



**US Army Corps
of Engineers®**
New York District

**WESTCHESTER COUNTY STREAMS,
BYRAM RIVER BASIN**

FLOOD RISK MANAGEMENT FEASIBILITY STUDY

FAIRFIELD COUNTY, CONNECTICUT AND WESTCHESTER COUNTY, NEW YORK

**FINAL INTEGRATED FEASIBILITY REPORT &
ENVIRONMENTAL IMPACT STATEMENT**

APPENDIX A.2:

Section 404 (b)(1) Evaluation

*Byram River Basin Flood Risk Management Feasibility Study,
Village of Port Chester, Westchester County, NY and Town of Greenwich,
Fairfield County, CT*

Section 404 (b)(1) Evaluation

I. Introduction

This 404(b)(1) summarizes the evaluation of effects the proposed action will have on water resources pursuant to the Clean Water Act Section 404(b)(1) guidelines. The proposed action involves the implementation of flood risk management measures in the Town of Greenwich, Fairfield County, CT, and the Village of Port Chester, Westchester County, NY. Specifically, the project involves the removal of the existing Route 1 bridge decks that cross the Byram River and replacing them with similar decks at an elevation approximately three feet higher in elevation to manage fluvial flooding risk. As part of the bridge removal/replacement, the existing center abutments will be removed. The abutments to the new bridge decks will be installed along the banks of the Byram River. Minor channel improvements consisting of grading will be required to bring the portion of the channel where the center abutment is removed to existing grade. In addition, scour protection in the form of riprap is proposed around the toe of the new concrete abutments.

For a full description of the project, existing conditions and environmental impacts, refer to the draft Feasibility Report/Environmental Impact Statement (draft Feasibility Report/EIS).

PROJECT DESCRIPTION

- a. Location: Byram River, Town of Greenwich, Fairfield, CT, and Village of Port Chester, Westchester County, NY.
- b. General Description: The project involves the removal and replacement of the two existing Route 1 bridge decks over the Byram River to manage flood risk.
- c. Authority and Purpose: The study was authorized by the Committee on Transportation and Infrastructure Docket 2779, dated May 2, 2007. The purpose of the study is to provide flood risk management to communities within the Byram River watershed.
- d. General Description of Fill Material:
 - 1) Characteristics of Material: a) Removal of stone abutments; b) replacement of existing stone abutments along the riverbanks with concrete abutments; c) riprap to provide scour protection around the new abutments; and d) in situ substrate will be used to bring the portion of the channel within the footprint of the former center abutment to grade.
 - 2) Quantity of Material: a) Approximately 3,732 cy of concrete to create the new abutments; b) 1,320 cy of riprap to be used for scour protection; and c) approximately 0.064 cy of in situ substrate to bring the portion of the channel within the footprint of the former center abutments to grade.
 - 3) Source of Material: Riprap to be used for scour protection around the new bridge abutments will be obtained from a state approved and permitted commercial source. The concrete used to construct the two new bridge abutments will be obtained from a reputable and licensed manufacturer.
- e. Description of the Proposed Discharge Sites

- 1) Location: The discharge site is located within the portion of the portion of the Byram River where it transitions from freshwater to tidal approximately 1.7 miles upstream from the confluence with Long Island Sound.
- 2) Size: Approximately 300 ft of the Byram River will be disturbed during construction of the proposed action.
- 3) Type of Site: The proposed action is in a heavily urbanized area and is located within the portion of the Byram River where it transitions from freshwater to tidally influenced. The surrounding area is comprised of Route 1, a major interstate, and businesses.
- 4) Types of Habitat: The proposed action is located in a combination of riverine unconsolidated bottom with a tidal influence, and estuarine/subtidal unconsolidated bottom.

Time and Duration of Disposal: The total construction duration is estimated at approximately two years.

- f. Description of Disposal Method: Land based construction equipment will be used to construct the project. The project will also be sequenced to minimize in water work to the extent possible.

II. FACTUAL DETERMINATION

a. Physical Substrate Determinations

Substrate Evaluation, Sediment Type and Slope: The substrate of the Byram River within the project area of the proposed action is predominantly comprised of muck and silt with exposed gravel bars. Streambank slopes in this location range from vertical retaining walls to approximately 1.5V:1H.

