



## C H A P T E R   T W O

### PLANNING FRAMEWORK

#### THE PLANNING PROCESS FOR JAMAICA BAY

The Planning Framework used to create the *Jamaica Bay Watershed Protection Plan* starts with a shared, long-term vision. To accomplish this vision, a number of steps have been or will need to be undertaken:

- Identify and categorize the issues facing the Bay including those that are widely known and discussed as well as any that surfaced during the compilation of *Volume 1: Jamaica Bay Watershed Regional Profile*.
- Formulate a comprehensive list of objectives for each set of Jamaica Bay and watershed issues.
- Then, identify management strategies and implementation actions to address the objective.

Ultimately, the development and refinement of these management strategies will be the road map for attaining the future vision of a healthy, sustainable Jamaica Bay.

The management strategies to address Jamaica Bay and watershed concerns are recognized as the key elements of this *Jamaica Bay Watershed Protection Plan*. The strategies are intended to shape the future management of the Bay and its watershed and, accordingly, will be monitored and adapted in the future based on feedback from the Bay's ecological system. The management strategies included in this *Jamaica Bay Watershed Protection Plan* have been evaluated based on environmental, technical and economic feasibility per Local Law (LL71).

There were several important considerations in the development of this *Jamaica Bay Watershed Protection Plan* regarding form and format. It is imperative that the document be well organized and readable; that it be understandable and not overwhelmed by technical jargon. At the same time, it is a critical planning document that will inform future choices; therefore, accuracy and detail are key. It is our hope that the *Jamaica Bay Watershed Protection Plan* is approachable by technical specialists and the general public alike.

The City of New York through the New York City Department of Environmental Protection (NYCDEP) and other City agencies, the federal government through the National Park Service (NPS) and other federal agencies, and New York State through the New York State Department of Environmental Conservation (NYSDEC) and other state departments, have been making considerable efforts to improve the water quality of Jamaica Bay. These City, state and federal agencies are taking steps to protect and restore the Bay's ecological systems and are studying further options to improve the ecological values of the Bay's watershed. Additionally, non-governmental organizations, community groups, and individuals have dedicated countless hours to improve conditions in the Bay and its watershed, and to encourage others to take up that cause. Their combined energies and resources have had a positive effect over the last two decades after the depredations of the previous century. The *Jamaica Bay Watershed Protection Plan* attempts to capture the current projects and



initiatives of governmental and non-governmental organizations whose actions have positively impacted the future of Jamaica Bay.

*“We do not inherit the earth from our ancestors, we borrow it from our children.”  
- Native American Proverb*

An important step in the development of this *Jamaica Bay Watershed Protection Plan* has been the inclusion of stakeholders in the process. Through the activities of the Jamaica Bay Watershed Protection Plan Advisory Committee (the Advisory Committee), and public meetings and workshops held by the NYCDEP, the public has had the opportunity to provide input during the development of the *Jamaica Bay Watershed Protection Plan*. The public commented on key issues, potential management strategies, and suggested outcomes. Thus, the Plan conforms to the stated criteria of a stakeholder-driven management process. Fundamental to the nature of a watershed planning process as well as critical to the ultimate implementation of the *Jamaica Bay Watershed Protection Plan*, this collaborative process will be continued during the implementation phases.

## ORGANIZATION OF THE PLAN

The *Jamaica Bay Watershed Protection Plan* is organized into two volumes. *Volume 1: Jamaica Bay Watershed Regional Profile* provides the context within which this *Jamaica Bay Watershed Protection Plan* has been developed. Volume 1 contains the history of Jamaica Bay, the key issues currently affecting the Bay, and current management efforts. This volume, *Volume 2: Jamaica Bay Watershed Protection Plan*, provides the vision, objectives, and management strategies for the *Jamaica Bay Watershed Protection Plan*. These volumes are designed to be stand-alone documents, yet work together for a complete understanding of the current conditions of Jamaica Bay and the future management of its watershed.

Volume I, *Jamaica Bay Watershed Regional Profile*, has several purposes. It is intended to be a comprehensive reference document for Jamaica Bay and provides information needed to identify issues of concern that face the Bay. Volume I sets the stage for the development of management strategies to address these issues, which are provided in this Volume 2.

