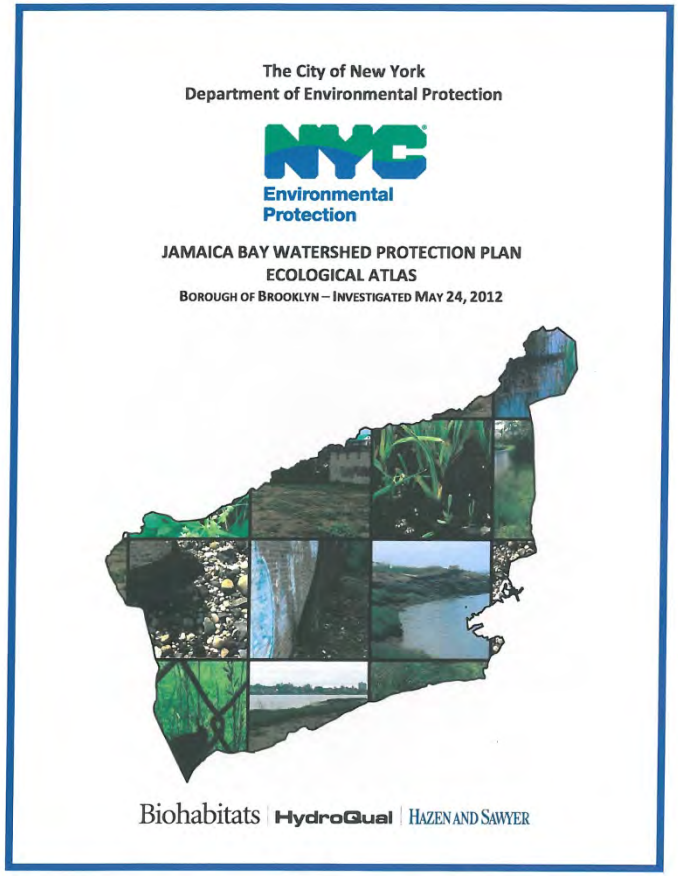
Environmental Protection



URBAN RESILENCE IN AN ERA OF CLIMATE CHANGE

GLOBAL INPUT FOR LOCAL SOLUTIONS

Kingsborough Community College

October 16, 2013

John McLaughlin

New York City Department of Environmental Protection

Jamaica Bay Watershed Ecological Atlas

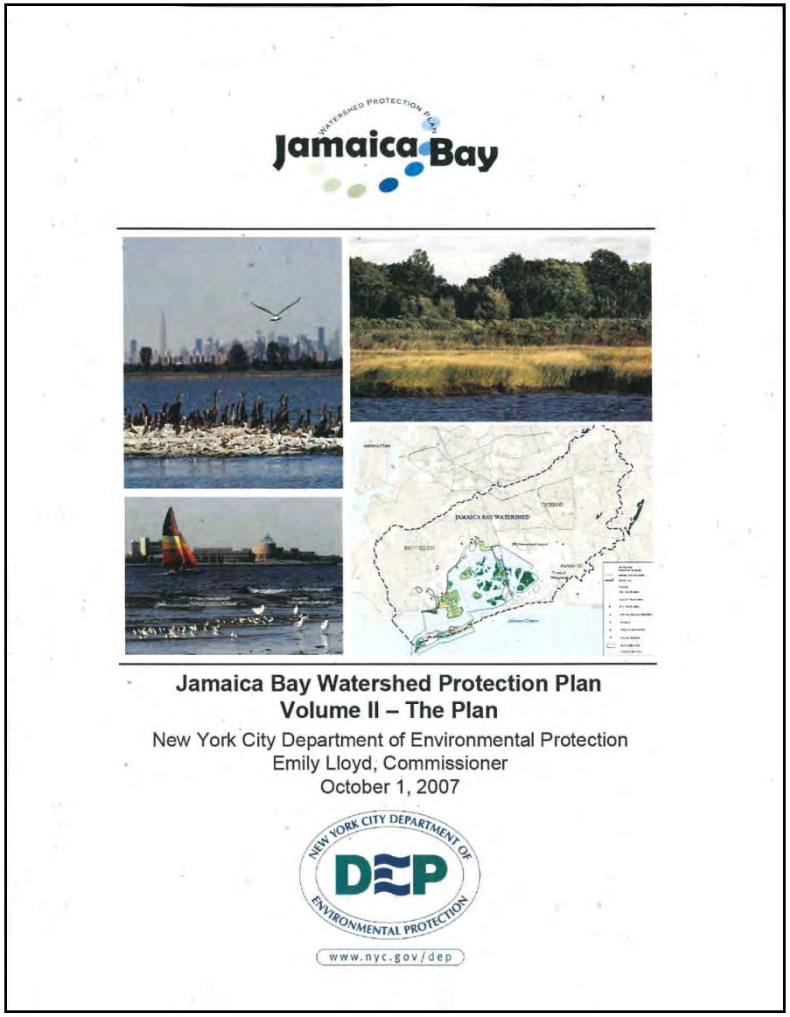
Planning Tool for the Ecological Restoration Practitioner

