauge public opinion

Task 5: Water Quality and sediment testing, spring/summer/fall 2020, Bronx River Alliance

Conduct full watershed water quality testing and sediment budget analysis to pinpoint specific pollution risks

Task 6: Produce updated Intermunicipal Watershed Management Plan including list of conceptual design projects to address climate change risks, fall 2020, Consultant

Consultant will design and format the final project report, suitable for print reproduction and an electronic version

Task 7: Public gathering to present Project results, winter 2021, Bronx River Alliance, Westchester County, Bronx Borough President’s office

Convene watershed-wide public event