Volume 2 is intended to serve as a blueprint for the future management of the Bay and its watershed to achieve a shared vision for Jamaica Bay. Therefore, Volume 2 starts with a vision for the Bay and issues that need to be overcome to achieve that vision. For each issue, objectives for the Bay were set, and for each objective, management strategies are identified to address the objective. This *Jamaica Bay Watershed Protection Plan* also documents the steps that will need to be undertaken to implement each recommended Management Strategy. Volume 2 includes:

- An introduction to watershed planning concepts (Chapter 1)
- The framework for the *Jamaica Bay Watershed Protection Plan* including the vision, issues identification, objectives, and management strategies (Chapter 2)
- Objectives, Management Strategies, Evaluation, and Implementation Strategies to address six categories:
  - Category 1: Water Quality (Chapter 3)
  - Category 2: Restoration Ecology (Chapter 4)



- Category 3: Stormwater Management through Sound Land Use (Chapter 5)
- Category 4: Public Education and Outreach (Chapter 6)
- Category 5: Public Use and Enjoyment (Chapter 7)
- Category 6: Implementation and Coordination (Chapter 8)
- Strategies for Future Consideration (Chapter 9)

## THE VISION FOR JAMAICA BAY

The *Jamaica Bay Watershed Protection Plan* begins with a shared long-term vision of what a future Jamaica Bay could be:

*The Jamaica Bay watershed is a place where New Yorkers and visitors co-exist with natural areas and clean water that harbor healthy waterfowl, fish, and shellfish populations. It is a place where urban communities embrace environmental stewardship and where wetlands and other natural areas are protected and restored for future generations. The Jamaica Bay estuary is once again a cultural and recreational hub for Brooklyn and Queens, where residents swim, fish, boat, and enjoy nature.*

The above vision statement was created early in the planning process, based on discussions between NYCDEP and the Advisory Committee about what a future Jamaica Bay could be to direct and coordinate water quality improvement and ecosystem restoration efforts. The vision was developed to support the planning process and help identify the most appropriate and effective objectives and management strategies.

## ISSUES IDENTIFICATION

### *The Key Issues*

To achieve the *Vision for Jamaica Bay*, the *Jamaica Bay Watershed Protection Plan* must address five key issues facing the watershed. These issues, as identified in Volume 1, are:

- Water Quality;
- Ecology;
- Land Use and Development;
- Public Education and Outreach; and
- Public Access, Open Space, and Recreation.

A summary of each of these issues is provided below. For a full description of each, see its applicable chapter in Volume 1, *Jamaica Bay Watershed Regional Profile*.

### *Water Quality*

The water quality of Jamaica Bay and its tributaries has degraded over time. Impairments to water quality in the Bay can be attributed to several factors:

- Increasing human populations in Brooklyn, Queens, and Rockaway and the associated increase in human waste products (in terms of sewage and solid wastes).



## Volume 2: Jamaica Bay Watershed Protection Plan

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- Increasing volumes of surface runoff as a result of urban development and the spread of impervious surfaces.
- Landfill operations displacing freshwater wetlands in the upper watershed and tidal wetlands in the estuary, impeding natural wetland filtration processes and altering tidal circulation patterns.
- The continuing westward extension of the Rockaway Spit, which may be contributing to the lack of circulation and mixing of Bay waters in the estuary.
- Dredging operations in the Jamaica Bay estuary, which have increased the bathymetric depth of the Bay and resulted in a decrease in circulation and mixing.

NYCDEP has a number of programs in place to upgrade the wastewater treatment plants that discharge into the watershed and to address combined sewer overflow (CSO) discharges. Current programs and additional measures under consideration to address water quality issues are discussed in Volume 2, Chapter 3, *Water Quality*.