Description of Ecological Atlas

- Funded by DEP with matching funds ($250K) from the New York State Department of State
- The *Jamaica Bay Watershed Ecological Atlas* project proposes to provide:
  - (1) A complete and updated inventory of all existing Jamaica Bay Watershed habitat locations;
  - (2) A GIS mapping and information data layer that can be used by restoration practitioners to develop and leverage future ecological restoration designs; and,
  - (3) A prioritized list and map of potential sites for restoration, conservation and green infrastructure opportunities.

- The restoration and conservation actions enabled by this project will ultimately provide critical benefits for plant and animal species, and will be integrated with green infrastructure practices to benefit comprehensive ecological improvements for the Jamaica Bay watershed and improve water quality.

Connection with Jamaica Bay WPP



- Relevant strategies identified within Jamaica Bay Watershed Protection Plan (JBWPP):
  - **Strategy 2b1:**

    Review existing recommendations for the acquisition and restoration of tidal wetlands and upland buffer areas around the Bay's periphery and evaluate the potential for additional acquisition and restoration opportunities.
  - **Strategy 2b2:**

    Prepare a GIS map of existing and/or potential locations that could benefit from grassland, woodland and shrubland restoration and prioritize restoration sites.
  - **Strategy 2b3:**

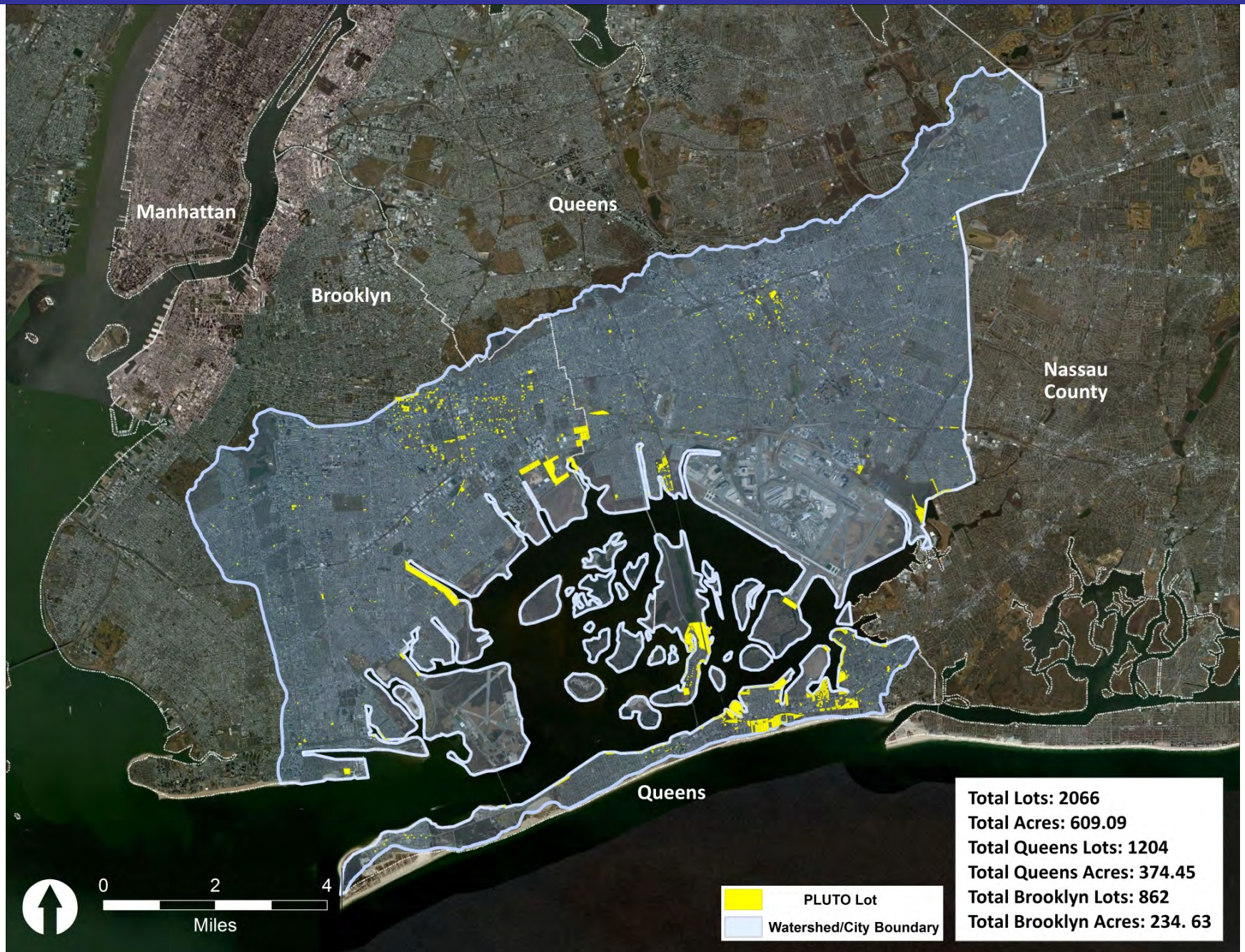
    Prepare a GIS map of existing and potential dune and beach habitats that could benefit from restoration and prioritize restoration sites.
  - **Strategy 2b4:**