- 1) Dredged/Fill Material Movement: Approximately 300 linear feet of the Byram River channel will experience disturbance as a result of the proposed action. Approximately 0.05 acres of open water will be impacted from the removal of the existing stone abutments along the streambanks and the installation of new, concrete abutments. Approximately 0.04 acres of open water will be filled as a result of installation of riprap for scour protection. Approximately 0.02 acres of open water habitat will be restored to natural conditions as a result of removing the center abutments of the north and south bridges.
- 2) Physical Effects on Stream Bottom: A total of approximately 0.09 acres of channel substrate will be converted to concrete and riprap as a result of the installation of the new abutments. However, approximately 0.02 acres of open water will be restored through the removal of the center abutments of each bridge.
- 3) Other Effects: N/A
- 4) Actions Taken to Minimize Impacts: Measures to be implemented to minimize adverse impacts to substrate include: a) implementation of erosion and sediment control best management practices, including turbidity curtains and cofferdams; b) on-site restoration of temporary work spaces; c) post construction site restoration actions such as streambank stabilization with native vegetation.

b. Water Circulation, Fluctuation and Salinity Determinations

- 1) Water, Consider Effects on:

- (a) Salinity: No effect
- (b) Water Chemistry: There may be minor changes to water chemistry as a result of suspended sediment during construction. Long term changes to water chemistry is not expected.
- (c) Clarity: Water clarity within the Byram River may be slightly to moderately impacted during construction, particularly during installation and removal of the cofferdams. However, no long-term effect is anticipated.
- (d) Color: Minor impacts associated with turbidity may affect water color during construction. Erosion and sediment control best management practices including the installation of turbidity barriers and cofferdams implemented during construction to minimize suspension of sediment that could cause discoloration.
- (e) Odor: There may be some minor emissions of foul odor when the work area is dewatered and the existing substrate is exposed. However, this is expected to be temporary and will cease once the sediment dries. No long term effects are anticipated.
- (f) Taste: The Byram River is not used as water supply so this policy does not apply.
- (g) Dissolved Gas Levels: Dissolved oxygen levels may be reduced to some degree during construction, but this will be a temporary effect. The installation of turbidity curtains and the cofferdams during construction, and the restoration of disturbed areas with native vegetation after construction will reduce sedimentation and pollutant runoff which can have detrimental impacts to dissolved oxygen levels.
- (h) Nutrients: There may be a minor increase to nutrient load within the Byram River as a result of resuspension of sediments during construction, particularly installation and removal of the cofferdams. However, this will be temporary and will return to normal levels once construction ends.
- (i) Eutrophication: Eutrophication is not expected to occur during construction due the implementation of erosion and sediment control best management practices.
- (j) Others as Appropriate: No other adverse impacts are anticipated from the project.

2) Current Patterns and Circulation:

- (a) Current Patterns and Flow: The purpose of the proposed action is to increase capacity of the channel during flood events in order to manage flood risk. The installation of the bridge decks and replacement of the existing abutments with abutments along the streambank will prevent water from backing up. In addition, the removal of the center abutment will allow the river to more naturally flow during low flow events. No significant long term adverse impacts are expected from the proposed action.
- (b) Velocity: Normal velocities are not expected to appreciably increase or decrease as a result of the proposed action. There may be minor, localized changes with velocities when the center abutments are removed, but the change is expected to be negligible.
- (c) Stratification: The project will not impact stratification.
- (d) Hydrologic Regime: The proposed action will not change normal daily or seasonal water level fluctuations.

- 3) Normal Water Level Fluctuations: The proposed action will not have any permanent adverse impacts on typical baseflow fluctuations. The elevation of the bridge decks and removal of the center abutment will increase the storage capacity of river during storm events to manage flood risk. The proposed action is not expected to appreciably increase or decrease normal tidal fluctuations.