### ***Ecology***

Impairment and loss of ecosystem function in the Jamaica Bay watershed has occurred since New York City expanded into Brooklyn and Queens at the turn of the 20th century. The primary drivers of ecosystem disturbance are:

- Direct displacement and fragmentation of habitat by residential, commercial, industrial, and transportation infrastructure.
- Landfilling of ecologically sensitive areas, especially tidal wetlands around the perimeter of the Jamaica Bay estuary and freshwater wetlands and riparian areas in the upper watershed.
- The introduction of invasive exotic flora and fauna into the watershed, which can prey on or out-compete the native species for available resources.
- Degraded water quality (discussed above) in marine and brackish environments that can lead to direct and indirect health problems for aquatic organisms.
- Changing climate patterns, which has a myriad of effects (many of them poorly understood or unforeseen) on ecosystems in the Jamaica Bay watershed.

NYCDEP is implementing a number of Jamaica Bay restoration projects including restoration of three landfills and a large wetland restoration effort in Idlewild Park. A number of public and private entities are also undertaking projects to restore environmental features and ecological functions including the joint restoration project at the Elders Point Salt Marsh Islands by NYCDEP, U.S. Army Corps of Engineers (USACE), NY/NJ Port Authority (Port Authority), NYSDEC, Natural Resource Conservation Service (NRCS), and NY/NJ Harbor Estuary Program (HEP). Current programs and additional measures under consideration to promote ecological restoration and enhancements are discussed in Volume 2, Chapter 4, *Restoration Ecology*.

### ***Land Use and Development***

Transportation, and residential, commercial, and industrial development patterns running along the perimeter of the Jamaica Bay estuary make it difficult for neighboring communities to access the Bay.



While private boating access is available, public boating access is very limited. Additionally, public access to fishing, hiking, bird watching, and swimming is only available in portions of the Bay.

A number of planning proposals develop options for amenities for and access to Jamaica Bay. Current programs and additional measures under consideration to address public access are discussed in Volume 2, Chapter 7, *Public Use and Enjoyment*.

### ***Public Access, Open Space, and Recreation***

Since 1636, when the first Dutch settlers began to populate the areas now known as Brooklyn and Queens, drastic alterations have occurred within the Jamaica Bay watershed. The primary mechanisms of transformation have been directly or indirectly related to human disturbance. Urban development, with the associated residential, commercial, industrial, and transportation infrastructure, has had a direct impact on water quality in the receiving waters of the Jamaica Bay estuary. The health of upland, wetland and estuarine ecosystems has resulted in impaired uses of the local environment. The primary impact of urbanizing environments – the covering of soils with impervious concrete and asphalt surfaces – decreases ground water infiltration, while increasing the volume and rate of stormwater runoff.

NYCDEP has a number of programs in place to address on-site stormwater runoff and is working with other agencies to provide greater stormwater control. Current programs and additional measures under consideration to address land use and development are discussed in Volume 2, Chapter 5, *Stormwater Management through Sound Land Use and Development*.

### ***Public Education and Outreach***

The physical barriers to the Bay, combined with extensive urban development, have disconnected the Bay from those who live in its watershed. Several water quality and ecological issues can be attributed to a lack of public awareness about the Bay, its current conditions, and related impacts of human activities. The public can help improve the Bay's condition through many options, such as conserving water, landscaping yards with native or noninvasive species, and participating in beach clean-ups. Education and outreach programs exist to increase the visibility of Jamaica Bay, yet one challenge is coordinating the many entities to effectively target or reach the diverse population groups – public officials, property owners, business owners, school children, etc. – throughout the watershed.

As mentioned, governmental agencies, non-governmental organizations and educators have programs to increase public awareness and stewardship through outreach and education activities. Current programs and additional measures under consideration to promote education and outreach are discussed in Volume 2, Chapter 6, *Public Education and Outreach*.

## **OBJECTIVES**

As touched upon in the introductory text for this chapter, for each of the five issue categories, a set of achievable and relevant Objectives has been identified to address the issue. The five categories and their respective Objectives are listed below:

### ***Category 1: Water Quality***

- ❖ Objective 1a: Reduce nitrogen loading to the tributary basins and Jamaica Bay.



- ❖ Objective 1b: Reduce CSO and other discharges into the tributary basins to improve pathogen and DO levels.
- ❖ Objective 1c: Increase dissolved oxygen levels in tributary basin areas of chronic hypoxia to improve ecological productivity.
- ❖ Objective 1d: Develop a robust and coordinated scientific monitoring program.