    Identify habitats of listed species and suggest projects that would support the recovery of animals and plants that are listed as rare, threatened or endangered.
  - **Strategy 2b6:**

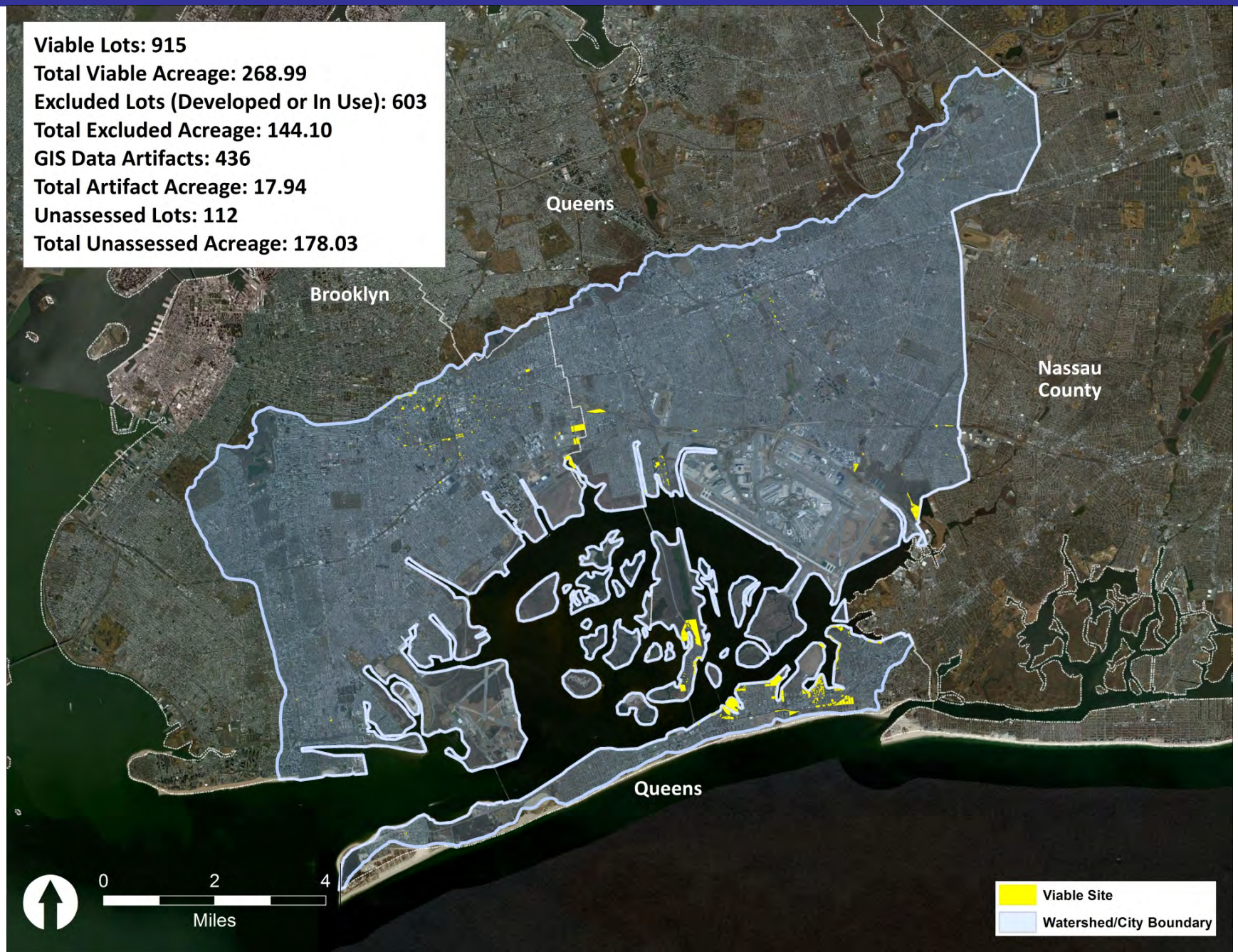
    Reduce the extent of invasive vegetation to create wetlands and/or upland buffers and develop a GIS layer displaying the extent of invasive vegetation within the watershed.
  - **Strategy 3b3:**

    Promote the use of vacant public lands for their potential conversion to stormwater management parks.