- 4) Salinity Gradients: The proposed action will have no significant adverse impacts on salinity gradients within the Byram River.
- 5) Actions Taken to Minimize Impacts: Measures to be implemented to minimize adverse impacts include: a) implementation of erosion and sediment control best management practices, including turbidity cofferdams; and b) adhering to an in-water work restriction from 1 January – 30 June to anadromous fish species.
- 6) Suspended Particulate/Turbidity Determinations.
 - 1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Sites: Minor increases in particle suspension and turbidity during construction; primarily during installation of the cofferdams.
 - 2) Effects on Chemical/Physical Properties of the Water Column:
 - (a) Light Penetration: Minor adverse impacts may occur within the project area during construction of the channel modifications within the Byram River due to turbid conditions.
 - (b) Dissolved Oxygen: Dissolved oxygen levels may be reduced during construction; however, the implementation of cofferdams will minimize this potential.
 - (c) Toxic Metals and Organics: There is a slight potential that construction activities may disturb sediments contaminated with organics. Erosion and sediment controls such as silt fence, turbidity curtains, and cofferdams will be employed during construction to minimize the risk.
 - (d) Pathogens: Given the urban nature of the Byram River, there is a potential that the sediments within these waterbodies could contain pathogens such as e. coli that could be transported downstream during construction. This potential will be minimized through conducting the work in the dry through the use of cofferdams.
 - (e) Aesthetics: Resuspension of sediment during construction activities may have a temporary negative impact to aquatic aesthetics. However, the implementation of erosion and sediment control best management practices will limit this impact to the immediate project area, which is located in areas where the land use consists of business/industrial development. No adverse impacts to aesthetics will occur once construction is completed.
 - (f) Others as Appropriate: Not applicable
 - 3) Effects on Biota:
 - (a) Primary Production, Photosynthesis: Removal of vegetation along river banks can reduce the amount of organic material within the river that aquatic species use for food/cover/spawning. This could likely occur within Byram River, given that there is a modest riparian zone. However, the overall impact on the river system will be minor.
 - (b) Suspension/ Filter Feeders: Construction activities could create turbid conditions that would temporarily impact suspension/filter feeders. Erosion and sediment control best management practices, including the installation of turbidity curtains and cofferdams, will be implemented during construction to reduce sedimentation to the portion Byram River downstream of the project area. No permanent adverse impact is expected.
 - (c) Sight Feeders: There may be temporary adverse impacts to sight feeders during the installation and removal of the cofferdams although this will be a temporary impact.

- 4) Actions Taken to Minimize Impacts: Measures to be implemented to minimize adverse impacts include: a) implementation of erosion and sediment control best management practices, including turbidity barriers and cofferdams; b) adhering to an in-water work restriction from 1 January through 30 June to anadromous fish species; and c) restoration of disturbed areas with native vegetation.
- c. Contaminant Determinations: Based on a review of existing available data, there are no known hazardous, toxic waste or radioactive sites within the project area. All fill material will be clean, come from state approved and permitted sites, and will not pose a risk.
- d. Aquatic Ecosystem and Organism Determinations.
 - 1) Effects on Plankton: An increase in sedimentation/nutrients during construction may increase some plankton species such as algae. Erosion and sediment control best management practices will be implemented to reduce this potential.
 - 2) Effects on Benthos: Mortality of benthic species within the immediate footprints of the proposed action is expected during construction activities. However, this impact is expected to be temporary as recruitment of benthic species from undisturbed areas of the Byram River is expected to occur subsequent of construction.
 - 3) Effects on Nekton: Mobile aquatic life is expected to move away from the area during construction.
 - 4) Effects on Aquatic Food Web: The project will have temporary adverse impacts on the food web as a result of turbidity during construction. Permanent impacts include the filling in of approximately 0.09 acres of open water. Approximately 0.02 acres of natural channel and substrate will be restored resulting from the removal of the existing central abutments and disturbed areas will be replanted with native vegetation after construction which will provide food sources and support the aquatic food web. Therefore, significant permanent significant adverse impacts are not expected from implementation of the project.
 - 5) Effects on Special Aquatic Sites:
 - (a) Sanctuaries and Refuges: Not applicable
 - (b) Wetlands: There are no wetlands within the project area.
 - (c) Mudflats: Not applicable
 - (d) Vegetated Shallows: Not applicable
 - (e) Coral Reefs: Not applicable
 - (f) Riffle and Pool Complexes: The footprint of the proposed action is predominantly limited to areas that have already experienced modification and does not have uniform riffle and pool complexes. Therefore, the proposed action will not have any permanent adverse impacts on this type of aquatic habitat. The removal of the center bridge abutments may facilitate the formation of riffle and pool complexes in the river given that a more natural flow regime may be restored.
 - 6) Threatened and Endangered Species: The proposed action may remove potential summer roosting habitat for the federally threatened northern long-eared bat. A tree clearing restriction from 1 April through 30 September will be implemented during construction to protect these species. There are no threatened and/or endangered aquatic species known to occur within the project area.