### ***Category 2: Restoration Ecology***

- ❖ Objective 2a: Restore the salt marsh islands in Jamaica Bay.
- ❖ Objective 2b: Preserve and enhance natural areas along periphery of the Bay and watershed.

### ***Category 3: Stormwater Management through Sound Land Use***

- ❖ Objective 3a: Promote the use of on-site Best Management Practices in new and existing development.
- ❖ Objective 3b: Promote the use of off-site stormwater Best Management Practices.

### ***Category 4: Public Education and Outreach***

- ❖ Objective 4a: Raise awareness of Jamaica Bay's Unique Assets and Challenges.

### ***Category 5: Public Use and Enjoyment***

- ❖ Objective 5a: Increase public access to Jamaica Bay.
- ❖ Objective 5b: Improve public access to a wider range of landscape types in the upper watershed in order to expand the public's understanding of the entire Jamaica Bay watershed.

## **MANAGEMENT AND IMPLEMENTATION STRATEGIES**

### ***Overview***

For each Objective, individual Management Strategies define a set of actions. The development and refinement of these management strategies is the proposed road map for attaining the future vision of a healthy, sustainable Jamaica Bay.

Chapters 3 through 7 are each dedicated to one of the 5 issues categories. Each chapter presents Objectives, related Current Programs, and Management Strategies. Each Management Strategy is described and evaluated; recommendations are made to select promising strategies; and implementation steps for recommended strategies are identified along with cost and schedule information where available.

### ***Interrelationship Between Strategies***

Although the management strategies are placed into one of five categories in this *Jamaica Bay Watershed Protection Plan*, it is important to recognize that many of the strategies within the categories are interdependent. For example, objectives and strategies related to wetlands, buffers, fish, and wildlife comprise Chapter 4, *Restoration Ecology* due to the direct interconnections between these types of restoration projects and expected impacts. However, the strategies identified in Chapter





4 are also expected to have a direct positive impact on the Bay's water quality, which is addressed in Chapter 3, *Water Quality*. This is common across all categories of issues, objectives, and strategies where the expected benefits of specific strategies transcend more than one issue.

The key issues and the interrelationships between the sources of perturbation, the resulting stressors, ecosystem effects, and human use impacts are further illustrated in the Ecosystem Model (Figure 2.1) developed as part of this planning process. This diagram displays the cause and effect of various disturbances that historically or presently occur in the Jamaica Bay watershed, detailing how natural and human-influenced processes have altered the environment. It is hierarchical in organization, meaning that the higher up in the diagram an element is located, the greater range of influence it has over other factors. For instance, the "sources" are ultimately the root causes of alteration, which lead to a series of environmental "stressors." If a "source" of alteration is mitigated, then the "stressor" will ultimately disappear. "Stressors" influence ecosystem elements, triggering an "ecosystem response." Finally, changes to the ecosystem influence the "human uses" of the landscape, which feed directly back to the original driver of perturbation, urbanization and landscape alteration.

### ***Advisory Committee Recommendations***

Many Management Strategies provided in Chapters 3 through 7 closely match the preliminary recommendations of the Advisory Committee submitted to the City Council and NYCDEP on June 29, 2006 and the recommendations of the Advisory Committee's response to the March 1, 2007 Draft Plan submitted in June 2007. As a result of an integrated process between NYCDEP, the Advisory Committee, and the stewards of Jamaica Bay, many Management Strategies contained in this *Jamaica Bay Watershed Protection Plan* were developed through communications with the Advisory Committee and the public, or the case may be that their recommendation was consistent with NYCDEP's approach for actions necessary to improve the Bay and its watershed.

NYCDEP generally supports the Advisory Committee's recommendations that promote Jamaica Bay as a natural and recreational resource for New York City. However, despite a robust capital investment program, the NYCDEP's budget for capital investments is not limitless and there are many competing needs for these funds citywide. These dollars must be carefully programmed for drinking water protection, infrastructure repair and maintenance, as well as for water quality protection of all the City's waterways.

Several of the Advisory Committee's recommendations are also outside of NYCDEP's authority or mission. For many of these recommendations, NYCDEP recognizes the direct benefits to the Bay that these strategies offer and will continue to work with other agencies and entities to pursue them. However, other City, state and federal agencies experience similar levels of financial responsibility to program limited funds throughout the City. Therefore, their support for projects must be considered in the context of other agency mandates.