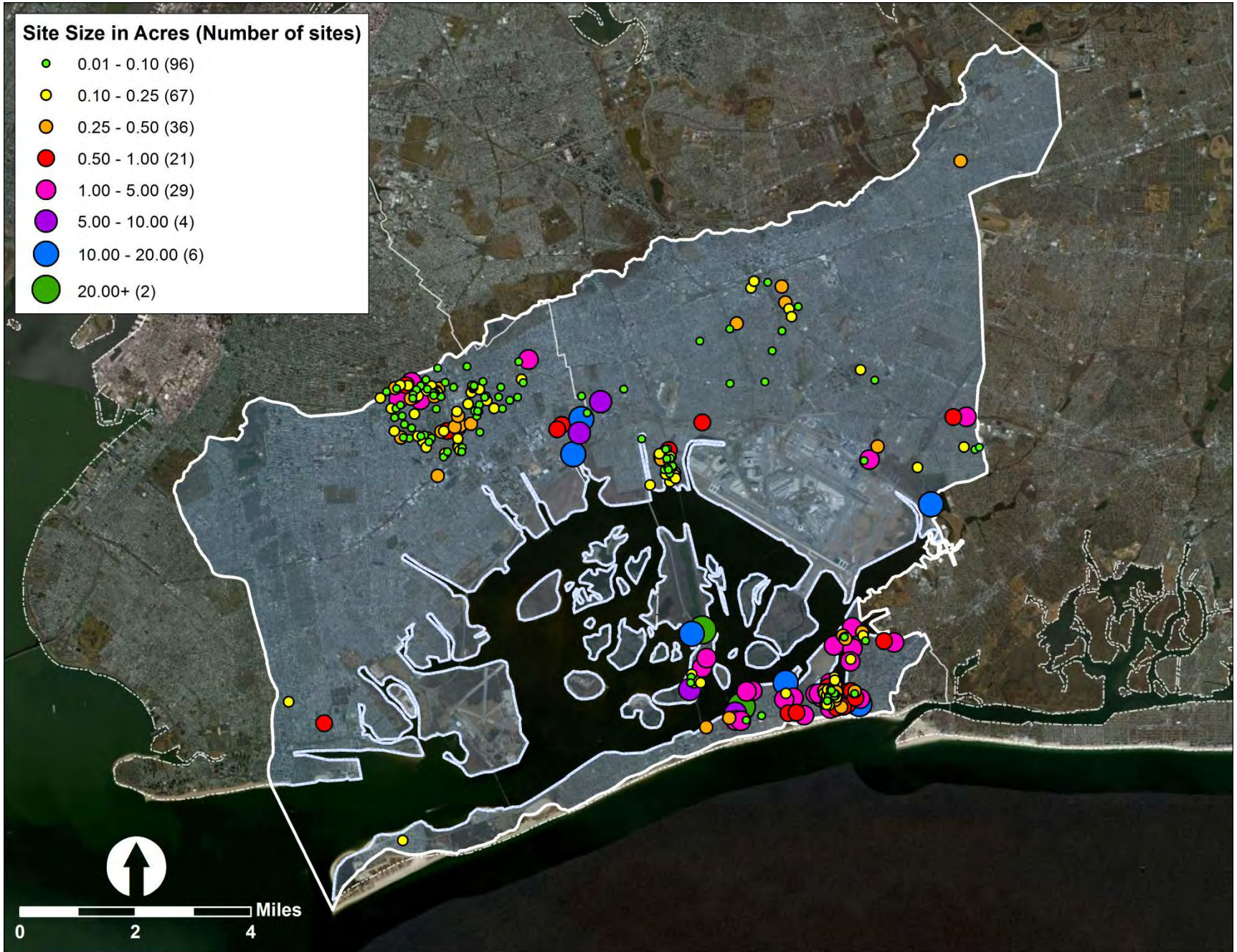
Verification of Potential Block/Lots



Field Determined Viable Sites



Size of Viable Sites



Field Data Sheets fill 27 Volumes

9-months of field data collection and approximately 6-months of office processing time

Partial List of DATA LAYER SHAPEFILES

Potential Green Infrastructure Sites
Surge Inundation Zones
Comprehensive Restoration Plan (CRP) sites
New York State Open Space Plan
Existing vegetation/habitat types
Bird Conservation Areas
Amphibian Habitat
Butterfly Distribution
Bird Migration Corridors
NYS Ecological Zones
Natural Heritage Community Occurrences
Significant Coastal Habitat
Open Space Properties

