



Proposed Report¹

DEPARTMENT OF THE ARMY
CHIEF OF ENGINEERS
2600 ARMY PENTAGON
WASHINGTON, D.C. 20310-2600

DAEN

SUBJECT: Hudson Raritan Estuary Ecosystem Restoration Feasibility Study, New York and New Jersey

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on the Hudson-Raritan Estuary Ecosystem Restoration, New York and New Jersey. It is accompanied by the report of the District Engineer. This report is an interim response to multiple resolutions by the United States House of Representatives: 1) August 1, 1990 Resolution by the United States House of Representatives Committee on Public Works and Transportation; 2) September 28, 1994 Resolution by the United States House of Representatives Committee on Public Works and Transportation; 3) March 24, 1998 Resolution by the United States House of Representatives Committee on Transportation and Infrastructure; and 4) April 15, 1999 Resolution by the United States House of Representatives Committee on Transportation and Infrastructure. The authorizations requested that the Secretary of the Army review existing reports with a view to determining the feasibility of environmental restoration and protection relating to water resources and sediment quality within the New York and New Jersey Port District, including but not limited to creation, enhancement, and restoration of aquatic, wetland, and adjacent upland habitats. Pre-construction Engineering and Design (PED) and additional studies, if funded, will continue under the HRE authority (1999) cited above.

2. The Hudson-Raritan Estuary (HRE) is designated as an estuary of national significance under the Environmental Protection Agency's National Estuary Program. The HRE is located within one of the most urbanized regions in the United States. Over 13 million people live within 25 miles of the Statue of Liberty, the approximate center of the estuary, including the highly urbanized cities of New York, and Jersey City, Newark, and Elizabeth, New Jersey. Two locations are within HRE (Bronx and Harlem River Watersheds NY & Lower Passaic River/Newark NJ) are subject to participating within the Urban Waters Federal Partnership and is part of the National Estuarine Research Reserve System in partnership with National Oceanic and Atmospheric Administration (NOAA) and the State of New York. There are currently 27 federally threatened or endangered species under the Endangered Species Act that utilize the HRE for habitat. As a result of years of collaborative planning amongst the region's stakeholders and estuarine scientists, the HRE Comprehensive Restoration Plan (CRP) was created. The CRP provided a regional consensus on ecosystem goals, objectives, targets, restoration opportunities and implementation strategies for ecosystem restoration in the estuary. The proposed actions

¹ This report contains the proposed recommendation of the Chief of Engineers. The recommendation is subject to change to reflect Washington-level review and comments from federal and state agencies.

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from the Hudson-Raritan Estuary Ecosystem Restoration Study are integral to this comprehensive effort. Implementing the restoration actions proposed by the study is identified in the New York - New Jersey Harbor & Estuary Program's Action Agenda as a near-term priority for HRE's recovery to become a "world class estuary."

3. The reporting officers recommend construction authorization at this time of a National Ecosystem Restoration (NER) Plan that will provide for the restoration of approximately 381 acres of estuarine wetland habitat including 16 acres/six miles of tidal channels, 50 acres of freshwater riverine wetland habitat, 27 acres of coastal and maritime forest habitat, 39 acres of shallow water habitat and 52 acres of oyster habitat. Two fish ladders would be installed and three weirs would be modified to re-introduce or expand fish passage (24 miles) and control flow rate and water volume along the Bronx River. Additionally, 1.6 miles of streambank restoration and 72 acres of stream bed and channel restoration is recommended. Monitoring and adaptive management of each restoration site within this interim recommendation has been budgeted for a period up to five-years post-construction.

The specific projects as part of this interim recommendation include (estuarine wetland restoration except where noted):

a. Jamaica Bay Planning Region – Perimeter Sites

(1) Fresh Creek. Habitat restoration consisting of 16.1 acres of low marsh, 4.4 acres of high marsh, 3.6 acres and 10.7 acres of coastal scrub shrub and maritime forest respectively, and the restoration of 45.08 acres of the existing channel for a total habitat of 79.88 acres. Non-federal sponsors are New York City Department of Environmental Protection (NYCDEP), New York City Department of Parks & Recreation (NYC Parks), and the New York State Department of Environmental Conservation (NYSDEC).