- 7) Other Wildlife: The project will mainly have temporary adverse impacts to wildlife. Minor adverse temporal impacts to wildlife will occur as a result of the removal of mature vegetation that is used for nesting, shelter and foraging. A shrub and tree clearing restriction from 1 April through 31 August will be implemented to comply with the Migratory Bird Treaty Act will protect these species. An in-water work restriction from 1 January through 30 June will be implemented to protect anadromous fish species.
- 8) Actions to Minimize Impacts: Measures to be implemented to minimize adverse impacts include: a) implementation of erosion and sediment control best management practices, including cofferdams; b) adhering to shrub and tree clearing restrictions from 1 April through 30 September to protect federal endangered and threatened bat species as well as migratory bird species; and c) adhering to an in-water work restriction from 1 January through 30 June to protect anadromous fish species.

e. Proposed Disposal Site Determinations

- 1) Mixing Zone: Not applicable
- 2) Determination of Compliance with Applicable Water Quality Standards: All fill used to construct the project will be comprised of clean material that meets water quality standards and comes from a state approved and permitted source.
- 3) Potential Effects on Human Use Characteristic:
 - (a) Municipal and Private Water Supply: The Byram River is not used for water supply. Therefore, there will be no significant adverse impacts to the water supply.
 - (b) Recreational and Commercial Fisheries: The Byram River does not support any recreational or commercial fisheries. In addition, there are no access points for recreational fishing within the project area. Therefore, significant adverse impacts to recreational and/or commercial fisheries is not expected.
 - (c) Water Related Recreation: The Byram River does not support any water-based recreation within the project area. Therefore, the proposed action will not significant adverse impacts on water related recreation.
 - (d) Aesthetics: The aesthetics of the project area will be adversely impacted during construction activities due to the presence of construction equipment and clearing and excavation activities. However, the majority of the proposed action is located in areas comprised of business and industrial land use.

The Route 1 bridges are on the National Register and are of a stone arch design. The new bridges will attempt to recreate the original aesthetics through the use of a stone façade or reclamation of the original stone to minimize impacts to the aesthetics of the bridges.

- (e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves:

The William James Gateway Memorial Park is immediately adjacent to the northbound Route 1 bridge. During construction, temporary closures to the sidewalk near the park may occur to ensure public safety near the work zone. Alternate access to the main park feature, the pump house pavilion, will be provided. In addition, minor grading may be required on the northern end of the park property to match the new grade of the bridge. However, this will not affect the ability to use the pump house pavilion. Access to the river through William James Memorial Park during construction will not be impeded.

There are no National and Historical monuments, seashores, wilderness areas or research sites within the immediate project area.

- f. Determination of Cumulative Effects on the Aquatic Ecosystem: The proposed action will have negligible cumulative impacts on the aquatic ecosystem. Mitigation measures proposed in the above sections will minimize cumulative impacts.
- g. Determination of Secondary Effects on the Aquatic Ecosystem: No secondary effects on the aquatic ecosystem are expected from this project.

III. FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE.

- a. No significant adaptation of the Section 404(b)(1) guidelines was made relative to this evaluation.
- b. The objective of flood risk management within the Byram River watershed necessitates the removal and replacement of the Route 1 bridges.
- c. The proposed activity will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.
- d. The proposed disposal operations will not harm any endangered species or their critical habitats under the Endangered Species Act of 1973.
- e. The proposed discharge of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife will not be significantly affected.
- f. Appropriate steps to minimize potential adverse impacts of the discharge of fill material include the implementation of an erosion and sediment control plan and judicious engineering practices.