Street Tree Survey
Tidal Wetlands
Freshwater Wetlands
Historic Wetland Coverage
Soils
National Hydrologic Dataset
Groundwater Depth
Landuse/Landcover

Priority Waterbodies
Railroads and Subways
Building Footprints
Block and Lot Data
Census Data
LIDAR Information
1' Digital Elevation Model

*** - Currently 53 shapefiles in database**

Ecological Atlas Sample Data

Basic Site Information

JAMAICA BAY ECOLOGICAL ATLAS Pa

Field Assessment Sheet

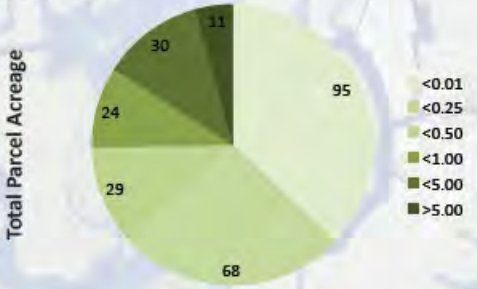
Block and Lot:	15653; 68, 62, 51 & 55
Site:	Q-02-11162011
Address:	Battery Rd. & Pinson St.
Owner:	NYCDPR
Acreage:	1.46
Date of Visit:	11.16.11

Exclude Site: N

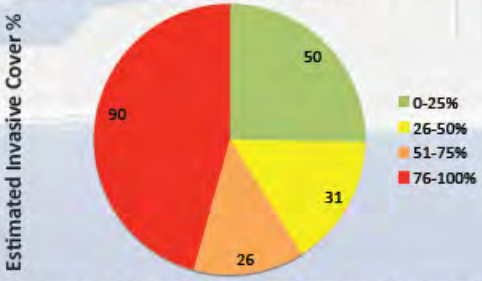
Observed Impacts:	Soil Compaction:	N	Trash and Dumping:	Y
	Erosion:	Y	Poor Vegetation Health:	N
	Fenced:	N		
Adjacent Landuse:	Residential:	Y	Transport-Related:	N
	Industrial:	Y	Park:	N
	Commercial:	N	Vacant:	N
	Institutional:	N	Undeveloped:	N
Lot Facing:	N:	N	E:	Y
	S:	Y	W:	N
Light Exposure:	Low:	N	Medium: N High:	Y
Hydrology	Standing Water:	Y	Downspout:	N
	Precipitation:	Y	Adjacent runoff:	N
	Water collects on parcel:	N	Water runs off of parcel:	Y
Soils:	Disturbed:	Y	Fill:	N
	Undisturbed:	N	Debris:	N
Slope:	%:	1	Direction:	NW
Landuse:	Developed:	N	Wetland:	Y
	Undeveloped:	Y	Water:	Y

Collected Data Examples:

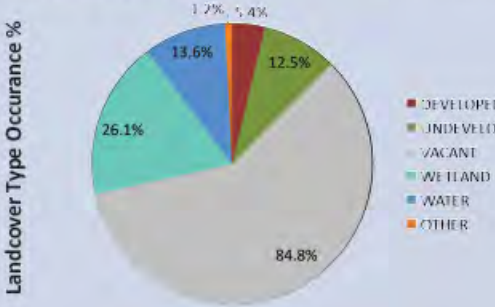
While many of the parcels assessed during this project were assemblages of multiple contiguous lots, the majority of the parcels consisted of one or two narrow, urban vacant lots. This is reflected in the distribution of assessed parcel acreage, visible below.



Estimated invasive cover within parcels was calculated through species identification and a visual assessment of total groundcover during site visits. The majority of assessed lots were dominated by invasive cover (see below). The presence of native species at a site may also efect site ranking in final prioritization.



The majority of vacant lots assessed contained landcover typical of a vacant lot. However, wetlands were also present on 26% of sites, and lands that appear to have no previous development at all appeared 12%. These variable and many others were factored in the final site prioritizations.



Ecological Communities (Edinger et al 2002)

JAMAICA BAY ECOLOGICAL ATLAS
Field Assessment Sheet

Page 2

Ecological Community:
(Edinger 2002)

ESTUARINE

Tidal creek:	Y
Salt shrub:	N
High salt marsh:	Y
Low salt marsh:	Y
Coastal salt pond:	N
Freshwater tidal marsh:	N
Freshwater intertidal mudflats:	N
Freshwater intertidal shore:	N
Artificial impoundment:	N
Estuarine ditch:	N
Estuarine impoundment marsh:	N
Estuarine riprap/artificial shore:	N

RIVERINE

Marsh headwater stream:	N
Intermittent stream:	N
Coastal plain stream:	N
Canal:	N
Ditch/artificial intermittent stream:	N
Industrial effluent stream:	N