(2) Dead Horse Bay. Habitat restoration consisting of 19 acres of low marsh, 5.4 acres of high marsh, 6.2 acres of scrub shrub, eight acres of adjacent upland, and restoration of 2.31 acres of the existing channel. Restoration would be implemented in coordination with the National Park Service (NPS) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities for a total habitat of 40.91 acres. Non-federal sponsors are NYCDEP, NYC Parks and NYSDEC.

b. Jamaica Bay Planning Region – Marsh Islands

(1) Duck Point. Habitat restoration consisting of 24.9 acres of low marsh, 5.6 acres of high marsh, 8.1 acres of scrub/shrub, 1.03 acres of channel restoration and 7.57 acres of shallow marine habitat for a total habitat of 47.2 acres beneficially using 213,776 CYD of dredge material. Non-federal sponsors are NYCDEP and NYSDEC.

(2) Stony Creek. Habitat restoration consisting of 26 acres of low marsh, 22.5 acres of high marsh, 3.49 acres of scrub/shrub, 1.43 acres of channel restoration and 8.67 acres of shallow

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marine habitat for a total habitat of 62.09 acres beneficially using 151,360 CYD of dredge material. Non-federal sponsors are NYCDEP and NYSDEC.

(3) Pumpkin Patch West. Habitat restoration consisting of 13.7 acres of low marsh, 8.61 acres of high marsh, 0.9 acres of scrub/shrub, 0.74 acres of channel restoration, and 3.88 acres of shallow marine habitat for a total habitat of 27.83 acres beneficially using 327,686 CYD of dredge material. Non-federal sponsors are NYCDEP and NYSDEC.

(4) Pumpkin Patch East. Habitat restoration consisting of 15.6 acres of low marsh, 10.1 acres of high marsh, 3.1 acres of scrub/shrub, 0.58 acres of channel restoration, and 5.22 acres of shallow marine habitat for a total habitat of 34.6 acres beneficially using 351,952 CYD of dredge material. Non-federal sponsors are NYCDEP and NYSDEC.

(5) Elders Center. Habitat restoration consisting of 15.2 acres of low marsh, 10.9 acres of high marsh, 1.4 acres of scrub/shrub, 0.95 acres of channel restoration, and 5.49 acres of shallow marine habitat for a total habitat of 33.94 acres beneficially using 284,891 CY of dredge material. Non-federal sponsors are NYCDEP and NYSDEC.

c. Harlem River, East River, and Western Long Island Sound Planning Region

(1) Flushing Creek. Habitat restoration consisting of 9.76 acres of low marsh, 2.47 acres of high marsh, 1.8 acres of scrub/shrub, 3.89 acres of coastal maritime forest and 1.37 acres of shallow marine habitat for a total habitat of 19.29 acres. Non-federal sponsor is NYCDEP.

(2) Bronx Zoo and Dam. Habitat restoration consisting of 1.16 acres of freshwater emergent wetlands, 0.48 acres of forested freshwater scrub/shrub wetland, 0.42 acres of invasive removal/native planting, the stabilization of 750 linear feet of stream bank, and incorporation of a fishway which will open 0.8 miles of previously unavailable stream habitat for a total habitat of 2.06 acres. Non-federal sponsors are NYCDEP and NYC Parks.

(3) Stone Mill Dam. Habitat restoration consisting of 0.032 acres of invasive removal/native planting, restoration of 0.5 acres of the channel bed, and the incorporation of a fishway which will open 22.9 miles of previously unavailable stream habitat (following fishway installation at Bronx Zoo) for a total habitat of 0.53 acres. Non-federal sponsor is NYC Parks.

(4) Shoelace Park. Habitat restoration consisting of 2.07 acres of freshwater emergent wetland, 1.1 acres of forested freshwater scrub/shrub wetland, 7.9 acres of invasive plant removal/native planting, 5.7 acres of channel bed and the stabilization of 7,415 linear feet of stream bank for a total habitat of 16.77 acres. Non-federal sponsors are NYCDEP and NYC Parks.

(5) Bronxville Lake. Habitat restoration consisting of 0.86 acres of freshwater emergent wetland, 2.49 acres of forested freshwater scrub/shrub wetland, 1.39 acres of invasive plant removal/native planting, restoration of 0.65 acres of channel bed, and the creation of a 0.3 acre

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forebay that will trap sediment and debris for a total habitat of 5.69 acres. Non-federal sponsor is Westchester County.