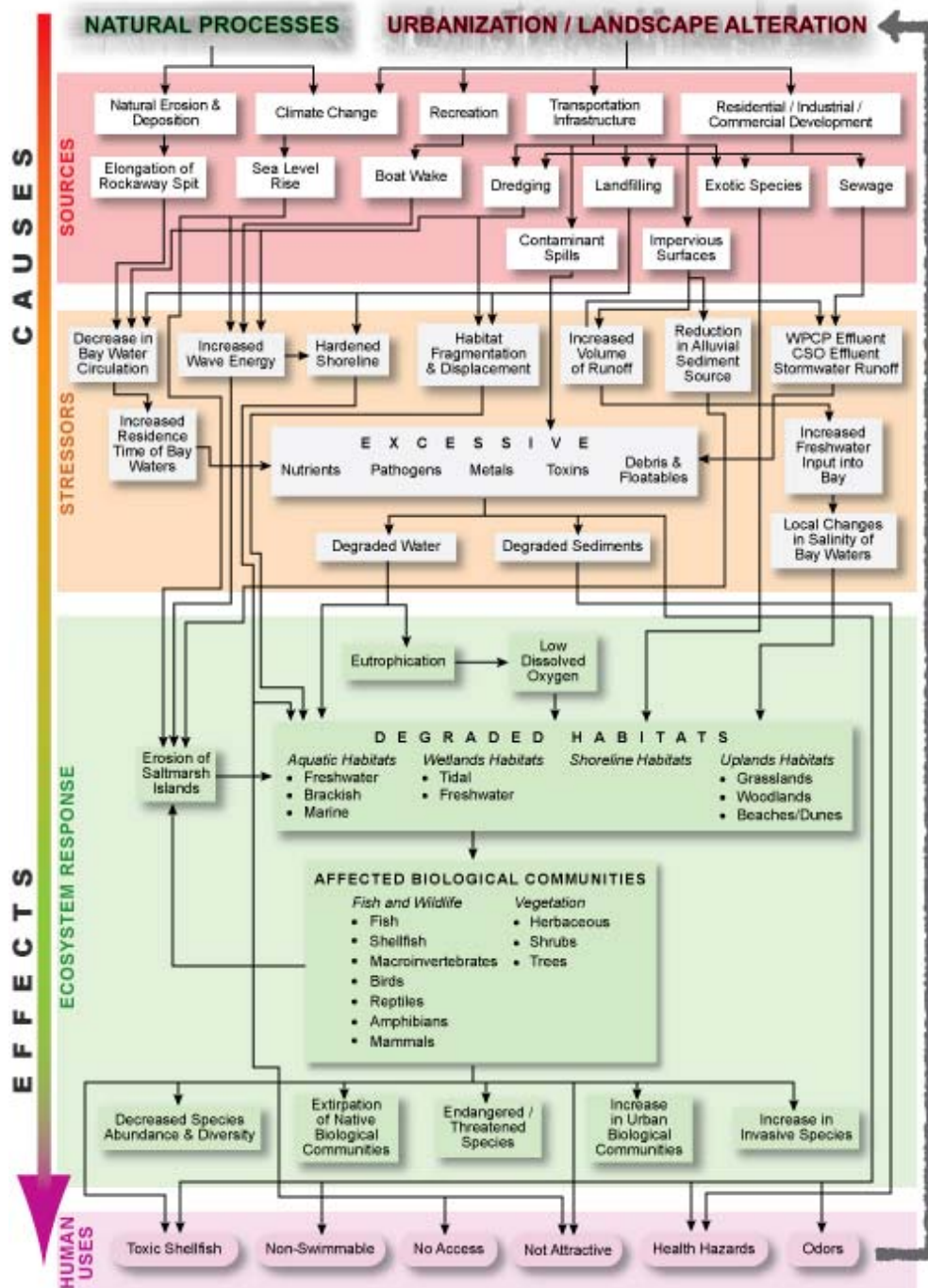


FIGURE 2.1. Jamaica Bay Watershed Ecosystem Model; Source: Biohabitats

This diagram helps to explain interrelationships between ecosystem elements as well as provide a tool for evaluating recommendations intended to alleviate the sources and stressors associated with ecosystem and human use impacts.