PALUSTRINE

Deep emergent marsh:	N
Shallow emergent marsh:	N
Shrub swamp:	N
Cobble shore wet meadow:	N
Impounded marsh:	N
Impounded swamp:	N
Reedgrass/loosestrife marsh:	Y
Dredge spoil wetland:	N
Water recharge wetland:	N

LACUSTRINE

Eutrophic pond:	N
Farm pond/artificial pond:	N
Reservoir/artificial impoundment:	N
Artificial pool:	N
Sewage treatment pond:	N

TERRESTRIAL

Sand beach:	N
Maritime beach:	N
Maritime shrubland:	Y
Maritime grassland:	Y
Shoreline outcrop:	N
Cobble shore:	N
Maritime forest:	N
Coastal forest:	N
Cropland/rowcrops:	N
Flower/herb garden:	N
Mowed lawn with trees:	N
Mowed Lawn:	N
Mowed roadside/pathway:	N
Unpaved road/path:	N
Paved road/path:	N
Riprap/erosion control roadside:	N
Brushy cleared land:	N
Artificial beach:	N
Riprap/artificial lake shore:	N
Landfill/dump:	N
Junkyard:	N
Urban vacant lot:	N
Urban structure exterior:	N

Vegetation Cover:

Canopy:	N	Canopy %(0-100):	0
Invasives:	Y	Invasives%(0-100):	60

Turf%:	0
Shrub%:	50
Other Herbaceous%:	50
Bare Soil%:	0
Impervious%:	0
	100 %

DRAFT

Ecological Communities of New York State
Second Edition

A revised and expanded edition of Carol Reschke's *Ecological Communities of New York State*

Edited by

Gregory J. Edinger, Ecologist
D. J. Evans, Associate Ecologist
Shane Gebauer, Associate Ecologist
Timothy G. Howard, Associate Ecologist
David M. Hunt, Associate Ecologist
Adele M. Olivero, Associate Ecologist

New York Natural Heritage Program
N.Y.S. Department of Environmental Conservation
625 Broadway, 5th Floor
Albany, NY 12233-4757

January 2002

What is possible?

JAMAICA BAY ECOLOGICAL ATLAS

Field Assessment Sheet

Possible Restoration:

Rain Barrel/Cistern:	Y	Phytoremediation:	N
Rain Garden:	Y	Create Urban Open Space:	Y
Provide Upland Biofilter/Bioretention:	N	Upland Planting:	Y
Remove Bisecting Road:	N	Wetland Planting:	N
Remove Impervious Cover:	Y	Create Parkland:	N
Remove Fill and Debris:	Y	Create/Enhance Detention Storage	N
Amend Soils:	Y	Reduce Hydrologic Impacts:	N
Invasives Management:	N	Other(Describe):	N

TEC Fulfilled:

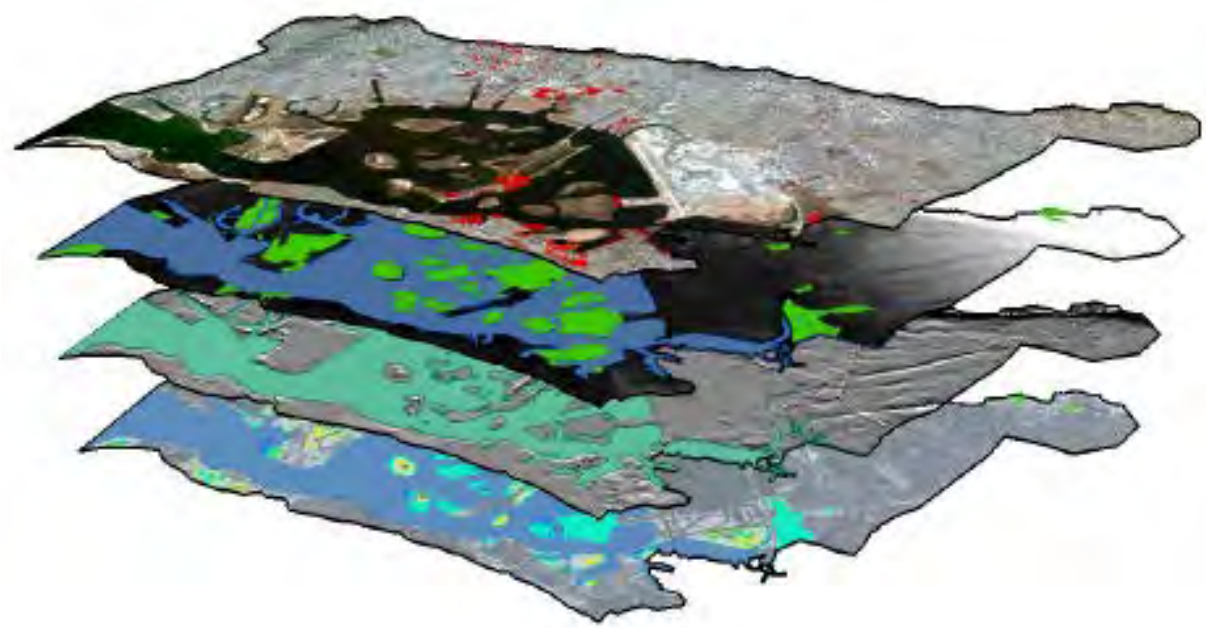
Coastal Wetlands:	N	Fish, Crab and Lobster Habitat:	N
Habitat for Waterbirds:	N	Tributary Connections:	N
Coastal/Maritime Communities:	N	Enclosed and Confined Water:	N
Oyster Reefs:	N	Sediment Quality:	N
Eelgrass Beds:	N	Public Access:	N
Shoreline and Shallows:	N	NA - Already in Use:	N