(6) Garth Woods-Harney Road. Habitat restoration consisting of 0.82 acres of freshwater emergent wetland, 1.67 acres of a freshwater wet meadow, 0.57 acres of forested freshwater scrub/shrub wetland, 1.63 acres of invasive plant removal/native planting, restoration of 2.19 acres of channel bed, and the stabilization of 200 linear feet of stream bank for a total habitat of 6.88 acres. Non-federal sponsor is Westchester County.

d. Newark Bay, Hackensack River, and Passaic River Planning Region

(1) Essex County Branch Brook Park. Habitat restoration consisting of the creation of 10.25 acres of freshwater emergent wetland; restoration of 8.8 acres of freshwater forested scrub/shrub wetland, 8.91 acres of invasive vegetation removal/native planting, and the restoration of 18.09 acres of channel bed for a total habitat of 46.05 acres. Non-federal sponsor is New Jersey Department of Environmental Protection (NJDEP).

(2) Metromedia Tract (Hackensack River). Habitat restoration consisting of 26.5 acres of low marsh, 11.7 acres of high marsh, 13.8 acres of scrub/shrub, 2.79 acres of existing channel restoration, and 6.5 acres of shallow marine habitat for a total habitat of 61.3 acres. Non-federal sponsors are NJDEP and New Jersey Sports and Exposition Authority (NJSEA).

(3) Meadowlark Marsh (Hackensack River). Habitat restoration consisting of 56.2 acres of low marsh, 6.5 acres of high marsh, 5.4 acres of scrub/shrub, 0.7 acres of adjacent upland, and the restoration 4.6 acres of an existing channel for a total habitat of 73.4 acres. Non-federal sponsors are NJDEP and NJSEA.

(4) Oak Island Yards. Habitat restoration consisting of 5.32 acres of low marsh, 0.85 acres of high marsh, 0.44 acres of scrub/shrub, 2.85 acres of adjacent upland, and the restoration of 1.36 acres of an existing channel. Restoration would be sequenced following the United States Environmental Protection Agency's (USEPA) remedial action implemented for the lower 8.3 miles of the Lower Passaic River for a total habitat of 10.82 acres. Non-federal sponsor is NJDEP.

e. Oyster Reef Restoration

(1) Naval Weapons Station Earle. Habitat restoration consisting of 10 acres of reef creation (oyster castles, shell and gabions). Non-federal sponsors are New York/New Jersey Baykeeper and NJDEP.

(2) Bush Terminal. Habitat restoration consisting of 31.9 acres of reef creation (spat on shell, oyster castles and gabions). Non-federal sponsors are New York Harbor School and NYC Parks.

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(3) Head of Jamaica Bay. Habitat restoration consisting of 10.1 acres of reef creation (spat on shell and gabions). Non-federal sponsor is NYCDEP.

4. The NER plan includes post-construction monitoring and adaptive management at each site for a period of five years to ensure project performance. Since the project purpose is aquatic ecosystem restoration, there is no need for habitat mitigation.

5. There will be multiple construction non-federal partners to implement the features described above. At October 2019 prices, the total project first cost of the NER Plan is estimated to be \$408,868,000. The non-federal responsibility for operation and maintenance of the nonstructural and nonmechanical elements of each restoration site shall cease ten years after ecological success has been determined in accordance with Section 2039 of the Water Resources Development Act of 2007, P.L. 110-114, as amended (33 U.S.C. 2330a). The non-federal costs include the value of lands, easements, rights-of-way, relocations and dredged or excavated material disposal areas estimated at \$7,328,570 for the recommended plan.

6. Based on a 2.75-percent interest rate and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be \$15,566,171. Average annual OMRR&R costs are estimated to be approximately \$118,074. The total OMRR&R costs are estimated to be \$4,225,365. Ecosystem restoration benefits for the recommended plan include generating an estimated 339 average annual habitat units.

7. The goals and objectives included in the Environmental Operating Principles and Campaign Plan of the U.S. Army Corps of Engineers have been integrated into the Hudson-Raritan Ecosystem Restoration Feasibility Study process. The recommended plan has been designed to avoid or minimize environmental impacts while maximizing the ecosystem benefits relative to costs.

8. The Draft Feasibility Report and Environmental Assessment was reviewed by the sponsors and public and received tremendous support by all parties. The recommended plan was developed in coordination and consultation with federal, state, and local agencies.