***Plan Framework’s Relationship to Local Law 71***

In 2005, the New York City Council took up the challenge of protecting Jamaica Bay and its watershed – on June 30, 2005 it passed by a vote of 50-0 LL 71 of 2005 “To amend the administrative code of the city of New York, in relation to a watershed protection plan for the watershed/sewershed of Jamaica Bay.” This is the first substantive legislation at a governmental level for a watershed approach to the protection of Jamaica Bay.

LL 71 required that several points be addressed as part of the process of preparing this *Jamaica Bay Watershed Protection Plan*, or be included in it. First, LL 71 requires in Subdivision (b) that: “The commissioner shall assess the technical, legal, environmental and economical feasibility of including the following measures, at a minimum, in the plan...” The noted measures and their respective locations in this *Jamaica Bay Watershed Protection Plan* are summarized in Table 2.1.

<b>TABLE 2.1 Local Law 71 Elements and the <i>Jamaica Bay Watershed Protection Plan</i></b>		
<b>Required Measure</b>	<b>Specific Item</b>	<b>Category in Plan</b>
“(1) best management practices for the minimization and control of soil erosion and stormwater runoff and reduction of both point and non-point source pollution, including, but not limited to, the promotion of development practices such as...”	“on-site detention and infiltration of stormwater runoff”	Water Quality and Land Use (see Chapter 3 and 5)
	“the minimization of impervious surfaces”	Land Use (see Chapter 5)
	“the creation of natural systems to control and minimize stormwater runoff”	Water Quality and Land Use (see Chapter 3 and 5)
“(2) measures to address threats to aquatic habitat, including, but not limited to...”	“stabilizing and restoring salt marshes, wetlands, soils and other natural areas”	Restoration Ecology (see Chapter 4)
	“strengthening ecological buffers”	Restoration Ecology (see Chapter 4)
	“restoring natural features to Jamaica bay watershed/sewershed shoreline”	Restoration Ecology (see Chapter 4)
	“reestablishing water flows”	Restoration Ecology and Land Use (see Chapters 4 and 5)
“(3) land use acquisition and land use planning practices and opportunities, including, but not limited to”	“incentives, such as expedited permitting and property tax relief, for infill, brownfield redevelopment and other environmentally beneficial development”	Restoration Ecology and Land Use (see Chapters 4 and 5)
	“disincentives, such as stricter development guidelines, for development that may adversely impact Jamaica bay”	Land Use (see Chapter 5)
“(4) a protocol for coordination with appropriate federal, state and city governmental entities that have jurisdiction over the Jamaica bay area, with respect to, but not limited to...”	“efforts to restore and maintain the water quality and ecological integrity of Jamaica bay”	Water Quality, Restoration Ecology, and Implementation and Coordination (see Chapters 3, 4 and 8)



**TABLE 2.1 Local Law 71 Elements and the *Jamaica Bay Watershed Protection Plan***

Required Measure	Specific Item	Category in Plan
	“notification regarding proposed development projects within the Jamaica bay watershed/sewershed that may adversely impact Jamaica bay”	Land Use and Implementation and Coordination (see Chapters 5 and 8)
“(5) a protocol for coordination with the office of environmental coordination...”		Land Use and Implementation and Coordination (see Chapters 5 and 8)
“(6) a public education program, including, but not limited to programs for schools, developers, commercial facilities, civic groups and other local organizations and entities to	“increase awareness about the ecological significance and degradation of Jamaica bay”	Public Education and Outreach (see Chapter 6)
	“restoration and watershed stewardship activities undertaken by the department and others involving Jamaica bay”	Restoration Ecology and Public Education and Outreach (see Chapters 4 and 6)
	“methods and practices to reduce pollution in Jamaica bay”	Water Quality, Land Use and Public Education and Outreach (see Chapters 3, 5, and 6)
“(7) a program to target enforcement efforts that will help reduce polluting behaviors and operations that may adversely impact Jamaica bay”		Implementation and Coordination (Chapter 8)