Potential Conflicts:

None:		Trees:	
Unknown:	U	Wetlands:	
Utilities:		Shallow Bedrock:	
Stream/Existing Drainage:		Conflict Description:	

Application

- Ecosystem Prioritization Map – what could go where
  - Digital Terrain Model
  - Wetland Information
  - Upland Vegetation
  - Soil Maps
  - Geologic Maps
  - Groundwater
  - Land Use
  - Hydrologic functions
  - Climate Change scenarios

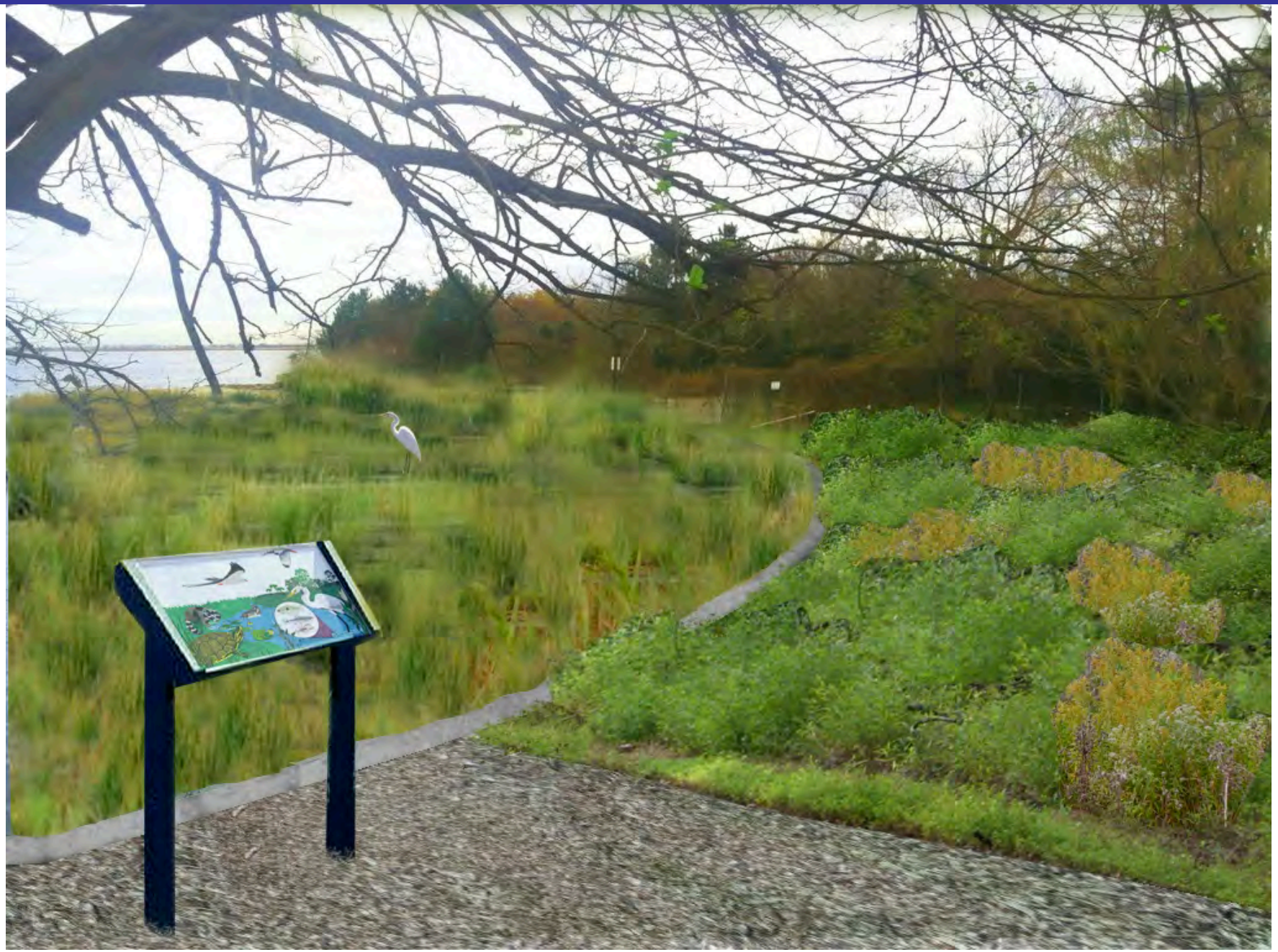


Ecological Restoration Example