9. In accordance with ER 1100-2-8126 *Incorporating Sea Level Change in Civil Works Programs*, the study evaluated potential impacts of sea level change in formulating and engineering the recommended plans. The risk reduction system and ecosystem restoration features being proposed are based on the intermediate Relative Sea Level Rise (RSLR) projection. However, the USACE will continue to monitor local conditions and determine if the intermediate scenario of RSLR is occurring. If observed conditions deviate from intermediate to high sea level forecasts during design or construction, reevaluation of the NER Plan will be required.

10. In accordance with the Corps of Engineers Circular (EC 1165-2-217) on the review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and rigorous review process to ensure technical quality. This includes a District Quality Control

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review, an Agency Technical Review (ATR), an Independent External Peer Review (IEPR) (Type 1), and a Corps Headquarters policy and legal review. The IEPR was completed by Battelle Memorial Institute. All comments from the above referenced reviews have been addressed and incorporated into the final documents. Overall, the reviews resulted in improvements to the technical quality of the report.

11. Washington level review indicates that the project recommended by the reporting officers is technically sound, environmentally and socially acceptable, and cost effective. The plan complies with all essential elements of the U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Land related resources implementation studies and complies with other administrative and legislative policies and guidelines. Also, the views of interested parties, including federal, state and local agencies have been considered.

12. I concur with the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that the interim plan for ecosystem restoration for Hudson-Raritan Estuary be authorized at an estimated project first cost of \$408,868,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies. The cost of the plan recommended in this report would be cost shared in accordance with Section 103 of the Water Resources Development Act of 1986, as amended (33 U.S.C. 2213), with a non-federal share of 35 percent of total NER costs. Applying these requirements, the federal portion (65%) is estimated at \$265,764,000 and the non-federal portion share (35%) estimated at \$143,104,000. In making this recommendation, I have carefully considered the unique aspects of the project. This recommendation is subject to the non-federal sponsor(s) agreeing to comply with all applicable federal laws and policies, including that it will:

a. Provide a minimum of 35 percent of initial project costs assigned to ecosystem restoration as further specified below:

(1) Provide, during design, 35 percent of design costs allocated to ecosystem restoration in accordance with the terms of a design agreement entered into prior to commencement of design work for the project;

(2) Provide all lands, easements, rights-of-way, and perform or assure performance of all relocations, including utility relocations, as determined by the federal government to be necessary for the initial construction, operation, and maintenance of the project(s), all in compliance with applicable provisions of the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601-4655) and the regulations contained in 49 C.F.R. Part 24;

(3) Provide, during construction, any additional amounts necessary to make its total contribution equal to 35 percent of initial project costs assigned to ecosystem restoration;

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b. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, rehabilitation, and replacement of the project and any betterments, except for damages due to the fault or negligence of the United States or its contractors;

c. Shall not use the ecosystem restoration features or lands, easements, and rights-of-way required for such features as a wetlands bank or mitigation credit for any other project.

d. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project lands, easements, and rights-of-way or the addition of facilities which might reduce the outputs produced by the ecosystem restoration features, hinder operation and maintenance of the project, or interfere with the project's proper function;

e. For so long as the project remains authorized, operate, maintain, repair, rehabilitate, and replace the project, or functional portions of the project, including any mitigation features, at no cost to the government, in a manner compatible with the project's authorized purposes and in accordance with applicable federal and state laws and regulations and any specific directions prescribed by the government.

f. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-federal sponsor with prior specific written direction, in which case the non-federal sponsor shall perform such investigations in accordance with such written direction;

g. Assume, as between the Federal Government and the non-federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project;

h. Agree, as between the Federal Government and the non-federal sponsor, that the non-federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, rehabilitate, and replace the project in a manner that will not cause liability to arise under CERCLA.

13. The recommendation contained herein reflects the information available at this time and current departmental policies governing the formulation of individual projects. It does not reflect

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program and budgeting priorities inherent in the formulation of a national Civil Works construction program or the perspective of higher review levels within the Executive Branch. Consequently, the recommendation may be modified before it is transmitted to Congress as a proposal for authorization and implementation funding. However, prior to transmittal to Congress, the sponsor, the state, interested federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

TODD T. SEMONITE
Lieutenant General, USA
Chief of Engineers