Existing Site Conditions

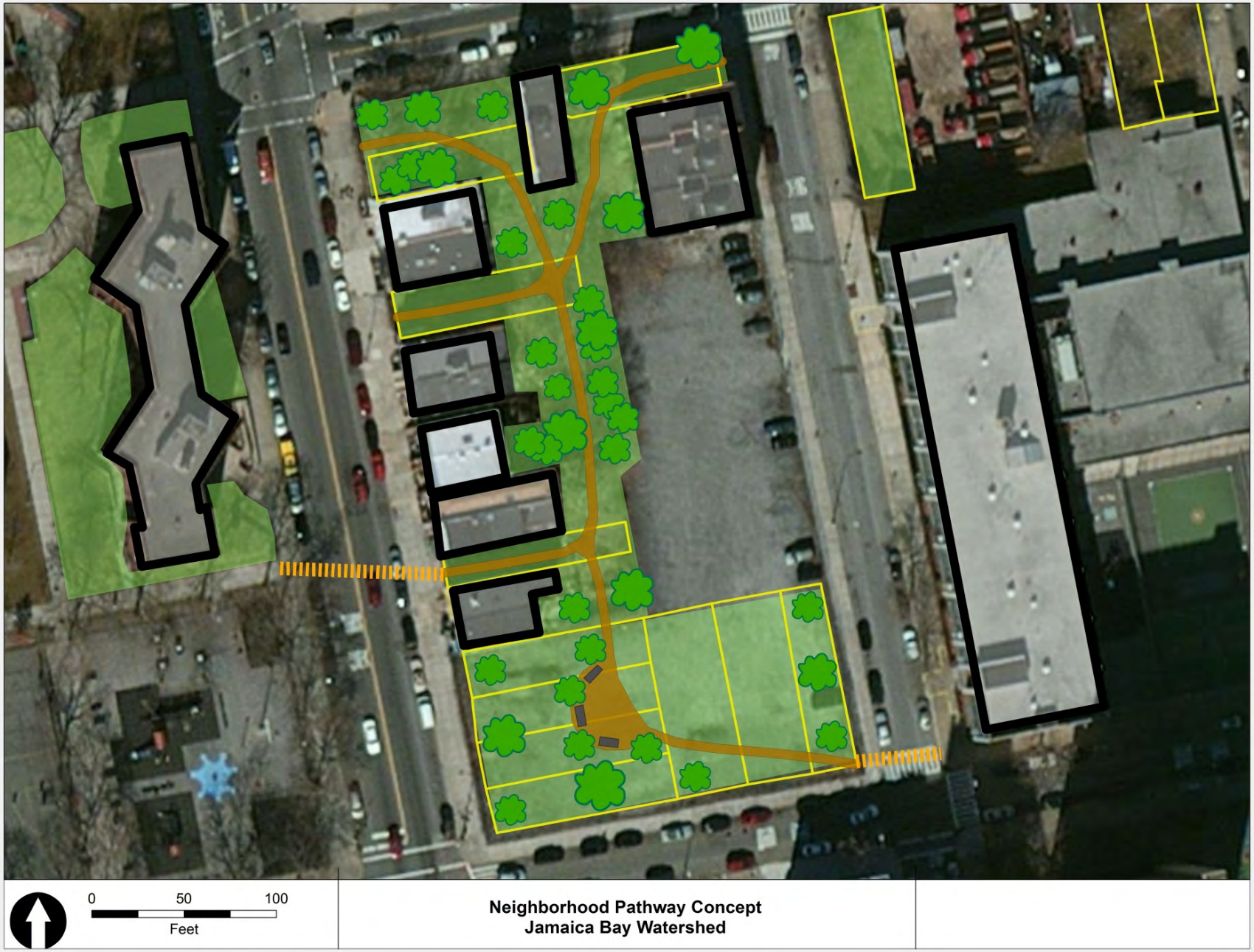
Concept Example

Restoration (Illustrative Purposes Only)



Green Infrastructure Potential – Example

Green Infrastructure (Illustrative Purposes Only)



Next Steps

- One more QA/QC of GIS Database and Refinement of Users Manual

- Work with partners to develop online version for "**Waters We Share"** website

- Place shapefile layers on DEP website for individual specific queries and analysis